OKLAHOMA
STATE DEPARTMENT of EDUCATION
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STATE SUPERINTENDENT of PUBLIC INSTRUCTION

Oklahoma School Testing Program (Grades 3–8 and 10)

2016–17 TECHNICAL REPORT

APRIL 27, 2018

measured progress

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TABLE OF CONTENTS

CHAPTER 1 OVERVIEW OF THE OKLAHOMA SCHOOL TESTING PROGRAM

1.1 PURPOSE OF THE OKLAHOMA SCHOOL TESTING PROGRAM

The Oklahoma School Testing Program (OSTP) assessments are state-mandated criterion-referenced tests that measure student proficiency in specific content areas. Each test has the purpose of measuring the student's knowledge relative to the Oklahoma Academic Standards (OAS), Oklahoma's content standards (Appendix A). OSTP assessments are also used for state and federal accountability and reporting. In spring 2017, the OSTP assessments were administered to all eligible students in grades 3–8 and 10. The OSTP covered: mathematics and English language arts (ELA) for grades 3–8 and 10; science for grades 5, 8, and 10; and U.S. history based upon high school course completion. Along with the operational tests (OP), other form variations were administered for the OSTP: breach forms used as a replacement form in cases of large-scale security breaches or cheating, Braille forms, and large-print forms administered when accommodations were needed.

Measured Progress was contracted by the Oklahoma State Department of Education (SDE) to develop and administer the OSTP.

1.2 PURPOSE OF THIS REPORT

This volume is intended to be one source of information to Oklahoma K–12 educational stakeholders (including testing coordinators, educators, parents/guardians, and other interested citizens) about the development, implementation, scoring, reporting, and technical attributes of the OSTP grades 3–8 and 10 assessments. Other sources of information regarding the OSTP grades 3–8 and 10 tests include the administration manual *OSTP 2016–17 Test Preparation Manual*, interpretation materials, implementation materials, training materials for administrators, schools, and teachers, and parent guides found at ok.gov/sde/assessment-administrator-resources-administrators. Technical manuals from previous assessment administrations may be found at sde.ok.gov/sde/documents/2014-08-29/OSTP-technical-manuals-archive.

This technical report summarizes the development and administration procedures along with the research data analyses conducted on the OSTP grades 3–8 and 10 test administrations and provides data-based evidence that supports the validity and reliability of the tests. The purpose of this report is to provide objective information regarding technical aspects of the OSTP grades 3–8 and 10 assessments in support of score interpretations (AERA et al., 2014) by specifying the technical details of the work accomplished from fall 2016 through the end of spring 2017 on these tests.

Because interpretations of test scores, and not a test itself, are evaluated for validity, each chapter contributes an important component in the investigation of score validation: test design and development

(Chapter 3); test administration (Chapter 4); scoring (Chapter 5); item analysis (Chapter 6); scaling and equating (Chapter 7); reliability (Chapter 8); and score reporting (Chapter 9).

1.3 VALIDATION FRAMEWORK

The *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 2014) refers to validity as the degree to which "evidence and theory support the interpretations of test scores entailed by proposed uses of tests." Additionally, Messick (1989) defines validity as "an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores and other modes of assessment." Both definitions emphasize evidence and theory to support inferences and interpretations of test scores.

In addition to the statements above, the Oklahoma State Department of Education defined specific assertions about the OSTP assessments. These assertions, or claims, are statements that connect aspects of the assessment process to the intended purposes of the assessments. Statement and identification of these claims lead into organization and presentation of supporting evidence from across the entire testing process, which begins to form a validation framework inspired by argument-based validation approaches (Bachman & Palmer, 2010; Mislevy, Almond, & Lukas, 2004).

- Claim 1: the assessments are reliable, valid, and aligned to the Oklahoma Academic Standards.
- Claim 2: student performance resulting from the assessments is comparable to results of other high-quality large-scale assessments
- Claim 3: the assessment results facilitate norm-referenced and criterion-referenced score interpretations
- Claim 4: the OSTP assessments provide a measure of future academic performance to assessments administered in high school

Chapter 10 summarizes the validity evidence in support of the claims, as provided across the chapters in this Technical Report.

CHAPTER 2 CURRENT YEAR UPDATES

On July 1, 2016, a new bill (HB 3218) went into effect that makes several changes to Oklahoma's student assessment and accountability system, including high school graduation requirements. The most significant change is that it is no longer a state requirement for Oklahoma students to pass End-of-Instruction exams in order to graduate with a standard high school diploma. HB 3218 directed the State Board of Education to establish a new system of assessments that **students entering Grade 9 in 2017–2018** will be required to take to graduate with a standard diploma. The End-of-Instruction (EOI) exams and Achieving Classroom Excellence (ACE) graduation requirements were repealed as of July 1, 2016. During the 2016–17 year, tenth graders took assessments in ELA, math and science. The tenth grade test will not be given in future years. Beginning with the 2017–18 year, grade 11 students will take either the ACT or the SAT and a grade 11 science content assessment to determine college/career readiness and high school accountability.

2.1 EXCERPTS FROM THE ASSESSMENT SYSTEM AND ASSESSMENT REQUIREMENTS REPORT:

Please see the following link for the full report: Assessment System and Assessment Requirements Full Report

2.1.1 Executive Summary

The Oklahoma Legislature directed the State Board of Education (OSBE) to evaluate Oklahoma's current state assessment system and make recommendations for its future. As a result, the Oklahoma State Department of Education (OSDE) held regional meetings across the state and convened the Oklahoma Assessment and Accountability Task Force to deliberate over many technical, policy, and practical issues associated with implementing an improved assessment system. The 95 Task Force members met four times between August 4 and October 18, 2016.

This report presents the results of those deliberations in the form of recommendations from the OSDE to the Oklahoma State Board of Education (OSBE).

2.1.2 House Bill 3218

In June 2016, Oklahoma Governor Mary Fallin signed House Bill 3218 (HB 3218), which relates to the adoption of a statewide system of student assessments. HB 3218 required the OSBE to study and develop assessment recommendations for the statewide assessment system. The House Bill specifically tasks the OSBE, in consultation with representatives from the Oklahoma State Regents for Higher Education, the Commission for Educational Quality and Accountability, the State Board of Career and Technology Education, and the Secretary of Education and Workforce Development, to study and develop assessment requirements. Additionally, HB 3218 requires the State Board to address accountability requirements under

ESSA, which will be presented in a separate report for accountability. This report focuses specifically on the assessment requirements of HB 3218, which include the degree to which the Oklahoma assessment:

- Aligns to the Oklahoma Academic Standards (OAS);
- Provides a measure of comparability among other states;
- Yields both norm-referenced and criterion-referenced scores;
- Has a track record of statistical reliability and accuracy; and
- Provides a measure of future academic performance for assessments administered in high school.

2.1.3 Collecting Feedback from Regional Engage Oklahoma Meetings and the Oklahoma Task Force

Prior to convening Oklahoma's Assessment and Accountability Task Force, the OSDE held regional meetings in Broken Arrow, Sallisaw, Durant, Edmond, Woodward, and Lawton. These meetings yielded responses on various questions addressing the desired purposes and types of assessments. This regional feedback was incorporated in the discussions with the Oklahoma Assessment and Accountability Task Force. The Task Force included 95 members who represented districts across the state, educators, parents, business and community leaders, tribal leaders, and lawmakers. Additionally, members from the Oklahoma State Regents for Higher Education, the Commission for Educational Quality and Accountability, the State Board of Career and Technology Education, and the Secretary of Education and Workforce Development were also represented on the Task Force. For a complete list of Task Force members, please refer to Appendix A of this report. (To view this appendix please review the Assessment System and Assessment Requirements Full Report.)

On four occasions, the members of the Task Force met with experts in assessment and accountability to consider each of the study requirements and provide feedback to improve the state's assessment and accountability systems. Two of those experts also served as the primary facilitators of the Task Force: Juan D'Brot, Ph.D., from the National Center for the Improvement of Educational Assessment (NCIEA) and Marianne Perie, Ph.D., from the University of Kansas' Achievement and Assessment Institute. These meetings occurred on August 4 and 5, September 19, and October 18, 2016. At each meeting, the Task Force discussed the elements of HB 3218, research and best practices in assessment and accountability development, and feedback addressing the requirements of HB 3218. This feedback was subsequently incorporated into OSDE's recommendations to the OSBE.

2.1.4 Key Summative Assessment Recommendations

Oklahoma's Assessment and Accountability Task Force and the OSDE recognized that assessment design is a case of optimization under constraints[1]. In other words, there may be many desirable purposes, uses, and goals for assessment, but they may be in conflict. Any given assessment can serve only a limited number of purposes well. Finally, assessments always have some type of restrictions (e.g., legislative requirements, time, and cost) that must be weighed in finalizing recommendations. Therefore, a critical early activity of the Task Force was to identify and prioritize desired characteristics and intended uses for a new Oklahoma statewide summative assessment for OSDE to consider.

Upon consolidating the uses and characteristics, the facilitators returned to the Task Force with draft goals for the assessment system. The Task Force provided revisions and input to these goals. Facilitators then presented the final goals to the Task Force. Once goals were defined, the desired uses and characteristics were clarified within the context of the Task Force's goals. The members of the Task Force agreed to the following goals for OSDE to consider for Oklahoma's assessment system:

1. Provide instructionally useful information to teachers and students with appropriate detail (i.e., differing grain sizes for different stakeholder groups) and timely reporting;
2. Provide clear and accurate information to parents and students regarding achievement and progress toward college- and career-readiness (CCR) using an assessment that is meaningful to students;
3. Provide meaningful information to support evaluation and enhancement of curriculum and programs; and
4. Provide information to appropriately support federal and state accountability decisions.

Following discussion of the Oklahoma assessment system's goals, the Task Force worked with the facilitators to articulate feedback for the grade 3-8 and high school statewide summative assessments. This feedback was subsequently incorporated into the OSDE's recommendations to the State Board. These recommendations are separated into those for grades 3-8 and those for high school.

2.1.5 Recommendations for Assessments in Grades 3-8

The feedback provided by the Task Force and subsequently incorporated by the OSDE for grades 3-8 can be grouped into four categories: Content Alignment and Timing, Intended Purpose and Use, Score Interpretation, and Reporting and State Comparability. The OSDE's recommendations are presented below.

[1] To view this footnote please review the Assessment System and Assessment Requirements Full Report.

2.1.5.1 CONTENT ALIGNMENT AND TIMING

- Maintain the focus of the new assessments on the Oklahoma Academic Standards (OAS) and continue to administer them at the end of grades 3 through 8; and
- Include an adequate assessment of writing to support coverage of the Oklahoma English Language Arts (ELA) standards.

2.1.5.2 INTENDED PURPOSE AND USE

- Ensure the assessment can support calculating growth for students in at least grades 4-8 and explore the potential of expanding growth to high school depending on the defensibility of the link between grade 8 and high school assessments and intended interpretations; and
- Ensure the assessment demonstrates sufficient technical quality to support the intended purposes and current uses of student accountability (e.g., promotion in grade 3 based on reading and driver's license requirements on the grade 8 ELA assessments).

2.1.5.3 SCORE INTERPRETATION

- Provide a measure of performance indicative of being on track to CCR, which can inform preparation for the Oklahoma high school assessment;
- Support criterion-referenced interpretations (i.e., performance against the OAS) and report individual claims including but not limited to scale score[2], Lexile[3], Quantile[4], content cluster[5], and growth[6] performance; and
- Provide normative information to help contextualize the performance of students statewide such as intra-state percentiles.

2.1.5.4 REPORTING AND STATE COMPARABILITY

- Support aggregate reporting on claims including but not limited to scale score, Lexile, Quantile, content cluster, and growth performance at appropriate levels of grain size (e.g., grade, subgroup, teacher, building/district administrator, state); and
- Utilize the existing National Assessment of Educational Progress (NAEP) data to establish statewide comparisons at grades 4 and 8. NAEP data should also be used during

[2] A scale score (or scaled scores) is a raw score that has been transformed through a customized set of mathematical procedures (i.e., scaling and equating) to account for differences in difficulty across multiple forms and to enable the score to represent the same level of difficulty from one year to the next.
[3] A score developed by MetaMetrics that represents either the difficulty of a text or a student's reading ability level.
[4] A score developed by MetaMetrics that represents a forecast of or a measure of a student's ability to successfully work with certain math skills and concepts.
[5] A content cluster may be a group of items that measures a similar concept in a content area on a given test.
[6] Growth can be conceptualized as the academic performance of the same student over two or more points in time. This is different from improvement, which is change in performance over time as groups of students matriculate or when comparing the same collection of students across time (e.g., Grade 3 students in 2016 and Grade 3 students in 2015).

standard- setting[7] activities to ensure the CCR cut score is set using national and other state data.

2.1.6 Recommendations for Assessments in High School

The feedback provided by the Task Force and subsequently incorporated by the OSDE can be grouped into four categories: Content Alignment and Timing, Intended Purpose and Use, Score Interpretation, and Reporting and State Comparability. The OSDE's recommendations are presented below.

2.1.6.1 CONTENT ALIGNMENT AND TIMING

- Use a commercial off-the-shelf college-readiness assessment (e.g., SAT, ACT) in lieu of state-developed high school assessments in grades 9 or 10; and
- Consider how assessments measuring college readiness can still adequately address assessment peer review requirements, including but not limited to alignment.

2.1.6.2 INTENDED PURPOSE AND USE

- Ensure the assessment demonstrates sufficient technical quality to support the need for multiple and differing uses of assessment results;
- Explore the possibility of linking college-readiness scores to information of value to students and educators (e.g., readiness for postsecondary, prediction of STEM readiness, remediation risk);
- Maintain a focus on rigorous expectations of college and career-readiness that are not lessened by tying assessments to graduation requirements or course grades; and
- Ensure that all students in the state of Oklahoma can be provided with a reliable, valid, and fair score, regardless of accommodations provided or the amount of time needed for a student to take the test. Ensure that scores reflecting college readiness can be provided universally to the accepting institution or employer of each student.

2.1.6.3 SCORE INTERPRETATION

- Support criterion-referenced interpretations (i.e., performance against the OAS) and report individual claims appropriate for high school students;
- Provide evidence to support claims of CCR. These claims should be (1) supported using theoretically related data in standard-setting activities (e.g., measures of college readiness and other nationally available data) and (2) validated empirically using available postsecondary data linking to performance on the college-readiness assessment; and

[7] The process through which subject matter experts set performance standards, or cut scores, on an assessment or series of assessments.

- Provide normative information to help contextualize the performance of students statewide such as intra-state percentiles.

2.1.6.4 REPORTING AND STATE COMPARABILITY

- Support aggregate reporting on claims at appropriate levels of grain size for high school assessments (e.g., grade, subgroup, teacher, building/district administrator, state); and
- Support the ability to provide norm-referenced information based on other states that may be administering the same college-ready assessments, as long as unreasonable administration constraints do not inhibit those comparisons.

2.1.7 Key Considerations for Summative Assessment Recommendations

While the Task Force addressed a targeted set of issues stemming from HB 3218, the facilitators were intentional in informing Task Force members of three key areas that must be considered in large-scale assessment development and/or selection:

1. **Technical quality**, which serves to ensure the assessment is reliable, valid for its intended use, and fair for all students;
2. **Peer Review**, which serves as a means to present evidence of technical quality; and
3. **Accountability**, which forces the issue of intended purpose and use.

In the time allotted, the Task Force was not able to consider all of the constraints and requirements necessary to fully expand upon their feedback to the OSDE. The facilitators worked to inform the Task Force that the desired purposes and uses reflected in their feedback would be optimized to the greatest extent possible in light of technical- and policy-based constraints[8]. As historically demonstrated, we can expect that the OSDE will continue to prioritize fairness, equity, reliability, and validity as the agency moves forward in maximizing the efficiency of Oklahoma's assessment system. A more detailed explanation of the context and considerations for adopting OSDE's recommendations is provided in the full report below.

2.1.8 Conclusion

The conversations that occurred among Task Force members, assessment and accountability experts, and the OSDE resulted in a cohesive set of goals for an aligned comprehensive assessment system which includes state and locally selected assessments designed to meet a variety of purposes and uses. These goals are listed on page 9 of this report. (To view page 9 please review the Assessment System and Assessment

[8] To view this footnote please review the Assessment System and Assessment Requirements Full Report.

Requirements Full Report.)The feedback provided by the Task Force and the recommendations presented by the OSDE, however, are focused only on Oklahoma's statewide summative assessments.

While the OSDE's recommendations can be grouped into the four categories of (1) Content Alignment and Timing, (2) Intended Purpose and Use, (3) Score Interpretation, and (4) Reporting and State Comparability, it is important to understand how these recommendations address the overarching requirements outlined in HB 3218.

2.1.8.1 ALIGNMENT TO THE OAS.

Summative assessments used for accountability are required to undergo peer review to ensure the assessments are reliable, fair, and valid for their intended uses. One such use is to measure student progress against Oklahoma's college- and career-ready standards. The Task Force and department believe it is of vital importance that students have the opportunity to demonstrate their mastery of the state's standards. However, there is also a perceived need to increase the relevance of assessments, especially in high school. The Task Force and OSDE believe a state-developed set of assessments for grades 3-8 and a college- readiness assessment in high school would best support teaching and learning efforts in the state.

2.1.8.2 COMPARABILITY WITH OTHER STATES.

Throughout feedback sessions, Task Force meetings, and OSDE deliberations, the ability to compare Oklahoma performance with that of other states was considered a valuable feature of the assessment system. However, there are tensions among administration constraints, test design requirements, and the strength of the comparisons that may make direct comparisons difficult. Currently, Oklahoma can make comparisons using statewide aggregated data (e.g., NAEP scores in grades 4 and 8, college-

readiness scores in grade 11), but is unable to support comparisons at each grade. Task Force feedback and OSDE recommendations suggest leveraging available national comparison data beyond its current use and incorporating it into assessment standard-setting activities. This will allow the OSDE and its stakeholders to determine CCR cut scores on the assessment that reflect nationally competitive expectations.

2.1.8.3 NORM-REFERENCED AND CRITERION-REFERENCED SCORES.

Based on Task Force feedback, the OSDE confirmed that reported information supporting criterion-referenced interpretations (e.g., scale score, Lexile, Quantile, content cluster, and growth performance) are valuable and should continue to be provided in meaningful and accessible ways. Additional feedback and OSDE's recommendations note that norm-referenced interpretations would enhance the value of statewide summative assessment results by contextualizing student learning and performance. By working with a

prospective vendor, the OSDE should be able to supplement the information provided to stakeholders with meaningful normative data based on the performance of other Oklahoma students.

2.1.8.4 STATISTICAL RELIABILITY AND ACCURACY.

The technical quality of an assessment is an absolute requirement for tests intended to communicate student grade-level mastery and for use in accountability. The Standards for Educational and Psychological Testing[9] present critical issues that test developers and test administrators must consider during assessment design, development, and administration. While custom state-developed assessments require field testing and operational administration to accumulate evidence of statistical reliability and accuracy, the quality of the processes used to develop those assessments can be easily demonstrated by prospective vendors and the state. In contrast, off-the-shelf assessments should already have evidence of this, and the state can generalize their technical quality if the assessment is given under the conditions defined for the assessment. Thus, the technical quality of an assessment is a key factor in ensuring assessment results are reliable, valid, and fair.

2.1.8.5 FUTURE ACADEMIC PERFORMANCE FOR ASSESSMENTS ADMINISTERED IN HIGH SCHOOL.

As noted earlier in the report, there is a clear value in high school assessment results being able to predict future academic performance. Based on OSDE's recommendation of using a college-readiness assessment in high school, the state and its prospective vendor should be able to determine the probability of success in early post-secondary academics based on high school assessments.

However, the state and its prospective vendor should amass additional Oklahoma-specific evidence that strengthens the claims of likely postsecondary success. This can be supported both through standard-setting activities and empirical analyses that examine high school performance based on postsecondary success. The recommendations made to the OSDE in the previous section offer relatively fine-grain suggestions that can be interpreted through the lens of the HB 3218 requirements. These recommendations also reflect the Task Force's awareness of the three areas of technical quality, peer review requirements, and accountability uses, which were addressed throughout deliberations. Through regional meetings and in-depth conversations with the Task Force, the OSDE was able to critically examine the feedback provided and present recommendations to support a strong statewide summative assessment that examines the requirements of HB 3218 and seeks to maximize the efficiency of the Oklahoma assessment system in support of preparing students for college and careers.

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[9] AERA, APA, & NCME. (2014). Standards for Educational and Psychological Testing. Washington, DC: AERA.

2.1.8.6 ISSUES IN SUBSCORE REPORTING

Subscores serve as achievement reports on subsets of the full set of knowledge and skill represented by a total score. For example, many ELA summative assessments produce a total score for ELA, subscores for at least reading and writing, and often finer-grained subscores for topics such as informational and literary reading. Similarly, a mathematics test typically yields an overall math score and potential subscores in topics such as numbers and operations, algebraic reasoning, measurement and geometry, and statistics and probability. One of the greatest challenges in current large-scale summative assessment design is to create tests that are no longer than necessary to produce a very reliable total score (e.g., grade 5 mathematics) while yielding adequately reliable subscores to help educators and others gain more instructionally-relevant information than gleaned from just the total score.

Unfortunately, there is a little known aspect of educational measurement (outside of measurement professionals) that large-scale tests are generally designed to report scores on a "unidimensional" scale. This means the grade 5 math test, for example, is designed to report overall math performance, but not to tease out differences in performance on things like geometry or algebra because the only questions that survive the statistical review processes are those that relate strongly to the total score of overall math. If the test was designed to include questions that better distinguish among potential subscores, the reliability (consistency) of the total score would be diminished. There are "multidimensional" procedures that can be employed to potentially produce reliable and valid subscores, but these are much more expensive to implement and complicated to ensure the comparability of these subscores and the total score across years. The National Assessment of Educational Progress (NAEP) is the one example of a well-known assessment designed to produce meaningful results at the subscore level, but NAEP has huge samples to work with and more financial resources and psychometric capacity at its disposal than any state assessment. In other words, it is not realistic at this time to consider moving away from a unidimensional framework for Oklahoma's next statewide summative assessment, which means the subscores will unfortunately be much less reliable estimates of the total score than useful content-based reports. This is true for essentially all commercially-available interim assessments as well, so in spite of user reports they like assessment X or Y because it produces fine-grain subscores useful for instructional planning, any differences in subscores are likely due to error rather than anything educationally meaningful.

In spite of this widely-held knowledge by measurement professionals, every state assessment designer knows they need to produce scores beyond the total score otherwise stakeholders would complain they are not getting enough from the assessment. Recall, producing very reliable total scores is critical for accountability uses of statewide assessments and, all things being equal, the reliability is related to the number of questions (or score points) on a test.

Therefore, most measurement experts recommend having at least 10 score points for each subscore to achieve at least some minimal level of reliability, so statewide summative tests tend to get longer to accommodate subscore reporting. Therefore, one way to lessen the time required on the statewide summative assessment is to focus the summative assessment on reporting the total score and use the optional modules for districts that would like more detailed and accurate information about particular aspects of the content domain.

CHAPTER 3 TEST DESIGN AND DEVELOPMENT

3.1 GRADES 3–8 AND 10 ELA—OSTP ASSESSMENTS

3.1.1 Develop/Review/Approve Test Blueprints with DOK Percentages

Items on the ELA OSTP grades 3–8 and grade 10 tests were developed specifically for Oklahoma and are directly linked to the Oklahoma Academic Standards (OAS). The standards are the basis for the reporting categories developed for each content area and are used to help guide the development of test items. Each item is designed to measure a specific standard and objective. The test blueprints were developed by the SDE and test specifications were done in collaboration between Measured Progress and the SDE.

The test blueprints identify the amount of content covered on the tests and are based on the importance and coverage of the OAS in Oklahoma schools. The ideal test blueprints are provided by the SDE at their website: http://sde.ok.gov/sde/sites/ok.gov.sde/files/documents/files/ELA%20School%20Testing%20Program%20Blueprint%20NEW.pdf or see Appendix C.

The distribution of emphasis for the OSTP grades 3–8 and grade 10 ELA content standards is shown in Tables 3-1 through 3-3. As indicated in the tables below, the actual and ideal distributions of content standards on each assessment match perfectly. The ideal number of items aligned to each standard can be found in Appendix C.

Table 3-1. 2016–2017 OSTP: Distribution of Emphasis in Terms of Target Percentage of Test by Grade—Grades 3–5 OAS ELA Standards

Standard	Grade 3		Grade 4		Grade 5	
	Ideal Percentage	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*
2: Reading and Writing Process	40%	40%	32%	32%	32%	32%
3: Critical Reading and Writing	12%	12%	20%	20%	24%	24%
4: Vocabulary	24%	24%	24%	24%	20%	20%
5: Language	12%	12%	12%	12%	12%	12%
6: Research	12%	12%	12%		12%	12%
Total	100%	100%	100%	100%	100%	100%

Table 3-2. 2016–2017 OSTP: Distribution of Emphasis in Terms of Target Percentage of Test by Grade—Grades 6–8 OAS ELA Standards

Standard	Grade 6		Grade 7		Grade 8	
	Ideal Percentage	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*
2: Reading and Writing Process	36%	36%	36%	36%	28%	28%
3: Critical Reading and Writing	20%	20%	20%	20%	28%	28%
4: Vocabulary	20%	20%	16%	16%	16%	16%
5: Language	12%	12%	12%	12%	14%	14%
6: Research	12%	12%	16%	16%	14%	14%
Total	100%	100%	100%	100%	100%	100%

Table 3-3. 2016–2017 OSTP: Distribution of Emphasis in terms of Target Percentage of Test by Grade—Grade 10 OAS ELA Standards

Standard	Grade 10	
	Ideal Percentage	*Actual Percentage*
2: Reading and Writing Process	27–33%	28%
3: Critical Reading and Writing	28–33%	28%
4: Vocabulary	13–17%	13%
5: Language	13–17%	17%
6: Research	13–17%	13%
Total	100%	100%

Note: Percentages were rounded.

Each item on the OSTP grades 3–8 and grade 10 ELA tests is assigned a DOK level according to the cognitive demand of the item. DOK is not synonymous with difficulty. The DOK level rates the complexity of the mental processing a student must use to answer the question. The DOK levels and the percentage of items on the tests at each of the levels by grade are shown in the tables below.

Table 3-4. 2016–17 OSTP: ELA DOK Levels by Grade—Form A

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	15–30%	18%	65–80%	72%	5–10%	10%
4	10–20%	20%	65–75%	68%	5–15%	12%
5	5–15%	14%	70–85%	76%	5–20%	10%
6	5–15%	14%	70–85%	76%	10–20%	10%
7	5–15%	12%	70–85%	74%	10–20%	14%

continued

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
8	5–10%	12%	60–75%	66%	20–30%	22%
10	5–15%	12%	46–65%	56%	30–45%	32%

Table 3-5. 2016–17 OSTP: ELA DOK Levels by Grade—Form B

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	15–30%	22%	65–80%	68%	5–10%	10%
4	10–20%	20%	65–75%	66%	5–15%	14%
5	5–15%	14%	70–85%	76%	5–20%	10%
6	5–15%	12%	70–85%	76%	10–20%	12%
7	5–15%	12%	70–85%	74%	10–20%	14%
8	5–10%	12%	60–75%	68%	20–30%	20%
10	5–15%	7%	46–65%	63%	30–45%	30%

Table 3-6. 2016–17 OSTP: ELA DOK Levels by Grade—Form C

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	15–30%	18%	65–80%	72%	5–10%	10%
4	10–20%	18%	65–75%	68%	5–15%	14%
5	5–15%	12%	70–85%	68%	5–20%	20%
6	5–15%	14%	70–85%	72%	10–20%	14%
7	5–15%	10%	70–85%	78%	10–20%	12%
8	5–10%	12%	60–75%	64%	20–30%	24%
10	5–15%	10%	46–65%	58%	30–45%	32%

Table 3-7. 2016–17 OSTP: ELA DOK Levels by Grade—Breach

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	15–30%	18%	65–80%	72%	5–10%	10%
4	10–20%	20%	65–75%	68%	5–15%	12%
5	5–15%	14%	70–85%	76%	5–20%	10%
6	5–15%	14%	70–85%	76%	10–20%	10%
7	5–15%	12%	70–85%	74%	10–20%	14%

continued

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
8	5–10%	12%	60–75%	66%	20–30%	22%
10	5–15%	12%	46–65%	56%	30–45%	32%

DOK 1 RECALL: requires students to recall, observe, question, or represent facts or simple skills or abilities. It requires only surface understanding of text, often verbatim recall. Level 1 activities include supporting ideas by reference to details in the text; using a dictionary to find meaning; identifying figurative language in a passage; and identifying the correct spelling or meaning of words.

DOK 2 SKILL/CONCEPT: requires processing beyond recall and observation; requires both comprehension and subsequent processing of text; and involves ordering and classifying text, as well as identifying patterns, relationships, and main points. Level 2 activities include using context to identify unfamiliar words; predicting logical outcomes; identifying and summarizing main points; applying knowledge of conventions of Standard American English; composing accurate summaries; and making general inferences and predictions for a portion of a text.

DOK 3 STRATEGIC THINKING: requires students to go beyond the text; requires students to explain, generalize, and connect ideas; involves inferencing, prediction, elaboration, and summary; and requires students to support positions using prior knowledge and to manipulate themes across passages. Level 3 activities include determining the effect of the author's purpose on text elements; summarizing information from multiple sources; critically analyzing literature; composing focused, organized, coherent, purposeful prose; and making explanatory and descriptive inferences and interpretations across an entire passage.

3.1.2 Test and Item Specification Development

Multiple-choice items were developed for administration in grades 3–8 and grade 10 in ELA. Each item requires approximately one minute for most students to answer. This item type affords efficient use of limited testing time and allows coverage of a wide range of knowledge and skills. Included in grade 10 ELA were evidence-based selected-response (EBSR) items that appeared as two-part (A and B) multiple-choice items that required the students to provide evidence to support what was chosen in Part A. At grades 5, 8, and 10, the writing portion of the ELA tests was assessed with extended responses that were associated with passages. Responses were scored with rubrics that assessed ideas and development; organization, unity, and coherence; word choice; sentences, and paragraphs; and grammar, usage, and mechanics. Previous test items released for public use are provided by the SDE (see http://sde.ok.gov/sde/assessment-material).

The test framework for ELA in grades 3–8 and grade 10 is based on the OAS, and each item on the grades 3–8 and 10 OSTP ELA tests are designed to measure a specific standard and objective. The measure of

Oklahoma students' level of proficiency responding to a variety of items linked to grade-level ELA content standards are identified in the OAS. The OAS are organized into five content standards, as shown in Table 3-8 below.

Table 3-8. 2016–17 OSTP: OAS ELA Content Standards

Grades 3–8 and10
Standard 2 Reading and Writing Process
Standard 3 Critical Reading and Writing
Standard 4 Vocabulary
Standard 5 Language
Standard 6 Research

3.1.3 Passage Development

Grade-level passages contain identifiable key concepts with relevant supporting details. Each passage is appropriate for determining the purpose for reading; analyzing character traits; compare/contrast; problem/solution; interpretation; application; analysis; synthesis; drawing conclusions; making an inference; being conducive for vocabulary analogies; and relevant reading tasks as defined by the OAS for the specific grade level.

The passages have a variety of sentence types and lengths, may include dialogue, reflect Oklahoma's cultural diversity, and possess sufficient structural integrity to allow them to be self-contained. Passages reflect a balance of genres from literary and expository texts as shown in Table 3-9. The majority of the selections used for the ELA test include authentic literature; a minor portion may be selected from commissioned works.

All passages were reviewed to eliminate cultural or other forms of bias that might disadvantage any group(s) of students. The passages avoid subject matter that might prompt emotional distress. Permissions to use selections from copyrighted material are obtained as necessary. For the 2016–2017 administration, grade-level passages for grades 6–8 were developed that would provide students with opportunities to apply their knowledge of grammar and rhetorical style as defined by the OAS for the specific grade level. All of the passages used to assess the language standard were selected from commissioned works.

The selected reading and grammar passages are at the appropriate grade level. The readability level of all passages is evaluated using recognized readability formulas. The formulas chosen for each grade vary according to the purpose for which the formula was developed. Appropriate readability formulas for all ELA passages include the Flesch-Kincaid Rating, the Dale-Chall Readability Rating, or any other formulas considered reliable.

In addition, sentence structure, length, vocabulary, content, visuals, and organization were reviewed when selecting appropriate grade-level passages. The teacher panel that reviewed the passages provided the final evaluation used to make a decision in regards to the readability of a passage.

The vocabulary words tested in OSTP come directly from the passage content. Words used for vocabulary items have sufficient surrounding context clues for the reader to determine the meaning. Students may encounter words in the text that are not tested but are above the student's grade placement. In grades 3–5, these challenging words and their definitions may be placed in a word box above the story or article. In grades 6–8 and 10, the definitions of challenging words may be placed in footnotes.

No single source is available to determine the reading level of various words. Therefore, the appropriateness and difficulty of a word is determined in various ways. Vocabulary words are checked in the following sources: *EDL Core Vocabularies in Reading, Mathematics, Science, and Social Studies*; *Basic Reading Vocabularies*; *The Living Word*; or other reliable readability sources. In addition to using the aforementioned printed resources to assist in creating vocabulary items, each vocabulary item was approved by Oklahoma's Content Review Committee. The committee, composed of Oklahoma educators from across the state, reviewed proposed vocabulary items for grade-level appropriateness. ELA tests have vocabulary at grade level. In all other tests, the vocabulary level is below the grade being tested except for content words. Grades 3 and 4 will be one grade level below, and grades 5, 6, 7, 8, and 10 will be two grade levels below.

Table 3-9. 2016–17 OSTP: Grades 3–8 and 10 Passage Types

Grades	Literary	Expository
3–5	contemporary realistic fiction, historical fiction, modern fantasy, poetry, drama, and traditional stories (legends, myths, fairy tales, and fables)	informational, biography, autobiographies, and functional text
6–7	short story, novel excerpt, drama, poetry, fable, folk tale, mystery, and myth	informational, biography, autobiographies, and functional text
8	short story, novel excerpt, drama, lyric poetry, historical fiction, fable, folk tale, mystery, myth, limericks, tall tales, and plays	informational, biography, autobiographies, and functional text
10	short story, novel excerpt, drama, lyric poetry, historical fiction, fable, folk tale, mystery, myth, limericks, tall tales, and plays	informational, biography, autobiographies, and functional text

3.1.4 Item Development

To determine the multiple-choice item development necessary for the ELA OSTP 2016–17, a realignment of the existing Oklahoma item bank to the new OAS standards was conducted. From there, gap analyses were done to identify deficits for particular standards/objectives, and item counts were determined to address those deficits during development. Except for items associated to standard 5, all items were developed to legacy passages. The following table shows the number of items developed per grade.

Table 3-10. 2016–2017 OSTP: ELA Items Developed per Grade

Grade	*Item Development Numbers for Standards 2, 3, 4, and 6*	*Item Development Numbers for Standard 5*
3	48	24
4	54	24
5	30	24
6	16	24
7	22	24
8	19	28
10	15	N/A

All newly developed ELA items were pre-reviewed by the SDE before items were submitted to an Item Review Committee made up of Oklahoma educators. Committee members only reviewed newly developed items/passages; none of the items/passages taken from the legacy item bank were reviewed by the committee. Committee members were provided a DOK training prior to reviewing the items. During the item review, committee members arrived at consensus of the appropriate DOK that should be applied to a particular item. Results of the ELA Item Review Committee meetings conducted August 24–25, 2016 (Standard 5) and October 3–5, 2016 (Standards 2, 3, 4, and 6) are presented in Table 3-11. Item Review Committees accepted 100% of Standard 5 items and 100% of items associated with Standards 2, 3, 4, and 6.

Table 3-11. 2016–2017 OSTP: ELA Item Review Results

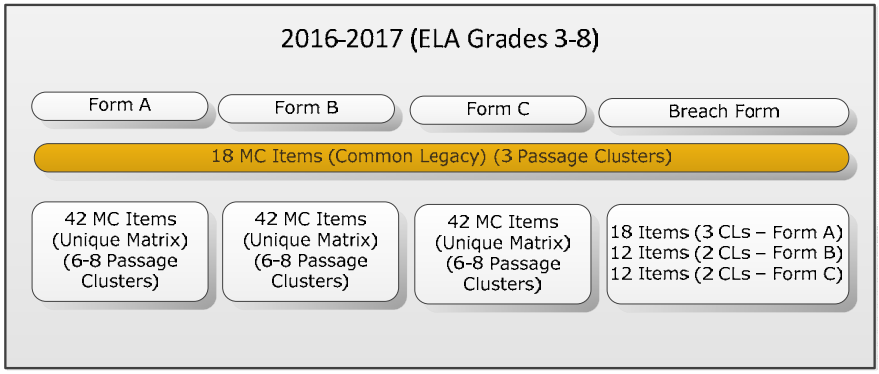
Grade	Item Review Results for Standards 2, 3, 4, and 6			Item Review Results for Standard 5		
	Accepted	*Rejected*	*Total*	*Accepted*	*Rejected*	*Total*
3	48	0	48	24	0	24
4	54	0	54	24	0	24
5	30	0	30	24	0	24
6	16	0	16	24	0	24
7	22	0	22	24	0	24
8	20	0	20	24	0	24
10	15	0	15	28	0	28

3.1.5 Spring 2017 Test Design and Development (Operational Field Test With Linking Items Across Forms and Replacement Slots)

The OSTP ELA tests were structured using both operational items (designated to contribute to a student's score) and embedded field-test items (not designated to contribute to the student's score) as noted in figure 3-1. Operational items were taken by all students in a given grade level. Across the three operational and breach forms that were constructed, there were common linking items that all forms shared, plus unique items associated with each particular form. Student scores were based only on operational items.

In the 2016–2017 administration, each form included 60 multiple-choice items of which 50 items contributed to the student's score and 10 were field-test items (did not contribute to the student's score). Eighteen items were common across all the forms and 42 of the 60 items were unique to each form. Each form contained 4 MetaMetrics items that were used as part of a Lexile linking study. Each student was administered only one form of the test and therefore answered a portion of all available field-test items. Field-test items were not distinguishable to students. Because all students participated in the field test, an adequate sample size was provided to produce reliable data that can be used to inform item selection for future tests. Figure 3-1 below illustrates the ELA test designs for grades 3–8.

Figure 3-1. 2016–2017 OSTP: ELA Grades 3–8 Test Design



The student experience for the 2016–2017 OSTP ELA tests for grades 3–8 and 10 is shown in Tables 3-12 through 3-14. In grades 3–8 all students experience 60 multiple-choice items addressing either single or paired passaged. In addition, in grades 5 and 8 students also experience a writing prompt addressed to a paired passage. In grade 10 all students experience 68 multiple-choice items addressing either single or paired passages, two EBSR items, and a writing prompt addressing paired passages.

Table 3-12. 2016–2017 OSTP: ELA Grades 3–8 and 10 Student Test Experience

	Operational Items Across Forms							
	WP		*MC*		*EBSR*		*Total*	
	Items	Pts	Items	Pts	Items	Pts	Items	Pts
G3–4	0	0	50	50	0	0	50	50
G5	1	5	50	50	0	0	51	55
G6–7	0	0	50	50	0	0	50	50
G8	1	7	50	50	0	0	51	57
G10	1	10	58	58	2	4	61	72

WP = Writing Prompt, MC = Multiple-Choice, EBSR = Evidence Based Selected Response

Table 3-13. 2016–2017 OSTP: ELA Grades 3–8 and 10 Student Test Experience

	Field-Test Items					
	MC		*EBSR*		*Total*	
	Items	Pts	Items	Pts	Items	Pts
G3–4	10	10	0	0	10	10
G5	10	10	0	0	10	10
G6–7	10	10	0	0	10	10
G8	10	10	0	0	10	10
G10	10	10	0	0	10	10

WP = Writing Prompt, MC = Multiple-Choice, EBSR = Evidence Based Selected Response

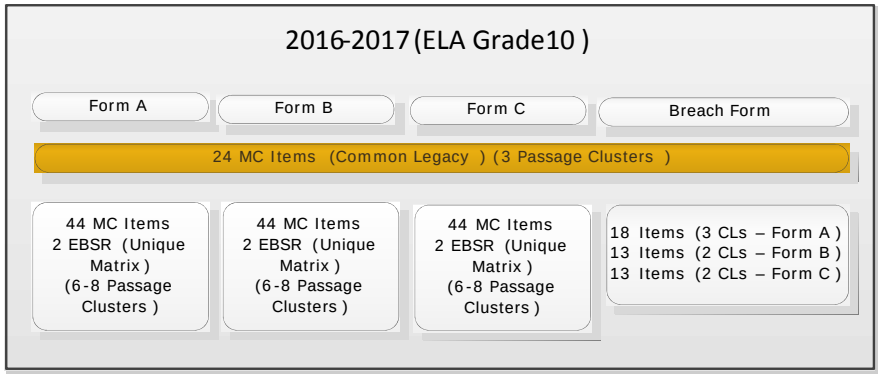
Table 3-14. 2016–2017 OSTP: ELA Grades 3–8 and 10 Student Test Experience

	Operational and Field-Test Items							
	WP		*MC*		*EBSR*		*Total*	
	Items	Pts	Items	Pts	Items	Pts	Items	Pts
G3–4	0	0	60	60	0	0	60	60
G5	1	5	60	60	0	0	61	65
G6–7	0	0	60	60	0	0	60	60
G8	1	7	60	60	0	0	61	67
G10	1	10	68	68	2	4	71	82

WP = Writing Prompt, MC = Multiple-Choice, EBSR = Evidence Based Selected Response

Figure 3-2 below illustrates the ELA test design for grade 10.

Figure 3-2. 2016–2017 OSTP: ELA Grade 10 Test Design



3.1.6 Writing (Grades 5, 8, and 10)

Students at grades 5, 8, and 10 were assessed on their ability to write for varied purposes and audiences in a specific mode. Student responses received a writing composite score that reflected how well the students integrated writing techniques to produce a good essay. Each piece of student writing was given five analytical scores that focused on specific writing skills. These ratings ranged from 4 (the highest score) to 1 (the lowest score). A weighted composite score, calculated from these analytic scores, contributed to each student's overall ELA scaled score.

3.1.7 Performance Level Descriptor Development

Performance Level Descriptors (PLDs) provide a narrative account of the knowledge, skills, and abilities demonstrated by students in each level of achievement. PLDs describe what students know and are able to do based on OAS. They inform stakeholders of how to interpret student test scores in relation to the OAS. The PLDs are typically used for standard setting and score reporting. The ELA PLDs can be found in Appendix D.

By law (State Statute: Title 70. Schools, Chapter 22- Testing and Assessment, Section 1210.541- Student Performance Levels and Cut Scores-Accountability System) the following are required:

- The Commission for Educational Quality and Accountability shall determine and adopt a series of student **performance levels** and the corresponding cut scores pursuant to the Oklahoma School Testing Program Act.
- The Commission for Educational Quality and Accountability shall have the authority to set cut scores using any method which the State Board of Education was authorized to use in setting cut scores prior to July 1, 2013.
- The **performance levels** shall be set by a method that indicates students are ready for the next grade, course, or level of education, as applicable.
- The Commission for Educational Quality and Accountability shall establish panels to review and revise the performance level descriptors for each content area and grade level. The Commission shall ensure that the criterion-referenced tests developed and administered by the State Board of Education pursuant to the Oklahoma School Testing Program Act in grades 3–8, and the tests administered at the high school level, are vertically aligned by content across grade levels to ensure consistency, continuity, alignment, and clarity.

The Commission shall adopt **performance levels** that are labeled and defined as follows:

- **Advanced**, which shall indicate that students demonstrate superior performance on challenging subject matter;
- **Proficient**, which shall indicate that students demonstrate mastery over appropriate grade-level subject matter and that students are ready for the next grade, course, or level of education, as applicable;

- **Limited Knowledge**, which shall indicate that students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level or course; and
- **Unsatisfactory**, which shall indicate that students have not performed at least at the limited knowledge level.

In February of 2017, Oklahoma educators assembled in content and grade band groups to draft the new ELA PLDs that would be used at the August 2017 Standard Setting meetings. Educators drafted the Proficient level first and reached an initial consensus before addressing the Advanced and Limited Knowledge levels. Educators determined the appropriate content and skills that should be added to each PLD level and made sure that student performance expectations increased as the levels increased. Once a consensus was reached by the content grade-band groups, representatives of each content grade-band group met to ensure vertical articulation of the PLDs across performance levels and grades. The PLDs from these committees were submitted to the SDE for final approval.

3.1.8 Reading Sufficiency Act (RSA)

The purpose of the Reading Sufficiency Act (RSA) is to ensure that all Oklahoma students are reading on grade level at the end of third grade (a critical juncture when students go from learning to read, to reading to learn). As part of meeting the requirements of the RSA, student performance on a subset of 32 items on the OSTP ELA will be used as one of the criteria to determine student readiness to be promoted to the fourth grade. These 32 items measure ELA Standard 2: Reading and Writing Process and Standard 4: Vocabulary. Separate PLDs were developed to support standard setting and score reporting for RSA requirements as follows:

- **Meets RSA Criteria** – Third grade students meeting the RSA criteria are performing at grade level on the reading portion of the Oklahoma School Testing Program (OSTP) Grade 3 English Language Arts assessment.
- **Does Not Meet RSA Criteria** – Third grade students not meeting the RSA criteria are not performing at grade level on the reading portion of the Oklahoma School Testing Program (OSTP) Grade 3 English Language Arts assessment.

3.1.9 Data Review

A conference call/WebEx between the SDE and Measured Progress was conducted to review the content of Spring 2017 ELA field-test items that were flagged due to psychometric criteria. Table 3-15 shows the criteria used for reviewing the flagged items.

Table 3-15. 2016–2017 OSTP: ELA Flagged Item Criteria

Statistic	*Flagging for Dichotomous Items*	*Flagging for Polytomous Items*
Item Difficulty (p-value)	Below 0.2 may be too difficult; Above 0.9 may be too easy	Below 0.2 may be too difficult; Above 0.9 may be too easy
Item Discrimination (corrwtotal)	Generally, 0.20 or higher is desired; Must be >0.10; Negative or zero values should not be used. For values between 0.10 and 0.20, difference between corrwtotal and any distractor option correlation value must be ≥ 0.09	Must be ≥ 0.40
Differential Item Functioning (DIF)	Values +/-C are serious DIF that must be looked at closely; +/-B values indicate moderate DIF that may warrant inspection	Values +/-C are serious DIF that must be looked at closely; +/-B values indicate moderate DIF that may warrant inspection

Statistics for flagged field-test items were reviewed by considering item difficulty (*p*-value), item discrimination (corrwtotal), and DIF. Decisions were made whether flagged items should or should not be included in the Oklahoma item bank for future operational use. Results of the Data Review meeting are presented in table 3-16. A total of 218 ELA items were flagged for review due to psychometric criteria with 93% being accepted.

Table 3-16. 2016–2017 OSTP: ELA Data Review Results

Grade	*Accepted*	*Rejected*	*Total*
3	20	0	20
4	19	0	19
5	19	1	20
6	19	1	20
7	19	1	20
8	17	2	19
English 2*	47	3	50
English 3*	43	7	50

* These items were developed prior to implementation of the OAS; grade 10 ELA items were selected as appropriate from this group.

3.1.10 Alignment Study

The Human Resources Research Organization (HumRRO) conducted an external, independent alignment study of the OSTP ELA tests. The alignment study included a review and analysis of the ELA tests administered at grades 3–8 and 10 to the OAS for ELA. The alignment study was done in order to meet both state and federal accountability requirements related to the SDE's use of the OSTP. The alignment study provided one form of evidence supporting the validity of the state assessment system. The alignment results indicated whether the assessments represented the full range of the content standards and that the assessments measured student knowledge in the same manner and at the same level of complexity as specified in the content standards.

To conduct the study, HumRRO facilitated a review of the alignment between the OSTP ELA and the OAS for ELA by panels (one per grade band per content area) of Oklahoma educators. Following the reviews and examination of the alignment, HumRRO analyzed the results and prepared a report that was submitted to SDE. The complete report can be found in Appendix E.

3.1.11 Linking Study/MetaMetrics

The 2016–17 OSTP included a MetaMetrics linking study designed to be able to report student reading ability as Lexile measures. For the MetaMetrics study, four Lexiles for reading linking items were provided by MetaMetrics and embedded in each of the three operational forms in place of four ELA "field-test" (replacement) item slots. In order to develop a valid link, the proposed MetaMetrics design essentially doubled the number of test forms (e.g., A1, A2, B1, B2, C1, C2) in order to provide the slots necessary for 24 Lexiles for reading linking items.

The linking study was developed in two phases:

1. Calibration of Oklahoma items to Lexile scales using the Lexile linking items as anchor items.
2. Linear link between Oklahoma scaled scores and Lexile measures based on the Oklahoma item calibrations.

The results of this study can be found in Appendix F.

3.2 GRADES 3–8 AND 10 MATHEMATICS—OSTP ASSESSMENTS

3.2.1 Develop/Review/Approve Test Blueprints with DOK Percentages

Items on the mathematics OSTP grades 3–8 and grade 10 were developed specifically for Oklahoma and are directly linked to the OAS. The standards are the basis for the reporting categories developed for each content area and are used to help guide the development of test items. Each item is designed to measure a specific standard and objective. Existing blueprints and test specifications were not developed by Measured Progress.

The test blueprints identify the amount of content covered on the tests and are based on the importance and coverage of the OAS in Oklahoma schools. The ideal test blueprints are provided by the SDE on their website: http://sde.ok.gov/sde/sites/ok.gov.sde/files/documents/files/Mathematics%20School%20Testing%20Program%20Blueprint%20NEW.pdf or see Appendix C.

The distribution of emphasis for the OSTP grades 3–8 and grade 10 mathematics content standards is shown in Tables 3-17 through 3-19. As indicated in the tables below, the actual and ideal distributions of content standards on each assessment match perfectly. The actual number of items aligned to each standard can be found in Appendix C.

Table 3-17. 2016–2017 OSTP: Distribution of Emphasis in Terms of Target Percentage of Test by Grade—Grades 3–5 OAS Mathematics Standards

Standard	Grade 3		Grade 4		Grade 5	
	Ideal Percentage	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*
Number and Operations	46%	46%	44%	44%	46%	46%
Algebraic Reasoning and Algebra	14%	14%	16%	16%	18%	18%
Geometry and Measurement	28%	28%	28%	28%	24%	24%
Data and Probability	12%	12%	12%	12%	12%	12%
Total	100%	100%	100%	100%	100%	100%

Table 3-18. 2016–2017 OSTP: Distribution of Emphasis in Terms of Target Percentage of Test by Grade—Grades 6–8 OAS Mathematics Standards

Standard	Grade 6		Grade 7		Grade 8	
	Ideal Percentage	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*
Number and Operations	40%	40%	20%	20%	18%	18%
Algebraic Reasoning and Algebra	22%	22%	30%	30%	46%	46%
Geometry and Measurement	24%	24%	30%	30%	20%	20%
Data and Probability	14%	14%	20%	20%	16%	16%
Total	100%	100%	100%	100%	100%	100%

Table 3-19. 2016–2017 OSTP: Distribution of Emphasis in Terms of Target Percentage of Test by Grade—Grade 10 Mathematics Standards

Standard	Grade 10	
	Ideal Percentage	*Actual Percentage*
Number and Operations	10%	10%
Algebraic Reasoning and Algebra	40%	40%
Functions	30%	30%
Data and Probability	10%	10%
Geometry	10%	10%
Total	100%	100%

Each item on the OSTP grades 3–8 and grade 10 mathematics tests is assigned a DOK level according to the cognitive demand of the item. DOK is not synonymous with difficulty. The DOK level rates the complexity of the mental processing a student must use to answer the question. The DOK levels and the percentage of items on the tests at each of the levels by grade are shown in Tables 3-20 through 3-23 below.

Table 3-20. 2016–17 OSTP: Mathematics DOK Levels by Grade—Form A

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	40–50%	44%	45–55%	46%	5–10%	10%
4	25–35%	32%	60–70%	60%	5–15%	8%
5	20–30%	22%	65–75%	68%	5–15%	10%

continued

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
6	15–25%	24%	65–75%	66%	10–20%	10%
7	15–25%	22%	65–75%	64%	10–20%	14%
8	10–20%	16%	65–75%	66%	15–25%	18%
10	10–20%	16.7%	65–75%	66.7%	15–25%	16.7%

Table 3-21. 2016–17 OSTP: Mathematics DOK Levels by Grade—Form B

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	40–50%	44%	45–55%	50%	5–10%	6%
4	25–35%	28%	60–70%	64%	5–15%	8%
5	20–30%	24%	65–75%	66%	5–15%	10%
6	15–25%	20%	65–75%	70%	10–20%	10%
7	15–25%	24%	65–75%	66%	10–20%	10%
8	10–20%	18%	65–75%	66%	15–25%	16%
10	10–20%	18.3%	65–75%	65%	15–25%	16.7%

Table 3-22. 2016–17 OSTP: Mathematics DOK Levels by Grade—Form C

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	40–50%	44%	45–55%	46%	5–10%	10%
4	25–35%	30%	60–70%	60%	5–15%	10%
5	20–30%	20%	65–75%	68%	5–15%	12%
6	15–25%	24%	65–75%	66%	10–20%	10%
7	15–25%	20%	65–75%	66%	10–20%	14%
8	10–20%	14%	65–75%	70%	15–25%	16%
10	10–20%	18.3%	65–75%	65%	15–25%	16.7%

Table 3-23. 2016–17 OSTP: Mathematics DOK Levels by Grade—Breach

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
3	40–50%	44%	45–55%	48%	5–10%	8%

continued

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
4	25–35%	34%	60–70%	60%	5–15%	6%
5	20–30%	20%	65–75%	66%	5–15%	14%
6	15–25%	24%	65–75%	66%	10–20%	10%
7	15–25%	24%	65–75%	66%	10–20%	10%
8	10–20%	16%	65–75%	68%	15–25%	16%
10	10–20%	15%	65–75%	70%	15–25%	15%

DOK1 RECALL AND REPRODUCTION: requires the student to recall facts, terms, definitions, or simple procedures, and to perform simple algorithms or apply formulas. One-step, well-defined, or straight algorithmic procedures should be included at this level.

DOK2 SKILLS AND CONCEPTS: requires the student to make some decisions as to how to approach the problem or activity. Level 2 activities include: making observations and collecting data; classifying, comparing, and organizing data; and organizing and displaying data in tables, charts, and graphs.

DOK3 STRATEGIC THINKING: requires reasoning, planning, using evidence, and a higher level of thinking. Level 3 activities include making conjectures, drawing conclusions from observations, citing evidence and developing a logical argument for concepts, explaining phenomena in terms of concepts, and using concepts to solve nonroutine problems.

3.2.2 Test and Item Specification Development

Multiple-choice items were administered in grades 3–8 and grade 10 in mathematics. Multiple-choice items require students to demonstrate a wide range of knowledge and skill. Each item requires approximately one minute for most students to answer. This item type affords efficient use of limited testing time and allows coverage of a wide range of knowledge and skills. In addition, technology-enhanced items (TEIs) were developed at grades 6–8 and 10. TEIs are used to more authentically address some aspects of the OAS performance expectations and/or provide more opportunity for students to construct rather than select their response. Interaction types are: match, hot-spot, drag-and-drop, and drop-down. Each TEI contains only one interaction type per item. Previous test items released for public use are provided by the SDE (see www.ok.gov/sde/documents/2013-09-05/blueprints-plds-item-specs).

The test framework for mathematics at grades 3–8 and grade 10 were based on the OAS. Each item on the grades 3–8 and grade 10 OSTP tests was designed to measure a specific standard and objective. The measure of Oklahoma students' level of proficiency responding to a variety of items linked to grade-level mathematics content standards are identified in the OAS. The mathematics objectives are organized into five content standards:

- Standard 1: Algebraic Reasoning: Patterns and Relationships
- Standard 2: Number Sense and Operation
- Standard 3: Geometry
- Standard 4: Measurement
- Standard 5: Data Analysis

3.2.3 Item Development

To determine the 2016–17 mathematics item development, a realignment of the existing Oklahoma item bank to the new OAS standards was done. From there, gap analyses were done to identify deficits for particular standards, and item counts were determined to address those deficits during development. Table 3-24 shows the number of items developed per grade:

Table 3-24. 2016–2017 OSTP: Mathematics Items Developed per Grade

Grade	*Item Development Numbers for Standards*
3	20
4	9
5	8
6	38
7	36
8	52
10	26

All newly developed mathematics items were pre-reviewed by the SDE before items were submitted to an Item Review Committee made up of Oklahoma educators. Committee members only reviewed newly developed items; none of the items taken from the legacy item bank were reviewed by the committee. Committee members were provided a DOK training prior to reviewing the items. During the item review, committee members arrived at consensus of the appropriate DOK that should be applied to a particular item. Results of the mathematics Item Review Committee meeting conducted in October of 2016 are presented in Table 3-25. Item Review Committees accepted 100% of mathematics items.

Table 3-25. 2016–2017 OSTP: Mathematics Item Review Results

Grade	Item Review Results for Standards 2, 3, 4, and 6		
	Accepted	*Rejected*	*Total*
3	48	0	48
4	54	0	54
5	30	0	30
6	16	0	16

continued

Grade	Item Review Results for Standards 2, 3, 4, and 6		
	Accepted	*Rejected*	*Total*
7	22	0	22
8	20	0	20
10	15	0	15

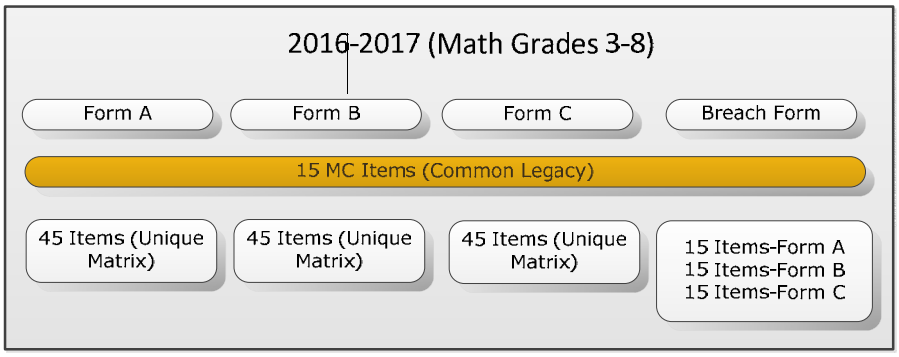
Following the reconciliation process during the Item Review Committee meeting in October 2016, SDE and MP content specialists met to review the forms for the Spring 2017 administration (operational field test). During these meetings all items to be included on forms were reviewed to ensure they were aligned to the OAS content standards and were of appropriate cognitive complexity.

3.2.4 Spring 2017 Test Design and Development (Operational Field Test With Linking Items Across Forms and Replacement Slots)

The OSTP mathematics tests were structured using both operational items (designated to contribute to a student's score) and embedded field-test items (not designated to contribute to the student's score). Operational items were taken by all students in a given grade level. Across the three operational and breach forms that were constructed, there were common linking items that all forms shared plus unique items associated with each particular form. Student scores were based only on operational items. During the 2016–2017 administration, in grades 3–8 each form included 60 multiple-choice items, of which 50 items contributed to the student's score and 10 did not contribute to the student's score. Fifteen items were common across all the forms and 45 of the 60 items were unique to each form. Each form contained three MetaMetrics items that were used as part of a Quantile linking study. Each student takes only one form of the test and therefore answers a portion of all available field-test items. Field-test items are not distinguishable to students. Because all students participate in the field test, an adequate sample size is provided to produce reliable data that can be used to inform item selection for future tests.

The number of unique forms and the number of common linking items for the 2016–2017 OSTP mathematics tests for grades 3–8 are shown in Figure 3-3 below.

Figure 3-3. 2016–2017 OSTP: Mathematics Grades 3–8 Test Design



The student experience for the 2016–2017 OSTP mathematics tests for grades 3–8 and 10 is shown in Tables 3-26 through 3-28 below.

In grades 3–5 all students experience 60 multiple-choice items, 15 multiple-choice items common to all forms and 45 unique items to each form.

In grades 6–8 all students experience 42 multiple-choice items and 3 technology-enhanced items. 15 multiple-choice items were common to all forms and 45 were unique to each form. In grade 10 all students experienced 66 multiple-choice items and 4 technology-enhanced items. 20 multiple-choice items were common to all forms and 50 were unique to each form.

Table 3-26. 2016–2017 OSTP: Mathematics Grades 3–8 and 10 Student Test Experience

	Operational Items Across Forms					
	MC		*TEI / PE*		*Total*	
	Items	Pts	Items	Pts	Items	Pts
G3–5	50	50	0	0	50	50
G6–8	47	47	3	3	50	50
G10	57	57	3	3	60	60

MC = Multiple-Choice, TEI = Technology Enhanced Item, PE = Paper Equivalent

Table 3-27. 2016–2017 OSTP: Mathematics Grades 3–8 and 10 Student Test Experience

	Field-Test Items					
	MC		*TEI / PE*		*Total*	
	Items	Pts	Items	Pts	Items	Pts
G3–5	10	10	0	0	10	10
G6–8	10	10	0	0	10	10
G10	9	9	1	1	10	10

MC = Multiple-Choice, TEI = Technology Enhanced Item, PE = Paper Equivalent

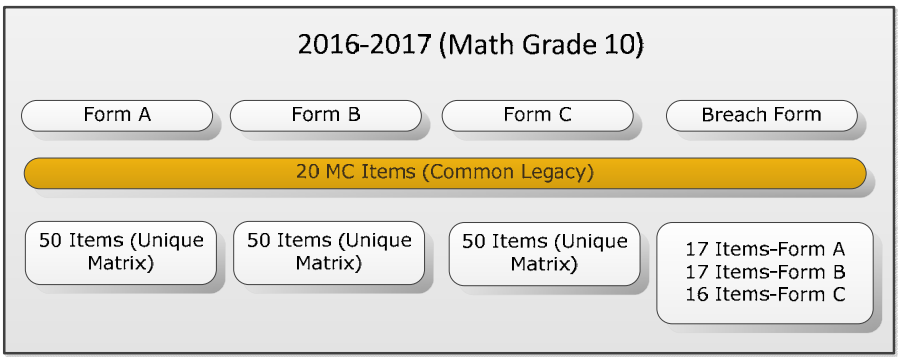
Table 3-28. 2016–2017 OSTP: Mathematics Grades 3–8 and 10 Student Test Experience

	Operational and Field-Test Items					
	MC		*TEI / PE*		*Total*	
	Items	Pts	Items	Pts	Items	Pts
G3–5	60	60	0	0	60	60
G6–8	57	57	3	3	60	60
G10	66	66	4	4	70	70

MC = Multiple-Choice, TEI = Technology Enhanced Item, PE = Paper Equivalent

The number of unique forms and the number of common linking items for the 2016–2017 OSTP mathematics tests for grade 10 are shown in Figure 3-4 below.

Figure 3-4. 2016–2017 OSTP: Mathematics Grade 10 Test Design



3.2.5 Performance Level Descriptor Development

PLDs provide a narrative account of the knowledge, skills, and abilities demonstrated by students in each level of achievement. PLDs describe what students know and are able to do based on the OAS. They inform stakeholders of how to interpret student test scores in relation to the OAS. The PLDs are typically used for standard setting and score reporting. The mathematics PLDs can be found in Appendix D.

By law (State Statute: Title 70. Schools, Chapter 22- Testing and Assessment, Section 1210.541- Student Performance Levels and Cut Scores-Accountability System) the following are required:

- The Commission for Educational Quality and Accountability shall determine and adopt a series of student **performance levels** and the corresponding cut scores pursuant to the Oklahoma School Testing Program Act.
- The Commission for Educational Quality and Accountability shall have the authority to set cut scores using any method which the State Board of Education was authorized to use in setting cut scores prior to July 1, 2013.

- The **performance levels** shall be set by a method that indicates students are ready for the next grade, course, or level of education, as applicable.
- The Commission for Educational Quality and Accountability shall establish panels to review and revise the performance level descriptors for each content area and grade level. The Commission shall ensure that the criterion-referenced tests developed and administered by the State Board of Education pursuant to the Oklahoma School Testing Program Act in grades 3–8, and the tests administered at the high school level, are vertically aligned by content across grade levels to ensure consistency, continuity, alignment, and clarity.

The Commission shall adopt **performance levels** that are labeled and defined as follows:

- **Advanced**, which shall indicate that students demonstrate superior performance on challenging subject matter;
- **Proficient**, which shall indicate that students demonstrate mastery over appropriate grade-level subject matter and that students are ready for the next grade, course, or level of education, as applicable;
- **Limited Knowledge**, which shall indicate that students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level or course; and
- **Unsatisfactory**, which shall indicate that students have not performed at least at the Limited Knowledge level.

In February of 2017, Oklahoma educators assembled in content and grade band groups to draft the new mathematics PLDs that would be used at the August 2017 Standard Setting meetings. Educators drafted the Proficient level first and reached an initial consensus before addressing the Advanced and Limited Knowledge levels. Educators determined the appropriate content and skills that should be added to each PLD level and made sure that student performance expectations increased as the levels increased. Once a consensus was reached by the content grade-band groups, representatives of each content grade-band group met to ensure vertical articulation of the PLDs across performance levels and grades. The PLDs from these committees were submitted to the SDE for final approval.

3.2.6 Data Review

A conference call/WebEx between the SDE and Measured Progress was conducted to review the content of Spring 2017 mathematics field-test items that were flagged due to psychometric criteria. The criteria used for reviewing the flagged items is shown in Table 3-29.

Table 3-29. 2016–2017 OSTP: Mathematics Flagged Item Criteria

Statistic	Flagging for Dichotomous Items	Flagging for Polytomous Items
Item Difficulty (*p*-value)	Below 0.2 may be too difficult; Above 0.9 may be too easy	Below 0.2 may be too difficult; Above 0.9 may be too easy
Item Discrimination (corrwtotal)	Generally, 0.20 or higher is desired; Must be >0.10; Negative or zero values should not be used. For values between 0.10 and 0.20, difference between corrwtotal and any distractor option correlation value must be ≥ 0.09	Must be ≥ 0.40
Differential Item Functioning (DIF)	Values +/-C are serious DIF that must be looked at closely; +/-B values indicate moderate DIF that may warrant inspection	Values +/-C are serious DIF that must be looked at closely; +/-B values indicate moderate DIF that may warrant inspection

Statistics for flagged field-test items were reviewed by considering item difficulty (*p*-value), item discrimination (corrwtotal), and DIF. Decisions were made whether flagged items should or should not be included in the Oklahoma item bank for future operational use. Results of the Data Review meeting are presented in table 3-30. A total of 271 mathematics items were flagged for review due to psychometric criteria with 97% being accepted.

Table 3-30. 2016–2017 OSTP: Mathematics Data Review Results

Grade	Accepted	Rejected	Total
3	18	2	20
4	19	1	20
5	20	0	20
6	20	0	20
7	20	0	20
8	20	0	20
Algebra 1	48	2	50
Geometry	52	0	52
Algebra 2	47	2	49

* These items were developed prior to implementation of the OAS; grade 10 mathematics items were selected as appropriate from this group.

3.2.7 Alignment Study

The Human Resources Research Organization (HumRRO) conducted an external, independent alignment study of the OSTP for mathematics also. The alignment study included a review and analysis of the mathematics tests administered at grades 3–8 and 10 to the OAS for mathematics. The alignment study was done in order to meet both state and federal accountability requirements related to the SDE's use of the OSTP. The alignment study provided one form of evidence supporting the validity of the state assessment system. The alignment results indicated whether the assessments represented the full range of the content standards

and that the assessments measured student knowledge in the same manner and at the same level of complexity as specified in the content standards.

To conduct the study, HumRRO facilitated a review of the alignment between the OSTP mathematics and the OAS for mathematics by panels (one per grade band per content area) of Oklahoma educators. Following the reviews and examination of the alignment, HumRRO analyzed the results and prepared a report that was submitted to the SDE. The complete report can be found in Appendix E.

3.2.8 Linking Study/MetaMetrics

The 2016–17 OSTP included a MetaMetrics linking study designed for reporting of student mathematics abilities as Quantile measures. The MetaMetrics study would embed three Quantiles for mathematics linking items, provided by MetaMetrics, in each of the three operational forms in place of three mathematics "field-test" (replacement) item slots. In order to develop a valid link, the proposed MetaMetrics design essentially doubles the number of test forms (e.g., A1, A2, B1, B2, C1, C2) in order to provide the slots necessary for 18 Quantiles for mathematics linking items. The items were provided by MetaMetrics and across-grade level items were used at each grade.

The linking study was developed in two phases:

1. Calibration of Oklahoma items to Quantile scales using the Quantile linking items as anchor items.
2. Linear link between Oklahoma scaled scores and Quantile measures based on the Oklahoma item calibrations.

The results of this study can be found in Appendix F.

3.3 Grades 5, 8, and 10 Science—OSTP Assessments

3.3.1 Develop/Review/Approve Test Blueprints With DOK Percentages

Items on the science OSTP grades 5, 8, and grade 10 tests were developed specifically for Oklahoma and are directly linked to the Oklahoma Academic Standards for Science (OAS-S). The standards are the basis for the reporting categories developed for each grade and are used to help guide the development of test items. Each item is designed to measure a specific Performance Expectation in the OAS-S. The test blueprints were developed in collaboration with Measured Progress and the SDE .

The test blueprints identify the amount of content covered on the tests and are based on the importance and coverage of the OAS-S in Oklahoma schools. The ideal test blueprints are provided by the

SDE on their website. For grades 5 and 8 science see: http://sde.ok.gov/sde/sites/ok.gov.sde/files/documents/files/Science%20School%20Testing%20Program%20Blueprint%20NEW.pdf; for grade 10 science see: http://sde.ok.gov/sde/sites/ok.gov.sde/files/documents/files/OSTP_2016-17_ItemSpecs_Sci_G10_interactive.pdf; these can also be found in Appendix C.

The distribution of emphasis for the OSTP grades 5, 8, and grade 10 assessable performance expectations is shown in Tables 3-31 and 3-32. As indicated in the tables below, the actual and ideal distributions of performance expectations on each assessment match perfectly. The actual number of items aligned to each objective can be found in Appendix C.

Table 3-31. 2016–2017 OSTP: Distribution of Emphasis in Terms of Target Percentage of Test by Grade—Grades 5 and 8 OAS-Science Standards

Standard	Grade 5		Grade 8	
	Ideal Percentage	*Actual Percentage*	*Ideal Percentage*	*Actual Percentage*
1: Physical Sciences	27–33%	27%	33–40%	33%
2: Life Sciences	27–33%	33%	21–27%	27%
3: Earth and Space Sciences	33–40%	40%	40–46%	40%
Total	100%	100%	100%	100%

Table 3-32. 2016–2017 OSTP: Distribution of Emphasis in terms of Target Percentage of Test by Grade—Grade 10 OAS-Science Standards

Standard	Grade 10	
	Ideal Percentage	*Actual Percentage*
1: Structure and Function	27–33%	33%
2: Ecosystem Dynamics	27–33%	33%
3: Heredity, Variation, & Diversity	33–40%	33%
Total	100%	100%

Note: Percentages were rounded.

3.3.2 Item Development

The OSTP science tests consist of clusters of items. A cluster is a set of items linked to a common stimulus. Table 3-33 below shows the number of new clusters that were developed and reviewed at the Summer 2016 Item Review Committee meeting, as well as the number of clusters that were field tested within the Spring 2017 operational test forms.

Table 3-33. 2016–2017 OSTP: Science Clusters to Field Test

Grade	Clusters to Item Review			Clusters to Field Test		
	MC	*TEI*	*Total*	*MC*	*TEI*	*Total*
5	10	0	10	5	0	5
8	8	2	10	4	1	5
10	8	2	10	4	1	5
Total	26	4	30	13	2	15

Note: MC Clusters contain 3 multiple-choice items. TEI Clusters contain 2 multiple-choice items and 1 technology-enhanced item.

Results of the science Item Review Committee meeting are presented in Table 3-34. Item Review Committees accepted 92% of science items.

Table 3-34. 2016–2017 OSTP: Science Item Review Results

Grade	Item Review Results for Standards 2, 3, 4, and 6		
	Accepted	Rejected	Total
5	57	3	60
8	38	7	45
10	60	4	64

3.3.3 Spring 2017 Test Design and Development

The OSTP science tests were structured using both operational and embedded field-test items. Operational items (or equivalent items in the paper form, for technology-enhanced items in the online form, for grades 8 and 10 science) were taken by all students in a given grade level. One operational form and one breach form were constructed. Across the operational and breach forms, approximately 50% of the items were common linking items; the rest of each form contained unique items. There were a total of 15 operational clusters (45 operational items) on each form. Student scores were based only on these operational items.

Field-test items were embedded in each form. In grade 5, six paper/pencil forms were administered; in grades 8 and 10, seven online forms and one paper/pencil form were administered. Each form contained three field-test clusters (nine field-test items in total). Note that each student takes only one form of the test and therefore answers a portion of all available field-test items; field-test items are not distinguishable to students. Because all students participate in the field test, an adequate sample size is provided to produce reliable data that can be used to inform item selection for future tests.

The student experience for the 2016–2017 OSTP science tests is shown in Tables 3-35 through 3-37 below.

Table 3-35. 2016–2017 OSTP: Science Clusters to Field Test

	Core						
	Stm	*MC*		*TEI/PMC*		*Total*	
	Single	Items	Pts	Items	Pts	Items	Pts
G5	15	45	45	0	0	45	45
G8	15	42	42	3	6	45	48
G10	15	42	42	3	6	45	48

MC = Multiple-Choice, TEI = Technology Enhanced Item, PMC = Paired Multiple-Choice

Table 3-36. 2016–2017 OSTP: Science Clusters to Field Test

	Field Test						
	Stm	*MC*		*TEI/PMC*		*Total*	
	Single	Items	Pts	Items	Pts	Items	Pts
G5	3	9	9	0	0	9	9
G8	3	8	8	1	2	9	10
G10	3	8	8	1	2	9	10

Table 3-37. 2016–2017 OSTP: Science Clusters to Field Test

	Core + Field Test						
	Stm	*MC*		*TEI/PMC*		*Total*	
	Single	Items	Pts	Items	Pts	Items	Pts
G5	18	54	54	0	0	54	54
G8	18	50	50	4	8	54	58
G10	18	50	50	4	8	54	58

3.3.4 Performance Level Descriptor Development

In consideration of the three-dimensional performance expectations in science, the PLDs were written with a focus on the Science and Engineering Practices represented in each grade level. This approach was employed by Achieve in writing the Evidence Statements that preliminarily defined what proficiency looks like in classroom learning of the similar, three-dimensional Next Generation Science Standards (NGSS). The Practices are the ways in which students engage in and apply the Disciplinary Core Ideas and Crosscutting Concepts in the performance expectations (PEs), and thus they provide a natural way to differentiate the types of performance and achievement expected by students at the different performance levels.

From both a content and psychometric perspective, Measured Progress did not recommend writing descriptors that addressed every performance expectation individually, because of the structure and nature of

the OSTP science assessment. Particularly in grades 8 and 10, the test does not assess every performance expectation in a given year.

PLDs were written with a focus on the Science and Engineering Practices. The intent was to tie the demonstration of the Practice to the particular Disciplinary Core Ideas and Crosscutting Concepts that are associated with each Practice in the PEs—and thus capture the full dimensionality and content of the OAS-S for each grade level. Practices that only appear once in a grade were "bundled" with another Practice that was logically associated, in order to avoid overemphasizing a Practice/PE that may or may not be present on any given operational test. The science PLDs can be found in Appendix D.

The PLD development process occurred in three stages:

1. An initial PLD authoring workshop was held July 21–22, 2016, with Oklahoma educators. Measured Progress staff provided training on PLD authoring (definitions, context, examples, and process instruction). Educators then created an initial draft of the PLDs for each grade level using templates that had each Practice (or combination of Practices) identified for participants to work on. Supporting materials for the educators' work included copies of the OAS-S and the OSTP science test and item specifications. Measured Progress and SDE staff provided support and guidance throughout the authoring process.

2. The SDE reviewed the drafts of the PLDs written by the educators, examining the clarity, quality, and coherence of the PLDs within and across the grades. SDE and Measured Progress staff worked together to resolve comments and edits for the PLD text.

3. Virtual validation meetings were held in December 2016. The purpose of these meetings, with SDE staff, the authoring workshop committee participants, and other appropriate stakeholders, was to review and approve the science PLDs. Measured Progress facilitated the meetings. After the meetings, Measured Progress made final updates to the PLDs based on the meeting discussion. A final copy of the standard-setting PLDs was provided to the SDE.

The SDE used the standard-setting PLDs to also develop reporting PLDs to be displayed on individual student reports.

3.3.5 Data Review

A conference call/WebEx between the SDE and Measured Progress was conducted to review the content of Spring 2017 grades 5 and 8 science field-test items that were flagged due to psychometric criteria; field-test data from the Spring 2017 grade 10 science test was not reviewed at this time because of the plans to

transition to a new, integrated science test design (physical science and life science), to be field tested in Spring 2018. The criteria used for reviewing the flagged items is shown in Table 3-38.

Table 3-38. 2016–2017 OSTP: Science Flagged Item Criteria

Statistic	*Flagging for Dichotomous Items*	*Flagging for Polytomous Items*
Item Difficulty (*p*-value)	Below 0.2 may be too difficult; Above 0.9 may be too easy	Below 0.2 may be too difficult; Above 0.9 may be too easy
Item Discrimination (corrwtotal)	Generally, 0.20 or higher is desired; Must be >0.10; Negative or zero values should not be used. For values between 0.10 and 0.20, difference between corrwtotal and any distractor option correlation value must be ≥ 0.09	Must be ≥ 0.40
Differential Item Functioning (DIF)	Values +/-C are serious DIF that must be looked at closely; +/-B values indicate moderate DIF that may warrant inspection	Values +/-C are serious DIF that must be looked at closely; +/-B values indicate moderate DIF that may warrant inspection

Statistics for flagged field-test items were reviewed by considering item difficulty (*p*-value), item discrimination (corrwtotal), and DIF. Decisions were made whether flagged items should or should not be included in the Oklahoma item bank for future operational use. Results of the Data Review meeting are presented in table 3-39. There were a total of 393 grade 5 and 8 science field test items of which 120 were flagged for review due to psychometric criteria. 74% of the total field test items were accepted.

Table 3-39. 2016-17 OSTP: Science Data Review Results

Grade	*Accepted*	*Rejected*	*Total*
5	114	52	166
8	175	52	227

3.3.6 Alignment Study

The Human Resources Research Organization (HumRRO) conducted an external, independent alignment study of the OSTP science tests. The alignment study included a review and analysis of the science tests administered at grades 5, 8, and 10 to the OAS-S. The alignment study was done in order to meet both state and federal accountability requirements related to the SDE's use of the OSTP. The alignment report provided one form of evidence supporting the validity of the state assessment system. The alignment results indicated whether the assessments represented the full range of the content standards and that the assessments

measured student knowledge in the same manner and at the same level of complexity as specified in the content standards.

To conduct the study, HumRRO facilitated a review of the alignment between the OSTP science and the OAS-S by panels (one per grade band) of Oklahoma educators. Following the reviews and examination of the alignment, HumRRO analyzed the results for a report that was submitted to the SDE. The complete report can be found in Appendix E.

3.3.7 Standards

The test frameworks for science at grades 5, 8, and 10 are based on the OAS-S. Items are developed within clusters, and each cluster/item is designed to measure a specific performance expectation in the OAS-S.

The grades 5 and 8 science performance expectations are organized across three content domains: Physical Sciences (PS), Life Sciences (LS), and Earth and Space Sciences (ESS). The assessable performance expectations in grade 10 are all in the content domain of LS. The LS performance expectations are organized by four Disciplinary Core Ideas:

A. From Molecules to Organisms: Structures and Processes

B. Ecosystems: Interactions, Energy, and Dynamics

C. Heredity: Inheritance and Variation of Traits

D. Biological Unity and Diversity

3.3.8 Item Types

The OSTP grades 5, 8, and 10 science tests consist primarily of multiple-choice items. The grades 8 and 10 tests also contain a very limited number of technology-enhanced items. On the accommodated paper form for grades 8 and 10, the technology-enhanced items are replaced by paired multiple-choice items.

All items are arranged in item clusters; no items are presented as standalone items. The use of multiple-choice items affords efficient use of limited testing time, and presenting the items in item clusters allows for better alignment to the breadth and depth of the performance expecations in the OAS-S. Examples of test items for public use are provided by the SDE within the test and item specifications and can be found at http://sde.ok.gov/sde/assessment-material.

3.3.9 Test Design

The items used on the OSTP grades 5, 8, and 10 science tests were written as clusters of items aligned to the performance expectations of the 2014 OAS-S that were determined to be assessable on the state summative assessment (see Appendix C, the test blueprints, and the test and item specifications documents; for reference, the full OAS-S can also be found at sde.ok.gov/sde/sites/ok.gov.sde/files/OAS_Science_Standards_3-2-15.pdf). Grade 5 clusters contained three multiple-choice items linked with a common stimulus. Grades 8 and 10 clusters contained either three multiple-choice items linked with a common stimulus or a set of two multiple-choice items and a technology-enhanced item linked with a common stimulus.

At grade 5, six field-test forms were administered with three field-test clusters (nine items in total) per form. At grade 8, seven field-test forms were administered with three field-test clusters (nine items) per form. At grade 10, seven field-test forms were administered with three field-test clusters (nine items) per form.

Field-test items for a range of performance expectations were tested to continue building an item bank that will support an appropriate sampling of the assessable performance expectations of the OAS-S each year.

Table 3-40 shows the design of the grade 5 test. Six operational (OP) forms and one breach (BR) form were constructed. As shown in green, a subset of operational items were common to each form. Other items (shown in orange and yellow) were unique to the breach or operational forms, respectively. Because of the limited exposure of the operational items unique to the breach form, these items were also placed in field-test slots on the operational forms so that additional data could be gathered for these items. Clusters were written such that a stimulus contained six items. Only three items were field-tested per student, however. Therefore, pairs of clusters containing the same stimulus but different items (e.g., New CL1A, New CL1B) were tested on different forms.

Table 3-40. 2016–2017 OSTP: Science Grade 5 Test Design

Spring 2017 BR		Spring 2017 OP								
Cluster	*1*	*Cluster*	*Core*	FT1 BR	FT1	FT2	FT3	FT4	FT5	FT6
1	MC OP1	1	MC OP1							
2	MC OP2	2	MC OP2							
3	MC OP16	3	MC OP9							
4	FT	4	FT	FT form 4-5	MC OP20	MC OP21	New CL1A	New CL4A	New CL1B	New CL4B
5	MC OP17	5	MC OP10							
6	MC OP3	6	MC OP3							
7	MC OP18	7	MC OP11							

continued

Spring 2017 BR		Spring 2017 OP								
Cluster	*1*	*Cluster*	*Core*	FT1 BR	FT1	FT2	FT3	FT4	FT5	FT6
8	MC OP19	8	MC OP12							
9	MC OP4	9	MC OP4							
10	MC OP5	10	MC OP5							
11	MC OP20	11	MC OP13							
12	FT	12	FT	FT form 4-5	MC OP16	MC OP17	New CL2A	New CL5A	New CL2B	New CL5B
13	MC OP21	13	MC OP14							
14	MC OP6	14	MC OP6							
15	MC OP22	15	MC OP15							
16	FT	16	FT	FT form 4-5	MC OP18	MC OP19	MC OP22	New CL3A	New CL3B	New CL3A
17	MC OP7	17	MC OP7							
18	MC OP8	18	MC OP8							

Common to both forms
Unique to BR
Unique to OP

Tables 3-41 and 3-42 show the designs of the grade 8 and grade 10 tests. A paper-based (PBT) operational (OP) and paper-based breach (BR) form were built for each grade. Additionally, seven computer-based (CBT) operational forms and one computer-based breach form were built for each grade. As shown in green, a subset of operational items were common to each form. Other items (shown in orange and yellow) were unique to the breach or operational forms, respectively. Because of the limited exposure of the operational items unique to the breach form, these items were also placed in field-test slots on the operational forms so that additional data could be gathered for these items. Clusters were written such that a stimulus contained six items. Only three items were field-tested per student, however. Therefore, pairs of clusters containing the same stimulus but different items (e.g., New CL1A, New CL1B) were tested on different forms. For clusters containing technology-enhanced items, additional item sets containing equivalent paired multiple-choice items (e.g., TEI PM v) were tested on different forms, for future use on paper-based forms.

Table 3-41. 2016–2017 OSTP: Science Grade 8 Test Design

Spring 2017 BR			Spring 2017 OP										
Cluster	*Core (PBT)*	*Core (CBT)*	*Cluster*	*Core (PBT)*	*Core (CBT)*	FT1 BR only (CBT and PBT)	FT1 (CBT and PBT)	FT2 (CBT)	FT3 (CBT)	FT4 (CBT)	FT5 (CBT)	FT6 (CBT)	FT7 (CBT)
1	MC OP1	MC OP1	1	MC OP1	MC OP1								
2	MC OP13	MC OP13	2	MC OP6	MC OP6								

continued

Spring 2017 BR			Spring 2017 OP										
Cluster	*Core (PBT)*	*Core (CBT)*	*Cluster*	*Core (PBT)*	*Core (CBT)*	FT1 BR only (CBT and PBT)	FT1 (CBT and PBT)	FT2 (CBT)	FT3 (CBT)	FT4 (CBT)	FT5 (CBT)	FT6 (CBT)	FT7 (CBT)
3	FT	FT	3	FT	FT	FT form 4-7	MC OP17	MC OP18	New CL1A	New CL4A	New CL1B	New CL4B	duplicate of CL1-CL4
4	MC OP14	MC OP14	4	MC OP7	MC OP7								
5	MC OP2	MC OP2	5	MC OP2	MC OP2								
6	MC OP3	MC OP3	6	MC OP3	MC OP3								
7	MC OP15	MC OP15	7	MC OP8	MC OP8								
8	MC OP16	MC OP16	8	MC OP9	MC OP9								
9	PM OP1	TEI OP1	9	PM OP1	TEI OP1								
10	MC OP4	MC OP4	10	MC OP4	MC OP4								
11	MC OP17	MC OP17	11	MC OP10	MC OP10								
12	FT	FT	12	FT	FT	FT form 4-7	MC OP13	MC OP14	duplicate of CL2-CL3	New CL3A	New CL3B	New CL2A	New CL2B
13	MC OP18	MC OP18	13	MC OP11	MC OP11								
14	MC OP5	MC OP5	14	MC OP5	MC OP5								
15	MC OP19	MC OP19	15	MC OP12	MC OP12								
16	FT	FT	16	FT	FT	FT form 4-7	MC OP15	MC OP16	MC OP19	(TEI PM v)	(TEI PM v)	(TEI PM v)	(TEI PM v)
17	PM OP2	TEI OP2	17	PM OP2	TEI OP2								
18	PM OP3	TE OP3	18	PM OP3	TE OP3								

Common to both forms
Unique to BR
Unique to OP

Table 3-42. 2016–2017 OSTP: Science Grade 10 Test Design

Spring 2017 BR			Spring 2017 OP										
Cluster	*Core (PBT)*	*Core (CBT)*	*Cluster*	*Core (PBT)*	*Core (CBT)*	FT1 BR only (CBT and PBT)	FT1 (CBT and PBT)	FT2 (CBT)	FT3 (CBT)	FT4 (CBT)	FT5 (CBT)	FT6 (CBT)	FT7 (CBT)
1	MC OP1	MC OP1	1	MC OP1	MC OP1								
2	MC OP13	MC OP13	2	MC OP6	MC OP6								

continued

Spring 2017 BR			Spring 2017 OP										
Cluster	*Core (PBT)*	*Core (CBT)*	*Cluster*	*Core (PBT)*	*Core (CBT)*	FT1 BR only (CBT and PBT)	FT1 (CBT and PBT)	FT2 (CBT)	FT3 (CBT)	FT4 (CBT)	FT5 (CBT)	FT6 (CBT)	FT7 (CBT)
3	FT	FT	3	FT	FT	FT form 4-7	MC OP13	MC OP18	New CL1A	New CL4A	New CL1B	New CL4B	duplicate of CL1-CL4
4	MC OP14	MC OP14	4	MC OP7	MC OP7								
5	MC OP2	MC OP2	5	MC OP2	MC OP2								
6	MC OP3	MC OP3	6	MC OP3	MC OP3								
7	MC OP15	MC OP15	7	MC OP8	MC OP8								
8	MC OP16	MC OP16	8	MC OP9	MC OP9								
9	PM OP1	TE OP1	9	PM OP1	TE OP1								
10	MC OP4	MC OP4	10	MC OP4	MC OP4								
11	MC OP17	MC OP17	11	MC OP10	MC OP10								
12	FT	FT	12	FT	FT	FT form 4-7	MC OP17	MC OP14	duplicate of CL2-CL3	New CL3A	New CL3B	New CL2A	New CL2B
13	MC OP18	MC OP18	13	MC OP11	MC OP11								
14	MC OP5	MC OP5	14	MC OP5	MC OP5								
15	MC OP19	MC OP19	15	MC OP12	MC OP12								
16	FT	FT	16	FT	FT	FT form 4-7	MC OP15	MC OP16	MC OP19	(TEI PM v)	(TEI PM v)	(TEI PM v)	(TEI PM v)
17	PM OP2	TE OP2	17	PM OP2	TE OP2								
18	PM OP3	TE OP3	18	PM OP3	TE OP3								

Common to both forms
Unique to BR
Unique to OP

3.3.10 **Depth of Knowledge**

Each item on the OSTP grades 5, 8, and 10 science tests is assigned a DOK level according to the cognitive demand of the item. DOK is not synonymous with difficulty. The DOK level rates the complexity of the mental processing a student must use to answer the question. The description of the DOK levels and the percentage of points on the tests at each of the levels by grade are shown in Tables 3-43 through 3-46. The difference in the tables between the recommended percentages and the actual percentages for grade 10 at

DOK levels 2 and 3 is due to the constraints of the current item bank with only one year's worth of field-tested items available for operational test construction.

Table 3-43. 2016–2017 OSTP: OAS-S Science DOK Levels by Grade—Form A

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
5	10–20%	18%	60–70%	64%	15–25%	18%
8	5–10%	8%	65–75%	67%	15–25%	25%
10	5–10%	10%	65–75%	63%	15–25%	27%

Table 3-44. 2016–2017 OSTP: OAS-S Science DOK Levels by Grade—Form B

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
8	5–10%	8%	65–75%	71%	15–25%	21%
10	5–10%	10%	65–75%	63%	15–25%	27%

Table 3-45. 2016–2017 OSTP: OAS-S Science DOK Levels by Grade—Form C

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
8	5–10%	8%	65–75%	67%	15–25%	25%
10	5–10%	13%	65–75%	63%	15–25%	25%

Table 3-46. 2016–2017 OSTP: OAS-S Science DOK Levels by Grade—Breach

Grade	DOK 1		DOK 2		DOK 3	
	Recommended	*Actual*	*Recommended*	*Actual*	*Recommended*	*Actual*
5	10–20%	13%	60–70%	62%	15–25%	25%
8	5–10%	8%	65–75%	71%	15–25%	21%
10	5–10%	13%	65–75%	63%	15–25%	25%

Note: Percentages were rounded.

DOK 1 RECALL AND REPRODUCTION: is defined as recalling information such as a fact, definition, term, or simple procedure, as well as performing a simple science process or procedure. At Level 1, students supply basic knowledge; plug in numbers to use a simple formula; make simple measurements; or perform a clearly defined, given series of steps. In simple/DOK 1 procedures, the step or steps to follow are already outlined and are very familiar to/routinely performed by students. Some examples that represent, but do not constitute all, Level 1 performances are

- recognizing or showing the correct representation of a basic scientific concept or relationship in words, diagrams, or simple models.
- performing a routine procedure, such as measuring length.
- identifying basic tools or steps needed for a defined scientific investigation.
- reading data from a graph or stating a simple, obvious pattern from data.
- restating information from scientific text.

DOK 2 SKILLS AND CONCEPTS: extends the mental processing beyond recalling or reproducing a response at DOK Level 1. The content knowledge and process involved are more complex than in Level 1. Level 2 items often require students to reason and make decisions as to how to approach the question or problem and to plan or consider a series of steps. Some examples that represent, but do not constitute all, Level 2 performances are

- specifying and explaining the relationship between basic concepts, properties, or variables.
- developing and using a scientific model in basic conceptual interpretations.
- determining/planning a procedure for a scientific investigation according to specified criteria and then performing the investigation.
- asking clarifying questions about a phenomenon, a scientific investigation, or an engineering problem.
- classifying objects or data into logical categories.
- organizing, displaying, comparing, and interpreting data in different graphical forms.
- predicting the outcome of changes in a system, scientific investigations, or other events.

DOK 3 STRATEGIC THINKING: requires reasoning, planning, using evidence, and using a higher level of thinking than the previous two levels. The cognitive demands of Level 3 are complex and abstract. The complexity does not result only from the fact that there could be multiple answers, a possibility for both Levels 1 and 2, but because the multistep task requires more demanding reasoning. In most instances, requiring students to explain their thinking is at Level 3, while requiring a very simple explanation or a word or two should be at Level 2. An activity that has more than one possible answer and requires students to justify the response they give would most likely be at Level 3. Some examples that represent, but do not constitute all, Level 3 performances are

- identifying rich research questions and designing investigations for a scientific or an engineering problem, typically with more than one dependent variable.
- developing a scientific model for a complex situation.
- interpreting and drawing conclusions from complex experimental data.
- justifying and providing evidence for explanations of phenomena.

- constructing a scientific argument with a claim, evidence, and scientific reasoning.
- evaluating the merits and limitations of models, investigative designs, scientific arguments, etc.
- using evidence to revise models, explanations, claims, etc.
- solving non-routine science and engineering problems.
- obtaining and combining information from multiple sources to explain or compare scientific issues.

3.3.11 Use of Hess Matrix in Assigning DOK Level

In assigning DOK levels to items, the matrix developed by Karin Hess (see static.pdesas.org/content/documents/M2-Activity_2_Handout.pdf) was also used as a reference. This matrix shows the intersections between Bloom's Revised Taxonomy and Webb's DOK levels, providing additional information that can be useful when assigning DOK levels.

3.3.12 Use of Calculators and Reference Sheets

Approved calculators were allowed on the OSTP grades 8 and 10 science tests. For approved calculators, see the calculator policy posted on the SDE website (http://sde.ok.gov/sde/sites/ok.gov.sde/files/CalculatorPolicy16-17.pdf). No other resource materials or reference sheets could be used by students during the test.

3.4 U.S. History

3.4.1 Standards and Objectives

The test framework for grade 10 U.S. history is based on the OAS, and each item on the U.S. history test is designed to measure a specific standard and objective. The measure of Oklahoma students' level of proficiency responding to a variety of items linked to grade-level social studies content standards are identified in the OAS. A list of assessable standards is provided below.

OAS U.S. History

- Standard 1: Transformation of the United States from Post-Reconstruction to the Progressive Era, 1878–1900
- Standard 2: Expanding Role of the United States in International Affairs
- Standard 3: Cycles of Economic Boom and Bust in the 1920s and 1930s

- Standard 4: Role of the U.S. in International Affairs and World War II, 1933–1946
- Standard 5: U.S. Foreign and Domestic Policies during the Cold War, 1945–1975
- Standard 6: U.S. Foreign and Domestic Policies, 1976 to the Present

3.4.2 Item Types

The OSTP U.S. history tests consisted of a collection of multiple-choice items. Multiple-choice items were administered to provide breadth of coverage of the assessment targets. Because multiple-choice items require approximately one minute for most students to answer, these items make efficient use of limited testing time and allow coverage of a wide range of knowledge and skills. Each multiple-choice item was worth one score point. Previous test items released for public use are provided by the SDE (see sde.ok.gov/sde/office-assessments).

3.4.3 Test Design

Table 3-47 summarizes the numbers and types of items that were used in the 2016–17 U.S. history high school tests. For the Spring 2017 administration, the Spring 2016 equvialent (EQ) form was used as the operational form, and the Summer 2016 form was used as the Spring 2017 breach form. Note that in U.S. history all students were administered one set of common items and one set of field-test items. Each multiple-choice item was worth one point.

Table 3-47. 2016–17 OSTP: Composition of the OAS U.S. History Tests

Content Area	*Operational (OP) Forms*	*Breach Forms*	*OP Items (per form)*	*FT Items (per form)*	*Possible Points (each test form)*
U.S. History	1	1	60	10	60

3.4.4 Blueprints

Table 3-48 summarizes the standards distribution for the U.S. history test. The test blueprints identify the amount of content covered on the tests and are based on the importance and coverage of the OAS in Oklahoma schools. The ideal test blueprints are provided by the SDE (see sde.ok.gov/sde/office-assessments). The actual number of items aligned to each objective can be found in Appendix C.

Table 3-48. 2016–17 OSTP: OAS U.S. History Distribution of Standards

U.S. History Standards	*Ideal Percentage*	*Actual Percentage Spring 2017 Operational Form*	*Actual Percentage Spring 2017 Breach Form*
Standard 1: Transformation of the United States from Post-Reconstruction to the Progressive Era, 1878–1900	13–15%	13%	12%
Standard 2: Expanding Role of the United States in International Affairs	10%	10%	10%
Standard 3: Cycles of Economic Boom and Bust in the 1920s and 1930s	13–15%	13%	13%
Standard 4: Role of the U.S. in International Affairs and World War II, 1933–1946	13–15%	13%	15%
Standard 5: U.S. Foreign and Domestic Policies during the Cold War, 1945–1975	30%	30%	30%
Standard 6: U.S. Foreign and Domestic Policies, 1976 to the Present	20%	20%	20%
Total	100%	100%	100%

Each item on the OSTP U.S. history test is assigned a DOK level according to the cognitive demand of the item. DOK is not synonymous with difficulty. The DOK level rates the complexity of the mental processing a student must use to answer the question. The DOK levels and the percentage of items on the tests at each of the levels by grade are shown in Table 3-49.

Table 3-49. 2016–17 OSTP: U.S. History Percentage of Items at Each DOK Level

Depth of Knowledge	*Ideal Percentage of Items*	*Actual Percentage Spring 2017 Operational Form*	*Actual Percentage Spring 2017 Breach Form*
Level 1 – Recall and Reproduction	10–15%	15% (9 items)	15% (9 items)
Level 2 – Skills and Concepts	60–70%	62% (37 items)	63% (38 items)
Level 3 – Strategic Thinking	15–25%	23% (14 items)	22% (13 items)

DOK 1 RECALL AND REPRODUCTION: asks students to recall facts, terms, concepts, and trends, or to recognize or identify specific information contained in graphics. This level generally requires students to identify, list, or define. The items at this level usually ask the students to recall who, what, when, and where. Items that require students to "describe" and/or "explain" could be classified at Level 1 or Level 2, depending on what is to be described and/or explained. A Level 1 "describe and/or explain" would require

students to recall, recite, or reproduce information. Items that require students to recognize or identify specific information contained in documents, excerpts, quotations, maps, charts, tables, graphs, or illustrations are generally Level 1.

DOK 2 SKILLS AND CONCEPTS: includes the engagement of some mental processing beyond recalling or reproducing a response. This level requires students to: contrast or compare people, places, events, and concepts; convert information from one form to another; give an example; classify or sort items into meaningful categories; draw conclusions; or describe, interpret, or explain issues and problems, patterns, reasons, cause and effect, significance or impact, relationships, points of view, or processes. A Level 2 "describe and/or explain" would require students to go beyond a description of recalled information to describe and/or explain the result or "how" or "why."

DOK 3 STRATEGIC AND EXTENDED THINKING: requires reasoning, using evidence, and utilizing a higher level of thinking than Level 1 and Level 2. Students will go beyond explaining or describing "how and why" to justifying the "how and why" through application and evidence. The cognitive demands at Level 3 are more complex and more abstract than Level 1 or Level 2. Items at Level 3 can include: drawing conclusions from multiple or complex stimuli; citing evidence; applying concepts to new situations; using concepts to solve problems; analyzing similarities and differences in issues and problems; proposing and evaluating solutions to problems; recognizing and explaining misconceptions; or making connections across time and place to explain a concept or "big idea." Items may require planning, investigating, or developing. At this level, the cognitive demands may be high, work may be very complex, and students may be required to: connect and relate ideas and concepts within the content area; analyze and synthesize information from multiple sources; examine and explain alternative perspectives across a variety of sources; and/or describe and illustrate how common themes and concepts are found across time and place. Students may make predictions with evidence as support.

3.5 TEST DEVELOPMENT PROCESS

3.5.1 Item Selection and Operational Test Assembly

In preparation for the item selection meeting, the test developers and psychometricians at Measured Progress considered the following when selecting sets of items to propose for the common (including items for release) and the embedded field-test items:

- **Content coverage/match to test design.** The test design stipulates a specific number of multiple-choice items from each content area.
- **Item difficulty and complexity.** Item statistics drawn from the data analysis of previously tested items were used to ensure similar levels of difficulty and complexity from year to year as well as quality psychometric characteristics.
- **"Cueing" items.** Items were reviewed for any information that might "cue" or provide information that would help to answer another item.

During assembly of the test forms, the following criteria were considered:

- **Option balance.** Items were balanced among the forms so that each form contained a fairly equal distribution of keys (correct answers).
- **Key patterns.** The sequence of keys was reviewed to ensure that key order appeared random.
- **Page fit.** Item placement was modified to ensure the best fit and arrangement of items on any given page.
- **Facing-page issues.** For multiple items associated with a single stimulus (inquiry task) and multiple-choice items with large graphics, consideration was given to whether those items needed to begin on a left- or right-hand page and to the nature and amount of material that needed to be placed on facing pages. These considerations serve to minimize the amount of page flipping required of students.
- **Relationship between forms.** Although equating and field-test items differ across forms, these items must take up the same number of pages in each form so that sessions begin on the same page in every form. Therefore, the number of pages needed for the longest form often determines the layout of each form.
- **Visual appeal.** The visual accessibility of each page of the form was taken into consideration, including such aspects as the amount of white space, the density of the text, and the number of graphics.

3.5.2 Operational Test Draft Review

After the forms were laid out as they would appear in the final test booklets, they were again thoroughly reviewed by Measured Progress editors and test developers to ensure that the items appeared exactly as the state specialists had requested. Finally, all the forms were reviewed by the state specialists for their final approval.

3.5.3 Alternative Presentations

Common items were translated into Braille by a subcontractor that specializes in test materials for students who are blind or visually impaired. In addition, the operational form was also adapted into a large-print version. The Braille vendor reviewed the form concurrently with the SDE review. This review included looking at items for any potential Braille ability issues. If any concerns were noted, these items went back to the Measured Progress content team for review and feedback. Measured Progress then provided the necessary information to the SDE to determine next steps or decisions needed including options to suppress the item.

3.5.4 Final Operational Test Form Definition

As an operational field test, it was expected that any items that were intended to contribute to a student's score but performed poorly were replaced with field-test items that performed well, evaluated against psychometric criteria described previously (e.g., Section 3.1.9 – *Data Review*). In making these replacements, the items were aligned to the same reporting category and, where possible, the same DOK level, to ensure the test blueprint criteria were maintained. For the 2016–17 OSTP tests, the final number of items contributing to student scores as well as final total scores are displayed in table 3-50, for each grade and subject across test forms.

As an operational test form, and not an operational field test, the number of items contributing to student's final score on the 2016–17 OSTP U.S. history test was 60 items yielding a total score of 60 points.

Table 3-50. 2016–17 OSTP: Final Operational Test Form Item Counts and Points

Grade	Final Items/ Points	ELA	Math	Science	U.S. History
3	Items	50	50		
	Points	48-50	50		
4	Items	50	50		
	Points	45-49	50		
5	Items	49-50	49-50	45	
	Points	51-55	49-50	45	
6	Items	48-50	48-50		
	Points	49-50	48-50		
7	Items	47-50	47-50		
	Points	48-50	47-50		
8	Items	47-50	47-50	41-45	
	Points	53-55	47-50	41-48	
10	Items	57-60	57-60	40-44	60
	Points	70-73	57-60	40-47	60

CHAPTER 4 TEST ADMINISTRATION

4.1 GENERAL ADMINISTRATION INFORMATION

Table 4-1. 2016–2017 OSTP: Testing Windows

Grade	*Paper/Pencil Testing Window*	*Online Testing Window*	*Assessments*
Grade 3	April 3 – April 21, 2017		ELA/Mathematics
Grade 4	April 3 – April 21, 2017		ELA/Mathematics
Grade 5	April 3 – April 21, 2017		ELA/Mathematics/Science
Grade 6	April 3 – April 21, 2017*	April 3 – April 28, 2017	ELA/Mathematics
Grade 7	April 3 – April 21, 2017*	April 3 – April 28, 2017	ELA/Mathematics
Grade 8	April 3 – April 21, 2017*	April 3 – April 28, 2017	ELA/Mathematics/Science
Grade 10	April 3 – April 21, 2017*	April 3 – April 28, 2017	ELA/Mathematics/Science[2]
	April 3 – April 21, 2017*	April 3 – April 28, 2017	U.S. History[1]

[1] Students enrolled in a high school U.S. history course
[2] Students with any Biology EOI performance level score may be exempt from the grade 10 science test.
* Under special circumstances only.

No Retesting Required for 2016–17 School Year

Total administration by test mode, paper-based tests or online computer-based tests, for each grade and content area is shown in Table 4-2 below. For grades 3 though 5 the only mode available is paper. Grades 6 through 8 are offered as online assessments. In those grades paper administration is only offerered as an accommodation.

Table 4-2. 2016–17 OSTP: Test Modes by Content Area and Grade

Grade	*Content Area*	*Test Mode*	*Count*
3	Mathematics	Paper	52,542
	ELA	Paper	52,436
4	Mathematics	Paper	51,215
	ELA	Paper	51,122
5	Mathematics	Paper	49,246
	ELA	Paper	49,160
	Science	Paper	49,241
6	Mathematics	Paper	669
		Online	45,984
	ELA	Paper	608
		Online	45,938
7	Mathematics	Paper	598
		Online	47,595
	ELA	Paper	517
		Online	47,591
8	Mathematics	Paper	599

continued

Grade	Content Area	Test Mode	Count
8	Mathematics	Online	47,371
	ELA	Paper	521
		Online	47,449
	Science	Paper	548
		Online	47,363
10	Mathematics	Paper	478
		Online	45,551
	ELA	Paper	377
		Online	45,684
	Science	Paper	368
		Online	29,524
	U.S. History	Paper	323
		Online	43,316

4.2 RESPONSIBILITY FOR ADMINISTRATION

The *2016–17 OSTP Test Administration Manual* indicated that school principals and/or their designated OSTP test coordinators were responsible for the proper administration of the OSTP tests. Uniformity of administration procedures from school to school was ensured by using manuals that contained explicit directions and scripts to be read aloud to students by test administrators and the associated trainings provided by the SDE for districts and schools. The SDE also conducted site monitoring visits during the test administration to assure all guidelines were followed.

4.3 ADMINISTRATION PROCEDURES

Assessment training modules, test administration workshops, pre-recorded webinars, and test administration manuals were provided to District Test Coordinators and other assessment support staff, to give clear direction and support for the test administration for paper/pencil and computer-based assessments. Refer to section 4.5 for a brief description of the training. The districts' designated OSTP test coordinators were instructed by the SDE to read the *2016–17 OSTP Test Administration Manual*. The checklists included in the *2016–17 OSTP Test Administration Manual* outlined tasks to be performed by school staff before, during, and after test administration. In addition to these checklists, the *2016–17 OSTP Test Administration Manual* described the testing material sent to each school and how to inventory it, track it during administration, and return it after testing was complete. An additional focus was on maintaining test security of the materials. The *2016–17 OSTP Test Administrator Manual* included checklists for the administrators to use to prepare themselves, their classrooms, and the students for the administration of the tests. The *2016–17 OSTP Test Administrator Manual* contained sections that detailed the procedures to be followed for each testing session and instructions for preparing paper-based and computer-based materials before the test coordinator returned it to Measured Progress.

4.4 PARTICIPATION REQUIREMENTS AND DOCUMENTATION

The intent of the SDE in Oklahoma is for all public school students in grades 3–8 and 10 to participate in the OSTP tests through a standard administration, an administration with accommodations (Appendix G), or an alternate assessment. Furthermore, any student who is absent during any session of the OSTP tests is expected to take a make-up test within the testing window. The state of Oklahoma does not recognize OSTP opt-outs. Approximately 98% of students participated in the OSTP.

House Bill 3218 repeals the previous system of student assessments including the EOIs and OCCTs. It required the adoption of assessment rules in compliance with ESSA by December 31, 2016, and created a transition year in 2016–2017. During this transition year, school districts are required to provide a test to every student enrolled in the respective testing grades. Both the statute and the language in the promulgated rule require every school district to administer a test to every student enrolled in a tested grade and content area. Because of these statutory and rule requirements, there is no "opt-out" option offered through the SDE. Schools were required to return a Student Answer Document for every enrolled student in the grade level, with the exception of students who took an alternate assessment. Students who were alternately assessed in the 2016–17 school year were not required to participate in the 2016–17 OSTP. On those occasions when it was deemed impossible to test a particular student, school personnel were required to inform the SDE. A summary of participation on the 2016–17 OSTP grades 3–8 and 10 by demographic category is shown in Appendix H.

4.4.1 Students With Disabilities

All students were expected to participate in the 2016–17 OSTP tests, unless they completed an alternate assessment during the 2016–17 school year.

Large-print versions of the tests were created using Form 1 of the tests at all grade levels enlarged to 20-point font for students with visual impairments. At all grades, only the operational items were translated into Braille by American Printing House for the Blind, a subcontractor that specializes in test materials for students who are blind or who need accommodations due to visual impairments.

For computer-based testing (CBT), the following accommodations were available:

- Color Contrast where the student can select alternative font and background colors
- Reverse Contrast where all colors are inverted
- Screen Zoom where the entire screen is zoomed up to 150%
- Guideline where the student has a box they can use to read long passages a little easier (similar to using a ruler or piece of paper to move down the page as you read)
- Text-to-Speech where the computer reads the text to the student

4.4.2 English Learners

Students who had received less than 12 months of consecutive instruction in a U.S. public school and were designated as English Learners (ELs) were only required to take the mathematics, science, and U.S. history OSTP tests. A one-year optional exemption was available for the ELA OSTP tests.

4.5 ADMINISTRATOR TRAINING

In addition to distributing the *2016–17 OSTP Test Administration Manual*, the Oklahoma SDE and Measured Progress conducted test administration workshops and webinars to inform school personnel about the OSTP tests and to provide training on the policies and procedures regarding administration of the tests. In-person trainings were conducted in February 2017. Seven trainings were conducted in Woodward, Lawton, Atoka, Tulsa and Oklahama City and two live web-based trainings were conducted. District Test Coordinators were required to attend the trainings, while other support personal were optional attendees. 1,100 people attended the in person trainings with several hundred more attending the live web-based training. In addition, an audio PowerPoint test administration workshop presentation was also prerecorded and provided to the state for inclusion on the SDE website.

4.6 DOCUMENTATION OF ACCOMMODATIONS

The *OSTP Accommodations Manual* provided directions for coding information related to test accommodations and modifications in the Student Answer Document. All accommodations used during any test session were required to be coded by authorized school personnel—not by students—after testing was completed. The following table shows the allowed state accommodations:

OSTP State-Approved Accommodations

I. Setting/Timing/Schedule	Procedures & Guidance
S1. Individual testing	This accommodation is required for many presentation or response accommodations. This accommodation is intended to reduce student distractions. Students must be actively monitored and may use a testing carrel or test in a special education resource room or other location that maintains test security.
S2. Small group testing (**8–10 maximum**)	This accommodation is intended to reduce student distractions and may be required for certain accommodations. Students must be actively monitored and may use a testing carrel or test in a special education resource room or other location that maintains test security. **Students should be tested with their non-disabled peers to the greatest extent possible.**

I. Setting/Timing/Schedule	Procedures & Guidance
S3. Preferential seating	Students may need to sit close to the front of the room so they can see or hear more easily, increase physical access, or have access to special equipment.
S4. Separate location **(No limit on number of students)**	This accommodation is intended to reduce student distractions. Students may use a testing carrel, or test in a special education resource room or other location that maintains test security.
S5. Provide special lighting	Specify type (e.g., 75 Watt incandescent, light box, etc.)
S6. Provide adaptive or special furniture	Students may need accommodations to provide better access (e.g., slant board, stander, etc.)
T1. Flexible schedule same day **Student test book(s) must be secured between sessions.**	Students are scheduled to allow for the best conditions/timing for their performance, and/or may be allowed to take the test during more than one sitting during a single day. Students are not allowed to study for or discuss tests between sessions. This is not intended for lunch or recess breaks. **(S4)** must be selected for this accommodation.
T2. Administer test over several sessions or "chunking" (except writing tasks/sections). **Student test book(s) must be secured between sessions.**	The test may be separated into smaller sections and administered over several days within the state testing window. Student may only work in one separated section at a time and may not go to previous sections or work ahead. **(S4)** must be selected for this accommodation.
T3. Allow frequent breaks during one test session **(maximum 10–15 minute duration)** **Student test book(s) must be secured during the break(s).**	Students must be monitored during breaks and may not study for or discuss the test during these breaks or view/change previously answered questions after a break. **This accommodation is not intended for lunch or recess breaks—students must complete a Section before being dismissed.**

II. Presentation	Procedures & Guidance
P1. Alternate Formats a. Large-Print Version (Instructions provided within kits.)	The Test Administrator must transcribe student answers verbatim into the standard answer document/test book that was provided in the large-print (paper/pencil) or Braille kit.
b. Contracted Braille Version (Instructions provided within kits.)	Braille test formats will be provided on paper using contracted Braille and Nemeth code for numbers and formulas.
c. Large-print through Online Testing Client (Vector-based Magnification)	Large print formats may be configured in the online testing client for certain assessments.
P2. Reverse Color Contrast	Students who have a visual impairment may require this to access the computer screen. This accommodation option must be selected in the online testing client student profile.

II. Presentation	Procedures & Guidance
P3. Use of assistive technology (AT) devices or supports: e.g., color overlays, magnifier, pencil grips, auditory amplification devices, noise buffers, wedge for positioning, and multiplication table/chart.	The specific device or support should be specified in the IEP/504 Plan, be routinely used by the student, and not alter the construct being measured. **(S1, S2, or S4)** may be appropriate for this accommodation as some AT devices may be distracting to other students.
P4. Text-to-Speech, Human Reader, or Sign Language Interpretation a. Text-to-Speech is built into the online testing client, requires the use of ear phones, and may be administered in individual, small group, or regular setting. b. Human Reader reads test directions, test items, and answer choices and must log the test booklet serial number on the Nondisclosure Agreement (NDA). This is limited to small group or individualized testing. c. Sign Language Interpretation may be accomplished by using a separate test booklet in a separate location. Please refer to the Human Reader directions on pages 12–14.	**P4 applies to Math, Science, U.S. History, and Grades 5 & 8 ELA writing/constructed response sections only.** Online tests have built-in Text-to-Speech functionality **(must be selected in online testing client before student starts the test)**. Ear phones are required. Students may test with nondisabled peers. However, if a Human Reader is required for the student, then the test must be read from the computer screen verbatim. **(S1 or S2)** is required when utilizing a Human Reader for Online Only tests. Paper tests **(test forms must be the same)** are read by a Human Reader. Test Administrator uses separate test booklet or reads over a student's shoulder and must log the test booklet serial number on the Nondisclosure Agreement (NDA). Small group testing (**S1 or S2: 8–10 maximum**) is required and test forms must be the same. **Students may request items be read more than once.**
P5. Use of Secure Braille Note-taker (students with a visual impairment)	An electronic note-taker, which may have a Braille or QWERTY-type keyboard, is an adaptive device similar to a PDA. This device may have built-in speech output and/or a refreshable Braille display. **(S1 or S2)** must be selected for this accommodation.
P6. Simplification/repetition/signage of directions	Student may ask for clarification, simplification, signage of directions. This does not include test questions or answer choices. Students may have directions reread for each page of questions.
P7. Turn off Universal Tools/Accessibility Features	Disable any tools that may be distracting to a student, tools a student does not need to use, or tools a student may be unable to use.
P8. Use of an abacus.	Students who have a visual impairment/blindness or access mathematical calculations tactilely may use an abacus.
P9. Use of a calculator on Grades 3–5 Mathematics. **See Calculator Requirements on page 12.**	A basic calculator may be used. Calculators with Computer Algebra Systems are prohibited.
P10. Provide cues (arrows, stop signs) on answer form	This applies to Paper Only tests. Cues may not clue a student to a correct or incorrect answer.

II. Presentation	Procedures & Guidance
P11. Use masking or templates to reduce the amount of visible print.	Masking involves blocking off content that is distracting to the student. Students are able to focus their attention on a specific part of a test item by masking. This feature is built into the online testing client.
P12. Secure paper to work area with tape or magnets.	This applies to Paper Only tests. Please be cautious when adhering tape to the test booklet or answer document by avoiding the tracking marks (black bars) for the scoring process.
P13. Student may read the test aloud or sign the test to himself or herself.	This requires individual testing (even if student is reading aloud quietly) and non-disclosure forms signed by Test Administrator/Test Proctor. **(S1)** must be selected for this accommodation.
P14. Placeholders, templates, or markers to maintain place	This applies to Paper Only tests.
P15. Audio Calculator	This requires ear phones for group testing. A non-embedded calculator for students needing a special calculator, such as a Braille calculator or a talking calculator, is currently unavailable within the online assessment platform. **(S1, S2, or S4)** may be appropriate for this accommodation.
P16. Paper & Pencil Test **Please see Paper & Pencil Test Format guidelines on page 4.**	Students unable to access an OSTP computer-based test must also receive classroom assessments, benchmark assessments, and districtwide assessments in this manner. Consequently, a student on an IEP/504 Plan does not automatically receive a paper & pencil test format.

III. Response	Procedures & Guidance
R1. Student marks answers in test book and not on an answer document, for later transfer by a Test Administrator to an answer document.	The Test Administrator with the Test Proctor present must transcribe answers verbatim into the standard answer document. **Does not apply to Grade 3 tests.** This accommodation applies to Paper Only tests.
R2. Human Scribe ELA, Mathematics, Science, Social Studies: a. Student dictates response to a scribe who records responses on an answer document or through the Online Testing Client by Test Administrator or Proctor. b. Student signs response to a scribe who records responses on an answer document or through the Online Testing Client by Test Administrator or Proctor. c. Student tapes or records response for a writing portion of the test for verbatim transcription by Test Administrator or Proctor.	A scribe is a Test Administrator or Proctor who writes down what a student dictates by speech, or through an assistive technology communication device. Signed Nondisclosure Agreements (NDAs) are required for both Test Administrator and Proctor. Students who have documented significant motor or processing difficulties that make it difficult to produce responses may need to dictate their responses to a human, who then records the students' responses verbatim. The use of this support may result in the student needing additional overall time to complete the assessment. **The guiding principle in scribing is to assist the student in accessing the test and responding to it.**

III. Response	Procedures & Guidance
Please see Scribe Instructions and Guidelines on pages 15–18.	**(S1)** must be selected for this accommodation.
R3. Use computer or other assistive technology device to respond. a. Student utilizes an electronic input device without the "help" features, such as spell check, an electronic dictionary, a thesaurus, or access to the Internet. Please see Scribe Instructions and Guidelines on pages 15–18.	Students may use a computer, typewriter, or other assistive technology device to respond. This may include software dictation or dictation devices the student uses during routine instruction. Extended written responses must be printed off for transcription. Return the original typed student response for secure materials submission. The Test Administrator must transcribe words verbatim into an answer document/test book or Online Testing Client. The electronic responses or recordings must be destroyed or erased by District Test Coordinator. **(S1 or S2)** must be selected for this accommodation.
R4. Test Administrator monitors placement of student responses on the answer document or the online testing client.	Test Administrator may redirect students. Students may not be directed to correct or incorrect answers in any way.
R5. Brailler/Secure, Braille Note-taker/Abacus (students with a visual impairment)	The Test Administrator must transcribe answers verbatim into the standard answer document/test book that was provided in the large-print (paper/pencil) or Braille kit. **(S1, S2, or S4)** must be selected for

OSTP Nonstandard Accommodations

IV. ELA Read-Aloud (Grades 3–8)	Eligibility Requirements
NS1. Human Reader or Sign Language Interpretation Accommodations for the English Language Arts Assessments. a. Human Reader reads test directions, test items, and answer choices from separate test booklet and must log the test booklet serial number on the Nondisclosure agreement (NDA). This is limited to small group or individualized testing b. Sign Language Interpretation may be accomplished by using a separate test booklet. Test directions, test items, and answer choices may be read verbatim. Refer to test formatting options. Students may request items be read more than once. **Due Date for Requests:** Requests must be submitted to the OSDE through the Nonstandard Accommodations on the SDE Single Sign-on by February 1st for the Spring testing window and responses will be provided on a case-by-case basis no later than March 15th.	This accommodation must be determined by the following 3-pronged approach: 1.The student has a specific disability that severely limits or prevents him/her from decoding printed text at any level of difficulty, even after varied and repeated attempts to teach the student to do so (i.e., the student is a non-reader, not simply reading below grade level); **and** 2.The student can only access printed materials through a screen reader (assistive technology) or human reader, and/or is provided with spoken text on audiotape, CD, video, or other electronic format during routine instruction (includes Sign Language Interpretation), except while the student is actually being taught to decode; **and** 3. The IEP/504 team will utilize and provide the required documentation from the **OSTP ELA Test Read-Aloud Protocol**, which includes the use of the Protocol for Accommodations in Reading (PAR) or the AEM Navigator for deaf or blind students. This documentation must be uploaded into the Nonstandard Accommodation Tool in the Single

IV. ELA Read-Aloud (Grades 3–8)	Eligibility Requirements
	Sign-on application for consideration by the OSDE. Paper tests are read by a Human Reader. (**S1 or S2)** is required and test forms must be the same. Online tests A human reader reads verbatim from the computer screen. **(S1, S2, or S4)** is required. **The request will be submitted annually through the Nonstandard Accommodation Tool in the Single Sign-on application.**
NS2. Unique Accommodations **Students with disabilities who have IEPs/504 plans are eligible for consideration for unique accommodations on state assessments (e.g., allow projection of test for students receiving the Sign Language Interpretation accommodation in small groups, manipulatives, etc.).** **A unique accommodation is an accommodation that requires changes or alterations to the test materials/ booklet or media presentation.** **The unique accommodation must be one that is regularly used by the student for classroom instruction, must be on the student's IEP, and must not alter the underlying content of the assessment.**	A request may be made (pursuant to the IEP/504 team's determination) for a unique accommodation utilizing **Form U** for a student with a disability on any specified subject area(s) of the OSTP. The **Form U** must be submitted: ˜ Due to the student's need for an accommodation that would enable the student to access the state assessment. ˜ Through the Nonstandard Accommodation Tool in the Single Sign-on application. ˜ With completed student information and any other requested information. **The requested accommodation must not impact the reliability or validity of the test, and the request may not exempt a student from taking any portion of the OSTP test(s).**

See Table 4-3 for the numbers of students tested with and without accommodations for the 2016–17 school year. In addition, the numbers of students who were tested with online testing accommodations are presented by accommodation type in Appendix H.

Table 4-3. 2016–17 OSTP: Numbers of Students Tested With and Without Accommodations by Content Area and Grade

Grade	Content Area	Number of Students Tested	
		With Accommodations	*Without Accommodations*
3	ELA	7,104	45,327
	Mathematics	7,643	44,894
4	ELA	6,831	44,284
	Mathematics	7,099	44,109
5	ELA	6,386	42,769
	Mathematics	6,651	42,590
	Science	6,540	42,669
6	ELA	4,436	42,104
	Mathematics	6,023	40,624
7	ELA	4,384	43,723
	Mathematics	6,447	41,745

continued

Grade	Content Area	Number of Students Tested	
		With Accommodations	*Without Accommodations*
8	ELA	4,683	43,282
	Mathematics	6,307	41,658
	Science	5,854	42,052
10	ELA	2,545	43,330
	Mathematics	4,115	41,728
	Science	3,553	26,186
	U.S. History	2,982	40,538

A test accommodation is a change in the way a test is administered or in the way a student responds to test questions. Similar to instructional accommodations, test accommodations are intended to offset the effects of a student's disability and to provide him or her with the opportunity to demonstrate knowledge and skills on statewide assessments.

The right of a student with a disability to receive allowable accommodations on OSTP tests is protected by both federal and state laws. The student's current individualized education program (IEP)/504 plan must specify precisely which test accommodation(s) he or she will receive. In cases where an IEP/504 plan is under development, the school personnel responsible for writing the plan must have already met and agreed upon the necessary accommodation(s) before a student may be provided the accommodation(s).

A student who does not have a documented disability or is not served by a current IEP/504 plan is not eligible to receive accommodations on OSTP tests, except for Emergency Accommodation situations. Scribes may be provided for any student (with or without an IEP or Section 504 plan) who has a short-term medical condition that affects his or her physical dexterity and thus impedes his or her ability to respond to the assessment format. Refer to the *Oklahoma Accommodations Manual* on the SDE website for more detailed information regarding assessment accommodations for paper/pencil and computer based assessments. This manual can be found at sde.ok.gov/sde/sites/ok.gov.sde/files/documents/files/OK%20Accommodations%20Manual.pdf. Refer to Appendix G for accommodations as well.

4.7 TEST SECURITY

Maintaining test security is critical to the success of the OSTP. The *2016–17 OSTP Test Administrator Manual* explains in detail all test security measures and test administration procedures. The SDE takes the matter of test security very seriously and has implemented stringent procedures to protect the security of the OSTP.

Each district test coordinator, building test coordinator, test administrator, and test proctor is responsible for all secure test materials received and for returning all secure test materials (see Section 210:10-13-4 of the Oklahoma Administrative Code). Violation of regulations may result in revocation of a person's teaching, counseling, administrative, and/or other certificates. The tests, and all the materials associated with these tests, are secure materials. It is important to prevent an opportunity for any student to

have access to the tests and thus have an advantage over other students before the administration of the tests. Prior exposure to the tests or individual items would invalidate scores. The materials associated with these tests may not be photographed, photocopied, or reproduced in any other fashion, including paraphrasing—to do so is in violation of copyright law. All test items have been copyrighted by the SDE. In addition, students are not permitted to have cell phones on their person during testing, to help prevent them from taking pictures of items.

The *2016–17 OSTP Test Administration Manual* describes in detail the policy and procedures for nondisclosure of test content, securing test materials, use of proctors, use of security forms, test administrator responsibilities, and reporting test irregularities. The SDE also conducts site visits during test administration to assure compliance to policies. During this administration 105 sites were selected for desk monitoring and 19 sites for onsite monitoring. During onsite monitoring the following list of activities is monitored:

1. Assessment monitors will check into the site office, presenting proper identification. Ask to see the building test coordinator. Be sure to sign-in.
2. If time permits, prior to the beginning of the testing session, conduct a walk-through of the testing rooms, observe where the secure materials are kept when not in the classroom, and check out the copiers for the required signage. All copy machines should have a sign posted.
3. When observing assessment activities, monitors will practice the principal of "observation from a distance," with the understanding that the site staff needs to go about performing their job tasks while taking little or no notice of their observers, who likewise should be able to conduct their observation without being asked to participate in the administration in any way.
4. The majority of the assessment day activities will be easily visible to observers. Before and after the administration, the observer may walk amongst the district/site assessment personnel to view their work.
5. The State observers may request access to view documentation for students who are receiving accommodations on the assessments.
6. During the assessment, the monitor should try to seat themselves where they can observe all assessment activities and complete the observation checklist while maintaining a comfortable distance between themselves, students and the site assessment personnel.
7. The observation may be extended after the conclusion of the assessment so that post-assessment activities can be observed.
8. If district/site staff are not following assessment protocol, this will be noted on the observation checklist. The observer will not correct site staff or make comments about task performance while in a testing room.
9. If an observation is made that needs immediate attention, notify the Office of Assessments and Accountability for additional guidance and permission to invalidate assessments. Notify the BTC of the violation and concern. Notify the DTC

10. At the conclusion of the visit, observation feedback will be submitted to the State Office of Assessments and Accountability, using the checklist document. (i.e., paper or electronic version)
11. The section for **Other Comments** may include the observer's thoughts regarding: administration of the assessment, such as appropriate tone, management, and monitoring of the session; provision for security and confidentiality of test materials, and school and student information; any information which might require action during this assessment cycle; and overall impressions of the assessment administration.
12. Completed checklists must be submitted to the State office in a timely manner, preferably within two days of completing the visit.

Materials were inventoried when returned to Measured Progress at the end of the test administration. A materials discrepancy report was provided after all secure materials were scanned. Measured Progress used this report to make all attempts to recover the missing materials. The process for researching the missing materials includes the following steps:

- Contact the District Test Coordinators (DTCs) whose schools appeared on the list to have them conduct a search for any missing materials to ensure they were returned. If those materials are located, Measured Progress arranges for the return of those materials.
- Measured Progress also conducts a physical box search on site at their facilities to search for materials.
- If materials were not located by Measured Progress or the DTC, a spreadsheet was maintained to document the missing materials.

At the end of the material discrepancy clean up period in 2017 there were 147 test books that were not able to be recovered. None of them contained student answers as all student scores were accounted for. In addition there were 6 Braille and Large Print kits that could not be accounted for.

4.8 Test and Administration Irregularities

There were no test administration irregularities in the Spring 2017 administration of the OSTP.

4.9 SERVICE CENTER

To provide additional support to schools before, during, and after testing, Measured Progress operates the OSTP Service Center. The support of a service center is essential to the successful administration of any statewide test program. The service center provides a centralized location to which individuals in the field can call, using a toll-free number, to ask specific questions or report any problems he or she may be experiencing with paper/pencil testing or computer-based testing. Representatives are responsible for receiving, responding to, and tracking calls, then routing issues to the appropriate person(s) for resolution. All calls are logged into a database that includes notes regarding the issue and resolution of each call.

The service center is staffed year-round and is available to receive calls from 8:00 a.m. to 4:00 p.m. CST, Monday through Friday. Extra representatives and extended hours were added beginning approximately two weeks before the start of the testing window and ending two weeks after the close of the testing window to assist with handling the additional call volume. There are three levels of support provided to callers as needed and based upon the issue needing support:

1. Level 1 Support – Measured Progress Technical Product Support
2. Level 2 Support – Measured Progress OSTP Program Help Desk
3. Level 3 Support – eMetric Support for Computer-Based Testing Issues / Technical Support

Figure 4-1 shows the call volume during the testing window.

Figure 4-1. 2016–17 OSTP: Call Volume During Testing Window

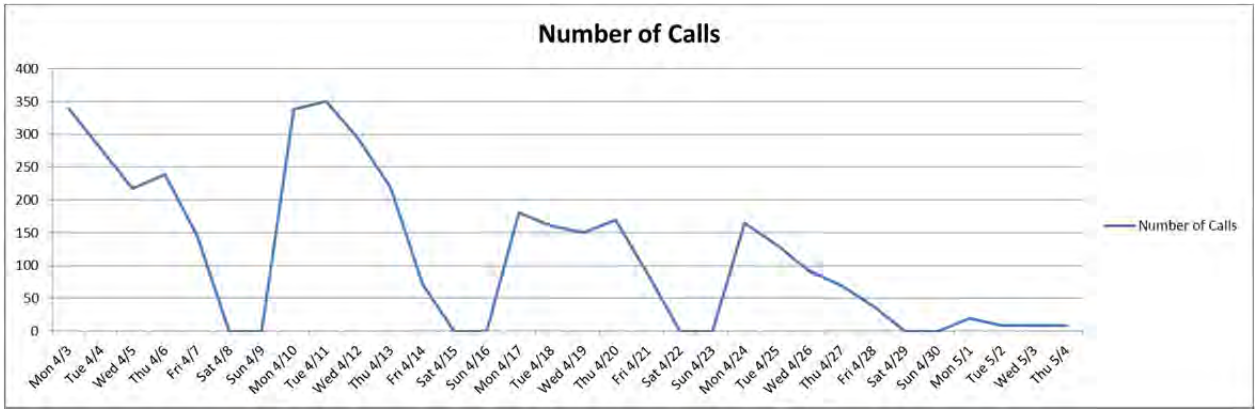
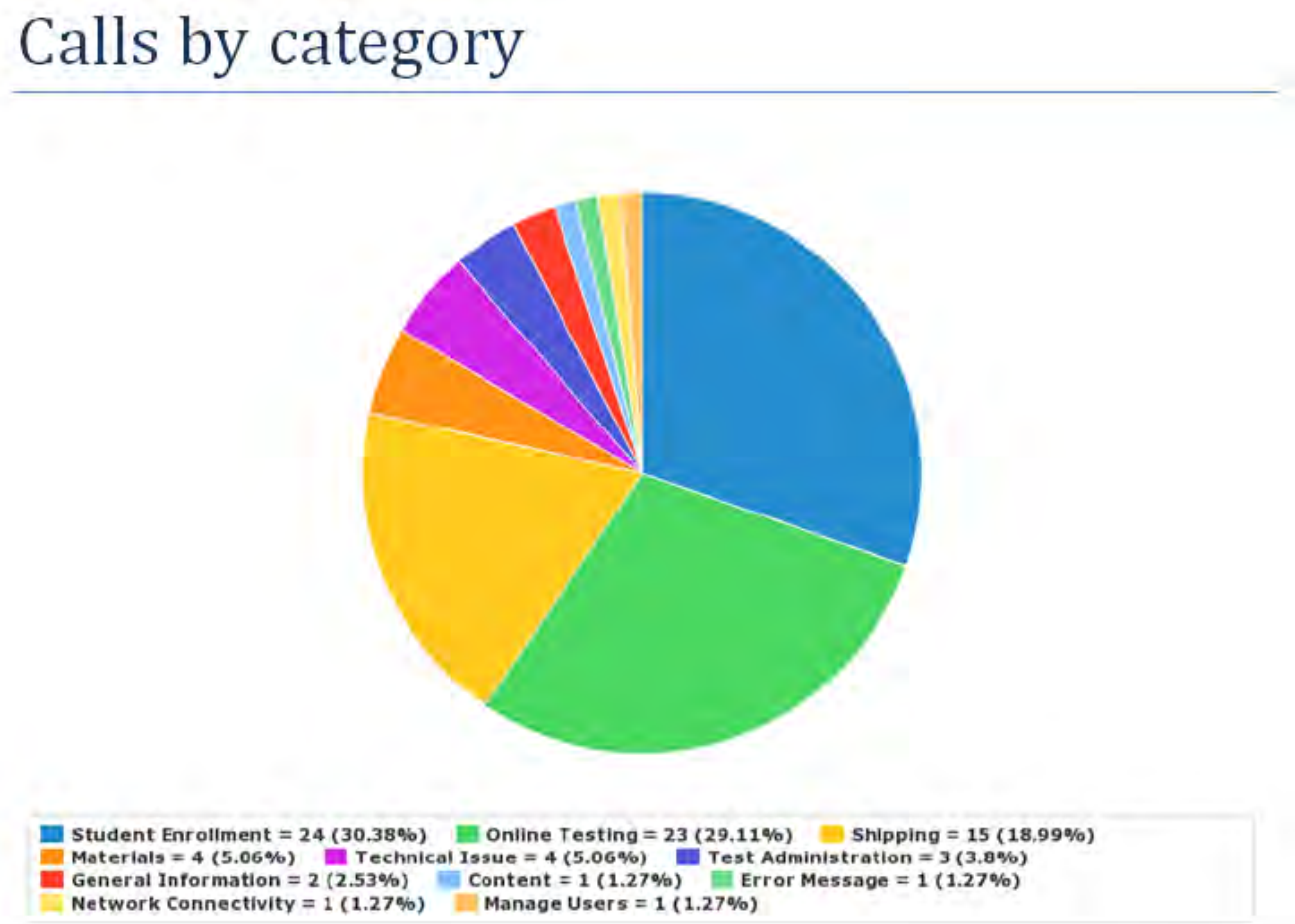


Figure 4-2 shows the summary of calls by category during the testing window.

Figure 4-2. 2016–17 OSTP: Summary of Calls by Category



CHAPTER 5 SCORING

Upon receipt of used copies of paper OSTP Student Answer Documents following testing, Measured Progress scanned all student responses, along with student identification and demographic information. Imaged data for multiple-choice responses were machine-scored. Images of open-response items were processed and organized by iScore, a secure server-to-server electronic scoring software designed by Measured Progress, for hand-scoring. All open-response items administered through computer-based testing were also loaded into iScore following a handoff between the test administration platform and the scoring system.

Student responses that could not be physically scanned (e.g., answer documents damaged during shipping) were physically reviewed and scored on an individual basis by trained, qualified Scoring Supervisors or the Scoring Content Specialist. These scores were linked to the student's demographic data and merged with the student's scoring file by Measured Progress's Data and Reporting Services Department.

5.1 MACHINE-SCORED ITEMS

Multiple-choice responses were compared to scoring keys using item analysis software. Correct answers were assigned a score of 1 point; incorrect answers were assigned a score of 0 points. Student responses with multiple marks or blank responses were also assigned 0 points.

The hardware elements of the scanners monitored themselves continuously for correct reads, and the software driving these scanners monitored the correct data reads. Standard checks included recognition of a sheet that did not belong, was upside down, or was backward; identification of missing critical data, including a student ID number or test form that was out of range or missing; and identification of page/document sequence errors. When a problem was detected, the scanner stopped and displayed an error message directing the operator to investigate and correct the situation.

5.2 ONLINE SCORING OF COMPUTER-BASED TESTS (CBT)

Item responses from students are compared to scoring keys using item analysis software. This robust software compares the student's response to the item to the answer key and assigns a maximum score for correct responses (1 point) and incorrect answers (0 points). Student responses with blank item responses are also assigned 0 points. At the end of an administration, a second independent validation of all the student responses is conducted to compare and validate results to ensure accurate machine-scoring.

5.3 HUMAN SCORING OF WRITING PROMPTS

The images of student responses to the constructed-response items were hand-scored through the iScore system. Using iScore minimized the need for scorers to physically handle actual answer booklets and

related scoring materials. Student confidentiality was easily maintained, as all Oklahoma scoring was blind (i.e., district, school, and student names were not visible to scorers). The iScore system maintained the link between the student response images and their associated test booklet numbers.

Through iScore, qualified scorers accessed electronically scanned images of student responses at computer terminals. The scorers evaluated each response and recorded each student's score via keypad or mouse entry through the iScore system. When a scorer finished one response, the next response immediately appeared on the computer screen.

The use of iScore also helped ensure that access to student response images was limited to only those who were scoring or who were working for Measured Progress in a scoring management capacity.

5.3.1 Scoring Location and Staff

Scoring Location

The iScore database, its operation, and its administrative controls are all based in Dover, New Hampshire. For 2016–17, the scoring of all grades was conducted in Measured Progress's Menands, New York, scoring facility.

Table 5-1. 2016–17 OSTP: Operational Scoring Locations by Content Area and Grade

Content Area	*Grade*	*Dover, NH*	*Menands, NY*	*Longmont, CO*
Writing	5		X	
	8		X	
	10		X	

The iScore system monitored accuracy, reliability, and consistency across all scoring sites. Constant daily communication and coordination were accomplished through e-mail, telephone, and secure websites to ensure that critical information and scoring modifications were shared and implemented across all scoring sites.

Staff Positions

The following staff members were involved with scoring the 2016–17 OSTP responses:

- The Oklahoma Scoring Project Manager oversaw communication and coordination of scoring across all scoring sites, scheduling of activities, and general management of all Oklahoma scoring related tasks.
- The iScore Operations Manager managed the technical aspects of the scoring engine.
- The Scoring Content Specialist (writing) ensured consistency of scoring and managed the scoring leadership team for all grades. The Content Specialist was responsible for monitoring scorer accuracy and accepting or rejecting scorers' work product.

- Multiple Scoring Supervisors trained and oversaw items at each grade level. They were selected from a pool of experienced Scoring Team Leaders for their ability to score accurately and to instruct and train scorers. Scoring Supervisors trained Scoring Team Leaders and Scorers on the item, answered questions during the scoring process, and worked closely with the Scoring Content Specialist.
- Numerous Scoring Team Leaders, selected from a pool of skilled and experienced scorers, provided read-behind activities for the scorers at their scoring tables. Scoring Team Leaders worked closely with the Scoring Supervisors to ensure accurate and consistent scoring for their assigned grade level. The ratio of Scoring Team Leaders to scorers was approximately 1: 6.
- Scorers were trained on and scored student responses for operational writing prompts. The chart below shows the number of scorers trained for each grade.

Table 5-2. 2016–17 OSTP: Scorers Trained by Grade

Grade	*Number of Scorers Qualified*	*Number of Scorers Dismissed for Failing to Qualify*
5	51	10
8	43	12
10	70	9

5.3.2 Benchmarking Meetings

The 2016–17 OSTP items did not include any new field-test items and, thus, did not require any standard benchmarking meetings. Since some of the writing prompts were re-used prompts, but with alterations to the wording of the prompt or changes to the rubric, conference call meetings occurred between the Scoring Content Specialist and the SDE Content Specialist to align the existing training material with the prompt and rubric edits prior to item training.

5.3.3 Scorer Recruitment and Qualifications

For scoring the 2016–17 OSTP tests, Measured Progress actively sought a diverse scoring pool. The broad range of scorer backgrounds included scientists, business professionals, authors, teachers, graduate school students, and retired educators. Demographic information (e.g., gender, race, educational background) about scorers was electronically captured for reporting. All scorers were required to sign a nondisclosure/confidentiality agreement. In all cases, potential scorers were required to submit documentation (e.g., résumé and/or transcripts) of their qualifications. Table 5-3 summarizes the qualifications of the 2016–17 OSTP scoring leadership and scorers.

Table 5-3. 2016–17 OSTP: Qualifications of Scoring Leadership and Scorers—Fall Administration

Scoring Responsibility	Educational Credentials				Total
	Doctorate	*Master's*	*Bachelor's*	*Other*	
Scoring Leadership	33.33%	50%	16.67%	0	100%
Scorers	16.67%	25%	58.34%	0	100%

Scoring Leadership: Scoring Supervisors and Scoring Team Leaders

5.3.4 Methodology for Scoring Polytomous Items

Possible Score Points

For all writing prompts, responses were scored in five traits (domains) on a 1–4 scale.

Nonscorable Items

Scorers could designate a response as nonscorable for any of the following reasons:

- Blank – Student provided no response or no intentional marks on the answer space.
- Unreadable – The response cannot be read, either due to a scanning error, light or hard to read handwriting, or other reasons. Unreadable responses are sent to Edit Scoring Supervisors who review the paper copy of the test book in order to assess the response.
- Non-English – Response was written in a language other than English.
- Off Topic – Includes a direct copy of the prompt without any original text, a totally irrelevant response that does not respond to the prompt, or any unrelated artwork.
- Refusal – Student's response indicates a clear refusal to answer the prompt.
- Illegible – The student's handwriting or spelling is so poor that the response cannot be evaluated.

Number of Reads

All responses were evaluated by at least one scorer, with at least 10% of the responses also scored by a second scorer (double-blind scoring). Double-blind scored items were scored independently by two scorers, whose scores were tracked for interrater agreement. The iScore system randomly routed 10% of all responses for double-blind scoring. In addition, any response that was scored as a condition code instead of a numeric score were also routed for a second score, regardless of whether the response was initially flagged for double scoring. This results in a functional double-blind rate that is higher than the baseline requirement. A small number of responses were scored as an Edit by the Content Specialist or Scoring Supervisor, and would not have been subject to double-blind scoring. An Edit score refers to an unscanable test book or other response that cannot be routed through the scoring system, and is viewed and scored outside the normal process flow.

5.3.5 Scorer Training

Scorer training began with an introduction of the on-site scoring staff and an overview of the purpose and goals of the project (including discussion about the security, confidentiality, and proprietary nature of testing materials, scoring materials, and procedures).

Next, scorers thoroughly reviewed and discussed the rubric for each item to be scored. Following review of an item's rubric, scorers reviewed the anchor and practice sets for the item before taking a qualification set.

Anchor Set

Responses in anchor sets are typical examples of each score point and were provided by the SDE. The responses in the anchor set were scored on all five traits.Responses were read aloud to the room of scorers in descending score order. Announcing the true score of each anchor response, trainers facilitated group discussion of responses in relation to score point descriptions to help scorers internalize the typical characteristics of score points. This anchor set continued to serve as a reference for scorers as they went on to calibration, scoring, and recalibration activities for that item.

Practice Set

Scorers practiced applying the scoring guide and anchors to responses in the practice set. The practice set is intended to mimic live scoring. As such, scorers assigned scores in each of the traits to each response without any knowledge of the given score. After scorers independently read and scored a practice set response, trainers would poll scorers or use online training system reports to record their initial range of scores. Trainers then led a group discussion of the responses, directing scorers' attention to difficult scoring issues (e.g., the borderline between two score points). Throughout the training, trainers modeled how to discuss scores by referring to the anchor set and to the rubric.

Qualifying Set

Scorers were required to score responses accurately and reliably in qualifying sets. The 10 responses in each qualifying set were selected from an array of responses that clearly illustrated the range of score points for that item as reviewed and approved by the state specialists. The qualification sets were reviewed and approved by the SDE prior to administration.

To be eligible to live-score one of the above items, scorers were required to demonstrate scoring accuracy rates of at least 70% exact agreement and at least 90% exact or adjacent agreement. Scorers had to enter a score for each of the traits on each qualification paper. Scoring Team Leaders reviewed the results with scorers after qualification.

Retraining

Scorers who did not pass the first qualifying set were retrained as a group by reviewing their performance with scoring leadership and then scoring a second qualifying set of responses. If they achieved the required accuracy rate on the second qualifying set, they were allowed to score operational responses. Scorers who did not achieve the required scoring accuracy rates on the second qualifying set were not allowed to score responses for that item.

5.3.6 Leadership Training

Scoring Supervisors reviewed training materials and consulted with the Scoring Content Specialist in advance of training to ensure full understanding of the scoring decisions for the item. The Scoring Supervisors then conducted training for Scoring Team Leaders in a separate training session prior to scorer training. In addition to a discussion of the items and their responses, leadership training included greater detail on the client's rationale behind the score points than that covered with regular scorers in order to better equip them to handle questions from the scorers.

5.3.7 Monitoring of Scoring Quality Control

Scorers were constantly monitored for accuracy during the course of the project. Read-behind and double-blind statistics were reviewed daily. Recalibration sets were administered repeatedly during the course of the project. Scorers who demonstrated inaccurate or inconsistent scoring through these quality control measures were stopped from scoring. Their work for the day was voided and rescored by other qualified scorers. Scorers were retrained, and allowed to resume scoring. However, anyone who repeatedly demonstrated accuracy and consistency in scoring below standard would have been removed from the project. Over the course of operation scoring 1 person was removed from the project for this reason.

Scorers were monitored for continued accuracy and consistency throughout the scoring process, using the following methods and tools (which are defined in this section):

- read-behind procedures
- double-blind scoring
- recalibration sets

It should be noted that any scorer whose accuracy rate fell below the expected rate for a particular item and monitoring method was retrained on that item. Upon approval by the Scoring Supervisor or Scoring Content Specialist as appropriate, the scorer was allowed to resume scoring. Scorers who met or exceeded the expected accuracy rates continued scoring. The use of multiple monitoring techniques is critical for monitoring scorer accuracy during the process of live scoring.

Read-Behind Scoring Procedures

Read-behind scoring refers to the scoring of a response by scoring leadership (usually a Scoring Team Leader) after a scorer has already scored the response. The practice was applied to all writing prompts.

Responses placed into the read-behind queue were randomly selected by scoring leadership; scorers were not aware which of their responses would be reviewed by their Scoring Team Leader. The iScore system allowed one, two, or three responses per scorer to be placed into the read-behind queue at a time.

The Scoring Team Leader entered his or her score into iScore before being allowed to see the scorer's score. The Scoring Team Leader then compared the two scores, and the score of record (i.e., the reported score) was determined as follows:

- If there was exact agreement between the scores, no action was necessary; the scorer's score remained.
- If scores were adjacent, the Scoring Team Leader's score became the score of record. (A significant number of adjacent scores for a scorer triggered an individual scoring consultation with the Scoring Team Leader, after which the Scoring Supervisor determined whether or when the scorer could resume scoring.)
- If the scores were discrepant (i.e., differed by more than one point), the Scoring Team Leader's score became the score of record. (This triggered an individual consultation for the scorer with the Scoring Team Leader, after which the Scoring Supervisor determined whether or when the scorer could resume scoring on that item.)

Table 5-4 illustrates how scores were resolved by read-behind.

Table 5-4. 2016–17 OSTP: Examples of Read-Behind Scoring Resolutions

Read-Behind Scoring[1]		
Scorer Score	*Leadership Score*	*Final Score*
4-4-4-4-4	4-4-4-4-4	4-4-4-4-4
4-3-3-4-3	3-3-3-4-3	3-3-3-4-3
4-3-3-3-3	2-2-2-3-2	2-2-2-3-2

[1] In all cases, the leadership score is the final score of record.

Team Leaders were tasked with conducting read-behinds on 10% of the total student population, with targets to distribute the read-behinds across all the scorers assigned to them. Scorers who hovered at the threshold of acceptable accuracy would have been targeted with more read-behinds than scorers who were consistently demonstrating high levels of accuracy.

Double-Blind Scoring

Scorers independently scored a response without knowing whether the response was to be double-blind scored. The practice was applied to all writing prompts. All writing prompts were scored with 10% double-blind scoring.

If there was a discrepancy (a difference greater than one score point) between double-blind scores, the response was placed into an arbitration queue. Arbitration responses were reviewed by scoring leadership (Scoring Team Leader or Scoring Supervisor) without knowledge of the two scorers' scores. Scoring leadership assigned the final score. Scoring leadership consulted individually with any scorer whose scoring rate fell below the required accuracy rate, and the Scoring Supervisor determined whether or when the scorer could resume scoring on that item. Once the scorer was allowed to resume scoring, scoring leadership carefully monitored the scorer's accuracy by increasing the number of read-behinds.

Recalibration Sets

To determine whether scorers were still calibrated to the scoring standard, they were required to take an online recalibration set at the start of the day at various points during the scoring project.

Each recalibration set consisted of five responses representing the entire range of possible scores.

Any scorer who demonstrated difficulty was retrained before being allowed by the Scoring Supervisor to continue scoring. Once allowed to resume scoring, scoring leadership carefully monitored these scorers by increasing the number of read-behinds.

Scoring Reports

Measured Progress's electronic scoring software, iScore, generated multiple reports that were used by scoring leadership to measure and monitor scorers for scoring accuracy, consistency, and productivity.

Samples of these reports are provided in Appendix I.

5.3.8 Interrater Consistency

Interrater consistency information is presented as evidence for the reliability of the human-scored results in ELA Grades 5, 8, and 10. Specifically, these results demonstrate the agreement between scores assigned by first and second rater. It must be noted that these results are descriptive and retrospective; procedures and metrics used to monitor and evaluate rater performance are described in Section 5.3.7 (Monitoring of Scoring Quality Control).

Various statistics are employed to evaluate interrater consistency such as the number of included scores, the percent exact agreement, percent adjacent agreement, and the correlation between the first two sets of scores. The correlation describes degree of consistency between the two raters with a correlation of one being perfect agreement. The percent of responses that required a third score is also included to quantify the

resolution between discrepant first and second raters as the third score is required when the scores of the raters are not adjacent. A summary of the interrater consistency results are collapsed across the hand-scored items by content area and form and presented in Table 5-5 below. This same information is provided at the item level in Appendix J.

Table 5-5. 2016–17 OSTP: Summary of Interrater Consistency Statistics Collapsed Across Items by Content Area

Content Area	Grade	Items	Number of		Percent		Correlation	Percent of Third Scores
			Score Categories	*Included Scores*	*Exact*	*Adjacent*		
ELA	5	5	5	24,415	66.48	32.71	0.55	0.81
	8	5	5	23,760	62.35	36.30	0.61	1.36
	10	5	5	22,945	62.18	36.70	0.62	1.12

CHAPTER 6 CLASSICAL ITEM ANALYSIS

As noted in Brown (1983), "A test is only as good as the items it contains." A complete evaluation of a test's quality must include an evaluation of each item. Both *Standards for Educational and Psychological Testing* (AERA et al., 2014) and *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) include standards for identifying quality items. Items should assess only knowledge or skills that are identified as part of the domain being tested and should avoid assessing irrelevant factors. Items should also be unambiguous and free of grammatical errors, potentially insensitive content or language, and other confounding characteristics. In addition, items must not unfairly disadvantage students in particular racial, ethnic, or gender groups.

Both qualitative and quantitative analyses are conducted to ensure that OSTP items meet these standards. Qualitative analyses are described in earlier chapters of this report; this chapter focuses on quantitative evaluations. Statistical evaluations are presented in four parts: 1) difficulty indices, 2) item-test correlations, 3) differential item functioning (DIF) statistics, and 4) dimensionality analyses. The item analyses presented here are based on the statewide administration of the OSTP in Spring 2017. Note that the information presented in this chapter is based on the items common to all forms, since those are the items on which student scores are calculated. (Item analyses are also performed for field-test items, and the statistics are then used during the item review process and form assembly for future administrations.)

6.1 CLASSICAL DIFFICULTY AND DISCRIMINATION INDICES

All multiple-choice items are evaluated in terms of item difficulty according to standard classical test theory practices. Difficulty is defined as the average proportion of points achieved on an item and is measured by obtaining the average score on an item and dividing it by the maximum possible score for the item. Multiple-choice items are scored dichotomously (correct vs. incorrect); for these items, the difficulty index is simply the proportion of students who correctly answered the item. Although this index is traditionally described as a measure of difficulty, it is properly interpreted as an *easiness* index, because larger values indicate easier items. An index of 0.0 indicates that all students received no credit for the item, and an index of 1.0 indicates that all students received full credit for the item.

Items that are answered correctly by almost all students provide little information about differences in student abilities, but they do indicate knowledge or skills that have been mastered by most students. Similarly, items that are correctly answered by very few students provide little information about differences in student abilities, but they may indicate knowledge or skills that have not yet been mastered by most students. In general, to provide the best measurement, difficulty indices should range from near-chance performance (0.25 for four-option multiple-choice items) to 0.90, with the majority of items generally falling between around 0.4 and 0.7. However, on a standards-referenced assessment such as the OSTP, it may be appropriate to include some items with very low or very high item difficulty values to ensure sufficient content coverage.

A desirable characteristic of an item is for higher-ability students to perform better on the item than lower-ability students do. The correlation between student performance on a single item and total test score is a commonly used measure of this characteristic of the item. Within classical test theory, the item-test correlation is referred to as the item's discrimination, because it indicates the extent to which successful performance on an item discriminates between high and low scores on the test. The theoretical range of these statistics is –1.0 to +1.0, with a typical observed range from 0.2 to 0.6.

Discrimination indices can be thought of as measures of how closely an item assesses the same knowledge and skills assessed by other items contributing to the criterion total score. That is, the discrimination index can be thought of as a measure of construct consistency.

A summary of the item difficulty and item discrimination statistics for each content area/grade combination is presented in Table 6-1. Note that the statistics are presented for all multiple-choice items. The mean difficulty and discrimination values shown in the table are within generally acceptable and expected ranges, with average difficulties (*p*-values) between 0.40 and 0.70 and average discrimination between 0.30 and 0.40.

Table 6-1. 2016–17 OSTP: Summary of Item Difficulty and Discrimination Statistics of Multiple-Choice Items by Content Area and Grade

Content Area	Grade	Number of Items	*p*-Value			Discrimination		
			Mean	*Standard Deviation*	*Range*	*Mean*	*Standard Deviation*	*Range*
Mathematics	3	120	0.69	0.18	0.17-0.96	0.40	0.09	0.12-0.58
	4	120	0.66	0.17	0.29-0.96	0.37	0.10	0.09-0.55
	5	121	0.63	0.18	0.17-0.93	0.39	0.08	0.13-0.58
	6	120	0.59	0.22	0.07-0.95	0.34	0.10	0.08-0.57
	7	121	0.49	0.21	0.04-0.94	0.35	0.10	0.11-0.55
	8	121	0.50	0.18	0.06-0.91	0.36	0.10	0.10-0.55
	10	140	0.47	0.16	0.10-0.84	0.36	0.11	0.11-0.60
ELA	3	115	0.61	0.17	0.19-0.91	0.37	0.10	0.10-0.56
	4	109	0.65	0.16	0.29-0.97	0.37	0.10	0.12-0.54
	5	113	0.66	0.15	0.15-0.92	0.38	0.10	0.09-0.55
	6	113	0.67	0.15	0.29-0.90	0.36	0.10	0.08-0.53
	7	113	0.65	0.15	0.23-0.95	0.34	0.10	0.08-0.57
	8	107	0.64	0.17	0.20-0.95	0.33	0.11	0.09-0.54
	10	131	0.55	0.15	0.09-0.91	0.33	0.11	0.08-0.56
Science	5	66	0.58	0.16	0.30-0.90	0.32	0.08	0.15-0.47
	8	65	0.53	0.14	0.26-0.89	0.34	0.10	0.13-0.51
	10	64	0.45	0.12	0.19-0.79	0.30	0.09	0.15-0.48
U.S. History	10	105	0.62	0.12	0.23-0.86	0.37	0.09	0.14-0.52

A comparison of indices across grade levels is complicated because these indices are population dependent. Direct comparisons would require that either the items or the students were common across groups. Since that is not the case, it cannot be determined whether differences in performance across grade

levels are due to differences in student abilities, differences in item difficulties, or both. With this caveat in mind, it appears generally that for mathematics, and to a lesser extent science, students in higher grades found their items more difficult than did students in lower grades, while in ELA, the difficulty values are fairly constant across grades.

In addition to the item difficulty and discrimination summaries presented above, item level classical statistics and item level score distributions were also calculated. Item level classical statistics are provided in Appendix K; item difficulty and discrimination values are presented for each item. The item difficulty and discrimination indices are within generally acceptable and expected ranges. Very few items were answered correctly at near-chance or near-perfect rates. Similarly, the positive discrimination indices indicate that students who performed well on individual items tended to perform well overall. There was a small number of items with near-zero discrimination indices.

6.2 DIF

Code of Fair Testing Practices in Education (2004) explicitly states that subgroup differences in performance should be examined when sample sizes permit and that actions should be taken to ensure that differences in performance are due to construct-relevant, rather than irrelevant, factors. *Standards for Educational and Psychological Testing* (AERA et al., 2014) includes similar guidelines. As part of the effort to identify such problems, all 2016–17 OSTP assessment items (operational and field-test) were evaluated in terms of DIF statistics.

For the OSTP, the standardization DIF procedure (Dorans & Kulick, 1986) was employed to evaluate subgroup differences. The standardization DIF procedure is designed to identify items for which subgroups of interest perform differently, beyond the impact of differences in overall achievement. The DIF procedure calculates the difference in item performance for two groups of students (at a time) matched for achievement on the total test. Specifically, average item performance is calculated for students at every total score. Then an overall average is calculated, weighting the total score distribution so that it is the same for the two groups.

When differential performance between two groups occurs on an item (i.e., a DIF index in the "low" or "high" categories, explained below), it may or may not be indicative of item bias. Course-taking patterns or differences in school curricula can lead to DIF but for construct-relevant reasons. On the other hand, if subgroup differences in performance could be traced to differential experience (such as geographical living conditions or access to technology), the inclusion of such items should be reconsidered.

Computed DIF indices have a theoretical range from -1.0 to 1.0 for multiple-choice items. Dorans and Holland (1993) suggested that index values between -0.05 and 0.05 should be considered negligible. The preponderance of assessment items fell within this range. Dorans and Holland further stated that items with

values between -0.10 and -0.05 and between 0.05 and 0.10 (i.e., "low" DIF) should be inspected to ensure that no possible effect is overlooked, and that items with values outside the [-0.10, 0.10] range (i.e., "high" DIF) are more unusual and should be examined very carefully.[10]

For the 2016–17 OSTP, 10 subgroup comparisons were evaluated for DIF:

- Male versus female
- White versus Hispanic or Latino
- White versus Black/African American
- White versus American Indian/Alaskan Native
- White versus Pacific Islander
- White versus two or more races
- Non-ELL versus ELL
- Non-IEP versus IEP
- Non-Economically Disadvantaged versus Economically Disadvantaged

DIF procedures were limited to the subgroups listed above, which have sufficiently large sample sizes so as to avoid inflation of type I error rates. The tables in Appendix L present the number of items classified as either "low" or "high" DIF, overall and by group favored. Generally speaking, the number of high DIF items was low for most tests. Most tests had 0 items with high DIF while some tests had less than 10 items with high DIF. In the higher grades, high DIF becomes more prevalent as non-English language learners (ELL) demonstrate better performance over ELL students.

6.3 DIMENSIONALITY ANALYSIS

Because tests are constructed with multiple content area subcategories and their associated knowledge and skills, the potential exists for a large number of dimensions being invoked beyond the common primary dimension. Generally, the subcategories are highly correlated with each other; therefore, the primary dimension they share typically explains an overwhelming majority of variance in test scores (Roussos & Ozbek, 2006). In fact, the presence of just such a dominant primary dimension is the psychometric assumption that provides the foundation for the unidimensional IRT models that are used for calibrating, linking, scaling, and equating the 2016–17 OSTP test forms.

[10] It should be pointed out here that DIF for items is evaluated initially at the time of field-testing. If an item displays high DIF, it is flagged for review by a Measured Progress content specialist. The content specialist consults with the SDE to determine whether to include the flagged item in a future operational test administration.

The purpose of dimensionality analyses is to investigate whether violation of the assumption of test unidimensionality is statistically detectable and, if so, (a) the degree to which unidimensionality is violated and (b) the nature of the multidimensionality. Findings from dimensionality analyses performed on the 2016–17 OSTP common items for mathematics, ELA, science, and U.S. history are reported below. (Note: only common/operational items were analyzed since they are used for score reporting.)

The dimensionality analyses were conducted using the nonparametric IRT-based methods DIMTEST (Stout, 1987; Stout, Froelich, & Gao, 2001) and DETECT (Zhang & Stout, 1999). Both methods use as their basic statistical building block the estimated average conditional covariances for item pairs. A conditional covariance is the covariance between two items conditioned on total score for the rest of the test, and the average conditional covariance is obtained by averaging over all possible conditioning scores. When a test is strictly unidimensional, all conditional covariances are expected to take on values within random noise of zero, indicating statistically independent item responses for examinees with equal expected scores. Nonzero conditional covariances are essentially violations of the principle of local independence, and local dependence implies multidimensionality. Thus, nonrandom patterns of positive and negative conditional covariances are indicative of multidimensionality.

DIMTEST is a hypothesis-testing procedure for detecting violations of local independence. The data are first randomly divided into a training sample and a cross-validation sample. Then an exploratory analysis of the conditional covariances is conducted on the training sample data to find the cluster of items that displays the greatest evidence of local dependence. The cross-validation sample is then used to test whether the conditional covariances of the selected cluster of items displays local dependence, conditioning on total score on the non-clustered items. The DIMTEST statistic follows a standard normal distribution under the null hypothesis of unidimensionality.

DETECT is an effect-size measure of multidimensionality. As with DIMTEST, the data are first randomly divided into a training sample and a cross-validation sample (these samples are drawn independent of those used with DIMTEST). The training sample is used to find a set of mutually exclusive and collectively exhaustive clusters of items that best fit a systematic pattern of positive conditional covariances for pairs of items from the same cluster and negative conditional covariances from different clusters. Next, the clusters from the training sample are used with the cross-validation sample data to average the conditional covariances: within-cluster conditional covariances are summed, from this sum the between-cluster conditional covariances are subtracted, this difference is divided by the total number of item pairs, and this average is multiplied by 100 to yield an index of the average violation of local independence for an item pair. DETECT values less than 0.2 indicate very weak multidimensionality (or near unidimensionality), values of 0.2 to 0.4 weak to moderate multidimensionality, values of 0.4 to 1.0 moderate to strong multidimensionality, and values greater than 1.0 very strong multidimensionality (Roussos & Ozbek, 2006).

DIMTEST and DETECT were applied to the 2016–17 OSTP, which consisted of 18 different combinations of grade levels and content areas (seven in mathematics, seven in ELA, three in science, and

one in U.S. history). In the 2016–17 OSTP administration, U.S. history used the old operational test form from the previous year. However, mathematics, ELA, and science were operational field-tests with multiple forms per grade. Table 6-2 presents the number of operational test forms analyzed for each content area and grade. These forms accounted for the vast majority of students (over 98%).

Table 6-2. 2016–17 OSTP: Number of Operational Forms in Dimensionality Analysis

Content Area	*Grade*	*Number of Operational Forms*
ELA	3	3
	4	3
	5	3
	6	3
	7	3
	8	3
	10	3
Mathematics	3	3
	4	3
	5	3
	6	3
	7	3
	8	3
	10	3
Science	5	1
	8	1
	10	1
U.S. History	10	1

As shown in the above table, 42 forms were analyzed for ELA and mathematics (three per grade for each content area) while one form per test was analyzed for the other four tests. Thus, a total of 46 test forms were analyzed. The data for each test form were split into a training sample and a cross-validation sample as described earlier. For ELA and mathematics, 34 out of 42 cases had sample sizes over 15,000 and all had sample sizes over 13,800. For science in grades 5 and 8, the sample size was over 47,000 for both grades; while science grade 10 had a sample size that was over 29,000. For U.S. history, the sample size was over 43,500. Because DIMTEST software has an upper limit of 24,000 students, the training and cross-validation samples for the test forms that had over 24,000 students were limited to 12,000 each, randomly sampled from the total sample. DETECT, on the other hand, had an upper limit of 500,000 students, so every training sample and cross-validation sample used all the available data. After randomly splitting the data into training and cross-validation samples, DIMTEST was applied to each dataset to see if the null hypothesis of unidimensionality would be rejected. Next, DETECT was applied to each dataset for which the DIMTEST null hypothesis was rejected in order to estimate the effect size of the multidimensionality.

Because of the large sample sizes for the Oklahoma tests, DIMTEST would be sensitive even to quite small violations of unidimensionality, and the null hypothesis was strongly rejected for every dataset with all *p*-values being less than 0.01, and most being less than 0.00005. Strong rejection of the null hypothesis of unidimensionality is not surprising because strict unidimensionality is an idealization that almost never holds exactly for a given dataset. Thus, it was important to use DETECT to estimate the effect size of the violations of local independence found by DIMTEST. Table 6-3 displays the multidimensional effect size estimates from DETECT.

Table 6-3. 2016–17 OSTP: Multidimensionality Effect Sizes by Content Area and Grade

Content Area	Grade	Multidimensionality Effect Sizes		
		Form1	*Form2*	*Form3*
ELA	3	0.16	0.16	0.18
	4	0.11	0.10	0.13
	5	0.10	0.12	0.11
	6	0.11	0.10	0.09
	7	0.09	0.10	0.12
	8	0.09	0.09	0.12
	10	0.12	0.13	0.12
Mathematics	3	0.12	0.18	0.14
	4	0.18	0.23	0.18
	5	0.23	0.19	0.19
	6	0.15	0.12	0.15
	7	0.16	0.18	0.15
	8	0.15	0.16	0.19
	10	0.19	0.19	0.17
Science	5	0.17		
	8	0.14		
	10	0.15		
U.S. History	10	0.10		

All the DETECT values for 2016–17 indicated very weak to weak multidimensionality. The average DETECT values for the three content areas were 0.17 for mathematics, 0.12 for ELA, 0.10 for U.S. history, and 0.15 for science. The values for the mathematics tests tended to be a bit higher than for the other content areas, potentially because of the ELA content present in the items. A thorough investigation employing experts in the substantive content of the test forms would be required to potentially identify the skills and knowledge areas associated with the DETECT clusters. Because writing prompts are known to sometimes exhibit multidimensionality relative to other aspects of ELA, the clusters in grades 5, 7, and 10 of the ELA test forms were inspected for evidence of multidimensionality associated with the writing prompts. In none of the tests did the writing prompts exhibit evidence of forming a dimension separate from the rest of ELA. This statement is based on inspecting the clusters from the DETECT analyses. In none of the grades did the writing prompt form a separate cluster from the other items. In any case the violations of local independence from all such effects, as evidenced by the DETECT effect sizes, were very small and do not warrant any changes in test design or scoring.

CHAPTER 7 ITEM RESPONSE THEORY SCALING AND EQUATING

In addition to the classical test theory item analyses previously described, the OSTP was analyzed according to item response theory (IRT) models. IRT analyses were used to place all 2016–17 forms on the same scale; details on the IRT calibration and equating procedures for the assessment are described below.

7.1 IRT

All OSTP items were calibrated using IRT. IRT uses mathematical models to define a relationship between an unobserved measure of student performance, usually referred to as theta (θ), and the probability (p) of getting a dichotomous item correct or of getting a particular score on a polytomous item. In IRT, it is assumed that all items are independent measures of the same construct (i.e., of the same θ). Another way to think of θ is as a mathematical representation of the latent trait of interest. Several common IRT models are used to specify the relationship between θ and p (Hambleton & van der Linden, 1997; Hambleton & Swaminathan, 1985). The process of determining the specific mathematical relationship between θ and p is called item calibration. After items are calibrated, they are defined by a set of parameters that specify a nonlinear, monotonically increasing relationship between θ and p. Once the item parameters are known, an estimate of θ for each student can be calculated. This estimate, $\hat{\theta}$, is considered to be an estimate of the student's true score or a general representation of student performance. It has characteristics that are preferable to those of raw scores for equating purposes.

For the 2016–17 OSTP tests, the three-parameter logistic (3PL) model was used for dichotomous items. The graded-response model (GRM) was used for polytomous items (Nering & Ostini, 2010), including polytomously scored multi-part items and open-response items.

The 3PL model for dichotomous items can be defined as

$$P_i(\theta_j) = c_i + (1 - c_i)\frac{\exp[Da_i(\theta_j - b_i)]}{1+\exp[Da_i(\theta_j - b_i)]}, \qquad \text{(Equation 1)}$$

where
i indexes the items,
j indexes students,
a represents item discrimination,
b represents item difficulty,
c is the pseudo guessing parameter, and
D is a normalizing constant equal to 1.701.

In the GRM for polytomous items, an item is scored in $k + 1$ graded categories that can be viewed as a set of k dichotomies. At each point of dichotomization (i.e., at each threshold), a two-parameter model can be used to model the probability that a student's response falls at or above a particular ordered category, given

θ. This implies that a polytomous item with $k + 1$ categories can be characterized by k item category threshold curves (ICTCs) of the two-parameter logistic form:

$$P_{ik}^{*}(\theta_j) = P(U_i \geq k|\theta_j) = \frac{\exp[Da_i(\theta_j - b_i + d_{ik})]}{1+\exp[Da_i(\theta_j - b_i + d_{ik})]}, \quad \text{(Equation 2)}$$

where
U indexes the scored response on an item,
i indexes the items,
j indexes students,
k indexes threshold,
θ is the student ability,
a represents item discrimination,
b represents item difficulty,
d represents threshold, and
D is a normalizing constant equal to 1.701.

After computing k ICTCs in the GRM, $k + 1$ item category characteristic curves (ICCCs), which indicate the probability of responding to a particular category given θ, are derived by subtracting adjacent ICTCs:

$$P_{ik}(\theta_j) = P(U_i = \mathrm{k}|\theta_j) = P_{ik}^{*}(\theta_j) - P_{i(k+1)}^{*}(\theta_j), \quad \text{(Equation 3)}$$

where
i indexes the items,
j indexes students,
k indexes threshold,
θ is the student ability,
P_{ik} represents the probability that the score on item i falls in category k, and
P_{ik}^{*} represents the probability that the score on item i falls at or above the threshold k ($P_{i0}^{*} = 1$ and $P_{i(m+1)}^{*} = 0$).

The GRM is also commonly expressed as:

$$P_{ik}(\theta_j) = \frac{\exp[Da_i(\theta_j - b_i + d_k)]}{1+\exp[Da_i(\theta_j - b_i + d_k)]} - \frac{\exp[Da_i(\theta_j - b_i + d_{k+1})]}{1+\exp[Da_i(\theta_j - b_i + d_{k+1})]}. \quad \text{(Equation 4)}$$

For more information about item calibration and determination, the reader is referred to Lord and Novick (1968), Hambleton and Swaminathan (1985), or Baker and Kim (2004).

7.2 ITEM RESPONSE RESULTS

PARSCALE v4.1 (Muraki & Bock, 2003) software was used to perform all IRT analyses for the OSTP. Each item occupied only one block in the calibration run, and the 1.701 normalizing constant was used for three-parameter logistic (3PL) items. A default convergence criterion of 0.001 was used. The tables in Appendix M give the IRT item parameters of all dichotomous (multiple-choice and short-answer) items on the 2016–17 OSTP tests by content area and grade.

Appendix N provides the test characteristic curves (TCCs) and test information functions (TIFs). TCCs display the expected (average) raw score associated with each θ_j value between -3.0 and 3.0. Mathematically, the TCC is computed by summing the item characteristic curves (ICCs) of all items that contribute to the raw score. The expected raw score at a given value of θ_j is

$$E\left(X\middle|\theta_j\right) = \sum_{i=1}^{n} P_i\left(1\middle|\theta_j\right), \quad \text{(Equation 5)}$$

where
i indexes the items (and n is the number of items contributing to the raw score),
j indexes students (here, θ_j runs from –4 to 4), and
$E\left(X\middle|\theta_j\right)$ is the expected raw score for a student of ability θ_j.

The expected raw score monotonically increases with θ_j, consistent with the notion that students of high ability tend to earn higher raw scores than do students of low ability. Most TCCs are "S-shaped," flatter at the ends of the distribution and steeper in the middle.

The TIF displays the amount of statistical information that the test provides at each value of θ_j. Information functions depict test precision across the entire latent trait continuum. There is an inverse relationship between the information of a test and its standard error of measurement (SEM). For long tests, the SEM at a given θ_j is approximately equal to the inverse of the square root of the statistical information at θ_j (Hambleton, Swaminathan, & Rogers, 1991), as follows:

$$SEM\left(\theta_j\right) = \frac{1}{\sqrt{I\left(\theta_j\right)}}. \quad \text{(Equation 6)}$$

Compared to the tails, TIFs are often higher near the middle of the distribution where most students are located and where most items are sensitive by design.

7.3 EQUATING

7.3.1 Equating Design

The Measured Progress psychometrics team has researched and conducted a wide variety of equating approaches. Because the OSTP assessments use IRT as the underlying statistical model, the equating is best accomplished using IRT methods. Generally, IRT equating methods fall under two broad categories: post-equated and pre-equated. There are a variety of approaches within each of these two categories. Post-equated approaches have the advantage of greater accuracy and precision. The accuracy is likely to be greater because post-equating can correct for item parameter drift; and the precision is greater because the item parameter estimates are based on the large sample sizes of the operational administration, rather than on the smaller field-test sample sizes often associated with pre-equating. In pre-equating designs, greater care must be taken to keep item parameter drift to a bare minimum since there is no chance to correct for it at the time of the scoring and reporting of the operational test results. However, the advantage of pre-equating is the faster reporting of student scores because the IRT model relies on the item parameters from previous administrations of the items.

For any equating design, it is critical that rigorous procedures are implemented to monitor the quality of the equating and to check that the assumptions underlying the equating are not violated. Measured Progress psychometricians have conducted research studies (Parker, Keller, & von Davier, 2009; Hagge & Keller, 2009; Keller, Keller, & Parker, 2008; Keller, Kim, Nering, & Keller, 2007) in this regard and have developed tools to estimate equating error across years under realistic violations of the equating assumptions. Measured Progress can thus monitor particular well-known violations of IRT equating assumptions and use that research to estimate their effects on the reliability and validity of the equating. Additionally, Measured Progress analyzes the equating data in detail for scale drift through traditional delta analyses and *b*-*b* analyses. The delta analysis converts *p*-values to a type of *z*-score called delta scores using the inverse of the normal cumulative function, followed by a linear transformation to a metric with a mean of 13 and a standard deviation of 4. The delta analysis then compares the old delta to the new delta using linear regression analysis. A standardized perpendicular difference from the regression line is calculated for each item, and any item with a difference of a magnitude of 3 or greater is flagged for drift. The *b*-*b* analyses are similar in nature, with the main difference being that the IRT *b*-parameters are used rather than transformed *p*-values.

Furthermore, the Psychometrics Department has special procedures in place during the calibration phase to check that the quality of the equating items is maintained consistently across years. Equating items that display lack of stability are flagged and removed from equating usage.

For the OSTP tests:

- ELA, mathematics, and science were not submitted to equating procedures since 2016–17 spring administration established new item parameters and scales.
- U.S. history used the pre-equating method.

7.3.1.1 PRE-EQUATING

The OSTP U.S. history test used the item pre-equating method as described in Kolen and Brennan (2014). Item pre-equating allows the raw-to-scaled score conversion to be produced before the form is administered, which in turn allows for faster reporting and turnaround times. In item pre-equating, new forms are built from a pool of preexisting IRT-calibrated items. In addition to these operational items, new nonoperational items can also be included on the forms. The operational items are then used as a set of common items for transforming the item parameters of the nonoperational items so that they are the same θ scale as the IRT-calibrated item pool. This allows for the item pool to be expanded continually.

However, with pre-equating there are a number of cautions that need to be taken into consideration. Kolen and Brennan (2014) state that to ensure items behave the same on each administration, the items should appear in the same contexts and positions operationally as they did nonoperationally. Thus, care must to be taken to avoid significant shifts in position and context. Any drift must be carefully monitored and controlled to ensure comparability between forms of the test. In addition, the presence of multidimensionality can be problematic when bringing new items on scale, so dimensionality needs to be carefully monitored as well (see section 6.3).

Item parameters for 2016–2017 administration are displayed in Appendix M. Raw score to scaled score look-up tables are displayed in Appendix O.

7.4 POST-EQUATED CHECK OF PRE-EQUATED TESTS

As described in section 7.3, U.S. history was equated using item pre-equating. However, with pre-equating there are a number of cautions that need to be taken into consideration. Kolen and Brennan (2014) state that to ensure that items behave the same on each administration the items should appear in the same contexts and positions operationally as they did nonoperationally. Thus, care must be taken to avoid significant shifts in position and context. Any drift must be carefully monitored and controlled to ensure comparability between forms of the test.

To provide scale validation evidence, Measured Progress performed a rigorous post-equated check of the test data. One primary usage of the check is to use item bank parameters selectively to exclude the adverse effect of parameter drift on the stability and health of the item bank. Another advantage of the check is the use of more calibration samples to get the better parameter estimates.

The procedures for the post-equated check generally mirror those for post-equating. Once the test score data are received they are calibrated using IRT models described in section 7.1. Next, to bring the calibrated parameters on to the same scale as the previous years they are equated using the Stocking and Lord (1983) method of equating. For this process, equating items were selected based on a rigorous set of criteria including position, context, and stability. Stability was checked through *b*-*b* and delta analyses to ensure there

was no significant drift in the parameters of the equating items. The delta analysis converts *p*-values to a type of *z*-score called delta scores using the inverse of the normal cumulative function, followed by a linear transformation to a metric with a mean of 13 and a standard deviation of 4. The delta analysis then compares the old delta to the new delta using linear regression analysis. A standardized perpendicular difference from the regression line is calculated for each item, and any item with a difference of a magnitude of 3 or greater is flagged for drift. The *b*-*b* analyses are similar in nature, with the main difference being that the IRT *b*-parameters are used rather than transformed *p*-values. Finally, the operational item parameters resulting from this process were updated in the item bank, and these updated parameters were used as part of field-test calibrations.

7.5 PERFORMANCE STANDARDS

Newly developed Oklahoma Academic Standards were implemented and became operational in 2017 necessitating the setting of new performance standards (i.e., cutpoints). The primary goal of standard setting was to determine the knowledge, skills, and abilities (KSAs) that are necessary for students to demonstrate in order to be classified into each of the performance levels based on their performance on assessment items. Standard setting meetings were convened June 20–21, 2017, to set the cutpoint for the grade 3 Reading Sufficient Act (RSA) status, and August 7–11, 2017, to set cutpoints in grades 3–8 and 10 ELA and mathematics as well as grades 5, 8, and 10 science. The following is a summary of the standard setting procedures and outcomes; further information and details can be found in the *Oklahoma School Testing Program: Standard Setting Report* (Measured Progress, 2017). Cutpoints for U.S. history were previously set at standard setting meetings held in Summer 2014 (CTB/McGraw-Hill, 2014).

The bookmark method was used to set performance standards on the OSTP assessments during the 2017 standard setting meetings. This method was selected because the OSTP assessments consist of primarily multiple-choice items; the bookmark procedure is appropriate for use with assessments that contain multiple-choice items that are scaled using IRT. According to this method, panels of 8–11 educators in each grade and content area evaluated booklets of items ordered by IRT difficulty, indicating the "bookmark" or location in the booklet where the KSAs demands of the items transitioned from one PLD to the next. After multiple rounds of test content review supported by feedback in the form of consensus and student outcome impact data, recommended cutpoints were identified and associated with locations on the theta scale.

Results of the standard setting process, which include the cutpoints and evidence of procedural validity, were presented to the SDE. This information assisted them in making the policy decision of where the final cut scores would be placed. The cutpoints on the theta scale that were established at the standard setting meetings for ELA, mathematics, and U.S. history are presented in Table 7-1 below. The θ metric cut scores that emerged from the standard setting meetings will remain fixed throughout the assessment program

unless standards are reset for any reason. Also shown in the table are the cutpoints on the reporting score scale (described below).

Table 7-1. 2016–17 OSTP: Cut Scores on the Theta Metric and Reporting Scale by Content Area and Grade

Content Area	Grade	Theta			Scaled Score				
		Cut 1	*Cut 2*	*Cut 3*	*Min*	*Cut 1*	*Cut 2*	*Cut 3*	*Max*
ELA	RSA	-0.92240	*	*	*	*	*	*	
	3	-0.53135	0.34092	1.39558	200	277	300	329	399
	4	-0.52719	0.38608	1.49870	200	275	300	331	399
	5	-0.78321	0.32533	1.17231	200	271	300	323	399
	6	-0.90856	0.28516	1.39169	200	269	300	330	399
	7	-0.49771	0.46660	1.25890	200	273	300	323	399
	8	-0.69508	0.45070	1.20801	200	269	300	322	399
	10	-0.88010	0.45602	1.25613	200	263	300	323	399
Mathematics	3	-0.84047	0.18660	0.98750	200	274	300	321	399
	4	-0.77087	0.26986	1.06199	200	273	300	322	399
	5	-0.82901	0.42687	1.16994	200	266	300	321	399
	6	-0.75897	0.44047	1.51120	200	267	300	330	399
	7	-0.33556	0.44732	1.47147	200	279	300	329	399
	8	-0.02698	0.75594	1.26746	200	277	300	316	399
	10	0.13593	0.68404	1.33423	200	284	300	320	399
Science	5	-0.91364	0.17570	1.32213	200	272	300	330	399
	8	-0.34011	0.27999	1.32579	200	284	300	328	399
	10	0.28292	1.02248	1.77837	200	276	300	326	399

* Note that only a single cutpoint was set for grade 3 RSA and no scaled scores were reported.

7.5.1 Performance-Level Distributions

Tables P-1 through P-4 in Appendix P show performance-level distributions for 2016–17 by content area and grade.

7.6 Scaled Scores

OSTP scores in ELA, mathematics, and science are reported on a scale ranging from 200 to 399; scores in U.S. history are reported on a scale ranging from 440 to 990. By providing information that is more specific about the position of a student's results, scaled scores supplement performance-level scores. School- and district-level scaled scores are calculated by computing the average of student-level scaled scores. Students' raw scores (i.e., total number of points) on the 2016–17 OSTP were translated to scaled scores using a data analysis process called *scaling*. Scaling simply converts from one scale to another. In the same way that a given temperature can be expressed on either Fahrenheit or Celsius scales, or the same distance can

be expressed in either miles or kilometers, student scores on the 2016–17 OSTP tests can be expressed in raw or scaled scores.

It is important to note that converting from raw scores to scaled scores does not change students' performance-level classifications. Given the relative simplicity of raw scores, it is fair to ask why scaled scores instead of raw scores are used in OSTP reports. Foremost, scaled scores offer the advantage of simplifying result reporting across content areas and subsequent years. Because the standard setting process typically results in different cut scores across content areas on a raw score basis, it is useful to transform these raw cut scores to a scale that is more easily interpretable and consistent. For the OSTP, a score of 300 is the cut score determining proficiency in ELA, mathematics, and science. The cut score determining proficiency in U.S. history was previously set at 700. Using scaled scores greatly simplifies the task of understanding how a student performed.

The scaled scores are obtained by a simple translation of ability estimates ($\hat{\theta}$) using the linear relationship between threshold values on the θ metric and their equivalent values on the scaled score metric. Students' ability estimates are based on their raw scores and are found by mapping through the TCC. Scaled scores are calculated using the linear equation

$$SS = m\hat{\theta} + b,$$

where
m is the slope and
b is the intercept.

A separate linear transformation is used for each grade and content area combination. Table 7-2 shows the slope and intercept terms used to calculate the scaled scores for each grade, content area, and performance level. Note that the values in Table 7-2 will not change unless the standards are reset.

The raw score to scaled score look-up tables for each content area are presented in Appendix O. Graphs of the scaled score cumulative frequency distributions for 2016–17 are presented in Appendix Q.

Table 7-2. 2016–17 OSTP: Scaled Score Slope and Intercept by Content Area and Grade*

Content Area	Grade	*m*-Slope	*b*-Intercept
Mathematics	3	27.055981	290.776075
	4	27.394076	289.423695
	5	26.941195	291.235221
	6	26.649869	292.400523
	7	28.018339	286.926643
	8	27.892824	287.428704
	10	27.934695	287.261220
ELA	3	25.961085	295.155662
	4	26.540559	292.837765
	5	27.706800	288.172798
	6	27.812661	287.749357
	7	27.866287	287.534853
	8	30.517315	276.930741

continued

Content Area	Grade	*m*-Slope	*b*-Intercept
ELA	10	29.855607	279.577570
Science	5	25.887090	295.451638
	8	26.612832	292.548673
	10	33.249147	266.003412
U.S. History	--	54.88	715.31

*Note: The slopes and intercepts are used to transform the theta scores on N(0,1) scale onto the scaled scores.

CHAPTER 8 RELIABILITY

Although an individual item's performance is an important focus for evaluation, a complete evaluation of an assessment must also address the way items function together and complement one another. Tests that function well provide a dependable assessment of the student's level of ability. Unfortunately, no test can do this perfectly. A variety of factors can contribute to a given student's score being either higher or lower than his or her true ability. For example, a student may misread an item, or mistakenly fill in the wrong bubble when he or she knew the answer. Collectively, extraneous factors that impact a student's score are referred to as measurement error. Any assessment includes some amount of measurement error; that is, no measurement is perfect. This is true of all academic assessments—some students will receive scores that underestimate their true ability, and other students will receive scores that overestimate their true ability. When tests have a high amount of measurement error, student scores are very unstable. Students with high ability may get low scores or vice versa. Consequently, one cannot reliably measure a student's true level of ability with such a test. Assessments that have less measurement error (i.e., errors made are small on average and student scores on such a test will consistently represent his or her ability) are described as more reliable.

There are a number of ways to estimate an assessment's reliability. One possible approach is to give the same test to the same students at two time points that are close to each other. If students receive the same scores on each test, then the extraneous factors affecting performance are small and the test is reliable. (This is referred to as "test-retest reliability.") A potential problem with this approach is that students may remember items from the first administration or may have gained (or lost) knowledge or skills in the interim between the two administrations. A solution to the "remembering items" problem is to give a different but parallel test at the second administration. If student scores on each test correlate highly, the test is considered reliable. (This is known as "alternate forms reliability," because an alternate form of the test is used in each administration.) This approach, however, does not address the problem that students may have gained (or lost) knowledge or skills in the interim between the two administrations. In addition, the practical challenges of developing and administering parallel forms generally preclude the use of parallel forms reliability indices. One way to address the latter problems is to split the test in half and then correlate students' scores on the two half-tests; this in effect treats each half-test as a complete test. By doing this, the problems associated with an intervening time interval and of creating and administering two parallel forms of the test are alleviated. This is known as a "split-half estimate of reliability." If the two half-test scores correlate highly, items on the two half-tests must be measuring very similar knowledge or skills. This is evidence that the items complement one another and function well as a group. This also suggests that measurement error will be minimal.

The split-half method requires psychometricians to select items that contribute to each half-test score. This decision may have an impact on the resulting correlation, since each different possible split of the test halves will result in a different correlation. Another problem with the split-half method of calculating reliability is that it underestimates reliability, because test length is cut in half. All else being equal, a shorter

test is less reliable than a longer test. Cronbach (1951) provided a statistic, α (alpha), that eliminates the problem of the split-half method by comparing individual item variances to total test variance. Cronbach's α was used to assess the reliability of the 2016–17 OSTP:

$$\alpha \equiv \frac{n}{n-1}\left[1 - \frac{\sum_{i=1}^{n}\sigma^2_{(Y_i)}}{\sigma^2_x}\right], \qquad \text{(Equation 6)}$$

where
i indexes the item,
n is the total number of items,
$\sigma^2_{(Y_i)}$ represents individual item variance, and
σ^2_x represents the total test variance.

8.1 Reliability and Standard Errors of Measurement

All reliability calculations (i.e., Cronbach's alpha and SEM) were based on the final sets of common and unique items which passed data review and were retained for operational scoring. Average values and ranges of Cronbach's α coefficient and raw score standard errors of measurement (SEMs) for each content area and grade based on the overall population of students who took the 2016–17 OSTP are presented in Table 8-1. Additionally, Appendix R presents descriptive statistics for raw scores and reliability results.

Table 8-1. 2016–17 OSTP: Summary of Reliability and SEM Results by Content Area and Grade

Subject	*Grade*	*Cronbach's Alpha (range)*	*SEM (range)*
Mathematics	3	0.91 (0.90-0.92)	2.73 (2.70-2.76)
	4	0.90 (0.90-0.90)	2.87 (2.81-2.93)
	5	0.90 (0.90-0.91)	2.89 (2.83-2.95)
	6	0.88 (0.87-0.90)	2.84 (2.79-2.87)
	7	0.89 (0.89-0.89)	2.98 (2.93-3.03)
	8	0.89 (0.88-0.90)	3.03 (2.99-3.08)
	10	0.91 (0.90-0.91)	3.36 (3.32-3.40)
	all	0.90 (0.87-0.92)	2.96 (2.70-3.40)
ELA	3	0.90 (0.90-0.90)	2.97 (2.92-3.01)
	4	0.89 (0.87-0.90)	2.92 (2.87-2.98)
	5	0.90 (0.90-0.90)	3.02 (2.99-3.04)
	6	0.89 (0.88-0.90)	2.91 (2.82-2.99)
	7	0.88 (0.87-0.88)	2.97 (2.93-3.00)
	8	0.87 (0.87-0.88)	3.02 (2.98-3.07)
	10	0.89 (0.88-0.90)	3.96 (3.92-4.01)
	all	0.89 (0.87-0.90)	3.11 (2.82-4.01)
Science	5	0.82 (0.76-0.87)	2.95 (2.90-2.99)
	8	0.82 (0.74-0.88)	3.10 (2.96-3.20)

continued

Subject	*Grade*	*Cronbach's Alpha (range)*	*SEM (range)*
Science	10	0.74 (0.65-0.83)	3.06 (2.95-3.17)
	all	0.80 (0.65-0.88)	3.05 (2.90-3.20)
U.S. History	10	0.91	3.36

Appendix R additionally presents reliabilities for various subgroups of interest. Subgroup Cronbach's α's were calculated using the formula defined above based only on the members of the subgroup in question in the computations; values are only calculated for subgroups with 10 or more students.

Of even more interest are reliabilities for the reporting subcategories within OSTP content areas, described in Chapter 3. Cronbach's α coefficients for subcategories were calculated via the same formula defined previously using just the items of a given subcategory in the computations. Again, these results are presented in Appendix R. Reliability of Achievement level Categorization

While related to reliability, the accuracy and consistency of classifying students into performance categories are even more important statistics in a standards-based reporting framework (Livingston & Lewis, 1995). After the performance levels were specified and students were classified into those levels, empirical analyses were conducted to determine the statistical accuracy and consistency of the classifications. For the OSTP, students are classified into one of four performance levels: Unsatisfactory (U), Limited Knowledge (LK), Proficient (P), or Advanced (A). This section of the report explains the methodologies used to assess the reliability of classification decisions, and results are given.

Accuracy refers to the extent to which decisions based on test scores match decisions that would have been made if the scores did not contain any measurement error. Accuracy must be estimated, because errorless test scores do not exist. Consistency measures the extent to which classification decisions based on test scores match the decisions based on scores from a second, parallel form of the same test. Consistency can be evaluated directly from actual responses to test items if two complete and parallel forms of the test are given to the same group of students. In operational test programs, however, such a design is usually impractical. Instead, techniques have been developed to estimate both the accuracy and consistency of classification decisions based on a single administration of a test. The Livingston and Lewis (1995) technique was used for the 2016–17 OSTP because it is easily adaptable to all types of testing formats, including mixed-format tests.

The accuracy and consistency estimates reported in Appendix R make use of "true scores" in the classical test theory sense. A true score is the score that would be obtained if a test had no measurement error. Of course, true scores cannot be observed and so must be estimated. In the Livingston and Lewis (1995) method, estimated true scores are used to categorize students into their "true" classifications.

For the 2016–17 OSTP, after various technical adjustments (described in Livingston & Lewis, 1995), a four-by-four contingency table of accuracy was created for each content area and grade, where cell $[i, j]$

represented the estimated proportion of students whose true score fell into classification i (where $i = 1$ to 4) and observed score into classification j (where $j = 1$ to 4). The sum of the diagonal entries (i.e., the proportion of students whose true and observed classifications matched) signified overall accuracy.

To calculate consistency, true scores were used to estimate the joint distribution of classifications on two independent, parallel test forms. Following statistical adjustments per Livingston and Lewis (1995), a new four-by-four contingency table was created for each content area and grade and populated by the proportion of students who would be categorized into each combination of classifications according to the two (hypothetical) parallel test forms. Cell $[i, j]$ of this table represented the estimated proportion of students whose observed score on the first form would fall into classification i (where $i = 1$ to 4) and whose observed score on the second form would fall into classification j (where $j = 1$ to 4). The sum of the diagonal entries (i.e., the proportion of students categorized by the two forms into exactly the same classification) signified overall consistency.

Another way to measure consistency is to use Cohen's (1960) coefficient κ (kappa), which assesses the proportion of consistent classifications after removing the proportion of consistent classifications that would be expected by chance. It is calculated using the following formula:

$$\kappa = \frac{(\text{Observed agreement}) - (\text{Chance agreement})}{1 - (\text{Chance agreement})} = \frac{\sum_i C_{ii} - \sum_i C_{i.} C_{.i}}{1 - \sum_i C_{i.} C_{.i}}, \qquad \text{(Equation 7)}$$

where

$C_{i.}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the first hypothetical parallel form of the test;

$C_{.i}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the second hypothetical parallel form of the test; and

C_{ii} is the proportion of students whose observed performance level would be Level i (where i = 1–4) on both hypothetical parallel forms of the test.

Because κ is corrected for chance, its values are lower than are other consistency estimates.

8.1.2 Accuracy and Consistency

The accuracy and consistency analyses described above are provided in Table 8-1. The table includes overall accuracy and consistency indices, including kappa. Accuracy and consistency values conditional on performance level are also given. For these calculations, the denominator is the proportion of students associated with a given performance level. For example, the conditional accuracy value is 0.67 for Proficient for mathematics grade 3. This figure indicates that among the students whose true scores placed them in this classification, 67% would be expected to be in this classification when categorized according to their observed scores. Similarly, a consistency value of 0.56 indicates that 56% of students with observed scores in the Proficient level would be expected to score in this classification again if a second, parallel test form were used.

Table 8-2. 2016–17 OSTP: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Overall and Conditional on Achievement Level

Content Area	Grade	Overall	Kappa	Conditional on Performance Level			
				Unsatisfactory	*Limited Knowledge*	*Proficient*	*Advanced*
ELA	3	0.76 (0.67)	0.54	0.86 (0.79)	0.74 (0.64)	0.74 (0.67)	0.70 (0.55)
	4	0.76 (0.67)	0.53	0.87 (0.80)	0.69 (0.58)	0.76 (0.70)	0.68 (0.49)
	5	0.75 (0.66)	0.52	0.87 (0.80)	0.76 (0.67)	0.63 (0.54)	0.67 (0.51)
	6	0.75 (0.66)	0.51	0.86 (0.78)	0.79 (0.72)	0.60 (0.49)	0.67 (0.46)
	7	0.72 (0.63)	0.48	0.87 (0.81)	0.73 (0.63)	0.60 (0.52)	0.58 (0.39)
	8	0.71 (0.62)	0.45	0.87 (0.80)	0.72 (0.63)	0.50 (0.40)	0.65 (0.44)
	10	0.78 (0.70)	0.56	0.87 (0.80)	0.80 (0.72)	0.67 (0.57)	0.72 (0.52)
Mathematics	3	0.76 (0.67)	0.55	0.88 (0.81)	0.75 (0.67)	0.67 (0.56)	0.76 (0.63)
	4	0.77 (0.68)	0.56	0.86 (0.80)	0.76 (0.68)	0.66 (0.55)	0.82 (0.71)
	5	0.78 (0.70)	0.57	0.83 (0.73)	0.79 (0.72)	0.72 (0.62)	0.83 (0.72)
	6	0.78 (0.69)	0.55	0.84 (0.75)	0.76 (0.68)	0.76 (0.68)	0.76 (0.60)
	7	0.80 (0.72)	0.56	0.88 (0.84)	0.64 (0.52)	0.78 (0.69)	0.82 (0.68)
	8	0.76 (0.67)	0.52	0.87 (0.82)	0.71 (0.59)	0.65 (0.53)	0.85 (0.74)
	10	0.80 (0.72)	0.58	0.89 (0.86)	0.64 (0.51)	0.74 (0.62)	0.87 (0.78)
Science	5	0.75 (0.66)	0.52	0.81 (0.71)	0.72 (0.63)	0.75 (0.67)	0.78 (0.63)
	8	0.82 (0.77)	0.53	0.95 (0.94)	0.57 (0.46)	0.76 (0.60)	0.88 (0.38)
	10	0.86 (0.81)	0.48	0.92 (0.91)	0.57 (0.42)	0.68 (0.50)	0.70 (0.41)
U.S. History	10	0.77 (0.69)	0.57	0.89 (0.84)	0.58 (0.46)	0.78 (0.71)	0.73 (0.60)

For some testing situations, the greatest concern may be decisions around level thresholds. For example, if a college gave credit to students who achieved an Advanced Placement test score of 4 or 5 but not to students with scores of 1, 2, or 3, one might be interested in the accuracy of the dichotomous decision below-4 versus 4-or-above. For the 2016–17 OSTP, Table Q-1 in Appendix S provides accuracy and consistency estimates at each cutpoint as well as false positive and false negative decision rates. (A false positive is the proportion of students whose observed scores were above the cut and whose true scores were below the cut. A false negative is the proportion of students whose observed scores were below the cut and whose true scores were above the cut.)

The above indices are derived from Livingston and Lewis's (1995) method of estimating the accuracy and consistency of classifications. It should be noted that Livingston and Lewis discuss two versions of the accuracy and consistency tables. A standard version performs calculations for forms parallel to the form taken. An "adjusted" version adjusts the results of one form to match the observed score distribution obtained in the data. The tables use the standard version for two reasons: (1) This "unadjusted" version can be considered a smoothing of the data, thereby decreasing the variability of the results; and (2) for results dealing with the consistency of two parallel forms, the unadjusted tables are symmetrical, indicating that the two parallel forms have the same statistical properties. This second reason is consistent with the notion of forms that are parallel; that is, it is more intuitive and interpretable for two parallel forms to have the same statistical distribution.

CHAPTER 9 SCORE REPORTING

The OSTP is designed to measure student performance against Oklahoma's content standards. Consistent with this purpose, results on the OSTP were reported in terms of four performance levels that describe student performance in relation to these established state standards: Unsatisfactory, Limited Knowledge, Proficient, and Advanced. Students receive a separate performance-level classification (based on overall scaled score) in each content area.

The OSTP is administered in both online and paper formats. In grades 3, 4, and 5, all tests are in paper format only. In grades 6, 7, and 8, the ELA, mathematics, science, and U.S. history tests are primarily online with paper as an accommodation option.

Reports are generated at the student, school, and district levels. Student results labels and student reports are printed and mailed to the districts for distribution to the schools. In addition to the paper reports, an online reporting tool is provided for school, district, and state users to dynamically generate their own reports and review the student and summary results of each test. The details of each report are presented in the sections that follow. Samples of the reports are included in Appendix T.

9.1 DECISION RULES

To ensure that reported results for the OSTP are accurate relative to collected data and other pertinent information, a document delineating decision rules is prepared prior to each reporting cycle. The decision rules are observed in the analyses of OSTP test data and in reporting content area results. These rules also guide data analysts in identifying students to be excluded from school-, district-, and state-level summary computations. Copies of the decision rules are included in Appendix U.

9.2 STATIC REPORTS

The following reporting deliverables were produced for the Oklahoma tests:

- Student Report
- Student Results Label
- eMetric Data Interaction Online Reporting Tool

The student report and student results labels were printed and shipped to the school districts for distribution to the schools. In addition, the school, district, and state users also had access to the eMetric Data Interaction reporting tool. Each of these reporting deliverables is described in the following sections.

9.2.1 Student Report

The student report created for each student is a double-sided, color report that provides scaled score, performance-level, and reporting category results for each tested content area, as well as a state level breakdown of student performance by performance level for each content area. Students receive a separate report for each tested content area. The first page of the report provides student demographic data, overall performance results, and normative performance comparisons for each content area's reporting categories. If the student tested in ELA or mathematics, the student also received a Lexile and Quantile measure, respectively. The back page of the report contains a state level breakdown of student performance by performance level for each content area. The performance level distributions reflect overall state performance at each performance level, by grade, with the student's earned performance level highlighted using color, while the remaining performance levels appear grayscaled. Two identical copies of the report are produced: one for the parent/guardian and one for the school.

The front page of the report provides the following identifying demographics about the student:

- Student name
- Local ID
- State ID
- Date of birth
- Grade
- Class name
- School name
- District Name

The top section of the front page includes a description of the purpose of the OSTP. Following the description is a graphical display of the student's scaled score and the earned performance level. Next to the graphical display is a statement about how to interpret the test scores as well as the possible range of scaled scores if the test were taken multiple times. For grade 3 ELA tests, there is also a statement about whether a student did or did not meet the RSA Criteria based upon Standard 2.0 (Vocabulary) and Standard 4.0 (Reading Comprehension/Critical Literacy). Student Lexile and Quantile measurements appear below the scaled score and performance level display for students who tested in ELA and/or mathematics.

The bottom section of the front page provides a graphical representation of normative comparisons of student performance for each reporting category. Arrow indicators are used to specify whether the student's performance in each reporting category is below, at/near, or above overall state level performance in that grade. Distinct colors are used to more clearly communicate the student's earned performance level. Stacked horizontal bars, using these same colors, are also used to provide an overview of state performance at each

level. It should be noted that, in some instances, adding each category's percentage points may not sum to 100 due to approved rounding rules that were applied to the underlying reporting data.

The back page of the report provides a graphical display of overall student performance in the state for each content area and grade. The student's earned performance level is summarized at the top of this graph using capital letters. Horizontal bars are used to illustrate the percentage of reported students at each performance level and the student's earned performance level is emphasized through the use of color and formatting. Performance level descriptors (PLDs) are also incorporated on the back page, immediately below the state level performance summary, with the student's earned performance level highlighted in gray. The back page also contains important resources and contact information as well as a glossary of terms to explain different terminology used throughout the student report.

9.2.2 Student Results Labels Report

A student results label is generated for each student. Each student label is two by four inches and provides the following student information:

- Student name
- Student ID
- Date of birth
- Gender
- Grade
- School name
- District name

The label provides the student's consolidated scaled score and performance level information for all tested content areas for the grade level. If a student did not earn a scaled score, the reason the student was not tested is reported.

9.3 Interactive Reports

Data Interaction, eMetric's Web-based reporting solution, features a range of report types that allow analysis across years from the group level down to the individual student level. Each report type may be customized to include or exclude fields and attributes to meet the SDE's specific needs. Report types include the following:

- Roster Report
- Group Summary Report
- Graphical Summary Report
- Longitudinal Roster Report

- Predefined, or Quick, report(s)
- Individual Student Report

9.3.1 Roster Report

The Roster Report includes individual student scores and demographics for each content area and single administration. Users can select to view, search, and filter by organization (school, district, or entire state, depending on the user's access level) and a variety of demographic data and score data. Drill-down features allow users to directly access individual student results.

9.3.2 Group Summary (Performance Levels)

The Group Summary Report provides a comparison of school, district, and state group performance over various summary statistics. Statistics include number of students tested, mean scaled score, and number and percent of students in each performance level. Users can customize the display by selecting different content areas, statistics, multiple administrations, demographic variables, and report views resulting in powerful and flexible ways to create dynamic reports. Drill-down features further allow users to disaggregate by subgroup or directly access individual student results for a selected subgroup.

9.3.3 Group Summary (Standards and Objectives)

The Group Summary Report for Standards and Objectives creates reports by school or district with results of standards and objectives by content area for one administration. The data can be filtered and disaggregated by score and demographic data. Drill-down features allow users to disaggregate by subgroup or to directly access individual student results. This is a legacy report that is only available when viewing data from the former OCCT assessment.

9.3.4 Graphical Summary (Performance Levels)

The Graphical Summary Report provides a visual alternative to analyze group data through the use of graphs and other visualization tools. Summary statistics include percent of students in each performance level, percent of students at or above proficient, percent of students below proficient, and RSA Status Level. Graphs include bar charts, pie charts, and histograms. Users can customize their graphs by selecting different content areas, statistics, multiple administrations, demographic variables, and views. Drill-down features allow users to disaggregate by subgroup or to directly access individual student results.

9.3.5 Longitudinal Roster Report

The Longitudinal Roster Report displays results of individual student scores and demographics by content area in multiple administrations. Users can select to view, search, and filter by organization (school, district, or entire state, depending on the user's access level) and a variety of demographic data and score data. Drill-down features allow users to directly access individual student results.

9.3.6 Quick Reports

Six quick reports are provided. These are the same summary or roster reports outlined above with specific preselected filters requested by the client that provide the most commonly used report data. Quick reports provided are:

- Summary Report of Total Tested (by organization, administration, and subject)
- Roster: All Selections (with all scores preselected)
- Group Summary PL: All Selections (with all scores and disaggregate variables preselected)
- Group Summary S & O: All Selections (with all scores and disaggregate variables preselected)
- Graphical Summary PL: All Selections (with all disaggregate variables preselected)
- Longitudinal Roster: All Selections (with all scores preselected)

It is important to note that some of these are legacy reports that are only available when viewing data from the former OCCT assessment.

9.4 Quality Assurance

Quality-assurance measures at Measured Progress are embedded throughout the entire process of analysis and reporting. The data processors and statistical analysts working on the OSTP implement quality-control checks of their respective computer programs and intermediate products. Moreover, when data are handed off to different functions within the Data and Reporting Services (DRS) division, the sending function verifies that the data are accurate prior to handoff. Additionally, when a function receives a data set, the first step is to verify the data for accuracy.

Another type of quality-assurance measure is parallel processing. One data analyst is responsible for writing all programs required to populate the student and aggregate reporting tables for the administration. Each reporting table is assigned to another data analyst on staff who uses the decision rules to independently program the reporting table. The production and quality-assurance tables are compared, and only when there is 100% agreement are the tables released for report generation.

The third aspect of quality control involves the procedures implemented by the quality-assurance group to check the accuracy of reported data. Using a sample of schools and districts, the quality-assurance group verifies that reported information is correct. The selection of sample schools and districts for this purpose is very specific and can affect the success of the quality-control efforts. There are two sets of samples selected that may not be mutually exclusive. The first set includes those that satisfy the following criteria:

- One-school district
- Two-school district
- Multischool district
- Special school, e.g., charter school
- Small school that does not have enough students to report aggregations
- School with excluded (not tested) students
- School with homeschooled students

The second set of samples includes districts or schools that have unique reporting situations as indicated by decision rules. This set is necessary to check that each rule is applied correctly. The quality-assurance group uses a checklist to implement its procedures. Once the checklist is completed, sample reports are circulated for psychometric checks and program management review. The appropriate sample reports are then sent to the SDE for review and signoff.

CHAPTER 10 VALIDITY

Five sources of validity evidence that can be used in evaluating claims are outlined by The Standards (AERA et al., 2014): test content, response processes, internal structure, relationship to other variables, and consequences of testing. Each of these sources speak to different *aspects* of validity but are not distinct *types* of validity. Instead, each contributes to a body of evidence about the comprehensive validity of score interpretations When validating test scores, these sources of evidence should be carefully considered;

10.1 EVIDENCE BASED ON TEST CONTENT

Evidence on test content validity is meant to determine how well the assessment tasks represent the curriculum and standards for each content area and supports Claim 1: "the assessments are reliable, valid, and aligned to the Oklahoma Academic Standards." Content validation is informed by the item development process, including how the test blueprints and test items align to the curriculum and standards. Viewed through this lens provided by the standards, evidence based on test content is described in Chapters 3 and 4. A description of the item development process, along with a description of the alignment process and test development, is presented in complete detail in Chapter 3—Test Design and Development. A detailed description of the test administration processes is found in Chapter 4—Test Administration. All operational and field-test items for OSTP grades 3–8 and 10 administered in spring 2017 were subjected to cycles of reviews by the SDE. All OSTP test items are aligned by Oklahoma educators to specific Oklahoma Academic Standards and undergo several rounds of review for content fidelity and appropriateness. Items are presented to students in multiple formats (constructed-response, short-answer, and multiple-choice) and ultimately administered according to state-mandated standardized procedures, with allowable accommodations, and all test proctors are required to attend annual training sessions. Finally, machine- and human-scoring of student responses are subject to standardized and rigorous procedures to ensure the accuracy and validity of the results in capturing student performance. The scoring information in Chapter 5 describes the steps taken to train hand-scorers and monitor the quality of the hand-scoring of student responses for short-answer and constructed-response items. Quality-control procedures related to scanning and machine-scoring are also described.

Through the content standards, evidence based on test content addresses Claim 4: "the OSTP assessments provide a measure of future academic performance to assessments administered in high school." The Oklahoma Academic Standards in Mathematics, English Language Arts, and Science all present the progression of expectations regarding knowledge and skills across PK-12 in serving to meet the demands of college and employers. Through this articulation of content standards, the Spring 2017 administration of the OSTP assessments supports high school academic performance.

10.2 EVIDENCE BASED ON INTERNAL STRUCTURE

Evidence based on internal structure is presented in the discussions of item analyses, reliability, and scaling and equating in Chapters 6 through 8. Technical characteristics of the internal structure of the assessments are presented in terms of classical item statistics (item difficulty, item-test correlation), differential item functioning (DIF) analyses, dimensionality analyses, reliability, standard errors of measurement (SEM), and IRT parameters and procedures. These various sources provide support for Claim 1: "the assessments are reliable, valid, and aligned to the Oklahoma Academic Standards."

The spring 2017 OSTP grades 3–8 and 10 scores for mathematics and ELA, and grades 5, 8, and 10 for science were newly calibrated as a result of field-testing and standard setting. The U.S. history test scores were based on a pre-equating design. Complete descriptions of the operational and field-test item analyses and the calibration, scaling, and equating analysis are found in Chapter 6—Classical Item Analysis and Chapter 7—Item Response Theory Scaling and Equating. Summaries of reliability and validity for different levels of analyses are found in Chapter 8—Reliability

In general, item difficulty and discrimination indices were in acceptable and expected ranges. Very few items were answered correctly at near-chance or near-perfect rates. Similarly, the positive discrimination indices indicate that most items were assessing consistent constructs, and students who performed well on individual items tended to perform well overall.

Reliability coefficients for operational forms were high and similar across grade; ranging from 0.87 to 0.92 for mathematics; for ELA, from 0.87 to 0.90; for science, from 0.83 to 0.88; and for U.S. history the reliability coefficient was 0.91. Standard errors of measurement demonstrated similar consistency, ranging 2.70 to 3.40 for mathematics; for ELA, from 2.82 to 4.01; for science, from 2.90 to 3.20; and 3.36 for U.S. history. The reliability of student subgroups should be interpreted with caution as reliabilities are dependent not only on the measurement properties of a test but on the statistical distribution of the studied subgroup. For example, it can be readily seen in Appendix R that subgroup sample sizes may vary considerably, which results in natural variation in reliability coefficients. As expected, subcategory reliabilities are lower than overall test reliabilities. These results are attributed to the fact that only a subset of items make up each reporting subcategory; reliability results are therefore seen to decrease an expected degree associated with test items.

Finally, we see Kappa values typically above 0.50 and accuracy values above 0.70, indicating that the majority of students were placed in the correct performance level having taken into account true score and classification according to chance. Consistency values are typically above 0.70 for the Unsatisfactory and Limited Knowledge categories, indicating that the majority students would be classified in the same performance level if administered a parallel test form. As a result of a smaller number of observable test scores in the Proficient and Advanced categories, consistency values are lower. For example, in Grade 8 ELA there are only 4 or 5 observable score points for the Proficiency performance level corresponding to an

accuracy value of 0.50; whereas the Limited Knowledge performance level encompasses 8 observable score points and corresponds to an accuracy value of 0.72.

10.3 Evidence Based on Response Processes

Evidence for validity of the OSTP assessments is also based on "the fit between the construct and the detailed nature of performance or response actually engaged in by examinees" (AERA, APA, & NCME, 2014). This evidence is collected by surveying examinees about their performance strategies or responses to particular items. Because items are developed to measure particular constructs and intellectual processes, evidence that examinees have engaged in relevant performance strategies to correctly answer the items supports the validity of the test scores. This is the third piece of evidence supporting Claim 1: "the assessments are reliable, valid, and aligned to the Oklahoma Academic Standards."

In September 2015, cognitive labs were conducted with Oklahoma students who were asked to provide think-aloud responses to a variety of items in Grades 5, 8, and 10 Science, appropriate to each students' grade level. Measured Progress staff recorded student responses to these items which were then used to inform test and item revision for subsequent administration in Spring 2017. Documentation of these cognitive labs are provided in Appendix V. Further cognitive labs in support of ELA and Mathematics are planned for this assessment program.

10.4 Evidence Based on Relations to Other Variables

Evidence based on the relationship to external measures of Mathematics, English Language Arts, and Science is addressed in the *Oklahoma School Testing Program: Standard Setting Report* (Measured Progress, 2017) and for U.S. history in the *Oklahoma School Testing Program: Standard setting technical report for OSTP Grade 5 Social Studies, Grade 8 U.S. History, and End-of-Instruction U.S. History* (CTB/McGraw-Hill, 2014). These sources of evidence provide support for Claim 2: "student performance resulting from the assessments is comparable to results of other high-quality large-scale assessments."

Standard setting procedures were designed to facilitate alignment of performance expectations between student performance eon the OSTP assessments and that demonstrated on the National Assessment of Educational Performance and ACT. A benchmarking procedure was implemented during standard setting that enabled panelists and stakeholders to evaluate student performance in the context of Proficiency on these comparable, external assessments. This resulted in cut points that are both appropriate and aspirational for student performance in Oklahoma.

10.5 Evidence Based on Testing Consequences

Evidence based on the consequences of testing is addressed in the reporting information in Chapter 9, as well as in the interpretive materials (see section 1.1—Purpose of the Oklahoma School Testing Program).

These sources of evidence are provided in support of Claim 3: “the assessment results facilitate norm-referenced and criterion-referenced score interpretations”.

These documents speak to the efforts undertaken to promote accurate and clear information provided to the public regarding test scores. Several different standard score reports are provided to stakeholders. In addition, a data analysis tool is provided to each school system to allow educators the flexibility to customize reports for local needs. These documents serve to provide useful and simple access to student performance information (i.e., scale scores and performance levels) at the individual and aggregate level.

10.6 SUMMARY OF EVIDENCE

Evidence for the validity of test score interpretations resulting from the Spring 2017 administration of the OSTP assessments is strengthened as the evidence supporting test score interpretations accrues. In this sense, the process of seeking and evaluating evidence for the validity of test score interpretation is ongoing. Nevertheless, there currently exists sufficient evidence to support the claims for the OSTP assessments stated in Chapter 1 with respect to test content, internal structure, response processes, relations to other variables, and testing consequences.

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APPENDICES

APPENDIX A—CONTENT STANDARDS

OKLAHOMA ACADEMIC STANDARDS

MATHEMATICS

OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

Table of Contents

Introduction

The Oklahoma Academic Standards for Mathematics 2016 is the result of the contributions of hundreds of mathematics teachers, mathematics educators, and mathematicians from across the state of Oklahoma. This document reflects a balanced synthesis of the work of all members of the Oklahoma Academic Standards for Mathematics Writing Committee and feedback from teachers, mathematicians, external reviews, and numerous education stakeholders including business, industry and commerce, parent groups, career tech, higher education, and external reviewers.

The Oklahoma Academic Standards for Mathematics 2016 specify what students should know and be able to do as learners of mathematics at the end of each grade level or course. Students are held responsible for learning standards listed at earlier grade levels as well as their current grade level. Throughout this document, the standards are written to allow time for study of additional material at every grade level. The order of the standards at any grade level is not meant to imply a sequence of topics and should be considered flexible for the organization of any course. The document provides standards for PK-7, Pre-Algebra, Algebra I, Geometry, and Algebra II with Algebra I as the pre-requisite for both Geometry and Algebra II.

Development of the Oklahoma Academic Standards for Mathematics

The Oklahoma Academic Standards for Mathematics writing team drew on the work of the National Council of Teachers of Mathematics (NCTM) standards documents; the National Research Council's report Adding It Up, the Oklahoma Priority Academic Standards (PASS), and other states' standards documents and curriculum framework guides (e.g., Minnesota, Virginia, and Massachusetts). Please see the reference list at the end of this document for a more complete list of all resources consulted.

Vision and Guiding Principles

These standards envision all students in Oklahoma will become mathematically proficient and literate through a strong mathematics program that emphasizes and engages them in problem solving, communicating, reasoning and proof, making connections, and using representations. Mathematically proficient and literate students can confidently and effectively use mathematics concepts, computation skills, and numbers to problem-solve, reason, and analyze information. Developing mathematical proficiency and literacy for Oklahoma students depends in large part on a clear, comprehensive, coherent, and developmentally appropriate set of standards to guide curricular decisions. The understanding and implementation of these standards throughout PK-12 mathematics experience for students is based on the following guiding principles:

Guiding Principle 1: Excellence in mathematics education requires equity—high expectations and strong support for all students.
All students must have opportunities to study—and support to learn—mathematics. Equity does not mean that every student should receive identical instruction; instead, it demands that reasonable and appropriate accommodations be made as needed to promote access and attainment for all students.

Guiding Principle 2: Mathematical ideas should be explored in ways that stimulate curiosity, create enjoyment of mathematics, and develop depth of understanding.
Students need to understand mathematics deeply and use it effectively. To achieve mathematical understanding, students should be actively engaged in doing meaningful mathematics, discussing mathematical ideas, and applying mathematics in interesting, thought provoking situations. Student understanding is

further developed through ongoing reflection about cognitively demanding and tasks relevant to their lives.

Tasks should challenge and engage students in mathematics in multiple ways. Short- and long-term investigations that connect procedures and skills with conceptual understanding are integral components of an effective mathematics program. Activities should build upon curiosity and prior knowledge, and enable students to solve progressively deeper, broader, and more sophisticated problems. Mathematical tasks reflecting significant mathematics should generate active classroom talk, promote the development of conjectures, and lead to an understanding of the necessity for mathematical reasoning.

Guiding Principle 3: An effective mathematics program focuses on problem solving.
Mathematical problem solving is the hallmark of an effective mathematics program. Skill in mathematical problem solving requires practice with a variety of mathematical problems as well as a firm grasp of mathematical techniques and their underlying principles. Students who possess a deeper knowledge of mathematics can then use mathematics in a flexible way to attack various problems and devise different ways of solving any particular problem. Mathematical problem solving calls for reflective thinking, persistence, and learning from the ideas of others. Success in solving mathematical problems helps to create an abiding interest in mathematics.

Guiding Principle 4: Technology is essential in teaching and learning mathematics.
Technology enhances the mathematics curriculum in many ways. Technology enables students to communicate ideas within the classroom or to search for needed information. It can be especially helpful in assisting students with special needs in regular and special classrooms, at home, and in the community. Technology changes what mathematics is to be learned and when and how it is learned. Tools such as measuring instruments, manipulatives (such as base ten blocks and fraction pieces), scientific and graphing calculators, and computers with appropriate software, if properly used, contribute to a rich learning environment for developing and applying mathematical concepts. Appropriate use of calculators is essential; calculators should not be used as a replacement for basic understanding and skills. Although the use of a graphing calculator can help middle and secondary students to visualize properties of functions and their graphs, graphing calculators should be used to enhance their understanding and skills rather than replace them.

Standards Overview

The Oklahoma Academic Standards for Mathematics are developed around four main content strands, Algebraic Reasoning and Algebra, Number and Operations, Geometry and Measurement, and Data and Probability organize the content standards throughout PK-7 and Pre-Algebra. The standards for Algebra I, Algebra II, and Geometry are fundamentally organized around these strands as well. The process standards are defined as the Mathematical Actions and Processes and are comprised of the skills and abilities students should develop and be engaged in throughout their PK-12 mathematics education. Among these are the ability to problem solve, communicate, and reason about mathematics which will help students be ready for the mathematics expectations of college and the skills desired by many employers. While the process and content standards work in concert to create clear, concise, and rigorous mathematics standards and expectations for Oklahoma students with the aim of helping them be college and career ready, it is not intended that each mathematical action and process will be utilized or developed with each standard. Certainly some standards and objectives can be achieved more readily with particular mathematics actions and processes. For example, an objective that involves explaining a particular concept may be best accomplished by also engaging students in communicating mathematically. Whereas, standards and objectives that focus in the early grades on fluency with operations will align well with the mathematical action and process focused on procedural fluency.

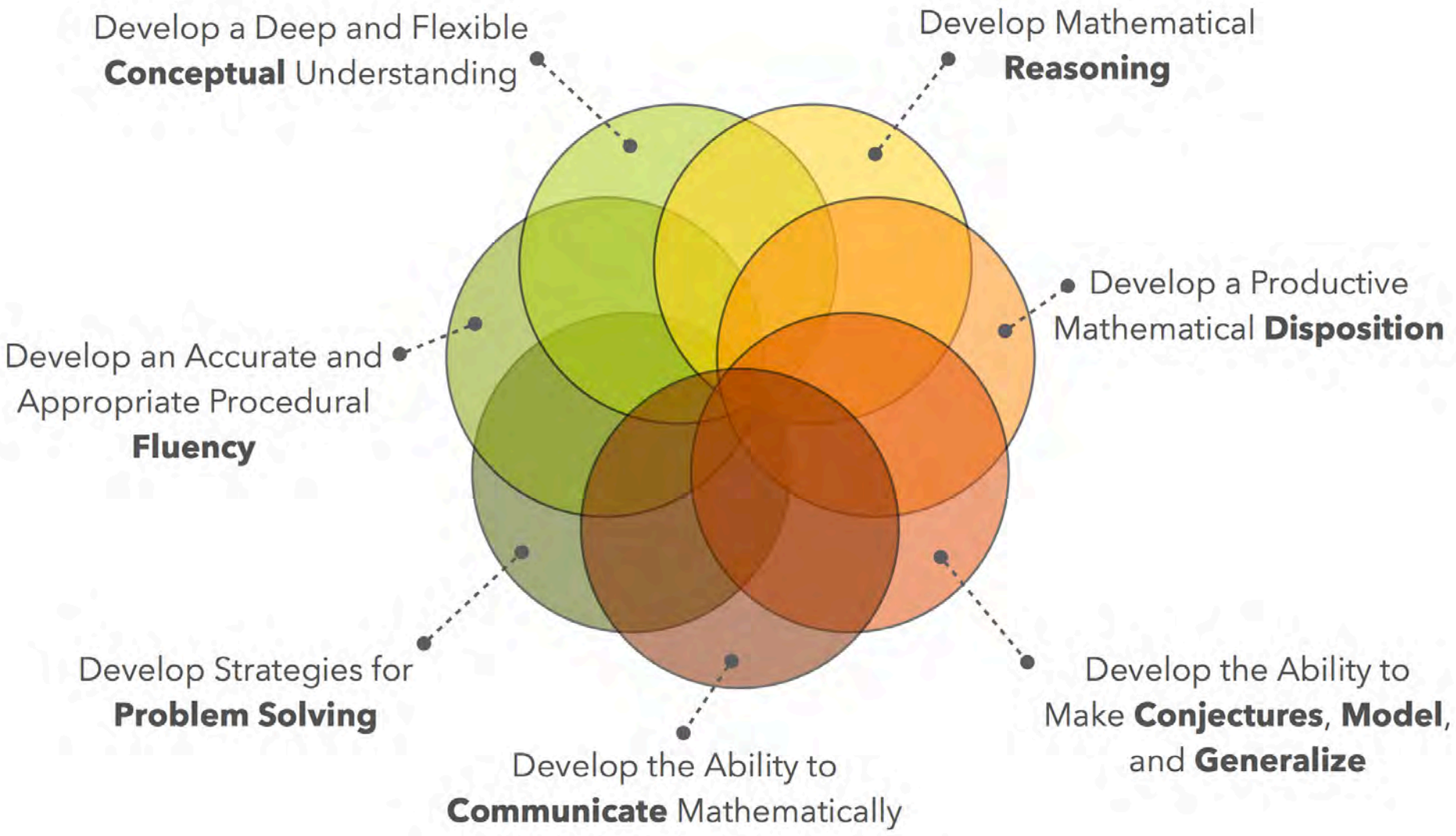
Number and Operations Strand: A focus on number and operations is the cornerstone of a strong mathematics program. Developing students' fluency with number and operations throughout their PK-12 mathematics experience requires a balance and connection between conceptual understanding and computational proficiency and efficiency. This strand provides focus on the importance of students' understanding of numbers, ways of representing numbers, relationships among numbers, relationships among number systems, and meanings of operations and how they relate to one another. An emphasis is placed on the development of estimation so students can determine the reasonableness of solutions and answers. Further, it requires that students should be able to compute efficiently and proficiently.

Algebraic Reasoning and Algebra Strand: All students should be able to reason algebraically and learn algebra. This strand provides focus for the PK-7 and Pre-Algebra standards around the notion that algebra is more than moving symbols around. It is about understanding patterns, relations and functions, representing and analyzing mathematical situations and structures using algebraic symbols, using mathematical models to represent and understand quantitative relationships, and analyzing change in various contexts. Understanding change is fundamental to algebraic reasoning and the concept of function with depth. This understanding is critical for success in college-level mathematics. It is also fundamental to understanding many real-world problems and situations students will face in their future careers.

Geometry and Measurement Strand: All students should gain experience using a variety of visual and coordinate representations to analyze and solve problems and learn how to use appropriate units and tools for measuring. This strand provides focus for the PK-7 and Geometry standards around the notion that geometry and measurement help students understand and represent ideas and solve problems they will encounter in their daily lives. A focus on geometry should enable students to analyze characteristics of two- and three-dimensional objects, develop arguments based on geometric relationships, describe spatial relationships using coordinate geometry and other representational systems, apply transformations and symmetry to analyze mathematical situations, and utilize visualization, spatial reasoning and geometric modeling to solve problems. A focus on measurement should enable students to understand measureable attributes of objects and the units, systems, and processes of measurement, and apply appropriate techniques, tools, and formulas to determine measurements.

Data and Probability Strand: An increased emphasis on understanding data should span all grade levels. Making sense of data and probability has become a part of our daily lives, supporting the importance of this strand throughout a students' PK-12 mathematics experience. A focus on data and probability should enable all students to formulate questions that can be addressed with data, and to collect, organize, and display relevant data to answer them. Students should select and use appropriate statistical methods to analyze data, develop and evaluate inferences and predictions that are based on data, and understand and apply basic concepts of probability. The study of data is also an opportunity to apply the basic skills of computing with numbers and being an educated consumer of information presented in the news and media while the study of probability provides application and use of fractions in daily life.

Mathematical Actions and Processes



Mathematical Actions and Processes

The Mathematical Actions and Processes simultaneously reflect the holistic nature of mathematics as a discipline in which patterns and relationships among quantities, numbers, and space are studied (National Academies of Sciences, 2014) and as a form of literacy such that all students are supported in accessing and understanding mathematics for life, for the workplace, for the scientific and technical community, and as a part of cultural heritage (NCTM, 2000). The seven Mathematical Actions and Processes leverage both the NCTM Process Standards and the Five Mathematical Proficiencies (NRC, 2001) to capture the mathematical experience of Oklahoma students as they pursue mathematical literacy.

Throughout their Pk-12 education experience, mathematically literate students will:

Develop a Deep and Flexible Conceptual Understanding
Demonstrate a deep and flexible conceptual understanding of mathematical concepts, operations, and relations while making mathematical and real-world connections. Students will develop an understanding of how and when to apply and use the mathematics they know to solve problems.

Develop Accurate and Appropriate Procedural Fluency
Learn efficient procedures and algorithms for computations and repeated processes based on a strong sense of numbers. Develop fluency in addition, subtraction, multiplication, and division of numbers and expressions. Students will generate a sophisticated understanding of the development and application of algorithms and procedures.

Develop Strategies for Problem Solving
Analyze the parts of complex mathematical tasks and identify entry points to begin the search for a solution. Students will select from a variety of problem solving strategies and use corresponding multiple representations (verbal, physical, symbolic, pictorial, graphical, tabular) when appropriate. They will pursue solutions to various tasks from real-world situations and applications that are often interdisciplinary in nature. They will find methods to verify their answers in context and will always question the reasonableness of solutions.

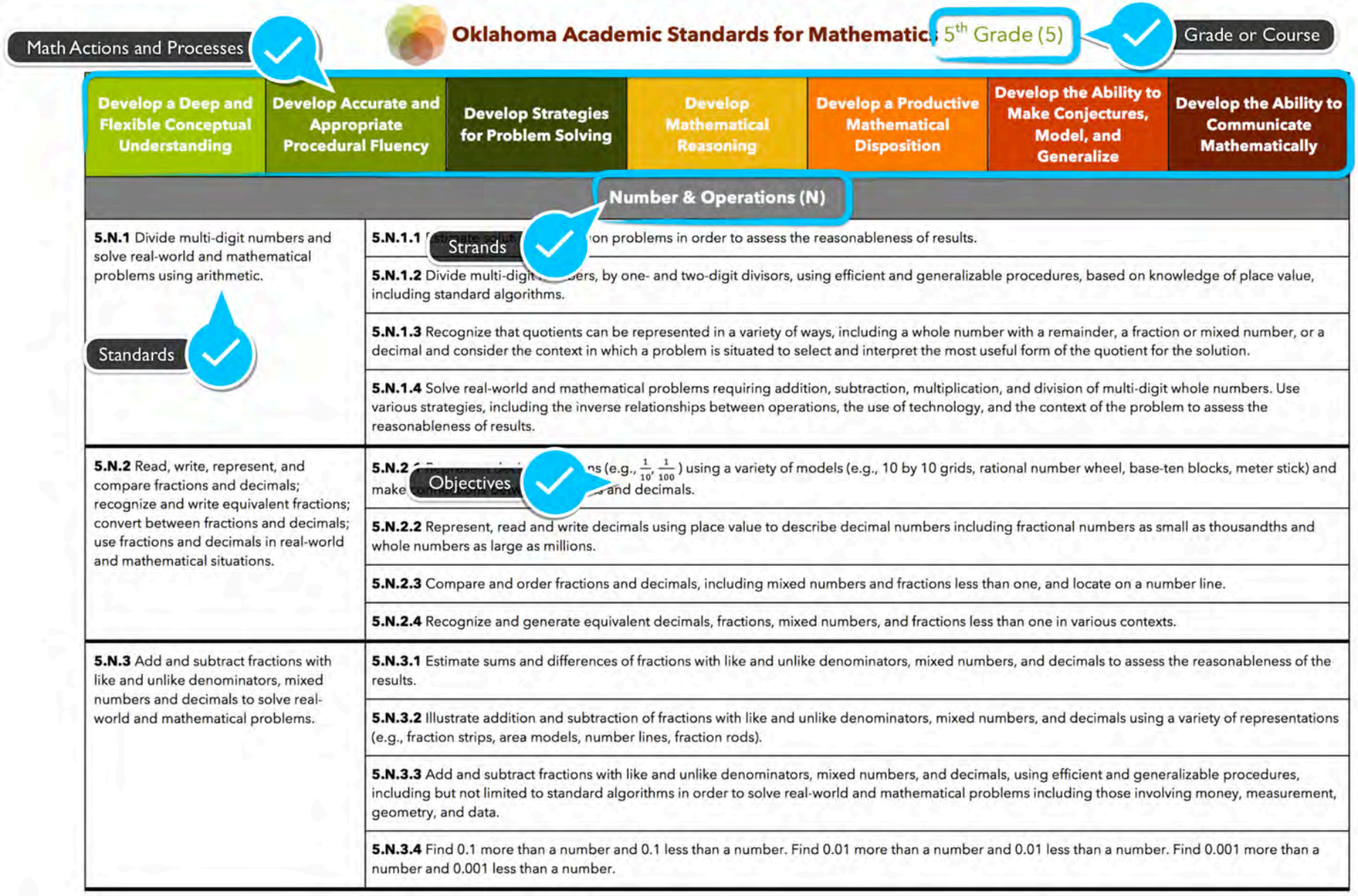
Develop Mathematical Reasoning
Explore and communicate a variety of reasoning strategies to think through problems. Students will apply their logic to critique the thinking and strategies of others to develop and evaluate mathematical arguments, including making arguments and counterarguments and making connections to other contexts.

Develop a Productive Mathematical Disposition
Hold the belief that mathematics is sensible, useful and worthwhile. Students will develop the habit of looking for and making use of patterns and mathematical structures. They will persevere and become resilient, effective problem solvers.

Develop the Ability to Make Conjectures, Model, and Generalize
Make predictions and conjectures and draw conclusions throughout the problem solving process based on patterns and the repeated structures in mathematics. Students will create, identify, and extend patterns as a strategy for solving and making sense of problems.

Develop the Ability to Communicate Mathematically
Students will discuss, write, read, interpret and translate ideas and concepts mathematically. As they progress, students' ability to communicate mathematically will include their increased use of mathematical language and terms and analysis of mathematical definitions.

Reading the Oklahoma Academic Standards for Mathematics



Develop a Deep and Flexible Conceptual Understanding	Develop Accurate and Appropriate Procedural Fluency	Develop Strategies for Problem Solving	Develop Mathematical Reasoning	Develop a Productive Mathematical Disposition	Develop the Ability to Make Conjectures, Model, and Generalize	Develop the Ability to Communicate Mathematically

Number & Operations (N)	
PK.N.1 Know number names and count in sequence.	**PK.N.1.1** Count aloud forward in sequence by 1s to 20.
	PK.N.1.2 Recognize and name written numerals 0-10.
	PK.N.1.3 Recognize that zero represents the count of no objects.
PK.N.2 Count to tell the number of objects.	**PK.N.2.1** Identify the number of objects, up to 10, in a row or column.
	PK.N.2.2 Use one-to-one correspondence in counting objects and matching groups of objects.
	PK.N.2.3 Understand the last numeral spoken, when counting aloud, tells how many total objects are in a set.
	PK.N.2.4 Count up to 5 items in a scattered configuration; not in a row or column.
PK.N.3 Compare sets using number.	**PK.N.3.1** Compare two sets of 1-5 objects using comparative language such as same, more, or fewer.
Algebraic Reasoning & Algebra (A)	
PK.A.1 Recognize, duplicate, and extend patterns.	**PK.A.1.1** Sort and group up to 5 objects into a set based upon characteristics such as color, size, and shape and explain verbally what the objects have in common.
	PK.A.1.2 Recognize, duplicate, and extend repeating patterns involving manipulatives, sound, movement, and other contexts.
Geometry & Measurement (GM)	
PK.GM.1 Identify common shapes.	**PK.GM.1.1** Identify circles, squares, rectangles, and triangles by pointing to the shape when given the name.
PK.GM.2 Describe and compare measureable attributes.	**PK.GM.2.1** Identify measurable attributes of objects. Describe them as little, big, long, short, tall, heavy, light, or other age appropriate vocabulary.
	PK.GM.2.2 Directly compare two objects with a common measurable attribute using words such as longer/shorter; heavier/lighter; or taller/shorter.
	PK.GM.2.3 Sort objects into sets by one or more attributes.

Data & Probability (D)	
PK.D.1 Collect and organize categorical data.	**PK.D.1.1** Collect and organize information about objects and events in the environment.
	PK.D.1.2 Use categorical data to create real-object graphs.

Develop a Deep and Flexible Conceptual Understanding	Develop Accurate and Appropriate Procedural Fluency	Develop Strategies for Problem Solving	Develop Mathematical Reasoning	Develop a Productive Mathematical Disposition	Develop the Ability to Make Conjectures, Model, and Generalize	Develop the Ability to Communicate Mathematically

Number & Operations (N)

K.N.1 Understand the relationship between quantities and whole numbers.	**K.N.1.1** Count aloud forward in sequence to 100 by 1's and 10's.
	K.N.1.2 Recognize that a number can be used to represent how many objects are in a set up to 10.
	K.N.1.3 Use ordinal numbers to represent the position of an object in a sequence up to 10.
	K.N.1.4 Recognize without counting (subitize) the quantity of a small group of objects in organized and random arrangements up to 10. **Clarification statement**: Subitizing is defined as instantly recognizing the quantity of a set without having to count. "Subitizing" is not a vocabulary word and is not meant for student discussion at this age.
	K.N.1.5 Count forward, with and without objects, from any given number up to 10.
	K.N.1.6 Read, write, discuss, and represent whole numbers from 0 to at least 10. Representations may include numerals, pictures, real objects and picture graphs, spoken words, and manipulatives.
	K.N.1.7 Find a number that is 1 more or 1 less than a given number up to 10.
	K.N.1.8 Using the words more than, less than or equal to compare and order whole numbers, with and without objects, from 0 to 10.
K.N.2 Develop conceptual fluency with addition and subtraction (up to 10) using objects and pictures.	**K.N.2.1** Compose and decompose numbers up to 10 with objects and pictures.
K.N.3 Understand the relationship between whole numbers and fractions through fair share.	**K.N.3.1** Distribute equally a set of objects into at least two smaller equal sets.
K.N.4 Identify coins by name.	**K.N.4.1** Identify pennies, nickels, dimes, and quarters by name.

Algebraic Reasoning & Algebra (A)	
K.A.1 Duplicate patterns in a variety of contexts.	**K.A.1.1** Sort and group up to 10 objects into a set based upon characteristics such as color, size, and shape. Explain verbally what the objects have in common.
	K.A.1.2 Recognize, duplicate, complete, and extend repeating, shrinking and growing patterns involving shape, color, size, objects, sounds, movement, and other contexts.
Geometry & Measurement (GM)	
K.GM.1 Recognize and sort basic two-dimensional shapes and use them to represent real-world objects.	**K.GM.1.1** Recognize squares, circles, triangles, and rectangles.
	K.GM.1.2 Sort two-dimensional objects using characteristics such as shape, size, color, and thickness.
	K.GM.1.3 Identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably.
	K.GM.1.4 Use smaller shapes to form a larger shape when there is an outline to follow.
	K.GM.1.5 Compose free-form shapes with blocks.
	K.GM.1.6 Use basic shapes and spatial reasoning to represent objects in the real world.
K.GM.2 Compare and order objects according to location and measurable attributes.	**K.GM.2.1** Use words to compare objects according to length, size, weight, position, and location.
	K.GM.2.2 Order up to 6 objects using measurable attributes, such as length and weight.
	K.GM.2.3 Sort objects into sets by more than one attribute.
	K.GM.2.4 Compare the number of objects needed to fill two different containers.
K.GM.3 Tell time as it relates to daily life.	**K.GM.3.1** Develop an awareness of simple time concepts using words such as yesterday, today, tomorrow, morning, afternoon, and night within his/her daily life.
Data & Probability (D)	
K.D.1 Collect, organize, and interpret categorical data.	**K.D.1.1** Collect and sort information about objects and events in the environment.
	K.D.1.2 Use categorical data to create real-object and picture graphs.
	K.D.1.3 Draw conclusions from real-object and picture graphs.

Develop a Deep and Flexible Conceptual Understanding	Develop Accurate and Appropriate Procedural Fluency	Develop Strategies for Problem Solving	Develop Mathematical Reasoning	Develop a Productive Mathematical Disposition	Develop the Ability to Make Conjectures, Model, and Generalize	Develop the Ability to Communicate Mathematically

Number & Operations (N)

1.N.1 Count, compare, and represent whole numbers up to 100, with an emphasis on groups of tens and ones.	**1.N.1.1** Recognize numbers to 20 without counting (subitize) the quantity of structured arrangements. **Clarification statement**: Subitizing is defined as instantly recognizing the quantity of a set without having to count. "Subitizing" is not a vocabulary word and is not meant for student discussion at this age.
	1.N.1.2 Use concrete representations to describe whole numbers between 10 and 100 in terms of tens and ones.
	1.N.1.3 Read, write, discuss, and represent whole numbers up to 100. Representations may include numerals, addition and subtraction, pictures, tally marks, number lines and manipulatives, such as bundles of sticks and base 10 blocks.
	1.N.1.4 Count forward, with and without objects, from any given number up to 100 by 1s, 2s, 5s and 10s.
	1.N.1.5 Find a number that is 10 more or 10 less than a given number up to 100.
	1.N.1.6 Compare and order whole numbers from 0 to 100.
	1.N.1.7 Use knowledge of number relationships to locate the position of a given whole number on an open number line up to 20.
	1.N.1.8 Use objects to represent and use words to describe the relative size of numbers, such as more than, less than, and equal to.
1.N.2 Solve addition and subtraction problems up to 10 in real-world and mathematical contexts.	**1.N.2.1** Represent and solve real-world and mathematical problems using addition and subtraction up to ten.
	1.N.2.2 Determine if equations involving addition and subtraction are true.
	1.N.2.3 Demonstrate fluency with basic addition facts and related subtraction facts up to 10.
1.N.3 Develop foundational ideas for fractions.	**1.N.3.1** Partition a regular polygon using physical models and recognize when those parts are equal.
	1.N.3.2 Partition (fair share) sets of objects into equal groupings.

1.N.4 Identify coins and their values.	**1.N.4.1** Identifying pennies, nickels, dimes, and quarters by name and value.
	1.N.4.2 Write a number with the cent symbol to describe the value of a coin.
	1.N.4.3 Determine the value of a collection of pennies, nickels, or dimes up to one dollar counting by ones, fives, or tens.
Algebraic Reasoning & Algebra (A)	
1.A.1 Identify patterns found in real-world and mathematical situations.	**1.A.1.1** Identify, create, complete, and extend repeating, growing, and shrinking patterns with quantity, numbers, or shapes in a variety of real-world and mathematical contexts.
Geometry & Measurement (GM)	
1.GM.1 Recognize, compose, and decompose two- and three-dimensional shapes.	**1.GM.1.1** Identify trapezoids and hexagons by pointing to the shape when given the name.
	1.GM.1.2 Compose and decompose larger shapes using smaller two-dimensional shapes.
	1.GM.1.3 Compose structures with three-dimensional shapes.
	1.GM.1.4 Recognize three-dimensional shapes such as cubes, cones, cylinders, and spheres.
1.GM.2 Select and use nonstandard and standard units to describe length and volume/capacity.	**1.GM.2.1** Use nonstandard and standard measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement.
	1.GM.2.2 Illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other.
	1.GM.2.3 Measure the same object/distance with units of two different lengths and describe how and why the measurements differ.
	1.GM.2.4 Describe a length to the nearest whole unit using a number and a unit.
	1.GM.2.5 Use standard and nonstandard tools to identify volume/capacity. Compare and sort containers that hold more, less, or the same amount.
1.GM.3 Tell time to the half and full hour.	**1.GM.3.1** Tell time to the hour and half-hour (analog and digital).
Data & Probability (D)	
1.D.1 Collect, organize, and interpret categorical and numerical data.	**1.D.1.1** Collect, sort, and organize data in up to three categories using representations (e.g., tally marks, tables, Venn diagrams).
	1.D.1.2 Use data to create picture and bar-type graphs to demonstrate one-to-one correspondence.
	1.D.1.3 Draw conclusions from picture and bar-type graphs.

Develop a Deep and Flexible Conceptual Understanding	Develop Accurate and Appropriate Procedural Fluency	Develop Strategies for Problem Solving	Develop Mathematical Reasoning	Develop a Productive Mathematical Disposition	Develop the Ability to Make Conjectures, Model, and Generalize	Develop the Ability to Communicate Mathematically

Number & Operations (N)

2.N.1 Compare and represent whole numbers up to 1,000 with an emphasis on place value and equality.	**2.N.1.1** Read, write, discuss, and represent whole numbers up to 1,000. Representations may include numerals, words, pictures, tally marks, number lines and manipulatives.
	2.N.1.2 Use knowledge of number relationships to locate the position of a given whole number on an open number line up to 100.
	2.N.1.3 Use place value to describe whole numbers between 10 and 1,000 in terms of hundreds, tens and ones. Know that 100 is 10 tens, and 1,000 is 10 hundreds.
	2.N.1.4 Find 10 more or 10 less than a given three-digit number. Find 100 more or 100 less than a given three-digit number.
	2.N.1.5 Recognize when to round numbers to the nearest 10 and 100.
	2.N.1.6 Use place value to compare and order whole numbers up to 1,000 using comparative language, numbers, and symbols (e.g., 425 > 276, 73 < 107, page 351 comes after page 350, 753 is between 700 and 800).
2.N.2 Add and subtract one- and two-digit numbers in real-world and mathematical problems.	**2.N.2.1** Use the relationship between addition and subtraction to generate basic facts up to 20.
	2.N.2.2 Demonstrate fluency with basic addition facts and related subtraction facts up to 20.
	2.N.2.3 Estimate sums and differences up to 100.
	2.N.2.4 Use strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers.
	2.N.2.5 Solve real-world and mathematical addition and subtraction problems involving whole numbers up to 2 digits.
	2.N.2.6 Use concrete models and structured arrangements, such as repeated addition, arrays and ten frames to develop understanding of multiplication.
2.N.3 Explore the foundational ideas of fractions.	**2.N.3.1** Identify the parts of a set and area that represent fractions for halves, thirds, and fourths.
	2.N.3.2 Construct equal-sized portions through fair sharing including length, set, and area models for halves, thirds, and fourths.
2.N.4 Determine the value of a set of coins.	**2.N.4.1** Determine the value of a collection(s) of coins up to one dollar using the cent symbol.
	2.N.4.2 Use a combination of coins to represent a given amount of money up to one dollar.

Algebraic Reasoning & Algebra (A)	
2.A.1 Describe the relationship found in patterns to solve real-world and mathematical problems.	**2.A.1.1** Represent, create, describe, complete, and extend growing and shrinking patterns with quantity and numbers in a variety of real-world and mathematical contexts.
	2.A.1.2 Represent and describe repeating patterns involving shapes in a variety of contexts.
2.A.2 Use number sentences involving unknowns to represent and solve real-world and mathematical problems.	**2.A.2.1** Use objects and number lines to represent number sentences.
	2.A.2.2 Generate real-world situations to represent number sentences and vice versa.
	2.A.2.3 Apply commutative and identity properties and number sense to find values for unknowns that make number sentences involving addition and subtraction true or false.
Geometry & Measurement (GM)	
2.GM.1 Analyze attributes of two-dimensional figures and develop generalizations about their properties.	**2.GM.1.1** Recognize trapezoids and hexagons.
	2.GM.1.2 Describe, compare, and classify two-dimensional figures according to their geometric attributes.
	2.GM.1.3 Compose two-dimensional shapes using triangles, squares, hexagons, trapezoids, and rhombi.
	2.GM.1.4 Recognize right angles and classify angles as smaller or larger than a right angle.
2.GM.2 Understand length as a measurable attribute and explore capacity.	**2.GM.2.1** Explain the relationship between the size of the unit of measurement and the number of units needed to measure the length of an object.
	2.GM.2.2 Explain the relationship between length and the numbers on a ruler by using a ruler to measure lengths to the nearest whole unit.
	2.GM.2.3 Explore how varying shapes and styles of containers can have the same capacity.
2.GM.3 Tell time to the quarter hour.	**2.GM.3.1** Read and write time to the quarter-hour on an analog and digital clock. Distinguish between a.m. and p.m.
Data & Probability (D)	
2.D.1 Collect, organize, and interpret data.	**2.D.1.1** Explain that the length of a bar in a bar graph or the number of objects in a picture graph represents the number of data points for a given category.
	2.D.1.2 Organize a collection of data with up to four categories using pictographs and bar graphs with intervals of 1s, 2s, 5s or 10s.
	2.D.1.3 Write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one.
	2.D.1.4 Draw conclusions and make predictions from information in a graph.

Develop a Deep and Flexible Conceptual Understanding	Develop Accurate and Appropriate Procedural Fluency	Develop Strategies for Problem Solving	Develop Mathematical Reasoning	Develop a Productive Mathematical Disposition	Develop the Ability to Make Conjectures, Model, and Generalize	Develop the Ability to Communicate Mathematically

Number & Operations (N)

3.N.1 Compare and represent whole numbers up to 100,000 with an emphasis on place value and equality.	**3.N.1.1** Read, write, discuss, and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives.
	3.N.1.2 Use place value to describe whole numbers between 1,000 and 100,000 in terms of ten thousands, thousands, hundreds, tens and ones, including expanded form.
	3.N.1.3 Find 10,000 more or 10,000 less than a given five-digit number. Find 1,000 more or 1,000 less than a given four- or five-digit number. Find 100 more or 100 less than a given four- or five-digit number.
	3.N.1.4 Use place value to compare and order whole numbers up to 100,000, using comparative language, numbers, and symbols.
3.N.2 Add and subtract multi-digit whole numbers; multiply with factors up to 10; represent multiplication and division in various ways; Solve real-world and mathematical problems through the representation of related operations.	**3.N.2.1** Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line and skip counting.
	3.N.2.2 Demonstrate fluency of multiplication facts with factors up to 10.
	3.N.2.3 Use strategies and algorithms based on knowledge of place value and equality to fluently add and subtract multi-digit numbers.
	3.N.2.4 Recognize when to round numbers and apply understanding to round numbers to the nearest ten thousand, thousand, hundred, and ten and use compatible numbers to estimate sums and differences.
	3.N.2.5 Use addition and subtraction to solve real-world and mathematical problems involving whole numbers. Use various strategies, including the relationship between addition and subtraction, the use of technology, and the context of the problem to assess the reasonableness of results.
	3.N.2.6 Represent division facts by using a variety of approaches, such as repeated subtraction, equal sharing and forming equal groups.
	3.N.2.7 Recognize the relationship between multiplication and division to represent and solve real-world problems.
	3.N.2.8 Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two-digit number by a one-digit number.

3.N.3 Understand meanings and uses of fractions in real-world and mathematical situations.	**3.N.3.1** Read and write fractions with words and symbols.
	3.N.3.2 Construct fractions using length, set, and area models.
	3.N.3.3 Recognize unit fractions and use them to compose and decompose fractions related to the same whole. Use the numerator to describe the number of parts and the denominator to describe the number of partitions.
	3.N.3.4 Use models and number lines to order and compare fractions that are related to the same whole.
3.N.4 Determine the value of a set of coins or bills.	**3.N.4.1** Use addition to determine the value of a collection of coins up to one dollar using the cent symbol and a collection of bills up to twenty dollars.
	3.N.4.2 Select the fewest number of coins for a given amount of money up to one dollar.
Algebraic Reasoning & Algebra (A)	
3.A.1 Describe and create representations of numerical and geometric patterns.	**3.A.1.1** Create, describe, and extend patterns involving addition, subtraction, or multiplication to solve problems in a variety of contexts.
	3.A.1.2 Describe the rule (single operation) for a pattern from an input/output table or function machine involving addition, subtraction, or multiplication.
	3.A.1.3 Explore and develop visual representations of growing geometric patterns and construct the next steps.
3.A.2 Use number sentences involving multiplication and unknowns to represent and solve real-world and mathematical problems.	**3.A.2.1** Find unknowns represented by symbols in arithmetic problems by solving one-step open sentences (equations) and other problems involving addition, subtraction, and multiplication. Generate real-world situations to represent number sentences.
	3.A.2.2 Recognize, represent and apply the number properties (commutative, identity, and associative properties of addition and multiplication) using models and manipulatives to solve problems.
Geometry & Measurement (GM)	
3.GM.1 Use geometric attributes to describe and create shapes in various contexts.	**3.GM.1.1** Sort three-dimensional shapes based on attributes.
	3.GM.1.2 Build a three-dimensional figure using unit cubes when picture/shape is shown.
	3.GM.1.3 Classify angles as acute, right, obtuse, and straight.
3.GM.2 Understand measurable attributes of real-world and mathematical objects using various tools.	**3.GM.2.1** Find perimeter of polygon, given whole number lengths of the sides, in real-world and mathematical situations.
	3.GM.2.2 Develop and use formulas to determine the area of rectangles. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into one unit by one unit squares and viewing these as grouped into rows and columns.
	3.GM.2.3 Choose an appropriate measurement instrument and measure the length of objects to the nearest whole centimeter or meter.
	3.GM.2.4 Choose an appropriate measurement instrument and measure the length of objects to the nearest whole yard, whole foot, or half inch.

	3.GM.2.5 Using common benchmarks, estimate the lengths (customary and metric) of a variety of objects.
	3.GM.2.6 Use an analog thermometer to determine temperature to the nearest degree in Fahrenheit and Celsius.
	3.GM.2.7 Count cubes systematically to identify number of cubes needed to pack the whole or half of a three-dimensional structure.
	3.GM.2.8 Find the area of two-dimensional figures by counting total number of same size unit squares that fill the shape without gaps or overlaps.
3.GM.3 Solve problems by telling time to the nearest 5 minutes.	**3.GM.3.1** Read and write time to the nearest 5-minute (analog and digital).
	3.GM.3.2 Determine the solutions to problems involving addition and subtraction of time in intervals of 5 minutes, up to one hour, using pictorial models, number line diagrams, or other tools.
Data & Probability (D)	
3.D.1 Summarize, construct, and analyze data.	**3.D.1.1** Summarize and construct a data set with multiple categories using a frequency table, line plot, pictograph, and/or bar graph with scaled intervals.
	3.D.1.2 Solve one- and two-step problems using categorical data represented with a frequency table, pictograph, or bar graph with scaled intervals.

Develop a Deep and Flexible Conceptual Understanding	Develop Accurate and Appropriate Procedural Fluency	Develop Strategies for Problem Solving	Develop Mathematical Reasoning	Develop a Productive Mathematical Disposition	Develop the Ability to Make Conjectures, Model, and Generalize	Develop the Ability to Communicate Mathematically

Number & Operations (N)

4.N.1 Solve real-world and mathematical problems using multiplication and division.	**4.N.1.1** Demonstrate fluency with multiplication and division facts with factors up to 12.
	4.N.1.2 Use an understanding of place value to multiply or divide a number by 10, 100 and 1,000.
	4.N.1.3 Multiply 3-digit by 1-digit or a 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms.
	4.N.1.4 Estimate products of 3-digit by 1-digit or 2-digit by 2-digit whole numbers using rounding, benchmarks and place value to assess the reasonableness of results. Explore larger numbers using technology to investigate patterns.
	4.N.1.5 Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction, and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of appropriate technology, and the context of the problem to assess the reasonableness of results.
	4.N.1.6 Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide 3-digit dividend by 1-digit whole number divisors. (e.g., mental strategies, standard algorithms, partial quotients, repeated subtraction, the commutative, associative, and distributive properties).
	4.N.1.7 Determine the unknown addend(s) or factor(s) in equivalent and non-equivalent expressions. (e.g., 5 + 6 = 4 + □ , 3 x 8 < 3 x □).
4.N.2 Represent and compare fractions and decimals in real-world and mathematical situations; use place value to understand how decimals represent quantities.	**4.N.2.1** Represent and rename equivalent fractions using fraction models (e.g. parts of a set, area models, fraction strips, number lines).
	4.N.2.2 Use benchmark fractions (0, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, 1) to locate additional fractions on a number line. Use models to order and compare whole numbers and fractions less than and greater than one using comparative language and symbols.
	4.N.2.3 Decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations (e.g., $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$).
	4.N.2.4 Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations.
	4.N.2.5 Represent tenths and hundredths with concrete models, making connections between fractions and decimals.
	4.N.2.6 Represent, read and write decimals up to at least the hundredths place in a variety of contexts including money.

	4.N.2.7 Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks.
	4.N.2.8 Compare benchmark fractions ($\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$) and decimals (0.25, 0.50, 0.75) in real-world and mathematical situations.
4.N.3 Determine the value of coins in order to solve monetary transactions.	**4.N.3.1** Given a total cost (whole dollars up to $20 or coins) and amount paid (whole dollars up to $20 or coins), find the change required in a variety of ways. Limited to whole dollars up to $20 or sets of coins.
Algebraic Reasoning & Algebra (A)	
4.A.1 Use multiple representations of patterns to solve real-world and mathematical problems.	**4.A.1.1** Create an input/output chart or table to represent or extend a numerical pattern.
	4.A.1.2 Describe the single operation rule for a pattern from an input/output table or function machine involving any operation of a whole number.
	4.A.1.3 Create growth patterns involving geometric shapes and define the single operation rule of the pattern.
4.A.2 Use multiplication and division with unknowns to create number sentences representing a given problem situation.	**4.A.2.1** Use number sense, properties of multiplication and the relationship between multiplication and division to solve problems and find values for the unknowns represented by letters and symbols that make number sentences true.
	4.A.2.2 Solve for unknowns in problems by solving open sentences (equations) and other problems involving addition, subtraction, multiplication, or division with whole numbers. Use real-world situations to represent number sentences and vice versa.
Geometry & Measurement (GM)	
4.GM.1 Name, describe, classify and construct polygons, and three-dimensional figures.	**4.GM.1.1** Identify points, lines, line segments, rays, angles, endpoints, and parallel and perpendicular lines in various contexts.
	4.GM.1.2 Describe, classify, and sketch quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms, and kites. Recognize quadrilaterals in various contexts.
	4.GM.1.3 Given two three-dimensional shapes, identify similarities, and differences.
4.GM.2 Understand angle, length, and area as measurable attributes of real-world and mathematical objects. Use various tools to measure angles, length, area, and volume.	**4.GM.2.1** Measure angles in geometric figures and real-world objects with a protractor or angle ruler.
	4.GM.2.2 Find the area of polygons that can be decomposed into rectangles.
	4.GM.2.3 Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms with whole-number edge lengths can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements such as cm^3.
	4.GM.2.4 Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or quarter-inch.
	4.GM.2.5 Solve problems that deal with measurements of length, when to use liquid volumes, when to use mass, temperatures above zero and money using addition, subtraction, multiplication, or division as appropriate (customary and metric).

4.GM.3 Determine elapsed time and convert between units of time.	**4.GM.3.1** Determine elapsed time.
	4.GM.3.2 Solve problems involving the conversion of one measure of time to another.
Data & Probability (D)	
4.D.1 Collect, organize, and analyze data.	**4.D.1.1** Represent data on a frequency table or line plot marked with whole numbers and fractions using appropriate titles, labels, and units.
	4.D.1.2 Use tables, bar graphs, timelines, and Venn diagrams to display data sets. The data may include benchmark fractions or decimals ($\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, 0.25, 0.50, 0.75).
	4.D.1.3 Solve one- and two-step problems using data in whole number, decimal, or fraction form in a frequency table and line plot.

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Number & Operations (N)

5.N.1 Divide multi-digit numbers and solve real-world and mathematical problems using arithmetic.	**5.N.1.1** Estimate solutions to division problems in order to assess the reasonableness of results.
	5.N.1.2 Divide multi-digit numbers, by one- and two-digit divisors, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms.
	5.N.1.3 Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal and consider the context in which a problem is situated to select and interpret the most useful form of the quotient for the solution.
	5.N.1.4 Solve real-world and mathematical problems requiring addition, subtraction, multiplication, and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results.
5.N.2 Read, write, represent, and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.	**5.N.2.1** Represent decimal fractions (e.g., $\frac{1}{10}$, $\frac{1}{100}$) using a variety of models (e.g., 10 by 10 grids, rational number wheel, base-ten blocks, meter stick) and make connections between fractions and decimals.
	5.N.2.2 Represent, read and write decimals using place value to describe decimal numbers including fractional numbers as small as thousandths and whole numbers as large as millions.
	5.N.2.3 Compare and order fractions and decimals, including mixed numbers and fractions less than one, and locate on a number line.
	5.N.2.4 Recognize and generate equivalent decimals, fractions, mixed numbers, and fractions less than one in various contexts.
5.N.3 Add and subtract fractions with like and unlike denominators, mixed numbers and decimals to solve real-world and mathematical problems.	**5.N.3.1** Estimate sums and differences of fractions with like and unlike denominators, mixed numbers, and decimals to assess the reasonableness of the results.
	5.N.3.2 Illustrate addition and subtraction of fractions with like and unlike denominators, mixed numbers, and decimals using a variety of representations (e.g., fraction strips, area models, number lines, fraction rods).
	5.N.3.3 Add and subtract fractions with like and unlike denominators, mixed numbers, and decimals, using efficient and generalizable procedures, including but not limited to standard algorithms in order to solve real-world and mathematical problems including those involving money, measurement, geometry, and data.
	5.N.3.4 Find 0.1 more than a number and 0.1 less than a number. Find 0.01 more than a number and 0.01 less than a number. Find 0.001 more than a number and 0.001 less than a number.

Algebraic Reasoning & Algebra (A)	
5.A.1 Describe and graph patterns of change created through numerical patterns.	**5.A.1.1** Use tables and rules of up to two operations to describe patterns of change and make predictions and generalizations about real-world and mathematical problems.
	5.A.1.2 Use a rule or table to represent ordered pairs of whole numbers and graph these ordered pairs on a coordinate plane, identifying the origin and axes in relation to the coordinates.
5.A.2 Understand and interpret expressions, equations, and inequalities involving variables and whole numbers, and use them to represent and evaluate real-world and mathematical problems.	**5.A.2.1** Generate equivalent numerical expressions and solve problems involving whole numbers by applying the commutative, associative, and distributive properties and order of operations (no exponents).
	5.A.2.2 Determine whether an equation or inequality involving a variable is true or false for a given value of the variable.
	5.A.2.3 Evaluate expressions involving variables when values for the variables are given.
Geometry & Measurement (GM)	
5.GM.1 Describe, classify, and draw representations of two- and three-dimensional figures.	**5.GM.1.1** Describe, classify and construct triangles, including equilateral, right, scalene, and isosceles triangles. Recognize triangles in various contexts.
	5.GM.1.2 Describe and classify three-dimensional figures including cubes, rectangular prisms, and pyramids by the number of edges, faces or vertices as well as the shapes of faces.
	5.GM.1.3 Recognize and draw a net for a three-dimensional figure (e.g., cubes, rectangular prisms, pyramids).
5.GM.2 Understand how the volume of rectangular prisms and surface area of shapes with polygonal faces are determined by the dimensions of the object and that shapes with varying dimensions can have equivalent values of surface area or volume.	**5.GM.2.1** Recognize that the volume of rectangular prisms can be determined by the number of cubes (n) and by the product of the dimensions of the prism ($a \times b \times c = n$). Know that rectangular prisms of different dimensions ($p, q,$ and r) can have the same volume if $a \times b \times c = p \times q \times r = n$.
	5.GM.2.2 Recognize that the surface area of a three-dimensional figure with rectangular faces with whole numbered edges can be found by finding the area of each component of the net of that figure. Know that three-dimensional shapes of different dimensions can have the same surface area.
	5.GM.2.3 Find the perimeter of polygons and create arguments for reasonable values for the perimeter of shapes that include curves.
5.GM.3 Understand angle and length as measurable attributes of real-world and mathematical objects. Use various tools to measure angles and lengths.	**5.GM.3.1** Measure and compare angles according to size.
	5.GM.3.2 Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or 1/16-inch.
	5.GM.3.3 Recognize and use the relationship between inches, feet, and yards to measure and compare objects.
	5.GM.3.4 Recognize and use the relationship between millimeters, centimeters, and meters to measure and compare objects.

Data & Probability (D)	
5.D.1 Display and analyze data to find the range and measures of central tendency (mean, median, and mode).	**5.D.1.1** Find the measures of central tendency (mean, median, or mode) and range of a set of data. Understand that the mean is a "leveling out" or central balance point of the data.
	5.D.1.2 Create and analyze line and double-bar graphs with whole numbers, fractions, and decimals increments.

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Number & Operations (N)	
6.N.1 Read, write, and represent integers and rational numbers expressed as fractions, decimals, percents, and ratios; write positive integers as products of factors; use these representations in real-world and mathematical situations.	**6.N.1.1** Represent integers with counters and on a number line and rational numbers on a number line, recognizing the concepts of opposites, direction, and magnitude; use integers and rational numbers in real-world and mathematical situations, explaining the meaning of 0 in each situation.
	6.N.1.2 Compare and order positive rational numbers, represented in various forms, or integers using the symbols <, >, and =.
	6.N.1.3 Explain that a percent represents parts "out of 100" and ratios "to 100."
	6.N.1.4 Determine equivalencies among fractions, decimals, and percents. Select among these representations to solve problems.
	6.N.1.5 Factor whole numbers and express prime and composite numbers as a product of prime factors with exponents.
	6.N.1.6 Determine the greatest common factors and least common multiples. Use common factors and multiples to calculate with fractions, find equivalent fractions, and express the sum of two-digit numbers with a common factor using the distributive property.
6.N.2 Add and subtract integers in order to solve real-world and mathematical problems.	**6.N.2.1** Estimate solutions to addition and subtraction of integers problems in order to assess the reasonableness of results.
	6.N.2.2 Illustrate addition and subtraction of integers using a variety of representations.
	6.N.2.3 Add and subtract integers; use efficient and generalizable procedures including but not limited to standard algorithms.
6.N.3 Understand the concept of ratio and its relationship to fractions and percents and to the multiplication and division of whole numbers. Use ratios to solve real-world and mathematical problems.	**6.N.3.1** Identify and use ratios to compare quantities. Recognize that multiplicative comparison and additive comparison are different.
	6.N.3.2 Determine the unit rate for ratios.
	6.N.3.3 Apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts, including those involving mixture and concentrations.
	6.N.3.4 Use multiplicative reasoning and representations to solve ratio and unit rate problems.
6.N.4 Multiply and divide decimals, fractions, and mixed numbers; solve real-world and mathematical problems with rational numbers.	**6.N.4.1** Estimate solutions to problems with whole numbers, decimals, fractions, and mixed numbers and use the estimates to assess the reasonableness of results in the context of the problem.
	6.N.4.2 Illustrate multiplication and division of fractions and decimals to show connections to fractions, whole number multiplication, and inverse relationships.

	6.N.4.3 Multiply and divide fractions and decimals using efficient and generalizable procedures.
	6.N.4.4 Solve and interpret real-world and mathematical problems including those involving money, measurement, geometry, and data requiring arithmetic with decimals, fractions and mixed numbers.
Algebraic Reasoning & Algebra (A)	
6.A.1 Recognize and represent relationships between varying quantities; translate from one representation to another; use patterns, tables, graphs and rules to solve real-world and mathematical problems.	**6.A.1.1** Plot integer- and rational-valued (limited to halves and fourths) ordered-pairs as coordinates in all four quadrants and recognize the reflective relationships among coordinates that differ only by their signs.
	6.A.1.2 Represent relationships between two varying quantities involving no more than two operations with rules, graphs, and tables; translate between any two of these representations.
	6.A.1.3 Use and evaluate variables in expressions, equations, and inequalities that arise from various contexts, including determining when or if, for a given value of the variable, an equation or inequality involving a variable is true or false.
6.A.2 Use properties of arithmetic to generate equivalent numerical expressions and evaluate expressions involving positive rational numbers.	**6.A.2.1** Generate equivalent expressions and evaluate expressions involving positive rational numbers by applying the commutative, associative, and distributive properties and order of operations to solve real-world and mathematical problems.
6.A.3 Use equations and inequalities to represent real-world and mathematical problems and use the idea of maintaining equality to solve equations. Interpret solutions in the original context.	**6.A.3.1** Represent real-world or mathematical situations using expressions, equations and inequalities involving variables and rational numbers.
	6.A.3.2 Use number sense and properties of operations and equality to solve real-world and mathematical problems involving equations in the form $x + p = q$ and $px = q$, where x, p, and q are nonnegative rational numbers. Graph the solution on a number line, interpret the solution in the original context, and assess the reasonableness of the solution.
Geometry & Measurement (GM)	
6.GM.1 Calculate area of squares, parallelograms, and triangles to solve real-world and mathematical problems.	**6.GM.1.1** Develop and use formulas for the area of squares and parallelograms using a variety of methods including but not limited to the standard algorithm.
	6.GM.1.2 Develop and use formulas to determine the area of triangles.
	6.GM.1.3 Find the area of right triangles, other triangles, special quadrilaterals, and polygons that can be decomposed into triangles and other shapes to solve real-world and mathematical problems.
6.GM.2 Understand and use relationships between angles in geometric figures.	**6.GM.2.1** Solve problems using the relationships between the angles (vertical, complementary, and supplementary) formed by intersecting lines.
	6.GM.2.2 Develop and use the fact that the sum of the interior angles of a triangle is 180° to determine missing angle measures in a triangle.

6.GM.3 Choose appropriate units of measurement and use ratios to convert within measurement systems to solve real-world and mathematical problems.	**6.GM.3.1** Estimate weights, capacities and geometric measurements using benchmarks in customary and metric measurement systems with appropriate units.
	6.GM.3.2 Solve problems in various real-world and mathematical contexts that require the conversion of weights, capacities, geometric measurements, and time within the same measurement systems using appropriate units.
6.GM.4 Use translations, reflections, and rotations to establish congruency and understand symmetries.	**6.GM.4.1** Predict, describe, and apply translations (slides), reflections (flips), and rotations (turns) to a two-dimensional figure.
	6.GM.4.2 Recognize that translations, reflections, and rotations preserve congruency and use them to show that two figures are congruent.
	6.GM.4.3 Use distances between two points that are either vertical or horizontal to each other (not requiring the distance formula) to solve real-world and mathematical problems about congruent two-dimensional figures.
	6.GM.4.4 Identify and describe the line(s) of symmetry in two-dimensional shapes.
Data & Probability (D)	
6.D.1 Display and analyze data.	**6.D.1.1** Calculate the mean, median, and mode for a set of real-world data.
	6.D.1.2 Explain and justify which measure of central tendency (mean, median, or mode) would provide the most descriptive information for a given set of data.
	6.D.1.3 Create and analyze box and whisker plots observing how each segment contains one quarter of the data.
6.D.2 Use probability to solve real-world and mathematical problems; represent probabilities using fractions and decimals.	**6.D.2.1** Represent possible outcomes using a probability continuum from impossible to certain.
	6.D.2.2 Determine the sample space for a given experiment and determine which members of the sample space are related to certain events. Sample space may be determined by the use of tree diagrams, tables or pictorial representations.
	6.D.2.3 Demonstrate simple experiments in which the probabilities are known and compare the resulting relative frequencies with the known probabilities, recognizing that there may be differences between the two results.

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Number & Operations (N)	
7.N.1 Read, write, represent, and compare rational numbers, expressed as integers, fractions, and decimals.	**7.N.1.1** Know that every rational number can be written as the ratio of two integers or as a terminating or repeating decimal.
	7.N.1.2 Compare and order rational numbers expressed in various forms using the symbols <, >, and =.
	7.N.1.3 Recognize and generate equivalent representations of rational numbers, including equivalent fractions.
7.N.2 Calculate with integers and rational numbers, with and without positive integer exponents, to solve real-world and mathematical problems; explain the relationship between absolute value of a rational number and the distance of that number from zero.	**7.N.2.1** Estimate solutions to multiplication and division of integers in order to assess the reasonableness of results.
	7.N.2.2 Illustrate multiplication and division of integers using a variety of representations.
	7.N.2.3 Solve real-world and mathematical problems involving addition, subtraction, multiplication and division of rational numbers; use efficient and generalizable procedures including but not limited to standard algorithms.
	7.N.2.4 Raise integers to positive integer exponents.
	7.N.2.5 Solve real-world and mathematical problems involving calculations with rational numbers and positive integer exponents.
	7.N.2.6 Explain the relationship between the absolute value of a rational number and the distance of that number from zero on a number line. Use the symbol for absolute value.
Algebraic Reasoning & Algebra (A)	
7.A.1 Understand the concept of proportionality in real-world and mathematical situations, and distinguish between proportional and other relationships.	**7.A.1.1** Describe that the relationship between two variables, x and y, is proportional if it can be expressed in the form $\frac{y}{x} = k$ or $y = kx$; distinguish proportional relationships from other relationships, including inversely proportional relationships ($xy = k$ or $y = \frac{k}{x}$).
	7.A.1.2 Recognize that the graph of a proportional relationship is a line through the origin and the coordinate (1, r), where both r and the slope are the unit rate (constant of proportionality, k).

7.A.2 Recognize proportional relationships in real-world and mathematical situations; represent these and other relationships with tables, verbal descriptions, symbols, and graphs; solve problems involving proportional relationships and interpret results in the original context.	**7.A.2.1** Represent proportional relationships with tables, verbal descriptions, symbols, and graphs; translate from one representation to another. Determine and compare the unit rate (constant of proportionality, slope, or rate of change) given any of these representations.
	7.A.2.2 Solve multi-step problems involving proportional relationships involving distance-time, percent increase or decrease, discounts, tips, unit pricing, similar figures, and other real-world and mathematical situations.
	7.A.2.3 Use proportional reasoning to solve real-world and mathematical problems involving ratios.
	7.A.2.4 Use proportional reasoning to assess the reasonableness of solutions.
7.A.3 Represent and solve linear equations and inequalities.	**7.A.3.1** Write and solve problems leading to linear equations with one variable in the form $px + q = r$ and $p(x + q) = r$, where $p, q, and\ r$ are rational numbers.
	7.A.3.2 Represent, write, solve, and graph problems leading to linear inequalities with one variable in the form $x + p > q$ and $x + p < q$, where p, and q are nonnegative rational numbers.
	7.A.3.3 Represent real-world or mathematical situations using equations and inequalities involving variables and rational numbers.
7.A.4 Use order of operations and properties of operations to generate equivalent numerical and algebraic expressions containing rational numbers and grouping symbols; evaluate such expressions.	**7.A.4.1** Use properties of operations (limited to associative, commutative, and distributive) to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents.
	7.A.4.2 Apply understanding of order of operations and grouping symbols when using calculators and other technologies.
Geometry & Measurement (GM)	
7.GM.1 Develop and understand the concept of surface area and volume of rectangular prisms.	**7.GM.1.1** Using a variety of tools and strategies, develop the concept that surface area of a rectangular prism with rational-valued edge lengths can be found by wrapping the figure with same-sized square units without gaps or overlap. Use appropriate measurements such as cm^2.
	7.GM.1.2 Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms with rational-valued edge lengths can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements such as cm^3.
7.GM.2 Determine the area of trapezoids and area and perimeter of composite figures.	**7.GM.2.1** Develop and use the formula to determine the area of a trapezoid to solve problems.
	7.GM.2.2 Find the area and perimeter of composite figures to solve real-world and mathematical problems.
7.GM.3 Use reasoning with proportions and ratios to determine measurements, justify formulas, and solve real-world and mathematical problems involving circles and related geometric figures.	**7.GM.3.1** Demonstrate an understanding of the proportional relationship between the diameter and circumference of a circle and that the unit rate (constant of proportionality) is π and can be approximated by rational numbers such as $\frac{22}{7}$ and 3.14.
	7.GM.3.2 Calculate the circumference and area of circles to solve problems in various contexts, in terms of π and using approximations for π.

7.GM.4 Analyze the effect of dilations, translations, and reflections on the attributes of two-dimensional figures on and off the coordinate plane.	**7.GM.4.1** Describe the properties of similarity, compare geometric figures for similarity, and determine scale factors resulting from dilations.
	7.GM.4.2 Apply proportions, ratios, and scale factors to solve problems involving scale drawings and determine side lengths and areas of similar triangles and rectangles.
	7.GM.4.3 Graph and describe translations and reflections of figures on a coordinate plane and determine the coordinates of the vertices of the figure after the transformation.
Data & Probability (D)	
7.D.1 Display and analyze data in a variety of ways.	**7.D.1.1** Design simple experiments, collect data and calculate measures of central tendency (mean, median, and mode) and spread (range). Use these quantities to draw conclusions about the data collected and make predictions.
	7.D.1.2 Use reasoning with proportions to display and interpret data in circle graphs (pie charts) and histograms. Choose the appropriate data display and know how to create the display using a spreadsheet or other graphing technology.
7.D.2 Calculate probabilities and reason about probabilities using proportions to solve real-world and mathematical problems.	**7.D.2.1** Determine the theoretical probability of an event using the ratio between the size of the event and the size of the sample space; represent probabilities as percents, fractions and decimals between 0 and 1.
	7.D.2.2 Calculate probability as a fraction of sample space or as a fraction of area. Express probabilities as percents, decimals and fractions.
	7.D.2.3 Use proportional reasoning to draw conclusions about and predict relative frequencies of outcomes based on probabilities.

Develop a Deep and Flexible Conceptual Understanding	Develop Accurate and Appropriate Procedural Fluency	Develop Strategies for Problem Solving	Develop Mathematical Reasoning	Develop a Productive Mathematical Disposition	Develop the Ability to Make Conjectures, Model, and Generalize	Develop the Ability to Communicate Mathematically

Number & Operations (N)	
PA.N.1 Read, write, compare, classify, and represent real numbers and use them to solve problems in various contexts.	**PA.N.1.1** Develop and apply the properties of integer exponents, including $a^0 = 1$ (with $a \neq 0$), to generate equivalent numerical and algebraic expressions.
	PA.N.1.2 Express and compare approximations of very large and very small numbers using scientific notation.
	PA.N.1.3 Multiply and divide numbers expressed in scientific notation, express the answer in scientific notation.
	PA.N.1.4 Classify real numbers as rational or irrational. Explain why the rational number system is closed under addition and multiplication and why the irrational system is not. Explain why the sum of a rational number and an irrational number is irrational; and the product of a non-zero rational number and an irrational number is irrational.
	PA.N.1.5 Compare real numbers; locate real numbers on a number line. Identify the square root of a perfect square to 400 or, if it is not a perfect square root, locate it as an irrational number between two consecutive positive integers.
Algebraic Reasoning & Algebra (A)	
PA.A.1 Understand the concept of function in real-world and mathematical situations, and distinguish between linear and nonlinear functions.	**PA.A.1.1** Recognize that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable.
	PA.A.1.2 Use linear functions to represent and explain real-world and mathematical situations.
	PA.A.1.3 Identify a function as linear if it can be expressed in the form $y = mx + b$ or if its graph is a straight line.
PA.A.2 Recognize linear functions in real-world and mathematical situations; represent linear functions and other functions with tables, verbal descriptions, symbols, and graphs; solve problems involving linear functions and interpret results in the original context.	**PA.A.2.1** Represent linear functions with tables, verbal descriptions, symbols, and graphs; translate from one representation to another.
	PA.A.2.2 Identify, describe, and analyze linear relationships between two variables.
	PA.A.2.3 Identify graphical properties of linear functions including slope and intercepts. Know that the slope equals the rate of change, and that the *y*-intercept is zero when the function represents a proportional relationship.
	PA.A.2.4 Predict the effect on the graph of a linear function when the slope or *y*-intercept changes. Use appropriate tools to examine these effects.
	PA.A.2.5 Solve problems involving linear functions and interpret results in the original context.

PA.A.3 Generate equivalent numerical and algebraic expressions and use algebraic properties to evaluate expressions.	**PA.A.3.1** Use substitution to simplify and evaluate algebraic expressions.
	PA.A.3.2 Justify steps in generating equivalent expressions by identifying the properties used, including the properties of operations (associative, commutative, and distributive laws) and the order of operations, including grouping symbols.
PA.A.4 Represent real-world and mathematical problems using equations and inequalities involving linear expressions. Solve and graph equations and inequalities symbolically and graphically. Interpret solutions in the original context.	**PA.A.4.1** Illustrate, write, and solve mathematical and real-world problems using linear equations with one variable with one solution, infinitely many solutions, or no solutions. Interpret solutions in the original context.
	PA.A.4.2 Represent, write, solve, and graph problems leading to linear inequalities with one variable in the form $px + q > r$ and $px + q < r$, where p, q, and r are rational numbers.
	PA.A.4.3 Represent real-world situations using equations and inequalities involving one variable.
Geometry & Measurement (GM)	
PA.GM.1 Solve problems involving right triangles using the Pythagorean Theorem.	**PA.GM.1.1** Informally justify the Pythagorean Theorem using measurements, diagrams, or dynamic software and use the Pythagorean Theorem to solve problems in two and three dimensions involving right triangles.
	PA.GM.1.2 Use the Pythagorean Theorem to find the distance between any two points in a coordinate plane.
PA.GM.2 Calculate surface area and volume of three-dimensional figures.	**PA.GM.2.1** Calculate the surface area of a rectangular prism using decomposition or nets. Use appropriate measurements such as cm^2.
	PA.GM.2.2 Calculate the surface area of a cylinder, in terms of π and using approximations for π, using decomposition or nets. Use appropriate measurements such as cm^2.
	PA.GM.2.3 Develop and use the formulas $V = lwh$ and $V = Bh$ to determine the volume of rectangular prisms. Justify why base area (B) and height (h) are multiplied to find the volume of a rectangular prism. Use appropriate measurements such as cm^3.
	PA.GM.2.4 Develop and use the formulas $V = \pi r^2 h$ and $V = Bh$ to determine the volume of right cylinders, in terms of π and using approximations for π. Justify why base area (B) and height (h) are multiplied to find the volume of a right cylinder. Use appropriate measurements such as cm^3.

Data & Probability (D)	
PA.D.1 Display and interpret data in a variety of ways, including using scatterplots and approximate lines of best fit. Use line of best fit and average rate of change to make predictions and draw conclusions about data.	**PA.D.1.1** Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Know how to create data displays using a spreadsheet and use a calculator to examine this impact.
	PA.D.1.2 Explain how outliers affect measures of central tendency.
	PA.D.1.3 Collect, display and interpret data using scatterplots. Use the shape of the scatterplot to informally estimate a line of best fit, make statements about average rate of change, and make predictions about values not in the original data set. Use appropriate titles, labels and units.
PA.D.2 Calculate experimental probabilities and reason about probabilities to solve real-world and mathematical problems.	**PA.D.2.1** Calculate experimental probabilities and represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown.
	PA.D.2.2 Determine how samples are chosen (random, limited, biased) to draw and support conclusions about generalizing a sample to a population.
	PA.D.2.3 Compare and contrast dependent and independent events.

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Number & Operations (N)	
A1.N.1 Extend the understanding of number and operations to include square roots and cube roots.	**A1.N.1.1** Write square roots and cube roots of monomial algebraic expressions in simplest radical form.
	A1.N.1.2 Add, subtract, multiply, and simplify square roots of monomial algebraic expressions and divide square roots of whole numbers, rationalizing the denominator when necessary.
Algebraic Reasoning & Algebra (A)	
A1.A.1 Represent and solve mathematical and real-world problems using linear equations, absolute value equations, and systems of equations; interpret solutions in the original context.	**A1.A.1.1** Use knowledge of solving equations with rational values to represent and solve mathematical and real-world problems (e.g., angle measures, geometric formulas, science, or statistics) and interpret the solutions in the original context.
	A1.A.1.2 Solve absolute value equations and interpret the solutions in the original context.
	A1.A.1.3 Analyze and solve real-world and mathematical problems involving systems of linear equations with a maximum of two variables by graphing (may include graphing calculator or other appropriate technology), substitution, and elimination. Interpret the solutions in the original context.
A1.A.2 Represent and solve real-world and mathematical problems using linear inequalities, compound inequalities and systems of linear inequalities; interpret solutions in the original context.	**A1.A.2.1** Represent relationships in various contexts with linear inequalities; solve the resulting inequalities, graph on a coordinate plane, and interpret the solutions.
	A1.A.2.2 Represent relationships in various contexts with compound and absolute value inequalities and solve the resulting inequalities by graphing and interpreting the solutions on a number line.
	A1.A.2.3 Solve systems of linear inequalities with a maximum of two variables; graph and interpret the solutions on a coordinate plane.
A1.A.3 Generate equivalent algebraic expressions and use algebraic properties to evaluate expressions and arithmetic and geometric sequences.	**A1.A.3.1** Solve equations involving several variables for one variable in terms of the others.
	A1.A.3.2 Simplify polynomial expressions by adding, subtracting, or multiplying.
	A1.A.3.3 Factor common monomial factors from polynomial expressions and factor quadratic expressions with a leading coefficient of 1.
	A1.A.3.4 Evaluate linear, absolute value, rational, and radical expressions. Include applying a nonstandard operation such as $a \odot b = 2a + b$.
	A1.A.3.5 Recognize that arithmetic sequences are linear using equations, tables, graphs, and verbal descriptions. Use the pattern, find the next term.
	A1.A.3.6 Recognize that geometric sequences are exponential using equations, tables, graphs and verbal descriptions. Given the formula $f(x) = a(r)^x$, find the next term and define the meaning of a and r within the context of the problem.

A1.A.4 Analyze mathematical change involving linear equations in real-world and mathematical problems.	**A1.A.4.1** Calculate and interpret slope and the x- and y-intercepts of a line using a graph, an equation, two points, or a set of data points to solve real-world and mathematical problems.
	A1.A.4.2 Solve mathematical and real-world problems involving lines that are parallel, perpendicular, horizontal, or vertical.
	A1.A.4.3 Express linear equations in slope-intercept, point-slope, and standard forms and convert between these forms. Given sufficient information (slope and *y*-intercept, slope and one-point on the line, two points on the line, *x*- and *y*-intercept, or a set of data points), write the equation of a line.
	A1.A.4.4 Translate between a graph and a situation described qualitatively.
Functions (F)	
A1.F.1 Understand functions as descriptions of covariation (how related quantities vary together) in real-world and mathematical problems.	**A1.F.1.1** Distinguish between relations and functions.
	A1.F.1.2 Identify the dependent and independent variables as well as the domain and range given a function, equation, or graph. Identify restrictions on the domain and range in real-world contexts.
	A1.F.1.3 Write linear functions, using function notation, to model real-world and mathematical situations.
	A1.F.1.4 Given a graph modeling a real-world situation, read and interpret the linear piecewise function (excluding step functions).
A1.F.2 Recognize functions and understand that families of functions are characterized by their rate of change.	**A1.F.2.1** Distinguish between linear and nonlinear (including exponential) functions arising from real-world and mathematical situations that are represented in tables, graphs, and equations. Understand that linear functions grow by equal intervals and that exponential functions grow by equal factors over equal intervals.
	A1.F.2.2 Recognize the graph of the functions $f(x) = x$ and $f(x) = \|x\|$ and predict the effects of transformations [$f(x + c)$ and $f(x) + c$, where c is a positive or negative constant] algebraically and graphically using various methods and tools that may include graphing calculators.
A1.F.3 Represent functions in multiple ways and use the representation to interpret real-world and mathematical problems.	**A1.F.3.1** Identify and generate equivalent representations of linear equations, graphs, tables, and real-world situations.
	A1.F.3.2 Use function notation; evaluate a function, including nonlinear, at a given point in its domain algebraically and graphically. Interpret the results in terms of real-world and mathematical problems.
	A1.F.3.3 Add, subtract, and multiply functions using function notation.

Data & Probability (D)	
A1.D.1 Display, describe, and compare data. For linear relationships, make predictions and assess the reliability of those predictions.	**A1.D.1.1** Describe a data set using data displays, describe and compare data sets using summary statistics, including measures of central tendency, location, and spread. Know how to use calculators, spreadsheets, or other appropriate technology to display data and calculate summary statistics.
	A1.D.1.2 Collect data and use scatterplots to analyze patterns and describe linear relationships between two variables. Using graphing technology, determine regression lines and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions.
	A1.D.1.3 Interpret graphs as being discrete or continuous.
A1.D.2 Calculate probabilities and apply probability concepts.	**A1.D.2.1** Select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities.
	A1.D.2.2 Describe the concepts of intersections, unions, and complements using Venn diagrams to evaluate probabilities. Understand the relationships between these concepts and the words AND, OR, and NOT.
	A1.D.2.3 Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.
	A1.D.2.4 Apply probability concepts to real-world situations to make informed decisions.

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Geometry: Reasoning & Logic (G.RL)	
G.RL.1 Use appropriate tools and logic to evaluate mathematical arguments.	**G.RL.1.1** Understand the use of undefined terms, definitions, postulates, and theorems in logical arguments/proofs.
	G.RL.1.2 Analyze and draw conclusions based on a set of conditions using inductive and deductive reasoning. Recognize the logical relationships between a conditional statement and its inverse, converse, and contrapositive.
	G.RL.1.3 Assess the validity of a logical argument and give counterexamples to disprove a statement.
Geometry: Two-Dimensional Shapes (G.2D)	
G.2D.1 Discover, evaluate and analyze the relationships between lines, angles, and polygons to solve real-world and mathematical problems; express proofs in a form that clearly justifies the reasoning, such as two-column proofs, paragraph proofs, flow charts, or illustrations.	**G.2D.1.1** Apply the properties of parallel and perpendicular lines, including properties of angles formed by a transversal, to solve real-world and mathematical problems and determine if two lines are parallel, using algebraic reasoning and proofs.
	G.2D.1.2 Apply the properties of angles, including corresponding, exterior, interior, vertical, complementary, and supplementary angles to solve real-world and mathematical problems using algebraic reasoning and proofs.
	G.2D.1.3 Apply theorems involving the interior and exterior angle sums of polygons and use them to solve real-world and mathematical problems using algebraic reasoning and proofs.
	G.2D.1.4 Apply the properties of special quadrilaterals (square, rectangle, trapezoid, isosceles trapezoid, rhombus, kite, parallelogram) and use them to solve real-world and mathematical problems involving angle measures and segment lengths using algebraic reasoning and proofs.
	G.2D.1.5 Use coordinate geometry to represent and analyze line segments and polygons, including determining lengths, midpoints, and slopes of line segments.
	G.2D.1.6 Apply the properties of polygons to solve real-world and mathematical problems involving perimeter and area (e.g., triangles, special quadrilaterals, regular polygons up to 12 sides, composite figures).
	G.2D.1.7 Apply the properties of congruent or similar polygons to solve real-world and mathematical problems using algebraic and logical reasoning.
	G.2D.1.8 Construct logical arguments to prove triangle congruence (SSS, SAS, ASA, AAS and HL) and triangle similarity (AA, SSS, SAS).
	G.2D.1.9 Use numeric, graphic and algebraic representations of transformations in two dimensions, such as reflections, translations, dilations, and rotations about the origin by multiples of 90°, to solve problems involving figures on a coordinate plane and identify types of symmetry.

Geometry: Three-Dimensional Shapes (G.3D)	
G.3D.1 Solve real-world and mathematical problems involving three-dimensional figures.	**G.3D.1.1** Solve real-world and mathematical problems using the surface area and volume of prisms, cylinders, pyramids, cones, spheres, and composites of these figures. Use nets, measuring devices, or formulas as appropriate.
	G.3D.1.2 Use ratios derived from similar three-dimensional figures to make conjectures, generalize, and to solve for unknown values such as angles, side lengths, perimeter or circumference of a face, area of a face, and volume.
Geometry: Circles (G.C)	
G.C.1 Solve real-world and mathematical problems using the properties of circles.	**G.C.1.1** Apply the properties of circles to solve problems involving circumference and area, approximate values and in terms of π, using algebraic and logical reasoning.
	G.C.1.2 Apply the properties of circles and relationships among angles; arcs; and distances in a circle among radii, chords, secants and tangents to solve problems using algebraic and logical reasoning.
	G.C.1.3 Recognize and write the radius r, center (h, k), and standard form of the equation of a circle $(x-h)^2+(y-k)^2=r^2$ with and without graphs.
	G.C.1.4 Apply the distance and midpoint formula, where appropriate, to develop the equation of a circle in standard form.
Geometry: Right Triangle Trigonometry (G.RT)	
G.RT.1 Develop and verify mathematical relationships of right triangles and trigonometric ratios to solve real-world and mathematical problems.	**G.RT.1.1** Apply the distance formula and the Pythagorean Theorem and its converse to solve real-world and mathematical problems, as approximate and exact values, using algebraic and logical reasoning (include Pythagorean Triples).
	G.RT.1.2 Verify and apply properties of right triangles, including properties of 45-45-90 and 30-60-90 triangles, to solve problems using algebraic and logical reasoning.
	G.RT.1.3 Use the definition of the trigonometric functions to determine the sine, cosine, and tangent ratio of an acute angle in a right triangle. Apply the inverse trigonometric functions to find the measure of an acute angle in right triangles.
	G.RT.1.4 Apply the trigonometric functions as ratios (sine, cosine, and tangent) to find side lengths in right triangles in real-world and mathematical problems.

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Number & Operations (N)	
A2.N.1 Extend the understanding of number and operations to include complex numbers, matrices, radical expressions, and expressions written with rational exponents.	**A2.N.1.1** Find the value of i^n for any whole number n.
	A2.N.1.2 Simplify, add, subtract, multiply, and divide complex numbers.
	A2.N.1.3 Use matrices to organize and represent data. Identify the order (dimension) of a matrix, add and subtract matrices of appropriate dimensions, and multiply a matrix by a scalar to create a new matrix to solve problems.
	A2.N.1.4 Understand and apply the relationship of rational exponents to integer exponents and radicals to solve problems.

Algebraic Reasoning & Algebra (A)	
A2.A.1 Represent and solve mathematical and real-world problems using nonlinear equations and systems of linear equations; interpret the solutions in the original context.	**A2.A.1.1** Represent real-world or mathematical problems using quadratic equations and solve using various methods (including graphing calculator or other appropriate technology), factoring, completing the square, and the quadratic formula. Find non-real roots when they exist.
	A2.A.1.2 Represent real-world or mathematical problems using exponential equations, such as compound interest, depreciation, and population growth, and solve these equations graphically (including graphing calculator or other appropriate technology) or algebraically.
	A2.A.1.3 Solve one-variable rational equations and check for extraneous solutions.
	A2.A.1.4 Solve polynomial equations with real roots using various methods and tools that may include factoring, polynomial division, synthetic division, graphing calculators or other appropriate technology.
	A2.A.1.5 Solve square root equations with one variable and check for extraneous solutions.
	A2.A.1.6 Solve common and natural logarithmic equations using the properties of logarithms.
	A2.A.1.7 Solve real-world and mathematical problems that can be modeled using arithmetic or finite geometric sequences or series given the n^{th} terms and sum formulas. Graphing calculators or other appropriate technology may be used.
	A2.A.1.8 Represent real-world or mathematical problems using systems of linear equations with a maximum of three variables and solve using various methods that may include substitution, elimination, and graphing (may include graphing calculators or other appropriate technology).
	A2.A.1.9 Solve systems of equations containing one linear equation and one quadratic equation using tools that may include graphing calculators or other appropriate technology.

A2.A.2 Represent and analyze mathematical situations and structures using algebraic symbols using various strategies to write equivalent forms of expressions.	**A2.A.2.1** Factor polynomial expressions including but not limited to trinomials, differences of squares, sum and difference of cubes, and factoring by grouping using a variety of tools and strategies.
	A2.A.2.2 Add, subtract, multiply, divide, and simplify polynomial and rational expressions.
	A2.A.2.3 Recognize that a quadratic function has different equivalent representations [$f(x) = ax^2 + bx + c$, $f(x) = a(x - h)^2 + k$, and $f(x) = (x - h)(x - k)$]. Identify and use the representation that is most appropriate to solve real-world and mathematical problems.
	A2.A.2.4 Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Functions (F)	
A2.F.1 Understand functions as descriptions of covariation (how related quantities vary together).	**A2.F.1.1** Use algebraic, interval, and set notations to specify the domain and range of functions of various types and evaluate a function at a given point in its domain.
	A2.F.1.2 Recognize the graphs of exponential, radical (square root and cube root only), quadratic, and logarithmic functions. Predict the effects of transformations [$f(x + c)$, $f(x) + c$, $f(cx)$, and $cf(x)$, where c is a positive or negative real-valued constant] algebraically and graphically, using various methods and tools that may include graphing calculators or other appropriate technology.
	A2.F.1.3 Graph a quadratic function. Identify the *x*- and *y*-intercepts, maximum or minimum value, axis of symmetry, and vertex using various methods and tools that may include a graphing calculator or appropriate technology.
	A2.F.1.4 Graph exponential and logarithmic functions. Identify asymptotes and *x*- and *y*-intercepts using various methods and tools that may include graphing calculators or other appropriate technology. Recognize exponential decay and growth graphically and algebraically.
	A2.F.1.5 Analyze the graph of a polynomial function by identifying the domain, range, intercepts, zeros, relative maxima, relative minima, and intervals of increase and decrease.
	A2.F.1.6 Graph a rational function and identify the *x*- and *y*-intercepts, vertical and horizontal asymptotes, using various methods and tools that may include a graphing calculator or other appropriate technology. (Excluding slant or oblique asymptotes and holes.)
	A2.F.1.7 Graph a radical function (square root and cube root only) and identify the *x*- and *y*-intercepts using various methods and tools that may include a graphing calculator or other appropriate technology.
	A2.F.1.8 Graph piecewise functions with no more than three branches (including linear, quadratic, or exponential branches) and analyze the function by identifying the domain, range, intercepts, and intervals for which it is increasing, decreasing, and constant.

A2.F.2 Analyze functions through algebraic combinations, compositions, and inverses, if they exist.	**A2.F.2.1** Add, subtract, multiply, and divide functions using function notation and recognize domain restrictions.
	A2.F.2.2 Combine functions by composition and recognize that $g(x) = f^{-1}(x)$, the inverse function of $f(x)$, if and only if $f(g(x)) = g(f(x)) = x$.
	A2.F.2.3 Find and graph the inverse of a function, if it exists, in real-world and mathematical situations. Know that the domain of a function f is the range of the inverse function f^{-1}, and the range of the function f is the domain of the inverse function f^{-1}.
	A2.F.2.4 Apply the inverse relationship between exponential and logarithmic functions to convert from one form to another.
Data & Probability (D)	
A2.D.1 Display, describe, and compare data. For linear and nonlinear relationships, make predictions and assess the reliability of those predictions.	**A2.D.1.1** Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve).
	A2.D.1.2 Collect data and use scatterplots to analyze patterns and describe linear, exponential or quadratic relationships between two variables. Using graphing calculators or other appropriate technology, determine regression equation and correlation coefficients; use regression equations to make predictions and correlation coefficients to assess the reliability of those predictions.
	A2.D.1.3 Based upon a real-world context, recognize whether a discrete or continuous graphical representation is appropriate and then create the graph.
A2.D.2 Analyze statistical thinking to draw inferences, make predictions, and justify conclusions.	**A2.D.2.1** Evaluate reports based on data published in the media by identifying the source of the data, the design of the study, and the way the data are analyzed and displayed. Given spreadsheets, tables, or graphs, recognize and analyze distortions in data displays. Show how graphs and data can be distorted to support different points of view.
	A2.D.2.2 Identify and explain misleading uses of data. Recognize when arguments based on data confuse correlation and causation.

Sample of Consulted Works

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Mathematical Glossary Terms and Tables

Whenever possible a reference was identified for glossary terms from the following resources:

(DPI) *http://dpi.wi.gov/standards*
(H) *http://www.hbschool.com/glossary/math2/*
(M) *http://www.merriam-webster.com/*
(MW) *http://www.mathwords.com*
(MA) *http://www.doe.mass.edu/frameworks/current.html*
(NCTM) *http://www.nctm.org*
(PASS) *http://www.ok.gov./sde/sites/ok.gov.sde/files/C3%20PASS%20math.pdf*

AA similarity (Angle-Angle similarity) If two triangles have two pairs of corresponding angles that are congruent, then the triangles are similar. (MW)

ASA congruence (Angle-Side-Angle congruence) If two triangles have two corresponding angles and the side adjacent to both angles congruent, then the triangles themselves are congruent. (MW)

Absolute value The absolute value of a real number is its (non-negative) distance from 0 on a number line. Formally,

$$|k| = \begin{cases} k \text{ if } k \geq 0 \\ -k \text{ if } k < 0 \end{cases}$$

Addend In the addition problem 3+2+6 = 11, the addends are 3, 2, and 6. (PASS)

Addition and subtraction within 5, 10, 20, 100, or 1,000 Addition or subtraction of two whole numbers with whole number answers, and with sum or minuend in the range 0–5, 0–10, 0–20, or 0–100, respectively. *Example: 8 + 2 = 10 is an addition within 10, 14 – 5 = 9 is a subtraction within 20, and 55 – 18 = 37 is a subtraction within 100. (MA)*

Additive inverses Two numbers whose sum is 0 are additive inverses of one another. *Example: 3/4 and –3/4 are additive inverses of one another because 3/4 + (–3/4) = (–3/4) + 3/4 = 0. (MA)*

Algorithm A finite set of steps for completing a procedure, e.g., long division. (H)

Analog Having to do with data represented by continuous variables, e.g., a clock with hour, minute, and second hands. (M)

Arc (minor and major) A portion of the circumference of a circle with ending points A and B. Unless stated otherwise, arc AB always refers to the shorter segment of the two (the minor arc). Together with the major arc the two portions beginning and ending at points A and B form the entire circumference of a circle.

Arc length The distance along the curved line forming the arc.

Arc measure The angle formed by the arc at the center of the circle.

Area A measurement of the amount of space within a closed two-dimensional shape. Area is usually measured in terms of "square units", in which 1 square unit is the amount of space within a square that measures 1 unit by 1 unit (for a given unit of length). For example, area may be measured in "square centimeters", 1 square centimeter being the amount of space within a 1cm by 1cm square.

Arithmetic sequence (progression) A sequence in which successive terms exhibit a common difference.

Array (rectangular) An orderly arrangement of objects into a rectangular configuration (e.g., take six tiles and arrange two long and three wide to form a rectangle). (PASS)

Associative property of addition See Table 1 in this Glossary.

Associative property of multiplication See Table 1 in this Glossary.

Assumption A fact or statement (as a proposition, axiom, postulate, or notion) taken for granted. (M)

Attribute Characteristic (e.g., size, shape, color, weight). (PASS)

Benchmark fraction A common fraction against which other fractions can be measured, such as ½. (MA)

Bar graph A display of categorical data in which vertical or horizontal bars represent the count of a category. The relative lengths of the various bars in the graph are commensurate with the relative sizes of the counts of the data.

Bivariate data Pairs of linked numerical observations. *Example: a list of heights and weights for each player on a football team*. (MA)

Box plot A graphic method that shows the distribution of data values by using the median, quartiles, and extremes of the data set. A box shows the middle 50% of the data. (DPI)

Capacity The maximum amount or number that can be contained or accommodated, e.g., a jug with a one-gallon *capacity;* the auditorium was filled to *capacity*. (MA)

Cardinal number A number (such as 1, 5, 15) that is used in simple counting and that indicates how many elements there are in a set. (MA)

Cardinality The cardinality of a finite collection of objects is the number of objects in the set. (For example, in PK-Grade 1 students are still learning that "5" represents the number of objects in any group of "five" objects.)

Categorical data Data that measures the number of occurrences of a discrete set of outcomes (e.g., noticing the different colors of shoes in the class and then recording the number of each color).

Chord A chord is a line that connects two points on a circle.

Circle The set of all points that are equidistant from a given point, called the center of the circle. The set of all points that lie inside the circle is called the *interior* of the circle.

> **Radius of a circle** Both a segment with one endpoint on the center of the circle and the other endpoint on the circle, and the length of this segment (which is necessarily the same for any point on the circle).
>
> **Diameter of a circle** Both a segment with endpoints on the circle that contains the center, and the length of this segment.
>
> **Circumference of a circle** The length of the circle if cut and opened up to make a straight line segment, which can be found with $C = 2\pi r$ where r is the radius and π is the irrational number "pi". (Can be thought of as the perimeter of the circle.)
>
> **Area of a circle** The area of the interior of the circle, which can be found with $A = \pi r^2$ where r is the radius and π the irrational number "pi".

Combinations A selection of objects without regard to order. (PASS)

Coefficient Any of the factors of a product considered in relation to a specific factor. Often, this will be a numerical factor in a product of numbers and variables, e.g., $3x^2$ has coefficient 3. (W)

Commutative property See Table 1 in this Glossary.

Complement (of a set) A set *A* is typically considered to be a subset of an understood "universal set." The complement of *A,* denoted by *A/C* is the set of all elements of the universal set that are not members of *A*.

Complementary angles Two angles whose measures have a sum of 90 degrees. (PASS)

Complex fraction A fraction *A/B* where *A* and/or *B* are fractions ($B \neq 0$). (MA)

Complex number Numbers of the form $a + bi$, where a, a real number, is the "real part" and b, also a real number, is the "imaginary part," and i is the imaginary number. *See also:* ***imaginary number***.

Complex plane A Cartesian plane in which the point (a,b) is used to represent $a + bi$.

Compose numbers To compose numbers is to create new numbers using any of the four operations with other numbers. For example, students compose 10 in many ways (9+1, 8+2, … , 5+5, …). Also, each place in the base ten place value is composed of ten units of the place to the left, i.e., one hundred is composed of ten bundles of ten, one ten is composed of ten ones, etc.

Compose shapes Join geometric shapes without overlaps to form new shapes. (MA)

Composite number Any positive integer divisible by one or more positive integers other than itself and 1. (PASS)

Computation algorithm A set of predefined steps applicable to a class of problems that gives the correct result in every case when the steps are carried out correctly. *See also:* ***algorithm***; ***computation strategy***. (MA)

Computation strategy Purposeful manipulations that may be chosen for specific problems, may not have a fixed order, and may be aimed at converting one problem into another. *See also:* ***computation algorithm***. (MA)

Conditional statement A statement of the form, "If P, then Q," where each of P and Q are themselves statements. For example, "If *it rains*, then *the streets get wet*," is a conditional statement. If the conditional statement "If P, then Q," is *true,* then this means that it is never the case that the statement P is true while the statement Q is false. For example, it will never be the case that "it rained" but "the streets are not wet".

Related statements are:

> **Converse:** "If Q, then P." This may or may not be true if the original statement is true.
>
> **Inverse:** "If NOT P, then NOT Q." This may or may not be true if the original statement is true.
>
> **Contrapositive:** "If NOT Q, then NOT P." This is always true if the original statement is true, and vice versa. For an example, notice that, "If the streets are NOT wet, then it did NOT rain," is logically equivalent to the example statement above.

Congruent Two geometric objects are congruent if one can be mapped onto the other using a sequence of rigid motions (*rigid motions* are geometric transformations that preserve lengths and angles).

Conjugate The result of writing a sum of two terms as a difference, or vice versa. *For example, the conjugate of x – 2 is x + 2.* (MW)

Conjecture A statement believed to be true but not yet proved. (PASS)

Constant A number on its own, or sometimes a letter such as a, b or c to stand for a fixed number. Example: in "x + 5 = 9", 5 and 9 are constants. If it is not a constant it is called a variable.

Constant of proportionality Given a proportional relationship expressed as $y=kx$, the number k is often called the constant of proportionality.

Coordinate plane A plane in which a point is represented using two coordinates that determine the precise location of the point. In the Cartesian plane, two perpendicular number lines are used to determine the locations of points. In the polar coordinate plane, points are determined by their distance along a ray through that point and the origin, and the angle that ray makes with a pre-determined horizontal axis.

Cosine (of an acute angle) In a right triangle, the cosine of an acute angle is the ratio of the length of the leg adjacent to the angle to the length of the hypotenuse. (PASS)

Counterexample An example to show that a given statement is false. For example, to disprove the statement "All right triangles are isosceles," all one needs to do is produce a right triangle that is scalene.

Counting number A number used in counting objects, i.e., a number from the set

$$\{1, 2, 3, 4, 5, \ldots\}.$$

See also: ***Natural number***.

Counting on A strategy for finding the number of objects in a group without having to count every member of the group. *For example, if a stack of books is known to have 8 books and 3 more books are added to the top, it is not necessary to count the stack all over again; one can find the total by counting on—pointing to the top book and saying "eight," following this with, "nine, ten, eleven. There are eleven books now."* (MA)

Continuous graph (of data) A graph is continuous if it contains intervals of data points.

Decimal expansion The resulting decimal number found when dividing a rational number in fraction form. May include terminating and repeating decimals.

Decimal fraction A fraction (as 0.25 = 25/100 or 0.025 = 25/1000) or mixed number (as 3.025 = 3 25/1000) in which the denominator is a power of ten, usually expressed by the use of the decimal point. (M)

Decimal number Any real number expressed in base 10 notation, such as 2.673. (MA)

Decompose numbers Given a number, identify pairs, triples, etc. of numbers that combine to form the given number.

Decompose shapes. Given a geometric shape, identify geometric shapes that meet without overlap to form the given shape. (MA)

Deductive reasoning Informally, the process of using known facts and relationships to derive new facts and relationships.

Dependent events. Events that influence each other. If one of the events occurs, it changes the probability of the other event. (PASS)

Dependent variable The output of a function. The quantity that is affected when the input is changed.

Digit a) Any of the Arabic numerals 1 to 9 and usually the symbol 0; b) One of the elements that combine to form numbers in a system other than the decimal system. (MA)

Digital Having to do with data that is represented in the form of numerical digits; providing a readout in numerical digits, e.g., a digital watch. (MA)

Dilation A transformation that moves each point along the ray through the point emanating from a fixed center, and multiplies distances from the center by a common scale factor. (MA)

Discrete graph (of data) A graph is discrete if it consists of separated data points and contains no intervals of data.

Divisible A non-zero integer *p* is said to be divisible by a non-zero integer *q* if there exists an integer *r* such that $q \times r = p$.

Domain of a relation The set of all the first elements or x-coordinates of a relation. (PASS)

Dot plot *See:* ***line plot***.

Equivalent expressions Two expressions (numerical or otherwise) are said to be equivalent if one can be obtained from the other using the properties of operations, such as the commutative, associative and distributive properties, as well as by representing numbers in the expressions in different but equivalent forms.

Equivalent fractions Two fractions a/b and c/d are said to be equivalent if there exists a non-zero number n such that $na/nb=c/d$. Equivalent fractions represent the same amount by changing both the size and the number of parts of a given fraction.

Equivalent ratios Two ratios $a:b$ and $c:d$ are equivalent if there is a non-zero number k such that $ka=c$ and $kb=d$. Equivalent ratios can be shown to have the same unit rate.

Expanded form A multi-digit number is expressed in expanded form when it is written as a sum of single-digit multiples of powers of ten. *For example, 643 = 600 + 40 + 3. (MA)*

Expected value For a random variable, the weighted average of its possible values, with weights given by their respective probabilities. (MA)

Experimental probability When trials of a probability experiment are run and data is collected, the experimental probability of a desired outcome is the relative frequency of that outcome as a ratio of the number of such outcomes to the total number of outcomes. For example, if a coin is flipped 100 times, and heads comes up 45 times, then the experimental probability of heads is 45/100 or 0.45. (The *theoretical probability* is 0.50, and if the number of trials is increased the experimental probability will get closer and closer to 0.50.)

Exponent (Integer) A negative integer exponent denotes the reciprocal of the base raised to the corresponding opposite integer. Thus $x^{-2} = \frac{1}{x^2}$.

Exponent (Whole Number) The number that indicates how many times the base is used as a factor, e.g., in $4^3 = 4 \times 4 \times 4 = 64$, the exponent is 3, indicating that 4 is repeated as a factor three times. (MA)

Exponential function An exponential function with base b is defined by $y = b^x$, where $b > 0$ and b is not equal to 1. (PASS).

Expression A mathematical phrase that combines operations, numbers, and/or variables (e.g., $3^2 \div a$). (H)

Exterior angles (of a polygon) The supplement of an interior angle of a polygon that is formed by extending one of the line segments determining the interior angle at a given vertex.

Extraneous solution A solution, such as that to an equation, that emerges from the process of solving the problem but is not a valid solution to the original problem. For example, consider the equation $\sqrt{2x+12} - 2 = x$. After adding 2 to both sides and squaring both sides of the equation, we obtain $2x + 12 = x^2 + 4x + 4$. We can subtract $2x$ and 12 to both sides to obtain the quadratic equation $x^2 + 2x - 8 = 0$. Solving this quadratic equation, we obtain two possible solutions, $x = 2$ and $x = -4$. While the original equation is true when evaluated at $x = 2$, -4 is considered an extraneous solution because it is false when evaluated at $x = -4$.

$$\sqrt{2x+12} - 2 = x$$
$$\sqrt{2(-4)+12} - 2 = -4$$
$$\sqrt{-8+12} - 2 = -4$$
$$\sqrt{4} - 2 = -4$$
$$2 - 2 = -4$$
$$0 \neq -4$$

Fluency Easily and accurately responding to calculations (Van de Walle). See Table 4 in this Glossary.

First quartile[1] For a data set with median *M*, the first quartile is the median of the data values less than *M*. *Example: For the data set {1, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the first quartile is 6. See also:* ***median, third quartile, interquartile range***. (MA)

Fraction A number expressible in the form *a*/*b* where *a* is a whole number and *b* is a positive whole number. (The word *fraction* in these standards always refers to a non-negative number.) *See also:* ***rational number*** *and* ***complex fraction***. (MA)

[1] Many different methods for computing quartiles are in use. The method defined here is sometimes called the Moore and McCabe method. See Langford, E., "Quartiles in Elementary Statistics," *Journal of Statistics Education* Volume 14, Number 3 (2006).

Frequency table A representation of data in which categories are listed in one column (row) of a table and the number of occurrences (frequency) of each category is indicated in another column (row).

Function A rule that assigns to every element of one set (the domain) exactly one element of another set (the range). A function is often thought of as an "input/output" rule, as in every input determines an output (usually according to mathematical operations performed on the input).

Function machine An input/output model (often made with milk cartons, boxes, or drawn on the board) to show one number entering and a different number exiting. Students guess the rule that produced the second number (e.g., enter 3, exit 5, rule: add 2). (PASS)

Function notation A notation that describes a function. For a function f, when x is a member of the domain, the symbol $f(x)$ denotes the corresponding member of the range (e.g., $f(x) = x + 3$).

Geometric sequence (progression) An ordered list of numbers that has a common ratio between consecutive terms, e.g., 2, 6, 18, 54. (H)

Histogram A type of bar graph used to display the distribution of measurement data across a continuous range. (MA)

Hypotenuse The longest side of a right triangle, necessarily opposite to the right angle. The other sides are called the *legs* of the right triangle (*longer* and *shorter* if applicable).

HL (Hypotenuse-Leg) congruence If two right triangles have hypotenuse and one corresponding leg congruent, then the triangles are congruent.

Identity property of 0 See Table 1 in this Glossary.

Imaginary number A number i is considered imaginary if $i^2 = -1$. *See also:* ***complex number***.

Independent events Events that do not influence one another. Each event occurs without changing the probability of the other event. Specifically, two events *A* and *B* are independent if $P(A \text{ AND } B) = P(A) \cdot P(B)$. (PASS)

Independent variable The input of a function. The quantity whose value is changed to affect the output.

Independently combined probability models. Two probability models are said to be combined independently if the probability of each ordered pair in the combined model equals the product of the original probabilities of the two individual outcomes in the ordered pair. (MA)

Inductive reasoning Informally, the process of examining patterns and making conclusions based on observed patterns.

Input/Output table Usually a two-column table (or two-row table) with one column (row) listing the inputs of a rule and the other column (row) listing the corresponding outputs for each input.

Integer The set of numbers that contains the whole numbers and their additive inverses (opposites). I.e., $\{\dots, -2, -1, 0, 1, 2, 3, \dots\}$.

Intercepts (of a graph) Geometrically, where a graph intersects an axis in a Cartesian plane.

Interquartile range A measure of variation in a set of numerical data, the interquartile range is the distance between the first and third quartiles of the data set. Example: For the data set {1, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the interquartile range is 15 – 6 = 9. *See also:* ***first quartile, third quartile***. (MA)

Intersection (of sets) For two sets A and B, the intersection $A \cap B$ is the set of all elements that are members of both sets simultaneously.

Inverse function. A function g that satisfies $g(f(x)) = x$ and $f(g(x)) = x$ is said to be an inverse function for f. The inverse of f is often denoted by f^{-1}.

Inverse operations Operations that undo each other (e.g., addition and subtraction are inverse operations; multiplication and division are inverse operations). (PASS)

Irrational number Numbers that are not rational. Irrational numbers have nonterminating, nonrepeating decimal expansions (e.g., square root of 2, pi). (MA)

Length (of a segment) The length of a (straight) line segment is a measurement of the distance from one endpoint of the object to the other. Once a unit of length is specified, the length of a segment is found by placing such units end-to-end without gaps or overlaps and counting how many such units are used.

Line Plot A representation of data in which categories are listed underneath points on a number line, and in which the number of occurrences (frequency) of each category is represented by a corresponding number of marks (X's, dots) above each category's point.

Linear association A set of bivariate data exhibits a linear association if a scatter plot of the data can be well-approximated by a line. (MA)

Linear equation Any equation that can be written in the form $Ax + By + C = 0$ where A and B cannot both be 0. The graph of such an equation is a line. (MA)

Linear function A function f is linear if it can be written in the form $f(x) = mx + b$.

Literal equation An equation involving multiple variables and numbers, often that cannot be solved for an explicit numerical value of any of the individual variables. In such a case one may solve for one variable as an expression of the others.

Logarithm The exponent that indicates the power to which a base number is raised to produce a given number. *For example, the logarithm of 100 to the base 10 is 2.* (M)

Logarithmic function Any function in which an independent variable appears in the form of a logarithm; they are the inverse functions of exponential functions. (MA)

Manipulatives Concrete materials (e.g., buttons, beans, egg and milk cartons, counters, attribute and pattern blocks, interlocking cubes, base-10 blocks, geometric models, geo-boards, fractions pieces, rulers, balances, spinners, dot paper) used to represent mathematical concepts, operations, and relationships. (PASS)

Matrix (pl. matrices) A rectangular array of numbers or variables. (MA)

Mean (arithmetic) A measure of center in a set of numerical data, computed by adding the values in a list and then dividing by the number of values in the list. *Example: For the data set {1, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the mean is 21.* (MA)

Mean absolute deviation A measure of variation in a set of numerical data, computed by adding the distances between each data value and the mean, then dividing by the number of data values. *Example: For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the mean absolute deviation is 20.* (MA)

Measure of central tendency A determination of the center of a data set meant to describe a set of data. *See also:* ***mean***, ***median***, ***mode***, *and* ***percentile***.

Measure of spread (or variability) A determination of how much the data in a set deviates from a measure of center .The most frequently used measure is standard deviation. *See also:* ***standard deviation***, ***range***.

Median A measure of center in a set of numerical data. The median of a list of values is the value appearing at the center of a sorted version of the list; or the mean of the two central values, if the list contains an even number of values. *Example: For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 90}, the median is 11.* (MA)

Midline In the graph of a sine or cosine function, the horizontal line halfway between its maximum and minimum values. (MA)

Mixed number A number written in the form $A\frac{b}{c}$, which is a shorthand way to represent the quantity $A+\frac{b}{c}$. A mixed number may be written as a fraction greater than 1 by writing $A\frac{b}{c}=A+\frac{b}{c}=\frac{Ac}{c}+\frac{b}{c}=\frac{Ac+b}{c}$.

Model A mathematical representation (e.g., number, graph, matrix, equation(s), geometric figure) for real-world or mathematical objects, properties, actions, or relationships. (DPI)

Modulus of a complex number The distance between a complex number and the origin on the complex plane. The modulus of a complex number, $a+bi$ is written $|a+bi|$ and is found by finding the hypotenuse of the triangle with legs a and b. Thus, $|a+bi|=\sqrt{a^2+b^2}$. For a complex number in polar form, $r(\cos\theta+i\sin\theta)$, the modulus is $|r|$.

Multiplication and division within 100 Multiplication or division of two whole numbers with whole number answers, and with product or dividend in the range 0–100. *Example:* $72 \div 8 = 9$. (MA)

Multiplication counting principle If *k* actions can be taken in N_1, N_2, … , N_k different ways, then there are a total of N_1, N_2, … , N_k different ways to perform those actions in sequence.

Multiplicative inverses Two numbers whose product is 1 are multiplicative inverses of one another. *Example: 3/4 and 4/3 are multiplicative inverses of one another because 3/4 ´ 4/3 = 4/3 ´ 3/4 = 1.* (MA)

Natural number A number used in counting objects, i.e., a number from the set

$$\{1, 2, 3, 4, 5, \ldots\}.$$

See also: ***Counting number***.

Net A two-dimensional representation of a three-dimensional figure constructed of polygons, such that if folds were made on certain edges of the net and appropriate sides were "glued" together, the resulting figure would be the original three-dimensional figure.

Network a) A figure consisting of vertices and edges that shows how objects are connected, b) A collection of points (vertices), with certain connections (edges) between them. (MA)

Non-linear association The relationship between two variables is nonlinear if the change in the second is not simply proportional to the change in the first, independent of the value of the first variable. (MA)

Nonstandard measurement A measurement determined by the use of nonstandard units such as hands, paper clips, beans, cotton balls, etc. (PASS)

Number line diagram A diagram of the number line used to represent numbers and support reasoning about them. In a number line diagram for measurement quantities, the interval from 0 to 1 on the diagram represents the unit of measure for the quantity. (MA)

Number sense The understanding of number size (relative magnitude), number representations, number operations, referents for quantities and measurement used in everyday situations, etc. (PASS)

Numeral A symbol or mark used to represent a number. (MA)

One-to-one correspondence A matching of the elements of two sets such that each element from the first set is matched with one and only one element of the second set, and such that each element of the second set is matched with some element of the first. Early grades students use this to establish the concept of cardinal use of numbers (as in "5" can represent any collection of five objects; if I can match the fingers on one hand to all the elements of a given set then that set has "5" objects.)

Operation General term for any one of addition, subtraction, multiplication, and division. (PASS)

Order of operations Convention adopted to perform mathematical operations in a consistent order.

Step 1. Perform all operations inside grouping symbols, and/or above and below a fraction bar in the order specified in Steps 2, 3 and 4.

Step 2. Find the value of any powers or roots;

Step 3. Multiply, including division, from left to right;

Step 4. Add, including subtraction, from left to right. (NCTM)

Ordinal number A number designating the place (as first, second, or third) occupied by an item in an ordered sequence. (M)

Outlier A data point that is far outside a representative range of the data set. For example, once the inter-quartile range (IQR) is computed, one might calculate the interval of 1.5× IQR above the median and 1.5× IQR below the median and decide that any data point that lies outside this range is considered an outlier.

Parallel lines Lines that do not intersect. Distinct lines can be shown to be parallel if and only if they have equal slopes.

Partition A process of dividing an object into parts or a set into (smaller) subsets. (MA)

Pascal's triangle A triangular arrangement of numbers in which each row starts and ends with 1, and each other number is the sum of the two numbers above it. (H)

Piecewise function A function that is defined differently on different intervals.

Percent rate of change A rate of change expressed as a percent. *Example: if a population grows from 50 to 55 in a year, it grows by 5/50 = 10% per year.* (MA)

Perfect square A number that is a whole number squared, that is, a number that can be expressed as n^2 for n a whole number.

Perimeter (of a polygon) The total length of all the edges of a polygon. Often, perimeter is thought of as the distance around an object, traversed once along the edges starting from one vertex and ending at the same vertex.

Periodic phenomena Events that recur over regular intervals, for example, ocean tides, machine cycles. (MA)

Perpendicular lines Lines that intersect such that all four angles that are created are congruent. Two lines can be shown to be perpendicular if and only if the product of their slopes is -1.

Pi (π) The irrational number that is derived by finding the ratio of the circumference to the diameter of circles. That this ratio is constant and an irrational number are important concepts and challenging to prove, so they are often arrived at empirically by students.

Picture graph A graph that uses pictures to show and compare information. (MA)

Place value The concept that the order in which digits are written in the base-10 number system determines the value of that digit. Thus, in the number 245, the digit 2 is in the "hundreds place", indicating that the value of that particular 2 is actually 2 hundreds or 200.

Polygon A closed, two-dimensional figure comprised of line segments connected end-to-end, and such that no two segments cross each other. The segments are typically called sides or edges, and the common endpoints of adjacent segments are called vertices (sing. vertex). The space within the polygon is called its *interior*. The angles formed by adjacent sides that lie in the interior of a polygon are called its *interior* angles.

Polynomial The sum or difference of terms which have variables raised to positive integer powers and which have coefficients that may be real or complex. The following are all polynomials: $5x^3 - 2x^2 + x - 13$, $x^2y^3 + xy$, and $(1 + i)a^2 + ib^2$. (MW)

Polynomial function Any function whose output is given by a polynomial expression of the input.

Postulate A statement accepted as true without proof. (MA)

Prime factorization A number written as the product of all its prime factors. (H)

Prime number A whole number greater than 1 whose only factors are 1 and itself. (MA)

Probability distribution The set of possible values of a random variable with a probability assigned to each. (MA)

Properties of equality See Table 2 in this Glossary.

Properties of inequality See Table 3 in this Glossary.

Properties of operations See Table 1 in this Glossary.

Probability The study and measure of the likelihood of an event happening. (PASS)

Probability model A probability model is used to assign probabilities to outcomes of a chance process by examining the nature of the process. The set of all outcomes is called the sample space, and their probabilities sum to 1. *See also:* ***uniform probability model***. (MA)

Proof A method of constructing a valid argument using deductive reasoning. (MA)

Proportion An equation that states that two ratios are equivalent, e.g., 4/8 = ½ or 4 : 8 = 1 : 2. (MA)

Pyramid A three-dimensional shape constructed from a polygon (called the *base*) and triangles that have one edge matching the edges of the base and such that the triangles share a common vertex.

Pythagorean theorem For any right triangle, the sum of the squares of the lengths of the legs equals the square of the lengths of the hypotenuse. (MA)

Quadratic equation An equation that is equivalent to $ax^2 + bx + c = 0$, where $a \neq 0$.

Quadratic expression An expression that contains variables raised to whole number exponents no higher than 2.

Quadratic function A function that can be represented by an equation of the form $y = ax^2 + bx + c$, where a, b, and c are arbitrary, but fixed, numbers and $a \neq 0$. The graph of this function is a parabola. (DPI)

Quadratic polynomial A polynomial where the highest degree of any of its terms is 2. (MA)

Quadrilateral A polygon with 4 sides. Important classes of quadrilaterals:

Trapezoid A quadrilateral in which at least two sides are parallel.

Parallelogram A quadrilateral in which opposite sides are parallel.

Rhombus A parallelogram in which opposite sides are congruent (have the same length).

Rectangle A parallelogram that has at least one right interior angle.

Square A rectangle that has all sides congruent.

Kite A quadrilateral that has two pairs of congruent adjacent sides.

Quotient The result of a division problem. Also, given whole numbers n and m with $n>m$, if we write $n=mq+r$ with $0\leq r<m$, then we say q is the quotient and r is the remainder.

Radical The $\sqrt{\ }$ symbol, which is used to indicate square roots or n^{th} roots. (MW)

Random sampling A smaller group of people or objects chosen from a larger group or population by a process giving equal chance of selection to all possible people or objects. (H)

Random variable An assignment of a numerical value to each outcome in a sample space. (M)

Range (of a relation) The set of all the second elements or y-coordinates of a relation is called the range. (PASS)

Range (of a data set) The difference between the maximum and minimum values of a data set, a measure of the spread of the data.

Ratio A relationship between quantities such that for every a units of one quantity there are b units of the other. A ratio is often denoted by $a:b$, and read "a to b."

Rational expression A quotient of two polynomials with a non-zero denominator. (MA)

Rational number A number expressible in the form a/b or $-a/b$ for some fraction a/b. The rational numbers include the integers. (MA)

Real number An element of the set of numbers consisting of all rational and all irrational numbers. (MA)

Rectangular array An arrangement of mathematical elements into rows and columns.(MA)

Rectangular prism A three-dimensional object constructed from three pairs of parallel rectangles (called *faces* in this context) that share common edges so as to form an enclosed space and such that opposite rectangles are congruent. The vertices of the rectangles are the vertices of the prism, and the sides of the rectangles are called edges. A **cube** is a rectangular prism in which each face is a square of the same size as the other faces.

Rectilinear figure A polygon, all angles of which are right angles. (MA)

Recursive pattern (or sequence) Patterns in which each number is found from the previous number by repeating a process (e.g. Fibonacci numbers). (PASS)

Reflection A type of transformation that flips points about a line, called the *line of reflection.* Taken together, the image and the pre-image have the line of reflection as a line of symmetry. (MA)

Real numbers (set of) The set of all rational and irrational numbers (PASS)

Relation A collection of ordered pairs of real numbers.

Relative frequency The empirical counterpart of probability. If an event occurs *N'* times in *N* trials, its relative frequency is *N'/N.* (M)

Remainder Theorem If f(x) is a polynomial in x then the remainder on dividing f(x) by x − a is f(a). (M)

Repeating decimal. A decimal in which, after a certain point, a particular digit or sequence of digits repeats itself indefinitely. (M) *See also:* ***terminating decimal***. (MA)

Right angle Informally, an angle whose measure is 90 degrees. Formally, if two congruent copies of a given angle are supplementary (that is, they form a straight line when one matches an edge of one copy with one edge of the other), then the given angle is said to be a right angle. (We can then define the measure of this angle to be 90 degrees and measure other angles in terms of a right angle.)

Rigid motion A transformation of points in space consisting of a sequence of one or more translations, reflections, and/or rotations. Rigid motions are here assumed to preserve distances and angle measures. (MA)

Rotation A type of transformation that turns a figure about a fixed point, called the *center of rotation*. (MA)

SAS congruence (Side-Angle-Side congruence) If in two triangles two corresponding sides and the angles formed by those sides are congruent, then the triangles are congruent. (MW)

SSS congruence (Side-Side-Side congruence) If two triangles have corresponding sides that are congruent, then the triangles are congruent. (MW)

Sample space In a probability model for a random process, a list of the individual outcomes that are to be considered. (MA)

Scale factor For similar shapes, the common ratio of corresponding side lengths is called the scale factor. Informally, it is the multiplicative amount by which the lengths of one shape are "blown up" or "shrunk down" to obtain the other shape to which it is similar.

Scatter plot A graph in the coordinate plane representing a set of bivariate data. *For example, the heights and weights of a group of people could be displayed on a scatter plot.* (DPI)

Scientific notation A widely used floating-point system in which numbers are expressed as products consisting of a number between 1 and 10 multiplied by an appropriate power of 10, e.g., $562 = 5.62 \times 10^2$. (MW)

Secant (of a circle) A line that intersects a circle at two points.

Sequence A set of elements ordered so that they can be labeled with consecutive positive integers starting with 1, e.g., 1, 3, 9, 27, 81. In this sequence, 1 is the *first term*, 3 is the *second term*, 9 is the *third term*, and so on. (MA)

Set model (for fractions) The use of a discrete set of objects to represent the whole and a subset of those objects to represent a fraction. For example, since 3 of the 15 students in class are wearing blue shirts, 3/15 of the students are wearing blue shirts.

Significant figures (digits) Digits included in a measurement that purposely indicate the precision of the measurement. For example, writing a measurement as 3.50 seconds instead of 3.5 seconds indicates that the measurement is accurate to the hundredths place.

Similar (shapes) Two geometric shapes are said to be similar (to each other) if one can be mapped onto the other by a sequence of similarity transformations.

Similarity transformation A rigid motion followed by a dilation. (MA)

Simultaneous equations Two or more equations containing common variables. (MW)

Sine (of an acute angle) The trigonometric function that for an acute angle is the ratio between the leg opposite the angle when the angle is considered part of a right triangle and the hypotenuse. (M)

Slope (of a line) A measure of the steepness of a line in a Cartesian plane, found by determining the constant change in the y-coordinate per 1-unit change in the x-coordinate.

Spatial sense The ability to build and manipulate mental representations of 2- and 3-dimensional objects and ideas. (PASS)

Standard deviation A measurement of how much each value in the data differs from the mean of the data. (PASS)

Statistics The study of data. (PASS)

Stem-and-leaf plot A frequency distribution made by arranging data in the following way (e.g., student scores on a test were 96, 87, 77, 93, 85, 85, and 75 would be displayed as:

9] 6,3

8] 7,5,5

7] 7,5

Subitize Instantly knowing "how many." Recognizing a number without using other mathematical processes. (Clements)

Substitution The substitution of one expression for an equivalent expression, used when rewriting expressions as equivalent ones or solving equations. It is based on the *transitive property of equality*, which states, "If $A=B$,and $B=C$, then $A=C$."

Summary statistics A collection of statistics (measurements based on data) that describe the data set. For example, the range, mean, and standard deviation of a given data set indicate certain features of the data set and hence are summary statistics.

Supplementary angles Two angles whose measures have a sum of 180 degrees. (PASS)

Supposition (act of supposing) Making a statement or assumption without proof. (PASS)

Surface area (of a rectangular prism) The total measure of the area of the faces of a rectangular prism. Equivalently, the total area of a net for the prism.

Tangent a) Meeting a curve or surface in a single point if a sufficiently small interval is considered. b) (of an acute angle) The trigonometric function that, for an acute angle, is the ratio between the leg opposite the angle and the leg adjacent to the angle when the angle is considered part of a right triangle. (MW)

Tape diagram A drawing that looks like a segment of tape, used to illustrate number relationships. Also known as a strip diagram, bar model, fraction strip, or length model. (MA)

Terminating decimal A decimal is called terminating if its repeating digit is 0. Every terminating decimal is the decimal form of some rational number. *See also:* ***repeating decimal***. (MA)

Third quartile For a data set with median *M*, the third quartile is the median of the data values greater than *M*. *Example: For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the third quartile is 15. See also:* ***median, first quartile, interquartile range***. (MA)

Transformation A prescription, or rule, that sets up a one-to-one correspondence between the points in a geometric object (the *pre-image*) and the points in another geometric object (the *image*). Reflections, rotations, translations, and dilations are particular examples of transformations. (MA)

Transitivity principle for indirect measurement If the length of object A is greater than the length of object B, and the length of object B is greater than the length of object C, then the length of object A is greater than the length of object C. This principle applies to measurement of other quantities as well. (MA)

Translation A type of transformation that moves every point in a graph or geometric figure by the same distance in the same direction without a change in orientation or size. (MW)

Transversal line A line that crosses two or more other lines is called a transversal.

Triangle A polygon with three sides. Important classes of triangles:

Equilateral triangle A triangle with all sides congruent.

Right triangle Contains an interior angle that is a right angle.

Scalene triangle A triangle with no side congruent to another.

Isosceles triangle A triangle with two congruent sides.

Trigonometric function Trigonometric functions (sine, cosine, tangent, and their reciprocals) are commonly defined as ratios of two sides of a right triangle containing the angle, and can equivalently be defined as the lengths of various line segments from a unit circle.

Trigonometry The study of trigonometric functions.

Uniform probability model A probability model which assigns equal probability to all outcomes. *See also:* ***probability model***.

Unit fraction A fraction with a numerator of 1, such as 1/3 or 1/5. (MA)

Unit of measurement When measuring a given attribute of an object, a "unit" is defined in terms of which all other measurements are determined. That a given unit is fixed is a concept to be learned by young students (e.g. we wouldn't measure the length of a room in hands because your hand is different from mine, and we wouldn't measure the length of a room using cm and inches at the same time).

Union (of sets) For two sets A and B, the union $A \cup B$ is the set of all elements that are members of one or both of the sets.

Variable (a) A quantity that can change or that may take on different values. (b) A symbol (often a letter of the alphabet, sometimes including the Greek alphabet) that represents a number in a mathematical expression.

Venn diagram A data display in which (typically) circles are used to represent categories and in which the overlapping of two (or more) circles indicates data that lies in each category in the overlap.

Visual fraction model A diagram or representation to show the relative size of a fraction, for example, a tape diagram, number line diagram, or area model. (MA)

Volume (of a 3D object) A measurement of the amount of space within a closed three-dimensional shape. Volume is often measured in terms of "cubic units", in which 1 cubic unit is the amount of space within a cube that measures 1 unit by 1 unit by 1 unit (for a given unit of length). For example, volume may be measured in "cubic centimeters", 1 cubic centimeter being the amount of space within a 1cm by 1cm by 1cm cube. Note that since one can measure the volume of a liquid by placing said liquid into a 3D shape, volume has historically been measured in various units such as cups, fluid ounces, and liters. Note that 1 cubic centimeter is equal to 1 milliliter, one way to connect such fluid units to cubic units.

Whole numbers The numbers 0, 1, 2, 3, …

Table 1: The Properties of Operations	
Here a, b and c stand for arbitrary numbers in a given number system. The properties of operations apply to the rational number system, the real number system, and the complex number system.	
Associative property of addition	$(a + b) + c = a + (b + c)$
Commutative property of addition	$a + b = b + a$
Additive identity property of 0	$a + 0 = 0 + a = a$
Existence of additive inverses	For every a there exists $-a$ so that $a + (-a) = (-a) + a = 0$.
Associative property of multiplication	$(a \times b) \times c = a \times (b \times c)$
Commutative property of multiplication	$a \times b = b \times a$
Multiplicative identity property of 1	$a \times 1 = 1 \times a = a$
Existence of multiplicative inverses	For every a (where $a \neq 0$) there exists $\frac{1}{a}$ so that $a \times \frac{1}{a} = \frac{1}{a} \times a = 1$.
Distributive property of multiplication over addition	$a \times (b + c) = a \times b + a \times c$

Table 2: The Properties of Equality	
Here a, b, and c stand for arbitrary numbers in the rational, real, or complex number systems.	
Reflexive property of equality	$a = a$
Symmetric property of equality	If $a = b$, then $b = a$.
Transitive property of equality	If $a = b$ and $b = c$, then $a = c$.
Addition property of equality	If $a = b$, then $a + c = b + c$.
Subtraction property of equality	If $a = b$, then $a - c = b - c$.
Multiplication property of equality	If $a = b$, then $a \times c = b \times c$.
Division property of equality	If $a = b$ and $c \neq 0$, then $a \div c = b \div c$.
Substitution property of equality	If $a = b$, then b may be substituted for a in any expression containing a.

Table 3: The Properties of Inequality	
Here a, b, and c stand for arbitrary numbers in the rational or real number systems.	
Law of Trichotomy	Exactly one of the following is true: $a < b$, $a = b$, or $a > b$
Reversal Property	If $a > b$, then $b < a$.
Additive Inverse	If $a > b$, then $-a < -b$.
Addition and Subtraction Property of Inequality	If $a > b$, then $a \pm c > b \pm c$.
Positive Multiplication Property of Inequality	If $a > b$ and $c > 0$, then $a \times c > b \times c$.
Negative Multiplication Property of Inequality	If $a > b$ and $c < 0$, then $a \times c < b \times c$.
Positive Division Property of Inequality	If $a > b$ and $c > 0$, then $a \div c > b \div c$.
Negative Division Property of Inequality	If $a > b$ and $c < 0$, then $a \div c < b \div c$.

Table 4: Fluency Expectations				
Grade level fluency expectations apply to operations of whole numbers.	**Addition**	**Subtraction**	**Multiplication**	**Division**
1st Grade	Through 10	Through 10		
2nd Grade	Through 20	Through 20		
3rd Grade			Through factors of 10	
4th Grade			Through factors of 12	Through factors of 12

Number & Operations (N)			
Topic	**Pre-Kindergarten (PK)**	**Kindergarten (K)**	**First Grade (1)**
Quantity	**PK.N.1 Know number names and count in sequence.** **PK.N.1.1** Count aloud forward in sequence by 1's to 20. **PK.N.1.2** Recognize and name written numerals 0-10. **PK.N.1.3** Recognize that zero represents the count of no objects. **PK.N.2 Count to tell the number of objects.** **PK.N.2.1** Identify the number of objects, up to 10, in a row or column. **PK.N.2.2** Use one-to-one correspondence in counting objects and matching groups of objects. **PK.N.2.3** Understand the last numeral spoken, when counting aloud, tells how many total objects are in a set. **PK.N.2.4** Count up to 5 items in a scattered configuration; not in a row or column. **PK.N.3 Compare sets using number.** **PK.N.3.1** Compare two sets of 1-5 objects using comparative language such as same, more, or fewer.	**K.N.1 Understand the relationship between quantities and whole numbers.** **K.N.1.1** Count aloud forward in sequence to 100 by 1's and 10's. **K.N.1.2** Recognize that a number can be used to represent how many objects are in a set up to 10. **K.N.1.3** Use ordinal numbers to represent the position of an object in a sequence up to 10. **K.N.1.4** Recognize without counting (subitize) the quantity of a small group of objects in organized and random arrangements up to 10. **Clarification statement:** Subitizing is defined as instantly recognizing the quantity of a set without having to count. "Subitizing" is not a vocabulary word and is not meant for student discussion at this age. **K.N.1.5** Count forward, with and without objects, from any given number up to 10. **K.N.1.6** Read, write, discuss, and represent whole numbers from 0 to at least 10. Representations may include numerals, pictures, real objects and picture graphs, spoken words, and manipulatives. **K.N.1.7** Find a number that is 1 more or 1 less than a given number up to 10. **K.N.1.8** Using the words more than, less than or equal to compare and order whole numbers, with and without objects, from 0 to 10.	**1.N.1 Count, compare and represent whole numbers up to 100, with an emphasis on groups of tens and ones.** **1.N.1.1** Recognize numbers to 20 without counting (subitize) the quantity of structured arrangements. **Clarification statement:** Subitizing is defined as instantly recognizing the quantity of a set without having to count. "Subitizing" is not a vocabulary word and is not meant for student discussion at this age. **1.N.1.2** Use concrete representations to describe whole numbers between 10 and 100 in terms of tens and ones. **1.N.1.3** Read, write, discuss, and represent whole numbers up to 100. Representations may include numerals, addition and subtraction, pictures, tally marks, number lines and manipulatives, such as bundles of sticks and base 10 blocks. **1.N.1.4** Count forward, with and without objects, from any given number up to 100 by 1s, 2s, 5s and 10s. **1.N.1.5** Find a number that is 10 more or 10 less than a given number up to 100. **1.N.1.6** Compare and order whole numbers from 0 to 100. **1.N.1.7** Use knowledge of number relationships to locate the position of a given whole number on an open number line up to 20. **1.N.1.8** Use objects to represent and use words to describe the relative size of numbers, such as more than, less than, and equal to.
Operations	Topic addressed at other grade levels.	**K.N.2 Develop conceptual fluency with addition and subtraction (up to 10) using objects and pictures.** **K.N.2.1** Compose and decompose numbers up to 10 with objects and pictures.	**1.N.2 Solve addition and subtraction problems up to 10 in real-world and mathematical contexts.** **1.N.2.1** Represent and solve real-world and mathematical problems using addition and subtraction up to ten. **1.N.2.2** Determine if equations involving addition and subtraction are true. **1.N.2.3** Demonstrate fluency with basic addition facts and related subtraction facts up to 10.

Number & Operations (N)			
Topic	**Pre-Kindergarten (PK)**	**Kindergarten (K)**	**First Grade (1)**
Fractions	Topic addressed at other grade levels.	**K.N.3 Understand the relationship between whole numbers and fractions through fair share.** **K.N.3.1** Distribute equally a set of objects into at least two smaller equal sets.	**1.N.3 Develop foundational ideas for fractions.** **1.N.3.1** Partition a regular polygon using physical models and recognize when those parts are equal. **1.N.3.2** Partition (fair share) sets of objects into equal groupings.
Money	Topic addressed at other grade levels.	**K.N.4 Identify coins by name.** **K.N.4.1** Identify pennies, nickels, dimes, and quarters by name.	**1.N.4 Identify coins and their values.** **1.N.4.1** Identify pennies, nickels, dimes, and quarters by name and value. **1.N.4.2** Write a number with the cent symbol to describe the value of a coin. **1.N.4.3** Determine the value of a collection of pennies, nickels, or dimes up to one dollar counting by ones, fives, or tens.
Algebraic Reasoning & Algebra (A)			
Topic	**Pre-Kindergarten (PK)**	**Kindergarten (K)**	**First Grade (1)**
Patterns	**PK.A.1 Recognize, duplicate, and extend patterns.** **PK.A.1.1** Sort and group up to 5 objects into a set based upon characteristics such as color, size, and shape and explain verbally what the objects have in common. **PK.A.1.2** Recognize, duplicate, and extend repeating patterns involving manipulatives, sound, movement, and other contexts.	**K.A.1 Duplicate patterns in a variety of contexts.** **K.A.1.1** Sort and group up to 10 objects into a set based upon characteristics such as color, size, and shape. Explain verbally what the objects have in common. **K.A.1.2** Recognize, duplicate, complete, and extend repeating, shrinking and growing patterns involving shape, color, size, objects, sounds, movement, and other contexts.	**1.A.1 Identify patterns found in real-world and mathematical situations.** **1.A.1.1** Identify, create, complete, and extend repeating, growing, and shrinking patterns with quantity, numbers, or shapes in a variety of real-world and mathematical contexts.
Number Sentences	Topic addressed at other grade levels.	Topic addressed at other grade levels.	Topic addressed at other grade levels.

Geometry & Measurement (GM)			
Topic	**Pre-Kindergarten (PK)**	**Kindergarten (K)**	**First Grade (1)**
Geometry	**PK.GM.1 Identify common shapes.** **PK.GM.1.1** Identify circles, squares, rectangles, and triangles by pointing to the shape when given the name.	**K.GM.1 Recognize and sort basic two-dimensional shapes and use them to represent real-world objects.** **K.GM.1.1** Recognize squares, circles, triangles, and rectangles. **K.GM.1.2** Sort two-dimensional objects using characteristics such as shape, size, color, and thickness. **K.GM.1.3** Identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably. **K.GM.1.4** Use smaller shapes to form a larger shape when there is an outline to follow. **K.GM.1.5** Compose free-form shapes with blocks. **K.GM.1.6** Use basic shapes and spatial reasoning to represent objects in the real world.	**1.GM.1 Recognize, compose, and decompose two- and three-dimensional shapes.** **1.GM.1.1** Identify trapezoids and hexagons by pointing to the shape when given the name. **1.GM.1.2** Compose and decompose larger shapes using smaller two-dimensional shapes. **1.GM.1.3** Compose structures with three-dimensional shapes. **1.GM.1.4** Recognize three-dimensional shapes such as cubes, cones, cylinders, and spheres.
Measurement	**PK.GM.2 Describe and compare measureable attributes.** **PK.GM.2.**1 Identify measurable attributes of objects. Describe them as little, big, long, short, tall, heavy, light, or other age appropriate vocabulary. **PK.GM.2.2** Directly compare two objects with a common measurable attribute using words such as longer/shorter; heavier/lighter; or taller/shorter. **PK.GM.2.3** Sort objects into sets by one or more attributes.	**K.GM.2 Compare and order objects according to location and measurable attributes.** **K.GM.2.1** Use words to compare objects according to length, size, weight, position, and location. **K.GM.2.2** Order up to 6 objects using measurable attributes, such as length and weight. **K.GM.2.3** Sort objects into sets by more than one attribute. **K.GM.2.4** Compare the number of objects needed to fill two different containers.	**1.GM.2 Select and use nonstandard and standard units to describe length and volume/capacity.** **1.GM.2.1** Use nonstandard and standard measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement. **1.GM.2.2** Illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other. **1.GM.2.3** Measure the same object/distance with units of two different lengths and describe how and why the measurements differ. **1.GM.2.4** Describe a length to the nearest whole unit using a number and a unit. **1.GM.2.5** Use standard and nonstandard tools to identify volume/capacity. Compare and sort containers that hold more, less, or the same amount.
Time	Topic addressed at other grade levels.	**K.GM.3 Tell time as it relates to daily life.** **K.GM.3.1** Develop an awareness of simple time concepts using words such as yesterday, today, tomorrow, morning, afternoon, and night within his/her daily life.	**1.GM.3 Tell time to the half and full hour.** **1.GM.3.1** Tell time to the hour and half-hour (analog and digital).

Data & Probability (D)			
Topic	**Pre-Kindergarten (PK)**	**Kindergarten (K)**	**First Grade (1)**
Data Analysis	**PK.D.1 Collect and organize categorical data.** **PK.D.1.1** Collect and organize information about objects and events in the environment. **PK.D.1.2** Use categorical data to create real-object graphs.	**K.D.1 Collect, organize, and interpret categorical data.** **K.D.1.1** Collect and sort information about objects and events in the environment. **K.D.1.2** Use categorical data to create real-object and picture graphs. **K.D.1.3** Draw conclusions from real-object and picture graphs.	**1.D.1 Collect, organize, and interpret categorical and numerical data.** **1.D.1.1** Collect, sort, and organize data in up to three categories using representations (e.g., tally marks, tables, Venn diagrams). **1.D.1.2** Use data to create picture and bar-type graphs to demonstrate one-to-one correspondence. **1.D.1.3** Draw conclusions from picture and bar-type graphs.

Number & Operations (N)			
Topic	**Second Grade (2)**	**Third Grade (3)**	**Fourth Grade (4)**
Quantity	**2.N.1 Compare and represent whole numbers up to 1,000 with an emphasis on place value and equality.** **2.N.1.1** Read, write, discuss, and represent whole numbers up to 1,000. Representations may include numerals, words, pictures, tally marks, number lines and manipulatives. **2.N.1.2** Use knowledge of number relationships to locate the position of a given whole number on an open number line up to 100. **2.N.1.3** Use place value to describe whole numbers between 10 and 1,000 in terms of hundreds, tens and ones. Know that 100 is 10 tens, and 1,000 is 10 hundreds. **2.N.1.4** Find 10 more or 10 less than a given three-digit number. Find 100 more or 100 less than a given three-digit number. **2.N.1.5** Recognize when to round numbers to the nearest 10 and 100. **2.N.1.6** Use place value to compare and order whole numbers up to 1,000 using comparative language, numbers, and symbols (e.g., 425 > 276, 73 < 107, page 351 comes after page 350, 753 is between 700 and 800).	**3.N.1 Compare and represent whole numbers up to 100,000 with an emphasis on place value and equality.** **3.N.1.1** Read, write, discuss, and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives. **3.N.1.2** Use place value to describe whole numbers between 1,000 and 100,000 in terms of ten thousands, thousands, hundreds, tens and ones, including expanded form. **3.N.1.3** Find 10,000 more or 10,000 less than a given five-digit number. Find 1,000 more or 1,000 less than a given four- or five-digit number. Find 100 more or 100 less than a given four- or five-digit number. **3.N.1.4** Use place value to compare and order whole numbers up to 100,000, using comparative language, numbers, and symbols.	Topic addressed at other grade levels.

Number & Operations (N)			
Topic	**Second Grade (2)**	**Third Grade (3)**	**Fourth Grade (4)**
Operations	**2.N.2 Add and subtract one- and two-digit numbers in real-world and mathematical problems.** **2.N.2.1** Use the relationship between addition and subtraction to generate basic facts up to 20. **2.N.2.2** Demonstrate fluency with basic addition facts and related subtraction facts up to 20. **2.N.2.3** Estimate sums and differences up to 100. **2.N.2.4** Use strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers. **2.N.2.5** Solve real-world and mathematical addition and subtraction problems involving whole numbers up to 2 digits. **2.N.2.6** Use concrete models and structured arrangements, such as repeated addition, arrays and ten frames to develop understanding of multiplication.	**3.N.2 Add and subtract multi-digit whole numbers; multiply with factors up to 10; represent multiplication and division in various ways; Solve real-world and mathematical problems through the representation of related operations.** **3.N.2.1** Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line and skip counting. **3.N.2.2** Demonstrate fluency of multiplication facts with factors up to 10. **3.N.2.3** Use strategies and algorithms based on knowledge of place value and equality to fluently add and subtract multi-digit numbers. **3.N.2.4** Recognize when to round numbers and apply understanding to round numbers to the nearest ten thousand, thousand, hundred, and ten and use compatible numbers to estimate sums and differences. **3.N.2.5** Use addition and subtraction to solve real-world and mathematical problems involving whole numbers. Use various strategies, including the relationship between addition and subtraction, the use of technology, and the context of the problem to assess the reasonableness of results. **3.N.2.6** Represent division facts by using a variety of approaches, such as repeated subtraction, equal sharing and forming equal groups. **3.N.2.7** Recognize the relationship between multiplication and division to represent and solve real-world problems. **3.N.2.8** Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two-digit number by a one-digit number.	**4.N.1 Solve real-world and mathematical problems using multiplication and division.** **4.N.1.1** Demonstrate fluency with multiplication and division facts with factors up to 12. **4.N.1.2** Use an understanding of place value to multiply or divide a number by 10, 100 and 1,000. **4.N.1.3** Multiply 3-digit by 1-digit or a 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms. **4.N.1.4** Estimate products of 3-digit by 1-digit or 2-digit by 2-digit whole numbers using rounding, benchmarks and place value to assess the reasonableness of results. Explore larger numbers using technology to investigate patterns. **4.N.1.5** Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction, and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of appropriate technology, and the context of the problem to assess the reasonableness of results. **4.N.1.6** Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide 3-digit dividend by 1-digit whole number divisors. (e.g., mental strategies, standard algorithms, partial quotients, repeated subtraction, the commutative, associative, and distributive properties). **4.N.1.7** Determine the unknown addend(s) or factor(s) in equivalent and non-equivalent expressions. (e.g., 5 + 6 = 4 + ☐ , 3 x 8 < 3 x ☐).

Number & Operations (N)			
Topic	**Second Grade (2)**	**Third Grade (3)**	**Fourth Grade (4)**
Fractions	**2.N.3 Explore the foundational ideas of fractions.** **2.N.3.1** Identify the parts of a set and area that represent fractions for halves, thirds, and fourths. **2.N.3.2** Construct equal-sized portions through fair sharing including length, set, and area models for halves, thirds, and fourths.	**3.N.3 Understand meanings and uses of fractions in real-world and mathematical situations**. **3.N.3.1** Read and write fractions with words and symbols. **3.N.3.2** Construct fractions using length, set, and area models. **3.N.3.3** Recognize unit fractions and use them to compose and decompose fractions related to the same whole. Use the numerator to describe the number of parts and the denominator to describe the number of partitions. **3.N.3.4** Use models and number lines to order and compare fractions that are related to the same whole.	**4.N.2 Represent and compare fractions and decimals in real-world and mathematical situations; use place value to understand how decimals represent quantities**. **4.N.2.**1 Represent and rename equivalent fractions using fraction models (e.g. parts of a set, area models, fraction strips, number lines). **4.N.2.2** Use benchmark fractions (0, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, 1) to locate additional fractions on a number line. Use models to order and compare whole numbers and fractions less than and greater than one using comparative language and symbols. **4.N.2.3** Decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations (e.g., $\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$). **4.N.2.4** Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations. **4.N.2.5** Represent tenths and hundredths with concrete models, making connections between fractions and decimals. **4.N.2.6** Represent, read and write decimals up to at least the hundredths place in a variety of contexts including money. **4.N.2.7** Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks. **4.N.2.8** Compare benchmark fractions ($\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$) and decimals (0.25, 0.50, 0.75) in real-world and mathematical situations.
Money	**2.N.4 Determine the value of a set of coins**. **2.N.4.1** Determine the value of a collection(s) of coins up to one dollar using the cent symbol. **2.N.4.2** Use a combination of coins to represent a given amount of money up to one dollar.	**3.N.4 Determine the value of a set of coins or bills.** **3.N.4.1** Use addition to determine the value of a collection of coins up to one dollar using the cent symbol and a collection of bills up to twenty dollars. **3.N.4.2** Select the fewest number of coins for a given amount of money up to one dollar.	**4.N.3 Determine the value of coins in order to solve monetary transactions.** **4.N.3.1** Given a total cost (whole dollars up to $20 or coins) and amount paid (whole dollars up to $20 or coins), find the change required in a variety of ways. Limited to whole dollars up to $20 or sets of coins.

Algebraic Reasoning & Algebra (A)			
Topic	**Second Grade (2)**	**Third Grade (3)**	**Fourth Grade (4)**
Patterns	**2.A.1 Describe the relationship found in patterns to solve real-world and mathematical problems.** **2.A.1.1** Represent, create, describe, complete, and extend growing and shrinking patterns with quantity and numbers in a variety of real-world and mathematical contexts. **2.A.1.2** Represent and describe repeating patterns involving shapes in a variety of contexts.	**3.A.1 Describe and create representations of numerical and geometric patterns.** **3.A.1.1** Create, describe, and extend patterns involving addition, subtraction, or multiplication to solve problems in a variety of contexts. **3.A.1.2** Describe the rule (single operation) for a pattern from an input/output table or function machine involving addition, subtraction, or multiplication. **3.A.1.3** Explore and develop visual representations of growing geometric patterns and construct the next steps.	**4.A.1 Use multiple representations of patterns to solve real-world and mathematical problems.** **4.A.1.1** Create an input/output chart or table to represent or extend a numerical pattern. **4.A.1.2** Describe the single operation rule for a pattern from an input/output table or function machine involving any operation of a whole number. **4.A.1.3** Create growth patterns involving geometric shapes and define the single operation rule of the pattern.
Number Sentences	**2.A.2 Use number sentences involving unknowns to represent and solve real-world and mathematical problems.** **2.A.2.1** Use objects and number lines to represent number sentences. **2.A.2.2** Generate real-world situations to represent number sentences and vice versa. **2.A.2.3** Apply commutative and identity properties and number sense to find values for unknowns that make number sentences involving addition and subtraction true or false.	**3.A.2 Use number sentences involving multiplication and unknowns to represent and solve real-world and mathematical problems.** **3.A.2.1** Find unknowns represented by symbols in arithmetic problems by solving one-step open sentences (equations) and other problems involving addition, subtraction, and multiplication. Generate real-world situations to represent number sentences. **3.A.2.2** Recognize, represent and apply the number properties (commutative, identity, and associative properties of addition and multiplication) using models and manipulatives to solve problems**.**	**4.A.2 Use multiplication and division with unknowns to create number sentences representing a given problem situation.** **4.A.2.1** Use number sense, properties of multiplication and the relationship between multiplication and division to solve problems and find values for the unknowns represented by letters and symbols that make number sentences true. **4.A.2.2** Solve for unknowns in problems by solving open sentences (equations) and other problems involving addition, subtraction, multiplication, or division with whole numbers. Use real-world situations to represent number sentences and vice versa.

Geometry & Measurement (GM)			
Topic	**Second Grade (2)**	**Third Grade (3)**	**Fourth Grade (4)**
Geometry	**2.GM.1 Analyze attributes of two-dimensional figures and develop generalizations about their properties.** **2.GM.1.1** Recognize trapezoids and hexagons. **2.GM.1.2** Describe, compare, and classify two-dimensional figures according to their geometric attributes. **2.GM.1.3** Compose two-dimensional shapes using triangles, squares, hexagons, trapezoids, and rhombi. **2.GM.1.4** Recognize right angles and classify angles as smaller or larger than a right angle.	**3.GM.1 Use geometric attributes to describe and create shapes in various contexts.** **3.GM.1.1** Sort three-dimensional shapes based on attributes. **3.GM.1.2** Build a three-dimensional figure using unit cubes when picture/shape is shown. **3.GM.1.3** Classify angles as acute, right, obtuse, and straight.	**4.GM.1 Name, describe, classify, and construct polygons and three-dimensional figures.** **4.GM.1.1** Identify points, lines, line segments, rays, angles, endpoints, and parallel and perpendicular lines in various contexts. **4.GM.1.2** Describe, classify, and sketch quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms, and kites. Recognize quadrilaterals in various contexts. **4.GM.1.3** Given two three-dimensional shapes, identify similarities, and differences.
Measurement	**2.GM.2 Understand length as a measurable attribute and explore capacity.** **2.GM.2.1** Explain the relationship between the size of the unit of measurement and the number of units needed to measure the length of an object. **2.GM.2.2** Explain the relationship between length and the numbers on a ruler by using a ruler to measure lengths to the nearest whole unit. **2.GM.2.3** Explore how varying shapes and styles of containers can have the same capacity.	**3.GM.2 Understand measurable attributes of real-world and mathematical objects using various tools.** **3.GM.2.1** Find perimeter of polygon, given whole number lengths of the sides, in real-world and mathematical situations. **3.GM.2.2** Develop and use formulas to determine the area of rectangles. Justify why length and width are multiplied to find the area of a rectangle by breaking the rectangle into one unit by one unit squares and viewing these as grouped into rows and columns. **3.GM.2.3** Choose an appropriate measurement instrument and measure the length of objects to the nearest whole centimeter or meter. **3.GM.2.4** Choose an appropriate measurement instrument and measure the length of objects to the nearest whole yard, whole foot, or half inch. **3.GM.2.5** Using common benchmarks, estimate the lengths (customary and metric) of a variety of objects. **3.GM.2.6** Use an analog thermometer to determine temperature to the nearest degree in Fahrenheit and Celsius. **3.GM.2.7** Count cubes systematically to identify the number of cubes needed to pack the whole or half of a three-dimensional structure. **3.GM.2.8** Find the area of two-dimensional figures by counting total number of same size unit squares that fill the shape without gaps or overlaps.	**4.GM.2 Understand angle, length, and area as measurable attributes of real-world and mathematical objects. Use various tools to measure angles, length, area, and volume.** **4.GM.2.1** Measure angles in geometric figures and real-world objects with a protractor or angle ruler. **4.GM.2.2** Find the area of polygons that can be decomposed into rectangles. **4.GM.2.3** Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms with whole-number edge lengths can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements such as cm^3. **4.GM.2.4** Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or quarter-inch. **4.GM.2.5** Solve problems that deal with measurements of length, when to use liquid volumes, when to use mass, temperatures above zero and money using addition, subtraction, multiplication, or division as appropriate (customary and metric).

Geometry & Measurement (GM)			
Topic	**Second Grade (2)**	**Third Grade (3)**	**Fourth Grade (4)**
Time	**2.GM.3 Tell time to the quarter hour.** **2.GM.3.1** Read and write time to the quarter-hour on an analog and digital clock. Distinguish between a.m. and p.m.	**3.GM.3 Tell time to the nearest 5-minutes and solve problems.** **3.GM.3.1** Read and write time to the nearest 5-minute (analog and digital). **3.GM.3.2** Determine the solutions to problems involving addition and subtraction of time in intervals of 5 minutes, up to one hour, using pictorial models, number line diagrams, or other tools.	**4.GM.3 Determine elapsed time and convert between units of time.** **4.GM.3.1** Determine elapsed time. **4.GM.3.2** Solve problems involving the conversion of one measure of time to another.

Data & Probability (D)			
Topic	**Second Grade (2)**	**Third Grade (3)**	**Fourth Grade (4)**
Data Analysis	**2.D.1 Collect, organize, and interpret data.** **2.D.1.1** Explain that the length of a bar in a bar graph or the number of objects in a picture graph represents the number of data points for a given category. **2.D.1.2** Organize a collection of data with up to four categories using pictographs and bar graphs with intervals of 1s, 2s, 5s or 10s. **2.D.1.3** Write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one. **2.D.1.4** Draw conclusions and make predictions from information in a graph.	**3.D.1 Summarize, construct, and analyze data.** **3.D.1.1** Summarize and construct a data set with multiple categories using a frequency table, line plot, pictograph, and/or bar graph with scaled intervals. **3.D.1.2** Solve one- and two-step problems using categorical data represented with a frequency table, pictograph, or bar graph with scaled intervals.	**4.D.1 Collect, organize, and analyze data.** **4.D.1.1** Represent data on a frequency table or line plot marked with whole numbers and fractions using appropriate titles, labels, and units. **4.D.1.2** Use tables, bar graphs, timelines, and Venn diagrams to display data sets. The data may include benchmark fractions or decimals ($\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, 0.25, 0.50, 0.75). **4.D.1.3** Solve one- and two-step problems using data in whole number, decimal, or fraction form in a frequency table and line plot.

Number & Operations (N)

Fifth Grade (5)	Sixth Grade (6)	Seventh Grade (7)	Pre-Algebra (PA)
5.N.1 Divide multi-digit numbers and solve real-world and mathematical problems using arithmetic. **5.N.1.1** Estimate solutions to division problems in order to assess the reasonableness of results. **5.N.1.2** Divide multi-digit numbers, by one- and two-digit divisors, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms. **5.N.1.3** Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal and consider the context in which a problem is situated to select and interpret the most useful form of the quotient for the solution. **5.N.1.4** Solve real-world and mathematical problems requiring addition, subtraction, multiplication, and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results. **5.N.2 Read, write, represent, and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.** **5.N.2.1** Represent decimal fractions (e.g., $\frac{1}{10}$, $\frac{1}{100}$) using a variety of models (e.g., 10 by 10 grids, rational number wheel, base-ten blocks, meter stick) and make connections between fractions and decimals.	**6.N.1 Read, write, and represent integers and rational numbers expressed as fractions, decimals, percents, and ratios; write positive integers as products of factors; use these representations in real-world and mathematical situations**. **6.N.1.1** Represent integers with counters and on a number line and rational numbers on a number line, recognizing the concepts of opposites, direction, and magnitude; use integers and rational numbers in real-world and mathematical situations, explaining the meaning of 0 in each situation. **6.N.1.2** Compare and order positive rational numbers, represented in various forms, or integers using the symbols <, >, and =. **6.N.1.3** Explain that a percent represents parts "out of 100" and ratios "to 100." **6.N.1.4** Determine equivalencies among fractions, decimals, and percents. Select among these representations to solve problems. **6.N.1.5** Factor whole numbers and express prime and composite numbers as a product of prime factors with exponents. **6.N.1.6** Determine the greatest common factors and least common multiples. Use common factors and multiples to calculate with fractions, find equivalent fractions, and express the sum of two-digit numbers with a common factor using the distributive property. **6.N.2 Add and subtract integers in order to solve real-world and mathematical problems.** **6.N.2.1** Estimate solutions to addition and subtraction of integers problems in order to assess the reasonableness of results.	**7.N.1 Read, write, represent, and compare rational numbers, expressed as integers, fractions, and decimals.** **7.N.1.1** Know that every rational number can be written as the ratio of two integers or as a terminating or repeating decimal. **7.N.1.2** Compare and order rational numbers expressed in various forms using the symbols <, >, and =. **7.N.1.3** Recognize and generate equivalent representations of rational numbers, including equivalent fractions. **7.N.2 Calculate with integers and rational numbers, with and without positive integer exponents, to solve real-world and mathematical problems; explain the relationship between absolute value of a rational number and the distance of that number from zero.** **7.N.2.1** Estimate solutions to multiplication and division of integers in order to assess the reasonableness of results. **7.N.2.2** Illustrate multiplication and division of integers using a variety of representations. **7.N.2.3** Solve real-world and mathematical problems involving addition, subtraction, multiplication and division of rational; use efficient and generalizable procedures including but not limited to standard algorithms. **7.N.2.4** Raise integers to positive integer exponents. **7.N.2.5** Solve real-world and mathematical problems involving calculations with rational numbers and positive integer exponents. **7.N.2.6** Explain the relationship between the absolute value of a rational number	**PA.N.1 Read, write, compare, classify, and represent real numbers and use them to solve problems in various contexts.** **PA.N.1.1** Develop and apply the properties of integer exponents, including $a^0 = 1$ (with $a \neq 0$), to generate equivalent numerical and algebraic expressions. **PA.N.1.2** Express and compare approximations of very large and very small numbers using scientific notation. **PA.N.1.3** Multiply and divide numbers expressed in scientific notation, express the answer in scientific notation. **PA.N.1.4** Classify real numbers as rational or irrational. Explain why the rational number system is closed under addition and multiplication and why the irrational system is not. Explain why the sum of a rational number and an irrational number is irrational; and the product of a non-zero rational number and an irrational number is irrational. **PA.N.1.5** Compare real numbers; locate real numbers on a number line. Identify the square root of a perfect square to 400 or, if it is not a perfect square root, locate it as an irrational number between two consecutive positive integers.

Number & Operations (N)			
Fifth Grade (5)	**Sixth Grade (6)**	**Seventh Grade (7)**	**Pre-Algebra (PA)**
5.N.2.2 Represent, read and write decimals using place value to describe decimal numbers including fractional numbers as small as thousandths and whole numbers as large as millions. **5.N.2.3** Compare and order fractions and decimals, including mixed numbers and fractions less than one, and locate on a number line. **5.N.2.4** Recognize and generate equivalent decimals, fractions, mixed numbers, and fractions less than one in various contexts. **5.N.3 Add and subtract fractions with like and unlike denominators, mixed numbers and decimals to solve real-world and mathematical problems.** **5.N.3.1** Estimate sums and differences of fractions with like and unlike denominators, mixed numbers, and decimals to assess the reasonableness of the results. **5.N.3.2** Illustrate addition and subtraction of fractions with like and unlike denominators, mixed numbers, and decimals using a variety of representations (e.g., fraction strips, area models, number lines, fraction rods). **5.N.3.3** Add and subtract fractions with like and unlike denominators, mixed numbers, and decimals, using efficient and generalizable procedures, including but not limited to standard algorithms in order to solve real-world and mathematical problems including those involving money, measurement, geometry, and data. **5.N.3.4** Find 0.1 more than a number and 0.1 less than a number. Find 0.01 more than a number and 0.01 less than a	**6.N.2.2** Illustrate addition and subtraction integers using a variety of representations. **6.N.2.3** Add and subtract integers; use efficient and generalizable procedures including but not limited to standard algorithms. **6.N.3 Understand the concept of ratio and its relationship to fractions and percents and to the multiplication and division of whole numbers. Use ratios to solve real-world and mathematical problems.** **6.N.3.1** Identify and use ratios to compare quantities. Recognize that multiplicative comparison and additive comparison are different. **6.N.3.2** Determine the unit rate for ratios. **6.N.3.3** Apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts, including those involving mixture and concentrations. **6.N.3.4** Use multiplicative reasoning and representations to solve ratio and unit rate problems. **6.N.4 Multiply and divide decimals, fractions, and mixed numbers; solve real-world and mathematical problems with rational numbers.** **6.N.4.1** Estimate solutions to problems with whole numbers, decimals, fractions, and mixed numbers and use the estimates to assess the reasonableness of results in the context of the problem. **6.N.4.2** Illustrate multiplication and division of fractions and decimals to show connections to fractions, whole number multiplication, and inverse relationships. **6.N.4.3** Multiply and divide fractions and decimals, using efficient and generalizable	and the distance of that number from zero on a number line. Use the symbol for absolute value.	

Number & Operations (N)

Fifth Grade (5)	Sixth Grade (6)	Seventh Grade (7)	Pre-Algebra (PA)
number. Find 0.001 more than a number and 0.001 less than a number.	procedures. **6.N.4.4** Solve and interpret real-world and mathematical problems including those involving money, measurement, geometry, and data requiring arithmetic with decimals, fractions and mixed numbers.		

Algebraic Reasoning & Algebra (A)

Fifth Grade (5)	Sixth Grade (6)	Seventh Grade (7)	Pre-Algebra (PA)
5.A.1 Describe and graph patterns of change created through numerical patterns. **5.A.1.1** Use tables and rules of up to two operations to describe patterns of change and make predictions and generalizations about real-world and mathematical problems. **5.A.1.2** Use a rule or table to represent ordered pairs of whole numbers and graph these ordered pairs on a coordinate plane, identifying the origin and axes in relation to the coordinates. **5.A.2 Understand and interpret expressions, equations, and inequalities involving variables and whole numbers, and use them to represent and evaluate real-world and mathematical problems.** **5.A.2.1** Generate equivalent numerical expressions and solve problems involving whole numbers by applying the commutative, associative, and distributive properties and order of operations (no exponents). **5.A.2.2** Determine whether an equation or inequality involving a variable is true or false for a given value of the variable.	**6.A.1 Recognize and represent relationships between varying quantities; translate from one representation to another; use patterns, tables, graphs and rules to solve real-world and mathematical problems.** **6.A.1.1** Plot integer- and rational-valued (limited to halves and fourths) ordered-pairs as coordinates in all four quadrants and recognize the reflective relationships among coordinates that differ only by their signs. **6.A.1.2** Represent relationships between two varying quantities involving no more than two operations with rules, graphs, and tables; translate between any two of these representations. **6.A.1.3** Use and evaluate variables in expressions, equations, and inequalities that arise from various contexts, including determining when or if, for a given value of the variable, an equation or inequality involving a variable is true or false. **6.A.2 Use properties of arithmetic to generate equivalent numerical expressions and evaluate expressions involving positive rational numbers.** **6.A.2.1** Generate equivalent expressions and evaluate expressions involving	**7.A.1 Understand the concept of proportionality in real-world and mathematical situations, and distinguish between proportional and other relationships.** **7.A.1.1** Describe that the relationship between two variables, x and y, is proportional if it can be expressed in the form $\frac{y}{x} = k$ or $y = kx$; distinguish proportional relationships from other relationships, including inversely proportional relationships ($xy = k$ or $y = \frac{k}{x}$). **7.A.1.2** Recognize that the graph of a proportional relationship is a line through the origin and the coordinate $(1, r)$, where both r and the slope are the unit rate (constant of proportionality, k). **7.A.2 Recognize proportional relationships in real-world and mathematical situations; represent these and other relationships with tables, verbal descriptions, symbols, and graphs; solve problems involving proportional relationships and interpret results in the original context.** **7.A.2.1** Represent proportional relationships with tables, verbal descriptions, symbols, and graphs;	**PA.A.1 Understand the concept of function in real-world and mathematical situations, and distinguish between linear and nonlinear functions.** **PA.A.1.1** Recognize that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. **PA.A.1.2** Use linear functions to represent and explain real-world and mathematical situations. **PA.A.1.3** Identify a function as linear if it can be expressed in the form $y = mx + b$ or if its graph is a straight line. **PA.A.2 Recognize linear functions in real-world and mathematical situations; represent linear functions and other function with tables, verbal descriptions, symbols, and graphs; solve problems involving linear functions and interpret results in the original context.** **PA.A.2.1** Represent linear functions with tables, verbal descriptions, symbols, and graphs; translate from one representation to another. **PA.A.2.2** Identify, describe, and analyze linear relationships between two variables.

Algebraic Reasoning & Algebra (A)			
Fifth Grade (5)	**Sixth Grade (6)**	**Seventh Grade (7)**	**Pre-Algebra (PA)**
5.A.2.3 Evaluate expressions involving variables when values for the variables are given.	positive rational numbers by applying the commutative, associative, and distributive properties and order of operations to solve real-world and mathematical problems. **6.A.3 Use equations and inequalities to represent real-world and mathematical problems and use the idea of maintaining equality to solve equations. Interpret solutions in the original context.** **6.A.3.1** Represent real-world or mathematical situations using expressions, equations and inequalities involving variables and rational numbers. **6.A.3.2** Use number sense and properties of operations and equality to solve real-world and mathematical problems involving equations in the form $x + p = q$ and $px = q$, where x, p, and q are nonnegative rational numbers. Graph the solution on a number line, interpret the solution in the original context, and assess the reasonableness of the solution.	translate from one representation to another. Determine and compare the unit rate (constant of proportionality, slope, or rate of change) given any of these representations. **7.A.2.2** Solve multi-step problems involving proportional relationships involving distance-time, percent increase or decrease, discounts, tips, unit pricing, similar figures, and other real-world and mathematical situations. **7.A.2.3** Use proportional reasoning to solve real-world and mathematical problems involving ratios. **7.A.2.4** Use proportional reasoning to assess the reasonableness of solutions. **7.A.3 Represent and solve linear equations and inequalities.** **7.A.3.1** Write and solve problems leading to linear equations with one variable in the form $px + q = r$ and $p(x+q) = r$, where p, q, and r are rational numbers. **7.A.3.2** Represent, write, solve, and graph problems leading to linear inequalities with one variable in the form $x+p>q$ and $x+p<q$, where p, and q are nonnegative rational numbers. **7.A.3.3** Represent real-world or mathematical situations using equations and inequalities involving variables and rational numbers. **7.A.4 Use order of operations and properties to generate equivalent numerical and algebraic expressions containing rational numbers and grouping symbols; evaluate such expressions.** **7.A.4.1** Use properties of operations (limited to associative, commutative, and distributive) to generate equivalent	**PA.A.2.3** Identify graphical properties of linear functions including slope and intercepts. Know that the slope equals the rate of change, and that the y-intercept is zero when the function represents a proportional relationship. **PA.A.2.4** Predict the effect on the graph of a linear function when the slope or y-intercept changes. Use appropriate tools to examine these effects. **PA.A.2.5** Solve problems involving linear functions and interpret results in the original context. **PA.A.3 Generate equivalent numerical and algebraic expressions and use algebraic properties to evaluate expressions**. **PA.A.3.1** Use substitution to simplify and evaluate algebraic expressions. **PA.A.3.2** Justify steps in generating equivalent expressions by identifying the properties used, including the properties of operations (associative, commutative, and distributive laws) and the order of operations, including grouping symbols. **PA.A.4 Represent real-world and mathematical problems using equations and inequalities involving linear expressions. Solve and graph equations and inequalities symbolically and graphically. Interpret solutions in the original context.** **PA.A.4.1** Illustrate, write, and solve mathematical and real-world problems using linear equations with one variable with one solution, infinitely many solutions, or no solutions. Interpret solutions in the original context. **PA.A.4.2** Represent, write, solve, and graph problems leading to linear

Algebraic Reasoning & Algebra (A)

Fifth Grade (5)	Sixth Grade (6)	Seventh Grade (7)	Pre-Algebra (PA)
		numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents. **7.A.4.2** Apply understanding of order of operations and grouping symbols when using calculators and other technologies.	inequalities with one variable in the form $px + q > r$ and $px + q < r$, where p, q, and r are rational numbers. **PA.A.4.3** Represent real-world situations using equations and inequalities involving one variable.

Geometry & Measurement (GM)

Fifth Grade (5)	Sixth Grade (6)	Seventh Grade (7)	Pre-Algebra (PA)
5.GM.1 Describe, classify, and draw representations of two- and three-dimensional figures. **5.GM.1.1** Describe, classify and construct triangles, including equilateral, right, scalene, and isosceles triangles. Recognize triangles in various contexts. **5.GM.1.2** Describe and classify three-dimensional figures including cubes, rectangular prisms, and pyramids by the number of edges, faces or vertices as well as the shapes of faces. **5.GM.1.3** Recognize and draw a net for a three-dimensional figure (e.g., cubes, rectangular prisms, pyramids). **5.GM.2 Understand how the volume of rectangular prisms and surface area of shapes with polygonal faces are determined by the dimensions of the object and that shapes with varying dimensions can have equivalent values of surface area or volume.** **5.GM.2.1** Recognize that the volume of rectangular prisms can be determined by the number of cubes (n) and by the product of the dimensions of the prism ($a \times b \times c = n$). Know that rectangular prisms of different dimensions (p, q, and r) can have the same volume if $a \times b \times c = p \times q \times r = n$.	**6.GM.1 Calculate area of squares, parallelograms, and triangles to solve real-world and mathematical problems.** **6.GM.1.1** Develop and use formulas for the area of squares and parallelograms using a variety of methods including but not limited to the standard algorithm. **6.GM.1.2** Develop and use formulas to determine the area of triangles. **6.GM.1.3** Find the area of right triangles, other triangles, special quadrilaterals, and polygons that can be decomposed into triangles and other shapes to solve real-world and mathematical problems. **6.GM.2 Understand and use relationships between angles in geometric figures**. **6.GM.2.1** Solve problems using the relationships between the angles (vertical, complementary, and supplementary) formed by intersecting lines. **6.GM.2.2** Develop and use the fact that the sum of the interior angles of a triangle is 180° to determine missing angle measures in a triangle. **6.GM.3 Choose appropriate units of measurement and use ratios to convert within measurement systems to solve real-world and mathematical problems.** **6.GM.3.1** Estimate weights, capacities	**7.GM.1 Develop and understand the concept of surface area and volume of rectangular prisms.** **7.GM.1.1** Using a variety of tools and strategies, develop the concept that surface area of a rectangular prism with rational-valued edge lengths can be found by wrapping the figure with same-sized square units without gaps or overlap. Use appropriate measurements such as cm^2. **7.GM.1.2** Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms with rational-valued edge lengths can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements such as cm^3. **7.GM.2 Determine the area of trapezoids and area and perimeter of composite figures.** **7.GM.2.1** Develop and use the formula to determine the area of a trapezoid to solve problems. **7.GM.2.2** Find the area and perimeter of composite figures to solve real-world and mathematical problems. **7.GM.3 Use reasoning with proportions**	**PA.GM.1 Solve problems involving right triangles using the Pythagorean Theorem**. **PA.GM.1.1** Informally justify the Pythagorean Theorem using measurements, diagrams or dynamic software and use the Pythagorean Theorem to solve problems in two and three dimensions involving right triangles. **PA.GM.1.2** Use the Pythagorean Theorem to find the distance between any two points in a coordinate plane. **PA.GM.2 Calculate surface area and volume of three-dimensional figures.** **PA.GM.2.1** Calculate the surface area of a rectangular prism using decomposition or nets. Use appropriate measurements such as cm^2. **PA.GM.2.2** Calculate the surface area of a cylinder, in terms of π and using approximations for π, using decomposition or nets. Use appropriate measurements such as cm^2. **PA.GM.2.3** Develop and use the formulas $V = lwh$ and $V = Bh$ to determine the volume of rectangular prisms. Justify why base area (B) and height (h) are multiplied to find the volume of a rectangular prism. Use appropriate measurements such as cm^3. **PA.GM.2.4** Develop and use the formulas

Geometry & Measurement (GM)			
Fifth Grade (5)	**Sixth Grade (6)**	**Seventh Grade (7)**	**Pre-Algebra (PA)**
5.GM.2.2 Recognize that the surface area of a three-dimensional figure with rectangular faces with whole numbered edges can be found by finding the area of each component of the net of that figure. Know that three-dimensional shapes of different dimensions can have the same surface area. **5.GM.2.3** Find the perimeter of polygons and create arguments for reasonable values for the perimeter of shapes that include curves. **5.GM.3 Understand angle and length as measurable attributes of real-world and mathematical objects. Use various tools to measure angles and lengths.** **5.GM.3.1** Measure and compare angles according to size. **5.GM.3.2** Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or 1/16-inch. **5.GM.3.3** Recognize and use the relationship between inches, feet, and yards to measure and compare objects. **5.GM.3.4** Recognize and use the relationship between millimeters, centimeters, and meters to measure and compare objects.	and geometric measurements using benchmarks in customary and metric measurement systems with appropriate units. **6.GM.3.2** Solve problems in various real-world and mathematical contexts that require the conversion of weights, capacities, geometric measurements, and time within the same measurement systems using appropriate units. **6.GM.4 Use translations, reflections, and rotations to establish congruency and understand symmetries.** **6.GM.4.1** Predict, describe, and apply translations (slides), reflections (flips), and rotations (turns) to a two-dimensional figure. **6.GM.4.2** Recognize that translations, reflections, and rotations preserve congruency and use them to show that two figures are congruent. **6.GM.4.3** Use distances between two points that are either vertical or horizontal to each other (not requiring the distance formula) to solve real-world and mathematical problems about congruent two-dimensional figures. **6.GM.4.4** Identify and describe the line(s) of symmetry in two-dimensional shapes.	**and ratios to determine measurements, justify formulas, and solve real-world and mathematical problems involving circles and related geometric figures.** **7.GM.3.1** Demonstrate an understanding of the proportional relationship between the diameter and circumference of a circle and that the unit rate (constant of proportionality) is π and can be approximated by rational numbers such as $\frac{22}{7}$ and 3.14. **7.GM.3.2** Calculate the circumference and area of circles to solve problems in various contexts, in terms of π and using approximations for π. **7.GM.4 Analyze the effect of dilations, translations, and reflections on the attributes of two-dimensional figures on and off the coordinate plane.** **7.GM.4.1** Describe the properties of similarity, compare geometric figures for similarity, and determine scale factors resulting from dilations. **7.GM.4.2** Apply proportions, ratios, and scale factors to solve problems involving scale drawings and determine side lengths and areas of similar triangles and rectangles. **7.GM.4.3** Graph and describe translations and reflections of figures on a coordinate plane and determine the coordinates of the vertices of the figure after the transformation.	$V = \pi r^2 h$ and $V = Bh$ to determine the volume of right cylinders, in terms of π and using approximations for π. Justify why base area (B) and height (h) are multiplied to find the volume of a right cylinder. Use appropriate measurements such as cm^3.

Data & Probability (D)			
Fifth Grade (5)	**Sixth Grade (6)**	**Seventh Grade (7)**	**Pre-Algebra (PA)**
5.D.1 Display and analyze data to find the range and measures of central tendency (mean, median, and mode). **5.D.1.1** Find the measures of central tendency (mean, median, or mode) and range of a set of data. Understand that the mean is a "leveling out" or central balance point of the data. **5.D.1.2** Create and analyze line and double-bar graphs with whole numbers, fractions, and decimals increments.	**6.D.1 Display and analyze data.** **6.D.1.1** Calculate the mean, median, and mode for a set of real-world data. **6.D.1.2** Explain and justify which measure of central tendency (mean, median, or mode) would provide the most descriptive information for a given set of data. **6.D.1.3** Create and analyze box and whisker plots observing how each segment contains one quarter of the data. **6.D.2 Use probability to solve real-world and mathematical problems; represent probabilities using fractions and decimals.** **6.D.2.1** Represent possible outcomes using a probability continuum from impossible to certain. **6.D.2.2** Determine the sample space for a given experiment and determine which members of the sample space are related to certain events. Sample space may be determined by the use of tree diagrams, tables or pictorial representations. **6.D.2.3** Demonstrate simple experiments in which the probabilities are known and compare the resulting relative frequencies with the known probabilities, recognizing that there may be differences between the two results.	**7.D.1 Display and analyze data in a variety of ways.** **7.D.1.1** Design simple experiments, collect data and calculate measures of central tendency (mean, median, and mode) and spread (range). Use these quantities to draw conclusions about the data collected and make predictions. **7.D.1.2** Use reasoning with proportions to display and interpret data in circle graphs (pie charts) and histograms. Choose the appropriate data display and know how to create the display using a spreadsheet or other graphing technology. **7.D.2 Calculate probabilities and reason about probabilities using proportions to solve real-world and mathematical problems.** **7.D.2.1** Determine the theoretical probability of an event using the ratio between the size of the event and the size of the sample space; represent probabilities as percents, fractions and decimals between 0 and 1. **7.D.2.2** Calculate probability as a fraction of sample space or as a fraction of area. Express probabilities as percents, decimals and fractions. **7.D.2.3** Use proportional reasoning to draw conclusions about and predict relative frequencies of outcomes based on probabilities.	**PA.D.1 Display and interpret data in a variety of ways, including using scatterplots and approximate lines of best fit. Use line of best fit and average rate of change to make predictions and draw conclusions about data.** **PA.D.1.1** Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Know how to create data displays using a spreadsheet and use a calculator to examine this impact. **PA.D.1.2** Explain how outliers affect measures of central tendency. **PA.D.1.3** Collect, display and interpret data using scatterplots. Use the shape of the scatterplot to informally estimate a line of best fit, make statements about average rate of change, and make predictions about values not in the original data set. Use appropriate titles, labels and units. **PA.D.2 Calculate experimental probabilities and reason about probabilities to solve real-world and mathematical problems.** **PA.D.2.1** Calculate experimental probabilities and represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown. **PA.D.2.2** Determine how samples are chosen (random, limited, biased) to draw and support conclusions about generalizing a sample to a population. **PA.D.2.3** Compare and contrast dependent and independent events.

Number & Operations (N)

Pre-Algebra (PA)	Algebra 1 (A1)	Algebra 2 (A2)
PA.N.1 Read, write, compare, classify, and represent real numbers and use them to solve problems in various contexts. **PA.N.1.1** Develop and apply the properties of integer exponents, including $a^0 = 1$ (with $a \neq 0$), to generate equivalent numerical and algebraic expressions. **PA.N.1.2** Express and compare approximations of very large and very small numbers using scientific notation. **PA.N.1.3** Multiply and divide numbers expressed in scientific notation, express the answer in scientific notation. **PA.N.1.4** Classify real numbers as rational or irrational. Explain why the rational number system is closed under addition and multiplication and why the irrational system is not. Explain why the sum of a rational number and an irrational number is irrational; and the product of a non-zero rational number and an irrational number is irrational. **PA.N.1.5** Compare real numbers; locate real numbers on a number line. Identify the square root of a perfect square to 400 or, if it is not a perfect square root, locate it as an irrational number between two consecutive positive integers.	**A1.N.1 Extend the understanding of number and operations to include square roots and cube roots.** **A1.N.1.1** Write square roots and cube roots of monomial algebraic expressions in simplest radical form. **A1.N.1.2** Add, subtract, multiply, and simplify square roots of monomial algebraic expressions and divide square roots of whole numbers, rationalizing the denominator when necessary.	**A2.N.1 Extend the understanding of number and operations to include complex numbers, matrices, radical expressions, and expressions written with rational exponents.** **A2.N.1.1** Find the value of i^n for any whole number n. **A2.N.1.2** Simplify, add, subtract, multiply, and divide complex numbers. **A2.N.1.3** Use matrices to organize and represent data. Identify the order (dimension) of a matrix, add and subtract matrices of appropriate dimensions, and multiply a matrix by a scalar to create a new matrix to solve problems. **A2.N.1.4** Understand and apply the relationship of rational exponents to integer exponents and radicals to solve problems.

Algebraic Reasoning & Algebra (A)

Pre-Algebra (PA)	Algebra 1 (A1)	Algebra 2 (A2)
PA.A.1 Understand the concept of function in real-world and mathematical situations, and distinguish between linear and nonlinear functions. **PA.A.1.1** Recognize that a function is a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. **PA.A.1.2** Use linear functions to represent and explain real-world and mathematical situations. **PA.A.1.3** Identify a function as linear if it can be expressed in the form $y = mx + b$ or if its graph is a straight line. **PA.A.2 Recognize linear functions in real-world and mathematical situations; represent linear functions and other function with tables, verbal descriptions, symbols, and graphs; solve problems involving linear functions and interpret results in the original context.**	**A1.A.1 Represent and solve mathematical and real-world problems using linear equations, absolute value equations, and systems of equations; interpret solutions in the original context.** **A1.A.1.1** Use knowledge of solving equations with rational values to represent and solve mathematical and real-world problems (e.g., angle measures, geometric formulas, science, or statistics) and interpret the solutions in the original context. **A1.A.1.2** Solve absolute value equations and interpret the solutions in the original context. **A1.A.1.3** Analyze and solve real-world and mathematical problems involving systems of linear equations with a maximum of two variables by graphing (may include graphing calculator or other appropriate technology), substitution, and elimination. Interpret the solutions in the original context.	**A2.A.1 Represent and solve mathematical and real-world problems using nonlinear equations and systems of linear equations; interpret the solutions in the original context.** **A2.A.1.1** Represent real-world or mathematical problems using quadratic equations and solve using various methods (including graphing calculator or other appropriate technology), factoring, completing the square, and the quadratic formula. Find non-real roots when they exist. **A2.A.1.2** Represent real-world or mathematical problems using exponential equations, such as compound interest, depreciation, and population growth, and solve these equations graphically (including graphing calculator or other appropriate technology) or algebraically. **A2.A.1.3** Solve one-variable rational equations and check for extraneous solutions. **A2.A.1.4** Solve polynomial equations with real roots using

Algebraic Reasoning & Algebra (A)

Pre-Algebra (PA)

PA.A.2.1 Represent linear functions with tables, verbal descriptions, symbols, and graphs; translate from one representation to another.
PA.A.2.2 Identify, describe, and analyze linear relationships between two variables.
PA.A.2.3 Identify graphical properties of linear functions including slope and intercepts. Know that the slope equals the rate of change, and that the *y*-intercept is zero when the function represents a proportional relationship.
PA.A.2.4 Predict the effect on the graph of a linear function when the slope or *y*-intercept changes. Use appropriate tools to examine these effects.
PA.A.2.5 Solve problems involving linear functions and interpret results in the original context.

PA.A.3 Generate equivalent numerical and algebraic expressions and use algebraic properties to evaluate expressions.
PA.A.3.1 Use substitution to simplify and evaluate algebraic expressions.
PA.A.3.2 Justify steps in generating equivalent expressions by identifying the properties used, including the properties of operations (associative, commutative, and distributive laws) and the order of operations, including grouping symbols.

PA.A.4 Represent real-world and mathematical problems using equations and inequalities involving linear expressions. Solve and graph equations and inequalities symbolically and graphically. Interpret solutions in the original context.
PA.A.4.1 Illustrate, write, and solve mathematical and real-world problems using linear equations with one variable with one solution, infinitely many solutions, or no solutions. Interpret solutions in the original context.
PA.A.4.2 Represent, write, solve, and graph problems leading to linear inequalities with one variable in the form $px + q > r$ and $px + q < r$, where p, q, and r are rational numbers.
PA.A.4.3 Represent real-world situations using equations and inequalities involving one variable.

Algebra 1 (A1)

A1.A.2 Represent and solve real-world and mathematical problems using linear inequalities, compound inequalities and systems of linear inequalities; interpret solutions in the original context.
A1.A.2.1 Represent relationships in various contexts with linear inequalities; solve the resulting inequalities, graph on a coordinate plane, and interpret the solutions.
A1.A.2.2 Represent relationships in various contexts with compound and absolute value inequalities and solve the resulting inequalities by graphing, and interpreting the solutions on a number line.
A1.A.2.3 Solve systems of linear inequalities with a maximum of two variables; graph and interpret the solutions on a coordinate plane.

A1.A.3 Generate equivalent algebraic expressions and use algebraic properties to evaluate expressions and arithmetic and geometric sequences.
A1.A.3.1 Solve equations involving several variables for one variable in terms of the others.
A1.A.3.2 Simplify polynomial expressions by adding, subtracting, or multiplying.
A1.A.3.3 Factor common monomial factors from polynomial expressions and factor quadratic expressions with a leading coefficient of 1.
A1.A.3.4 Evaluate linear, absolute value, rational, and radical expressions. Include applying a nonstandard operation such as $a \odot b = 2a + b$.
A1.A.3.5 Recognize that arithmetic sequences are linear using equations, tables, graphs, and verbal descriptions. Using the pattern, find the next term.
A1.A.3.6 Recognize that geometric sequences are exponential using equations, tables, graphs and verbal descriptions. Given the formula $f(x) = a(r)^x$, find the next term and define the meaning of a and r within the context of the problem.

A1.A.4 Analyze mathematical change involving linear equations in real-world and mathematical problems.
A1.A.4.1 Calculate and interpret slope and the *x*- and *y*-intercepts of a line using a graph, an equation, two points, or a set of data points to solve real-world and mathematical

Algebra 2 (A2)

various methods and tools that may include factoring, polynomial division, synthetic division, graphing calculators or other appropriate technology.
A2.A.1.5 Solve square root equations with one variable and check for extraneous solutions.
A2.A.1.6 Solve common and natural logarithmic equations using the properties of logarithms.
A2.A.1.7 Solve real-world and mathematical problems that can be modeled using arithmetic or finite geometric sequences or series given the n^{th} terms and sum formulas. Graphing calculators or other appropriate technology may be used.
A2.A.1.8 Represent real-world or mathematical problems using systems of linear equations with a maximum of three variables and solve using various methods that may include substitution, elimination, and graphing (may include graphing calculators or other appropriate technology).
A2.A.1.9 Solve systems of equations containing one linear equation and one quadratic equation using tools that may include graphing calculators or other appropriate technology.

A2.A.2 Represent and analyze mathematical situations and structures using algebraic symbols using various strategies to write equivalent forms of expressions.
A2.A.2.1 Factor polynomial expressions including but not limited to trinomials, differences of squares, sum and difference of cubes, and factoring by grouping using a variety of tools and strategies.
A2.A.2.2 Add, subtract, multiply, divide, and simplify polynomial and rational expressions.
A2.A.2.3 Recognize that a quadratic function has different equivalent representations [$f(x) = ax^2 + bx + c$, $f(x) = a(x - h)^2 + k$, and $f(x) = (x - h)(x - k)$]. Identify and use the representation that is most appropriate to solve real-world and mathematical problems.
A2.A.2.4 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Algebraic Reasoning & Algebra (A)		
Pre-Algebra (PA)	**Algebra 1 (A1)**	**Algebra 2 (A2)**
	problems. **A1.A.4.2** Solve mathematical and real-world problems involving lines that are parallel, perpendicular, horizontal, or vertical. **A1.A.4.3** Express linear equations in slope-intercept, point-slope, and standard forms and convert between these forms. Given sufficient information (slope and *y*-intercept, slope and one-point on the line, two points on the line, *x*- and *y*-intercept, or a set of data points), write the equation of a line. **A1.A.4.4** Translate between a graph and a situation described qualitatively.	
Functions (F)		
Pre-Algebra (PA)	**Algebra 1 (A1)**	**Algebra 2 (A2)**
Strand addressed at other grade levels.	**A1.F.1 Understand functions as descriptions of covariation (how related quantities vary together) in real-world and mathematical problems.** **A1.F.1.1** Distinguish between relations and functions. **A1.F.1.2** Identify the dependent and independent variables as well as the domain and range given a function, equation, or graph. Identify restrictions on the domain and range in real-world contexts. **A1.F.1.3** Write linear functions, using function notation, to model real-world and mathematical situations. **A1.F.1.4** Given a graph modeling a real-world situation, read and interpret the linear piecewise function (excluding step functions). **A1.F.2 Recognize functions and understand that families of functions are characterized by their rate of change.** **A1.F.2.1** Distinguish between linear and nonlinear (including exponential) functions arising from real-world and mathematical situations that are represented in tables, graphs, and equations. Understand that linear functions grow by equal intervals and that exponential functions grow by equal factors over equal intervals. **A1.F.2.2** Recognize the graph of the functions $f(x) = x$ and $f(x) = \|x\|$ and predict the effects of transformations [$f(x + c)$ and $f(x) + c$, where c is a positive or negative constant] algebraically and graphically using various	**A2.F.1 Understand functions as descriptions of covariation (how related quantities vary together).** **A2.F.1.1** Use algebraic, interval, and set notations to specify the domain and range of functions of various types and evaluate a function at a given point in its domain. **A2.F.1.2** Recognize the graphs of exponential, radical (square root and cube root only), quadratic, and logarithmic functions. Predict the effects of transformations [$f(x + c)$, $f(x) + c$, $f(cx)$, and $cf(x)$, where c is a positive or negative real-valued constant] algebraically and graphically, using various methods and tools that may include graphing calculators or other appropriate technology. **A2.F.1.3** Graph a quadratic function. Identify the *x*- and *y*-intercepts, maximum or minimum value, axis of symmetry, and vertex using various methods and tools that may include a graphing calculator o appropriate technology. **A2.F.1.4** Graph exponential and logarithmic functions. Identify asymptotes and *x*- and *y*-intercepts using various methods and tools that may include graphing calculators or other appropriate technology. Recognize exponential decay and growth graphically and algebraically. **A2.F.1.5** Analyze the graph of a polynomial function by identifying the domain, range, intercepts, zeros, relative maxima, relative minima, and intervals of increase and

Functions (F)

Pre-Algebra (PA)	Algebra 1 (A1)	Algebra 2 (A2)
	methods and tools that may include graphing calculators. **A1.F.3 Represent functions in multiple ways and use the representation to interpret real-world and mathematical problems.** **A1.F.3.1** Identify and generate equivalent representations of linear equations, graphs, tables, and real-world situations. **A1.F.3.2** Use function notation; evaluate a function, including nonlinear, at a given point in its domain algebraically and graphically. Interpret the results in terms of real-world and mathematical problems. **A1.F.3.3** Add, subtract, and multiply functions using function notation.	decrease. **A2.F.1.6** Graph a rational function and identify the *x*- and *y*-intercepts, vertical and horizontal asymptotes, using various methods and tools that may include a graphing calculator or other appropriate technology. (Excluding slant or oblique asymptotes and holes.) **A2.F.1.7** Graph a radical function (square root and cube root only) and identify the *x*- and *y*-intercepts using various methods and tools that may include a graphing calculator or other appropriate technology. **A2.F.1.8** Graph piecewise functions with no more than three branches (including linear, quadratic, or exponential branches) and analyze the function by identifying the domain, range, intercepts, and intervals for which it is increasing, decreasing, and constant. **A2.F.2 Analyze functions through algebraic combinations, compositions, and inverses, if they exist.** **A2.F.2.1** Add, subtract, multiply, and divide functions using function notation and recognize domain restrictions. **A2.F.2.2** Combine functions by composition and recognize that $g(x) = f^{-1}(x)$, the inverse function of $f(x)$, if and only if $f\big(g(x)\big) = g\big(f(x)\big) = x$. **A2.F.2.3** Find and graph the inverse of a function, if it exists, in real-world and mathematical situations. Know that the domain of a function f is the range of the inverse function f^{-1}, and the range of the function f is the domain of the inverse function f^{-1}. **A2.F.2.4** Apply the inverse relationship between exponential and logarithmic functions to convert from one form to another.

Data & Probability (D)

Pre-Algebra (PA)	Algebra 1 (A1)	Algebra 2 (A2)
PA.D.1 Display and interpret data in a variety of ways, including using scatterplots and approximate lines of best fit. Use line of best fit and average rate of change to make predictions and draw conclusions about data. **PA.D.1.1** Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Know how to create data displays using a spreadsheet and	**A1.D.1 Display, describe, and compare data. For linear relationships, make predictions and assess the reliability of those predictions.** **A1.D.1.1** Describe a data set using data displays, describe and compare data sets using summary statistics, including measures of central tendency, location, and spread. Know how to use calculators, spreadsheets, or other appropriate	**A2.D.1 Display, describe, and compare data. For linear and nonlinear relationships, make predictions and assess the reliability of those predictions.** **A2.D.1.1** Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve). **A2.D.1.2** Collect data and use scatterplots to analyze patterns and describe linear, exponential or quadratic

Data & Probability (D)		
Pre-Algebra (PA)	**Algebra 1 (A1)**	**Algebra 2 (A2)**
use a calculator to examine this impact. **PA.D.1.2** Explain how outliers affect measures of central tendency. **PA.D.1.3** Collect, display and interpret data using scatterplots. Use the shape of the scatterplot to informally estimate a line of best fit, make statements about average rate of change, and make predictions about values not in the original data set. Use appropriate titles, labels and units. **PA.D.2 Calculate experimental probabilities and reason about probabilities to solve real-world and mathematical problems.** **PA.D.2.1** Calculate experimental probabilities and represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown. **PA.D.2.2** Determine how samples are chosen (random, limited, biased) to draw and support conclusions about generalizing a sample to a population. **PA.D.2.3** Compare and contrast dependent and independent events.	technology to display data and calculate summary statistics. **A1.D.1.2** Collect data and use scatterplots to analyze patterns and describe linear relationships between two variables. Using graphing technology, determine regression lines and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions. **A1.D.1.3** Interpret graphs as being discrete or continuous. **A1.D.2 Calculate probabilities and apply probability concepts.** **A1.D.2.1** Select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities. **A1.D.2.2** Describe the concepts of intersections, unions, and complements using Venn diagrams to evaluate probabilities. Understand the relationships between these concepts and the words AND, OR, and NOT. **A1.D.2.3** Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes. **A1.D.2.4** Apply probability concepts to real-world situations to make informed decisions.	relationships between two variables. Using graphing calculators or other appropriate technology, determine regression equation and correlation coefficients; use regression equations to make predictions and correlation coefficients to assess the reliability of those predictions. **A2.D.1.3** Based upon a real-world context, recognize whether a discrete or continuous graphical representation is appropriate and then create the graph. **A2.D.2 Analyze statistical thinking to draw inferences, make predictions, and justify conclusions.** **A2.D.2.1** Evaluate reports based on data published in the media by identifying the source of the data, the design of the study, and the way the data are analyzed and displayed. Given spreadsheets, tables, or graphs, recognize and analyze distortions in data displays. Show how graphs and data can be distorted to support different points of view. **A2.D.2.2** Identify and explain misleading uses of data. Recognize when arguments based on data confuse correlation and causation.

Reasoning & Logic (G.RL)		
Seventh Grade (7)	**Pre-Algebra (PA)**	**Geometry (G)**
Topic addressed at other grade levels.	Topic addressed at other grade levels.	**G.RL.1 Use appropriate tools and logic to evaluate mathematical arguments.** **G.RL.1.1** Understand the use of undefined terms, definitions, postulates, and theorems in logical arguments/proofs. **G.RL.1.2** Analyze and draw conclusions based on a set of conditions using inductive and deductive reasoning. Recognize the logical relationships between a conditional statement and its inverse, converse, and contrapositive. **G.RL.1.3** Assess the validity of a logical argument and give counterexamples to disprove a statement.
Two-Dimensional Shapes (G.2D)		
Seventh Grade (7)	**Pre-Algebra (PA)**	**Geometry (G)**
7.GM.2 Determine the area of trapezoids and area and perimeter of composite figures. **7.GM.2.1** Develop and use the formula to determine the area of a trapezoid to solve problems. **7.GM.2.2** Find the area and perimeter of composite figures to solve real-world and mathematical problems. **7.GM.4 Analyze the effect of dilations, translations, and reflections on the attributes of two-dimensional figures on and off the coordinate plane**. **7.GM.4.1** Describe the properties of similarity, compare geometric figures for similarity, and determine scale factors resulting from dilations. **7.GM.4.2** Apply proportions, ratios, and scale factors to solve problems involving scale drawings and determine side lengths and areas of similar triangles and rectangles. **7.GM.4.3** Graph and describe translations and reflections of figures on a coordinate plane and determine the coordinates of the vertices of the figure after the transformation.	Topic addressed at other grade levels.	**G.2D.1 Discover, evaluate, and analyze the relationships between lines, angles, and polygons to solve real-world and mathematical problems; express proofs in a form that clearly justifies the reasoning, such as two-column proofs, paragraph proofs, flow charts, or illustrations.** **G.2D.1.1** Apply the properties of parallel and perpendicular lines, including properties of angles formed by a transversal, to solve real-world and mathematical problems and determine if two lines are parallel, using algebraic reasoning and proofs. **G.2D.1.2** Apply the properties of angles, including corresponding, exterior, interior, vertical, complementary, and supplementary angles to solve real-world and mathematical problems using algebraic reasoning and proofs. **G.2D.1.3** Apply theorems involving the interior and exterior angle sums of polygons and use them to solve real-world and mathematical problems using algebraic reasoning and proofs. **G.2D.1.4** Apply the properties of special quadrilaterals (square, rectangle, trapezoid, isosceles trapezoid, rhombus, kite, parallelogram) and use them to solve real-world and mathematical problems involving angle measures and segment lengths using algebraic reasoning and proofs. **G.2D.1.5** Use coordinate geometry to represent and

		analyze line segments and polygons, including determining lengths, midpoints, and slopes of line segments. **G.2D.1.6** Apply the properties of polygons to solve real-world and mathematical problems involving perimeter and area (e.g., triangles, special quadrilaterals, regular polygons up to 12 sides, composite figures). **G.2D.1.7** Apply the properties of congruent or similar polygons to solve real-world and mathematical problems using algebraic and logical reasoning. **G.2D.1.8** Construct logical arguments to prove triangle congruence (SSS, SAS, ASA, AAS and HL) and triangle similarity (AA, SSS, SAS). **G.2D.1.9** Use numeric, graphic and algebraic representations of transformations in two dimensions, such as reflections, translations, dilations, and rotations about the origin by multiples of 90˚, to solve problems involving figures on a coordinate plane and identify types of symmetry.
Three-Dimensional Shapes (G.3D)		
Seventh Grade (7)	**Pre-Algebra (PA)**	**Geometry (G)**
7.GM.1 Develop and understand the concept of surface area and volume of rectangular prisms. **7.GM.1.1** Using a variety of tools and strategies, develop the concept that surface area of a rectangular prism with rational-valued edge lengths can be found by wrapping the figure with same-sized square units without gaps or overlap. Use appropriate measurements such as cm^2. **7.GM.1.2** Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms with rational-valued edge lengths can be found by counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements such as cm^3.	**PA.GM.2 Calculate surface area and volume of three-dimensional figures.** **PA.GM.2.1** Calculate the surface area of a rectangular prism using decomposition or nets. Use appropriate measurements such as cm^2. **PA.GM.2.2** Calculate the surface area of a cylinder, in terms of π and using approximations for π, using decomposition or nets. Use appropriate measurements such as cm^2. **PA.GM.2.3** Develop and use the formulas $V = lwh$ and $V = Bh$ to determine the volume of rectangular prisms. Justify why base area (B) and height (h) are multiplied to find the volume of a rectangular prism. Use appropriate measurements such as cm^3. **PA.GM.2.4** Develop and use the formulas $V = \pi r^2 h$ and $V = Bh$ to determine the volume of right cylinders, in terms of π and using approximations for π. Justify why base area (B) and height (h) are multiplied to find the volume of a right cylinder. Use appropriate measurements such as cm^3.	**G.3D.1 Solve real-world and mathematical problems involving three-dimensional figures.** **G.3D.1.1** Solve real-world and mathematical problems using the surface area and volume of prisms, cylinders, pyramids, cones, spheres, and composites of these figures. Use nets, measuring devices, or formulas as appropriate. **G.3D.1.2** Use ratios derived from similar three-dimensional figures to make conjectures, generalize, and to solve for unknown values such as angles, side lengths, perimeter or circumference of a face, area of a face, and volume.

Circles (G.C)

Seventh Grade (7)	Pre-Algebra (PA)	Geometry (G)
7.GM.3 Use reasoning with proportions and ratios to determine measurements, justify formulas, and solve real-world and mathematical problems involving circles and related geometric figures. **7.GM.3.1** Demonstrate an understanding of the proportional relationship between the diameter and circumference of a circle and that the unit rate (constant of proportionality) is π and can be approximated by rational numbers such as $\frac{22}{7}$ and 3.14. **7.GM.3.2** Calculate the circumference and area of circles to solve problems in various contexts, in terms of π and using approximations for π.	Topic addressed at other grade levels.	**G.C.1 Solve real-world and mathematical problems using the properties of circles.** **G.C.1.1** Apply the properties of circles to solve problems involving circumference and area, approximate values and in terms of π, using algebraic and logical reasoning. **G.C.1.2** Apply the properties of circles and relationships among angles; arcs; and distances in a circle among radii, chords, secants and tangents to solve problems using algebraic and logical reasoning. **G.C.1.3** Recognize and write the radius r, center (h, k), and standard form of the equation of a circle $(x-h)^2 + (y-k)^2 = r^2$ with and without graphs. **G.C.1.4** Apply the distance and midpoint formula, where appropriate, to develop the equation of a circle in standard form.

Right Triangle Trigonometry (G.RT)

Seventh Grade (7)	Pre-Algebra (PA)	Geometry (G)
Topic addressed at other grade levels.	**PA.GM.1 Solve problems involving right triangles using the Pythagorean Theorem.** **PA.GM.1.1** Informally justify the Pythagorean Theorem using measurements, diagrams, or dynamic software and use the Pythagorean Theorem to solve problems in two and three dimensions involving right triangles. **PA.GM.1.2** Use the Pythagorean Theorem to find the distance between any two points in a coordinate plane.	**G.RT.1 Develop and verify mathematical relationships of right triangles and trigonometric ratios to solve real-world and mathematical problems.** **G.RT.1.1** Apply the distance formula and the Pythagorean Theorem and its converse to solve real-world and mathematical problems, as approximate and exact values, using algebraic and logical reasoning (include Pythagorean Triples). **G.RT.1.2** Verify and apply properties of right triangles, including properties of 45-45-90 and 30-60-90 triangles, to solve problems using algebraic and logical reasoning. **G.RT.1.3** Use the definition of the trigonometric functions to determine the sine, cosine, and tangent ratio of an acute angle in a right triangle. Apply the inverse trigonometric functions to find the measure of an acute angle in right triangles. **G.RT.1.4** Apply the trigonometric functions as ratios (sine, cosine, and tangent) to find side lengths in right triangles in real-world and mathematical problems.

OKLAHOMA ACADEMIC STANDARDS

ENGLISH LANGUAGE ARTS

OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

Table of Contents: Oklahoma Academic Standards for English Language Arts

OKLAHOMA ENGLISH LANGUAGE ARTS STANDARDS GUIDING PRINCIPLES

Teachers use standards as guides for developing curriculum and instruction that is appropriately engaging, challenging, and sequenced for the students in their care. By nature, acquiring language arts knowledge and skills is a recursive learning endeavor: students revisit concepts again and again as they use language at increasingly sophisticated levels. Because of this recursive learning process, language arts learning will not progress for students in the strictly linear way it may in other content areas. Nonetheless, it is important for any set of standards to provide "concise, written descriptions of what students are expected to know and be able to do at a specific stage of their education" (Great Schools Partnership, 2014). In order to make this document a clear, coherent description of what students are expected to know and be able to do at specific stages, the writers have adopted some guidelines for design and organization.

Clarity

- ★ Standard statements are written with verbs that indicate specifically what learning students must demonstrate and at what depth. When students *defend, compare, estimate, paraphrase, predict,* or *summarize,* they are able to show a broader range of mastery of a concept than when they are expected to *identify, recognize,* or *recall*. However, the writers also have given full consideration to the complexity of the content itself. For example, it is more challenging to identify the implied theme of an extended essay than to identify the subject of a sentence. The progression of language arts learning from pre-kindergarten through high school should reflect a grade-level appropriate relationship between the level of critical thinking students use and the actual listening, speaking, reading, and writing experiences students have.
- ★ Content to be emphasized and assessed at specific grade levels (e.g., modes of writing or particular elements of grammar) is clearly identified.
- ★ Definitions for terms used in the standards document are compiled in an updated, expanded glossary.

Coherence

- ★ Eight overarching standards, the College- and Career- Ready English Language Arts standards, identify the knowledge and skills of the discipline that PK-12 students are to learn; each standard for every grade is delineated at the appropriate level.
- ★ A PK-12 vertical progression of standards, organized by the eight overarching standards, allows for educators to recognize how all the standards are intertwined to develop the total literacy of a student. When a skill is no longer present, mastery is implied; however, teachers must support previous grade level skills according to the mastery level of their students. This grade-to-grade, standard-by-standard progression can be viewed in a horizontal format, organized into overlapping grade bands.
- ★ Users must examine all of the standards for each grade level as a whole to have a coherent understanding of what is required of learners.
- ★ Because of the interconnectedness of language arts concepts and skills, various aspects of what students know and can do may be described in more than one standard. For example, learners conducting research (Standard 6) should use speaking and listening (Standard 1), the reading and writing processes (Standard 2), academic vocabulary (Standard 4), critical reading and writing (Standard 3), formal grammar and usage (Standard

5), and more than likely, they will access research and complete their research products because they are competent in multimodal literacies (Standard 7).

★ As students progress through grade levels, expectations encompass the content of the previous grades. Specifically in connection to reading assignments, the complexity of texts increases as students advance to later grades; however, simpler texts can be used effectively in order for learners to develop a deeper understanding of content (as examples – theme, figurative language, genre, structure).

Purpose

In addition to a commitment to clear and coherent standards, the writers were guided by four fundamental purposes of English language arts education.

★ All learners must hear the voices of their own heritage in the literature they encounter. They must be given the opportunity to speak with the voices they choose for themselves in the writing they create. The language arts classroom is a place that is inclusive of race, ethnicity, culture, and all perspectives that reflect the richness of human experience.

★ All learners are supported to become independent readers in a range of disciplines. The ability to interpret literature as well as informative, highly technical, and often lengthy reading passages on one's own is paramount in achieving academic and career success. Furthermore, learners who possess the skills required to read independently have the power to choose both what they *need* and what they *want* to read.

★ All learners are supported to become independent writers for a variety of audiences and a range of purposes. Four- and five-year-olds begin writing by verbally telling their ideas and stories to others, but their status as independent writers is not earned with mastery of the five-paragraph essay form in high school. Independent writers are able to access multiple strategies and formats to communicate and craft the message so that it resonates with any readers they want to reach.

★ A literate citizenry possesses the skills required to analyze, evaluate, act upon, and compose a wide range of communications. An ultimate goal of language arts education is the development of informed citizens who can contribute to the common good.

OKLAHOMA COLLEGE- AND CAREER-READY ENGLISH LANGUAGE ARTS STUDENTS

The following eight standards encompass the content and competencies of English language arts. Each standard reflects both reading and writing applications, as these processes are bound together in the literate world.

The order of the standards is meant to suggest that students learn to read and write by speaking and listening on their way to the ultimate goal of becoming independent, critical readers and writers. At the same time, speaking and listening skills will continue to be developed as students progress through the grade levels, and concepts of independent reading and writing will be introduced even in the earliest grades.

Independent reading and writing is a natural outgrowth of strong standards implementation through rigorous curriculum. Standard 8 addresses the integrated nature of English language arts and acknowledges students' need to grow increasingly independent for college and career readiness. Being able to work independently and seek out opportunities to read and write is a significant part of life-long learning. These skills easily transfer to test taking, civic engagement, and citizen participation.

Standard 1: Speaking and Listening
Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

Standard 2: Reading Foundations/Reading Process and Writing Process
Students will develop foundational skills for future reading success by working with sounds, letters, and text. Students will use recursive processes when reading and writing.

Standard 3: Critical Reading and Writing
Students will apply critical thinking skills to reading and writing.

Standard 4: Vocabulary
Students will expand their working vocabularies to effectively communicate and understand texts.

Standard 5: Language
Students will apply knowledge of grammar and rhetorical style to reading and writing.

Standard 6: Research
Students will engage in inquiry to acquire, refine, and share knowledge.

Standard 7: Multimodal Literacies
Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

Standard 8: Independent Reading and Writing
Students will read and write for a variety of purposes including, but not limited to, academic and personal, for extended periods of time.

OKLAHOMA ENGLISH LANGUAGE ARTS STANDARDS GUIDING RESEARCH

Well-recognized guiding research in language arts upholds Oklahoma's Eight CCR Standards as a whole, especially the standards' emphasis on the reciprocal relationship between reading and writing: we read what others have written and write to create reading for audiences beyond ourselves. This guiding research deserves expanded commentary.

READING FOUNDATIONS

The International Literacy Association (ILA) and the Report of the Subgroups of the National Reading Panel have identified important components of reading. Foundational reading skills are included within Standard 2: Reading Process.

PRINT CONCEPTS - the ability to understand distinguishing features of print, including knowing that the print on the page contains a message, that print contains words that can be read aloud, that print has a distinct "right side up," and that words are read from left to right.

PHONOLOGICAL/PHONEMIC AWARENESS - the understanding that words and syllables can be broken down into smaller units or phonemes is a strong predictor of later reading success.

PHONICS/DECODING - instruction that provides students with a consistent strategy to apply knowledge of sound-symbol relationships to assist them in identifying unfamiliar words.

VOCABULARY – a comprehension that a reader's understanding of text is inextricably linked to his or her vocabulary base that can be developed through reading, direct instruction, and student-centered activities.

READING FLUENCY – a recognition that fluent reading is characterized by reading words with automaticity and expression and recognizing words with speed, accuracy, and prosody; such automatic word recognition frees a student's attention to comprehend the text.

COMPREHENSION/CRITICAL LITERACY – a recognition that the goal of reading is understanding text by establishing a purpose for reading and determining what is literal and what is implied in the text. Critical literacy involves the reader being able to make connections between parts of a text and between texts. In addition to these foundational components, skilled reading is influenced by the development of motivation and engagement, attitude, and stance toward reading and writing and the process of interacting with text before, during and after reading.

MOTIVATION and ENGAGEMENT - readers' desire to interact with a text, influenced by their own self-efficacy as well as the genre, text level, author, illustrator, or topic of a text. The reader's engagement with text may be influenced by motivation to interact with a specific text.

ATTITUDE - a reader's attitude toward reading for academic or leisure purposes influences the probability that he/she will choose to become engaged in the reading process.

STANCE - whether a reader is approaching a text for pleasure or for information.

READING PROCESS - the importance of a reader being involved with the text before (setting a purpose for reading), during (reading, monitoring comprehension, investigating terms he/she does not understand), and after (referring back to the text to strengthen one's understanding, answer questions, engage in discussions and complete projects) reading.

WRITING PROCESS

The National Council of Teachers of English (NCTE) has identified a process, confirmed by research, that skilled writers use to create text. Because writing is recursive, the stages of the process may not occur in a linear sequence, but the writer may revert to an activity characteristic of an earlier stage. The stages of the writing process include –

PREWRITING - preparing to write by gathering and organizing ideas, generating a topic, and clarifying purpose, audience, and form.

DRAFTING - putting ideas down on paper with a focus on content while using notes or ideas generated during prewriting, without over-concern about adherence to grammatical rules, spelling, or mechanics.

REVISING - refining of content, not mechanics. Revision begins during the prewriting activity and continues through the final draft, as writers think again about the choices made for content and add, delete, or rearrange the material. Skilled writers may revise a draft several times, accepting suggestions for improvement from peers and teachers in addition to self-critique.

EDITING – making writing suitable for publication, including the correction of errors in punctuation, capitalization, spelling, usage, sentence structure, and legibility so that errors in conventions do not interfere with an audience's ability to understand the message.

PUBLISHING - sharing the writer's product with and/or being evaluated by the intended audience, or readers in general. An authentic audience, one with whom the students want to communicate, is necessary for effective writing. It is important to note that not every piece that a writer begins will be carried through the entire writing process and polished for publication. However, each student should be expected to develop some pieces of writing thoroughly enough to be published. Publishing reinforces the knowledge that writing is an act of communication.

MULTIMODAL LITERACIES

The Multimodal Literacies advanced from the Oklahoma *Priority Academic Student Skills'* Visual Literacy standard.

Text in the twenty-first century is not limited to print. Increasingly, texts are composites of print, images, sound, video, charts, and interactive links. Students need to know how to interpret and produce these kinds of texts for college, career, and informed citizenship. A statement by the NCTE Executive Committee (February 2013) confirms,

> ... the 21st century demands that a literate person possess a wide range of abilities and competencies, many literacies. These literacies are multiple, dynamic, and malleable. As in the past, they are inextricably linked with particular histories, life possibilities, and social trajectories of individuals and groups. Active, successful participants in this 21st century global society must be able to
>
> - develop proficiency and fluency with the tools of technology;
> - build intentional cross-cultural connections and relationships with others so as to pose and solve problems collaboratively and strengthen independent thought;
> - design and share information for global communities to meet a variety of purposes;
> - manage, analyze, and synthesize multiple streams of simultaneous information; create, critique, analyze, and evaluate multimedia texts; and
> - attend to the ethical responsibilities required by these complex environments.

The committee asserts,

> The use of multimodal literacies has expanded the ways we acquire information and understand concepts. Ever since the days of illustrated books and maps texts have included visual elements for the purpose of imparting information. The contemporary difference is the ease with which we can combine words, images, sound, color, animation, video, and styles of print in projects so that they are part of our everyday lives and, at least by our youngest generation, often taken for granted.

What this means for teaching

The techniques of acquiring, organizing, evaluating, and creatively using multimodal information should become an increasingly important component of the English language arts classroom (November 2005).

Further Support

A large body of research has been consulted for each of Oklahoma's Eight College- and Career- Ready Standards; these sources are provided in a complete bibliography which can be accessed on the Oklahoma Department of Education's English Language Arts Standards webpage.

OKLAHOMA ENGLISH LANGUAGE ARTS EIGHT OVERARCHING STANDARDS IN READING AND WRITING

Academic standards establish objective performance criteria. They are used as guides for developing curriculum and instruction that is appropriately engaging, challenging, and sequenced for students. Acquiring language arts knowledge and skills is a recursive learning endeavor. Students need to revisit concepts as they develop language arts acumen at increasingly higher levels of complexity.

The eight overarching standards reinforce the recursive nature of the language arts, a non-linear process that involves the continuous and thoughtful refinement of concepts and skills. In each of the eight overarching English language arts standards, concepts and skills are expressed in terms of both reading and writing, intended to support integrated, rather than isolated, reading/writing instruction. Research supports this integrated model of English language arts, where students read to understand the meaning and composition of a text and write with readers' expectations and assumptions in mind.

ENGLISH LANGUAGE ARTS COLLEGE- AND CAREER- STANDARDS

Standard 1: Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

Reading	Writing
Students will develop and apply effective communication skills through speaking and active listening.	Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.

Standard 2: Reading Foundations/Reading and Writing Process - Students will develop foundational skills for future reading success by working with sounds, letters, and text. Students will use a variety of recursive reading and writing processes.

Reading	Writing
Students will read and comprehend increasingly complex literary and informational texts.	Students will develop and strengthen writing by engaging in a recursive process that includes prewriting, drafting, revising, editing, and publishing.

Standard 3: Critical Reading and Critical Writing - Students will apply critical thinking skills to reading and writing.

Reading	Writing
Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.	Students will write for varied purposes and audiences in all modes, using fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice.

Standard 4: Vocabulary - Students will expand their working vocabularies to effectively communicate and understand texts.

Reading
Students will expand academic, domain-appropriate, grade-level vocabularies through reading, word study, and class discussion.

Writing
Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.

Standard 5: Language - Students will apply knowledge of grammar and rhetorical style to reading and writing.

Reading
Students will apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts.

Writing
Students will demonstrate command of Standard English grammar, mechanics, and usage through writing and other modes of communication.

Standard 6: Research - Students will engage in inquiry to acquire, refine, and share knowledge.

Reading
Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.

Writing
Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.

Standard 7: Multimodal Literacies - Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

Reading
Students will evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments.

Writing
Students will create multimodal texts to communicate knowledge and develop arguments.

Standard 8: Independent Reading and Writing - Students will read and write for a variety of purposes including, but not limited to, academic and personal, for extended periods of time.

Reading
Students will read independently for a variety of purposes and for extended periods of time. Students will select appropriate texts for specific purposes.

Writing
Students will write independently for extended periods of time. Students will vary their modes of expression to suit audience and task.

Navigating the Vertical Alignment

Overarching Oklahoma College- and Career- Ready Standard for English Language Arts

1: Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

	5th Grade	6th Grade	7th Grade
Reading Students will develop and apply effective communication skills through speaking and active listening.	**5.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with awareness of verbal and nonverbal cues. **5.1.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding. **5.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.	**6.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with awareness of verbal and nonverbal cues. **6.1.R.2** Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **6.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.	**7.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with awareness and control of verbal and nonverbal cues. **7.1.R.2** Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **7.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
Writing Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.	**5.1.W.1** Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content for audience. **5.1.W.2** Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.	**6.1.W.1** Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content and purpose for audience. **6.1.W.2** Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.	**7.1.W.1** Students will give formal and informal presentations in a group or individually, providing evidence to support a main idea. **7.1.W.2** Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.

Oklahoma Academic Standards for English Language Arts | 15

Vertical Grade-level Progressions

Recursive Reading and Writing Strands with Guiding Principles

Standard Objectives delineated for each grade and vertically aligned

Standard Code

Grade . Standard Number . Strand . Objective

Instructional Design Considerations

EIGHT CONSISTENT STANDARDS

The standards were developed with consideration to teachers and curriculum designers. **Rich units of study can be designed by incorporating each of the eight overarching standards.** Further grade-specific guidance is provided in the Reading and Writing strands.

READING and WRITING STRANDS

The standards were designed to develop the total literacy of students by intentionally taking into consideration what they do when reading and writing. **Every standard includes a reading and writing strand with standard objectives delineated by grade-level.**

Reading instruction supports the development and refinement of writing skills. Writing instruction supports the development and refinement of reading skills.

RECURSIVE TEACHING and LEARNING

Teaching and learning language arts is a recursive endeavor: students will revisit concepts again and again as they use language at increasingly sophisticated levels. **Skills are repeated with an implied expectation that they are attributed to increasingly more complex texts.**

Because of this recursive learning process, language arts learning does not progress for students in a strictly linear way.

Oklahoma ELA standards are not taught in isolation. Standards can be bundled for educators to develop grade-appropriate lessons, tasks, and assessments.

Standard 1

Speaking and Listening

Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

Reading

Students will develop and apply effective communication skills through speaking and active listening.

Writing

Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.

1: Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will develop and apply effective communication skills through speaking and active listening.	**PK.1.R.1** Students will actively listen and speak using agreed-upon rules with guidance and support. **PK.1.R.2.** Students will begin to ask and answer questions about information presented orally or through text or other media with guidance and support. **PK.1.R.3** Students will begin to engage in collaborative discussions about appropriate topics and texts with peers and adults in small and large groups with guidance and support. **PK.1.R.4** Students will follow simple oral directions.	**K.1.R.1** Students will actively listen and speak using agreed-upon rules for discussion with guidance and support. **K.1.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally or through text or other media with guidance and support. **K.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts with peers and adults in small and large groups with guidance and support. **K.1.R.4** Students will follow one and two step directions.	**1.1.R.1** Students will actively listen and speak using agreed-upon rules for discussion. **1.1.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media, to confirm understanding. **1.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts with peers and adults in small and large groups. **1.1.R.4** Students will restate and follow simple two-step directions.
Writing Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.	**PK.1.W.1** Students will begin to orally describe personal interests or tell stories to classmates with guidance and support. **PK.1.W.2** Students will work respectfully with others with guidance and support.	**K.1.W.1** Students will orally describe personal interests or tell stories, facing the audience and speaking clearly in complete sentences and following implicit rules for conversation, including taking turns and staying on topic. **K.1.W.2** Students will work respectfully with others with guidance and support.	**1.1.W.1** Students will orally describe people, places, things, and events with relevant details expressing their ideas. **1.1.W.2** Students will work respectfully in groups.

1: Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

	2nd Grade	3rd Grade	4th Grade
Reading Students will develop and apply effective communication skills through speaking and active listening.	**2.1.R.1** Students will actively listen and speak using appropriate discussion rules. **2.1.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally, through text or other media to confirm understanding. **2.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts with peers and adults in small and large groups. **2.1.R.4** Students will restate and follow multi-step directions.	**3.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules. **3.1.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding. **3.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly in pairs, diverse groups, and whole class settings.	**4.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules. **4.1.R.2** Students will ask and answer questions to seek help, get information, or clarify information presented orally through text or other media to confirm understanding. **4.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
Writing Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.	**2.1.W.1** Students will report on a topic or text, tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences. **2.1.W.2** Students will work respectfully within groups, share responsibility for collaborative work, and value individual contributions made by each group member.	**3.1.W.1** Students will report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences at an appropriate pace. **3.1.W.2** Students will work respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.	**4.1.W.1** Students will report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences at an appropriate pace. **4.1.W.2** Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.

1: Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

	5th Grade	6th Grade	7th Grade
Reading Students will develop and apply effective communication skills through speaking and active listening.	**5.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with awareness of verbal and nonverbal cues. **5.1.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding. **5.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.	**6.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with awareness of verbal and nonverbal cues. **6.1.R.2** Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **6.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.	**7.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with awareness and control of verbal and nonverbal cues. **7.1.R.2** Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **7.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
Writing Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.	**5.1.W.1** Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content for audience. **5.1.W.2** Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.	**6.1.W.1** Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content and purpose for audience. **6.1.W.2** Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.	**7.1.W.1** Students will give formal and informal presentations in a group or individually, providing evidence to support a main idea. **7.1.W.2** Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.

1: Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will develop and apply effective communication skills through speaking and active listening.	**8.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with control of verbal and nonverbal cues. **8.1.R.2** Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **8.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.	**9.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with control of verbal and nonverbal cues. **9.1.R.2** Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **9.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.	**10.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with control of verbal and nonverbal cues. **10.1.R.2** Students will actively listen and evaluate, analyze, and synthesize a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **10.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
Writing Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.	**8.1.W.1** Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea. **8.1.W.2** Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.	**9.1.W.1** Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea. **9.1.W.2** Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.	**10.1.W.1** Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea. **10.1.W.2** Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.

1: Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.

	11th Grade - English III	12th Grade - English IV
Reading Students will develop and apply effective communication skills through speaking and active listening.	**11.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with control of verbal and nonverbal cues. **11.1.R.2** Students will actively listen and evaluate, analyze, and synthesize a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **11.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas by contributing to, building on, and questioning the ideas of others in pairs, diverse groups, and whole class settings.	**12.1.R.1** Students will actively listen and speak clearly using appropriate discussion rules with control of verbal and nonverbal cues. **12.1.R.2** Students will actively listen and evaluate, analyze, and synthesize a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective. **12.1.R.3** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas by contributing to, building on, and questioning the ideas of others in pairs, diverse groups, and whole class settings.
Writing Students will develop and apply effective communication skills through speaking and active listening to create individual and group projects and presentations.	**11.1.W.1** Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea. **11.1.W.2** Students will work effectively and respectfully within diverse groups, demonstrate willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.	**12.1.W.1** Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea. **12.1.W.2** Students will work effectively and respectfully within diverse groups, demonstrate willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.

Standard 2:

Reading Foundations

Students will develop foundational skills for future reading success by working with sounds, letters, and text.

Phonological Awareness
Phonological awareness is the ability to recognize, think about, and manipulate sounds in spoken language without using text.
pg. 20

Print Concepts
Students will demonstrate their understanding of the organization and basic features of print, including book handling skills and the understanding that printed materials provide information and tell stories.
pg. 22

Phonics and Word Study
Students will decode and read words in context and isolation by applying phonics and word analysis skills.
pg. 24

Fluency
Students will recognize high-frequency words and read grade-level text smoothly and accurately, with expression that connotes comprehension.
pg. 26

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	Pre-Kindergarten	Kindergarten	1st Grade
Phonological Awareness Phonological awareness is the ability to recognize, think about, and manipulate sounds in spoken language without using text.	**PK.2.PA.1** Students will distinguish spoken words in a sentence with guidance and support. **PK.2.PA.2** Students will recognize spoken words that rhyme. **PK.2.PA.3** Students will begin to recognize syllables in spoken words *(e.g., sunshine= sun + shine).* **PK.2.PA.4** Students will begin to isolate initial and final sounds in spoken words. **PK.2.PA.5** Students will begin to recognize initial sounds in a set of spoken words (*i.e., alliteration*). **PK.2.PA.6** Students will combine onsets and rimes to form familiar one syllable spoken words with pictorial support (*e.g., /c/ + at = cat).*	**K.2.PA.1** Students will distinguish spoken words in a sentence. **K.2.PA.2** Students will recognize and produce pairs of rhyming words, and distinguish them from non-rhyming pairs. **K.2.PA.3** Students will isolate and pronounce the same initial sounds in a set of spoken words *(i.e., alliteration*) (*e.g., "the puppy pounces"*). **K.2. PA.4** Students will recognize the short or long vowel sound in one syllable words. **K.2.PA.5** Students will count, pronounce, blend, segment, and delete syllables in spoken words. **K.2.PA.6** Students will blend and segment onset and rime in one syllable spoken words *(e.g., Blending: /ch/ + at = chat; segmenting: cat = /c/+ at).* **K.2.PA.7** Students will blend phonemes to form one syllable spoken words with 3 to 5 phonemes *(e.g., /f/ /a/ /s/ /t/= fast)* **K.2.PA.8** Students will segment phonemes in one syllable spoken words with 3 to 5 phonemes *(e.g., "fast" = /f/ /a/ /s/ /t/).* **K.2.PA.9** Students will add, delete, and substitute phonemes in one syllable spoken words *(e.g., "add /c/ to the beginning of "at" to say "cat;" "remove the /p/ from "pin," to say "in;" "change the /d/ in "dog" to /f/ /r/ to say "frog").*	**1.2.PA.1** Students will blend and segment onset and rime in spoken words *(e.g., /ch/+ /at/ = chat).* **1.2.PA.2** Students will differentiate short from long vowel sounds in one syllable words. **1.2.PA.3** Students will isolate and pronounce initial, medial, and final sounds in spoken words. **1.2.PA.4** Students will blend phonemes to form spoken words with 4 to 6 phonemes*)* including consonant blends *(e.g., /s/ /t/ /r/ /i/ /ng/=string).* **1.2.PA.5** Students will segment phonemes in spoken words with 4 to 6 phonemes into individual phonemes *(e.g. string= /s/ /t/ /r/ /i/ /ng/).* **1.2.PA.6** Students will add, delete, and substitute phonemes in spoken words *(e.g., "add /g/ to the beginning of low to say 'glow;' "remove the /idge/ from 'bridge,' to say 'br;' "change the /ar/ in 'charm' to /u/ to say 'chum').*

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	2nd Grade	3rd Grade	4th Grade
Phonological Awareness Phonological awareness is the ability to recognize, think about, and manipulate sounds in spoken language without using text.	***Students will continue to review and apply earlier grade level expectations for this standard.*** ***If phonological awareness skills are not mastered, students will address skills from previous grades.***		

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	Pre-Kindergarten	Kindergarten	1st Grade
Print Concepts Students will demonstrate their understanding of the organization and basic features of print, including book handling skills and the understanding that printed materials provide information and tell stories.	**PK.2.PC.1** Students will write the majority of the letters in their first name and some uppercase and lowercase letters with guidance and support. **PK.2.PC.2** Students will understand that print carries a message by recognizing labels, signs, and other print in the environment with guidance and support. **PK.2.PC.3** Students will begin to demonstrate correct book orientation and identify the front and back covers of a book. **PK.2.PC.4** Students will recognize that written words are made up of letters and are separated by spaces with guidance and support. **PK.2.PC.5** Students will begin to understand that print moves from top to bottom, left to right, and front to back. **PK.2.PC.6** Students will recognize ending punctuation marks in print during shared reading or other text experiences with guidance and support.	**K.2.PC.1** Students will correctly form letters to write their first and last name and most uppercase and lowercase letters correctly. **K.2.PC.2** Students will demonstrate their understanding that print carries a message by recognizing labels, signs, and other print in the environment. **K.2.PC.3** Students will demonstrate correct book orientation and identify the title, title page, and the front and back covers of a book. **K.2.PC.4** Students will recognize that written words are made up of letters and are separated by spaces. **K.2.PC.5** Students will recognize that print moves from top to bottom, left to right, and front to back (does not have to be matched to voice). **K.2.PC.6** Students will recognize the distinguishing features of a sentence. *(e.g., capitalization of the first word, ending punctuation: period, exclamation mark, question mark)* with guidance and support.	**1.2.PC.1** Students will correctly form letters and use appropriate spacing for letters, words, and sentences using left-to-right and top-to-bottom progression. **1.2.PC.2** Students will recognize the distinguishing features of a sentence *(e.g., capitalization of the first word, ending punctuation,comma, quotation marks)*. --- ***Students will continue to review and apply earlier grade level expectations for this standard.*** ***If print concepts skills are not mastered, students will address skills from previous grades.***

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	2nd Grade	3rd Grade	4th Grade
Print Concepts Students will demonstrate their understanding of the organization and basic features of print, including book handling skills and the understanding that printed materials provide information and tell stories.	**2.2.PC** Students will correctly form letters in print and use appropriate spacing for letters, words, and sentences.	**3.2.PC** Students will correctly form letters in print and cursive and use appropriate spacing for letters, words, and sentences.	**4.2.PC** Students will correctly form letters in print and cursive and use appropriate spacing for letters, words, and sentences.
	Students will continue to review and apply earlier grade level expectations for this standard. ***If print concepts skills are not mastered, students will address skills from previous grades.***		

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	Pre-Kindergarten	Kindergarten	1st Grade

Phonics and Word Study
Students will decode and read words in context and isolation by applying phonics and word analysis skills.
	PK.2.PWS.1 Students will name the majority of the letters in their first name and many uppercase and lowercase letters with guidance and support.	**K.2.PWS.1** Students will name all uppercase and lowercase letters.	**1.2.PWS.1** Students will decode phonetically regular words by using their knowledge of:
			• single consonants *(e.g., c = /k/, c = /s/, s = /s/, s = /z/, x = /ks/, x = /z/)*
			• consonant blends *(e.g., bl, br, cr)*
			• consonant digraphs and trigraphs *(e.g., sh-, -tch)*
			• vowel sounds:
			  ○ long
			  ○ short
			• r-controlled vowels *(e.g., ar, er, ir or, ur)*
			• vowel spelling patterns:
			  ○ vowel digraphs *(e.g., ea, oa, ee)*
			  ○ vowel-consonant-silent-e *(e.g., lake)*

	PK.2.PWS.2 Students will produce some sounds represented by letters with guidance and support.	**K.2.PWS.2** Students will sequence the letters of the alphabet.	**1.2.PWS.2** Students will decode words by applying knowledge of structural analysis: • most major syllable patterns *(e.g., closed, open, vowel team, vowel silent e, r-controlled)* • inflectional endings *(e.g., -s, -ed, -ing)* • compound words • contractions
		K.2.PWS.3 Students will produce the primary or most common sound for each consonant, short and long vowel sounds *(e.g., c = /k/, c = /s/, s = /s/, s = /z/, x = /ks/, x = /z/).* **K.2.PWS.4** Students will blend letter sounds to decode simple *Vowel / Consonant (VC)* and *Consonant / Vowel / Consonant (CVC)* words *(e.g., VC words= at, in, up; CVC words = pat, hen, lot).*	**1.2.PWS.3** Students will read words in common word families *(e.g., -at, -ab, -am, -in).*

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	2nd Grade	3rd Grade	4th Grade

Phonics and Word Study
Students will decode and read words in context and isolation by applying phonics and word analysis skills.
	2.2.PWS.1 Students will decode one- and two- syllable words by using their knowledge of:
	• single consonants, including those with two different sounds *(e.g., soft and hard c [cent, cat] and g [gem,goat])*
	• consonant blends *(e.g., bl, br, cr)*
	• consonant digraphs and trigraphs *(e.g., sh-, -tch)*
	• vowel sounds:
	  ○ long
	  ○ short
	  ○ "r" controlled vowels *(e.g., ar, er, ir or, ur)*
	• vowel spelling patterns:
	  ○ vowel digraphs *(e.g., ea, oa, ee)*
	  ○ vowel-consonant-silent-e *(e.g., lake)*
	  ○ vowel diphthongs *(vowel combinations having two vowel sounds e.g., oi as in boil, oy as in boy]*
		3.2.PWS.1 Students will decode multisyllabic words using their knowledge of:
		• "r" controlled vowels (*e.g., ar, er, ir or, ur)*
		• vowel diphthongs *(vowel combinations having two vowel sounds e.g., oi as in boil, oy as in boy]*
			4.2.PWS.1 Students will use their combined knowledge of letter-sound correspondences, syllable patterns, morphology and semantics to accurately read unfamiliar words, including multisyllabic words.

	2.2.PWS.2 Students will decode words by applying knowledge of structural analysis: • all major syllable patterns *(e.g., closed, consonant +le, open, vowel team, vowel silent e, r-controlled)* • inflectional endings *(e.g., -s, -ed, -ing)* • compound words • contractions • abbreviations • common roots and related prefixes and suffixes	**3.2.PWS.2** Students will decode multisyllabic words by applying knowledge of structural analysis: • all major syllable patterns • contractions • abbreviations • common roots and related prefixes and suffixes	
	2.2.PWS.3 Students will read words in common word families *(e.g., -ight, -ink, -ine, ow)*.	**3.2.PWS.3** Students will use decoding skills and semantics in context when reading new words in a text, including multisyllabic words.	
	Students will continue to review and apply earlier grade level expectations for this standard. If these decoding skills are not mastered, students will address skills from previous grades.		

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	Pre-Kindergarten	Kindergarten	1st Grade
Fluency Students will recognize high-frequency words and read grade-level text smoothly and accurately, with expression that connotes comprehension.	**PK.2.F.1** Students will read first name in print.	**K.2.F.1** Students will read first and last name in print. **K.2.F.2** Students will read common high frequency grade-level words by sight *(e.g., not, was, to, have, you, he, is, with, are).*	**1.2.F.1** Students will read high frequency and/or common irregularly spelled grade-level words with automaticity in text. **1.2.F.2** Students will orally read grade-level text at an appropriate rate, smoothly and accurately, with expression that connotes comprehension.

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	2nd Grade	3rd Grade	4th Grade
Fluency Students will recognize high-frequency words and read grade-level text smoothly and accurately, with expression that connotes comprehension.	**2.2.F.1** Students will read high frequency and/or common irregularly spelled grade-level words with automaticity in text. **2.2.F.2** Students will orally read grade-level text at an appropriate rate, smoothly and accurately, with expression that connotes comprehension.	**3.2.F.1** Students will read high frequency and/or irregularly spelled grade-level words with automaticity in text. **3.2.F.2** Students will orally read grade-level text at an appropriate rate, smoothly and accurately, with expression that connotes comprehension.	**4.2.F.1** Students will read high frequency and irregularly spelled grade-level words with automaticity in text. **4.2.F.2** Students will orally read grade-level text at an appropriate rate, smoothly and accurately, with expression that connotes comprehension.
	Students will continue to review and apply earlier grade level expectations for this standard. If these fluency skills are not mastered, students will address skills from previous grades.		

2: Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.

	5th Grade	6th Grade	7th Grade	8th Grade
Fluency Students will recognize high-frequency words and read grade-level text smoothly and accurately, with expression that connotes comprehension.	***Students will continue to review and apply earlier grade level expectations for this standard.*** ***If these fluency skills are not mastered, students will address skills from previous grades.***			

Standard 2

Reading and Writing Process

Students will use a variety of recursive reading and writing processes.

Reading

Students will read and comprehend increasingly complex literary and informational texts.

Writing

Students will develop and strengthen writing by engaging in a recursive process that includes prewriting, drafting, revising, editing, and publishing.

2: Reading and Writing Process - Students will use a variety of recursive reading and writing processes.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will read and comprehend increasingly complex literary and informational texts.	**PK.2.R** Students will begin to retell or reenact major events from a read-aloud with guidance and support to recognize the main idea.	**K.2.R.1** Students will retell or reenact major events from a read-aloud with guidance and support to recognize the main idea. **K.2.R.2** Students will discriminate between fiction and nonfiction/informational text with guidance and support. **K.2.R.3** Students will sequence the events/plot *(i.e., beginning, middle, and end)* of a story or text with guidance and support.	**1.2.R.1** Students will retell or reenact major events in a text, focusing on important details to recognize the main idea. **1.2.R.2** Students will discriminate between fiction and nonfiction/informational text. **1.2.R.3** Students will sequence the events/plot *(i.e., beginning, middle, and end)* of a story or text.
Writing Students will develop and strengthen writing by engaging in a recursive process that includes prewriting, drafting, revising, editing, and publishing.	**PK.2.W** Students will begin to express themselves through drawing, dictating, and emergent writing.	**K.2.W.1** Students will begin to develop first drafts by expressing themselves through drawing and emergent writing. **K.2.W.2** Students will begin to develop first drafts by sequencing the action or details of stories/texts. **K.2.W.3** Students will begin to edit first drafts using appropriate spacing between letters and words.	**1.2.W.1** Students will develop and edit first drafts using appropriate spacing between letters, words, and sentences using left-to-right and top-to-bottom progression. **1.2.W.2** Students will develop drafts by sequencing the action or details in a story or about a topic through writing sentences with guidance and support. **1.2.W.3** Students will correctly spell grade-appropriate, highly decodable words *(e.g., cup, like, cart)* and common, irregularly spelled sight words *(e.g., the)* while editing. **1.2.W.4** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook).*

2: Reading and Writing Process - Students will use a variety of recursive reading and writing processes.

	2nd Grade	3rd Grade	4th Grade
Reading Students will read and comprehend increasingly complex literary and informational texts.	**2.2.R.1** Students will locate the main idea and supporting details of a text. **2.2.R.2** Students will begin to compare and contrast details *(e.g., plots or events, settings, and characters)* to discriminate genres. **2.2.R.3** Students will begin to summarize events or plots *(i.e., beginning, middle, end, and conflict)* of a story or text.	**3.2.R.1** Students will locate the main idea and key supporting details of a text or section of text. **3.2.R.2** Students will compare and contrast details *(e.g., plots or events, settings, and characters)* to discriminate genres. **3.2.R.3** Students will summarize events or plots *(i.e., beginning, middle, end, and conflict)* of a story or text.	**4.2.R.1** Students will distinguish how key details support the main idea of a passage. **4.2.R.2** Students will compare and contrast details in literary and nonfiction/informational texts to discriminate various genres. **4.2.R.3** Students will summarize events or plots *(i.e., beginning, middle, end, conflict, and climax)* of a story or text. **4.2.R.4** Students will begin to paraphrase main ideas with supporting details in a text.
Writing Students will develop and strengthen writing by engaging in a recursive process that includes prewriting, drafting, revising, editing, and publishing.	**2.2.W.1** Students will develop drafts by sequencing the action or details in a story or about a topic through writing sentences. **2.2.W.2** Students will develop and edit first drafts using appropriate spacing between letters, words, and sentences. **2.2.W.3** Students will correctly spell grade-appropriate words while editing. **2.2.W.4** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, dictionaries).*	**3.2.W.1** Students will develop drafts by categorizing ideas and organizing them into paragraphs using correct paragraph indentations. **3.2.W.2** Students will edit drafts and revise for clarity and organization. **3.2.W.3** Students will correctly spell grade-appropriate words while editing. **3.2.W.4** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries).*	**4.2.W.1** Students will develop drafts by categorizing ideas and organizing them into paragraphs. **4.2.W.2** Students will edit drafts and revise for clarity and organization. **4.2.W.3** Students will correctly spell grade-appropriate words while editing. **4.2.W.4** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*

2: Reading and Writing Process - Students will use a variety of recursive reading and writing processes.

	5th Grade	6th Grade	7th Grade
Reading Students will read and comprehend increasingly complex literary and informational texts.	**5.2.R.1** Students will create an objective summary, including main idea and supporting details, while maintaining meaning and a logical sequence of events. **5.2.R.2** Students will compare and contrast details in literary and nonfiction/informational texts to distinguish genres. **5.2.R.3** Students will begin to paraphrase main ideas with supporting details in a text.	**6.2.R.1** Students will create an objective summary, including main idea and supporting details, while maintaining meaning and a logical sequence of events. **6.2.R.2** Students will analyze details in literary and nonfiction/informational texts to distinguish genres. **6.2.R.3** Students will paraphrase main ideas with supporting details in a text.	**7.2.R.1** Students will create an objective summary, including main idea and supporting details, while maintaining meaning and a logical sequence of events. **7.2.R.2** Students will analyze details in literary and nonfiction/informational texts to distinguish genres. **7.2.R.3** Students will paraphrase main ideas with supporting details in a text.
Writing Students will develop and strengthen writing by engaging in a recursive process that includes prewriting, drafting, revising, editing, and publishing.	**5.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **5.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **5.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **5.2.W.4** Students will edit and revise multiple drafts for intended purpose *(e.g., staying on topic),* organization, and coherence. **5.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*	**6.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **6.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **6.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **6.2.W.4** Students will edit and revise multiple drafts for intended purpose *(e.g., staying on topic),* organization, coherence, using a consistent point of view. **6.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*	**7.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **7.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **7.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **7.2.W.4** Students will edit and revise multiple drafts for organization, transitions to improve coherence and meaning, using a consistent point of view. **7.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*

2: Reading and Writing Process - Students will use a variety of recursive reading and writing processes.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will read and comprehend increasingly complex literary and informational texts.	**8.2.R.1** Students will summarize and paraphrase ideas, while maintaining meaning and a logical sequence of events, within and between texts. **8.2.R.2** Students will analyze details in literary and nonfiction/informational texts to evaluate patterns of genres. **8.2.R.3** Students will generalize main ideas with supporting details in a text.	**9.2.R.1** Students will summarize, paraphrase, and generalize ideas, while maintaining meaning and a logical sequence of events, within and between texts. **9.2.R.2** Students will analyze details in literary and nonfiction/informational texts to evaluate patterns of genres. **9.2.R.3** Students will synthesize main ideas with supporting details in texts.	**10.2.R.1** Students will summarize, paraphrase, and synthesize ideas, while maintaining meaning and a logical sequence of events, within and between texts. **10.2.R.2** Students will analyze details in literary and nonfiction/informational texts to connect how genre supports the author's purpose.
Writing Students will develop and strengthen writing by engaging in a recursive process that includes prewriting, drafting, revising, editing, and publishing.	**8.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **8.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **8.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **8.2.W.4** Students will edit and revise multiple drafts for organization, transitions to improve coherence and meaning, sentence variety, and use of consistent point of view. **8.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*	**9.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **9.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **9.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **9.2.W.4** Students will edit and revise multiple drafts for organization, transitions to improve coherence and meaning, sentence variety, and use of consistent tone and point of view. **9.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*	**10.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **10.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **10.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **10.2.W.4** Students will edit and revise multiple drafts for organization, enhanced transitions and coherence, sentence variety, and consistency in tone and point of view to establish meaningful texts. **10.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*

2: Reading and Writing Process - Students will use a variety of recursive reading and writing processes.

	11th Grade - English III	12th Grade - English IV
Reading Students will read and comprehend increasingly complex literary and informational texts.	**11.2.R.1** Students will summarize, paraphrase, and synthesize ideas, while maintaining meaning and a logical sequence of events, within and between texts. **11.2.R.2** Students will evaluate details in literary and non-fiction/informational texts to connect how genre supports the author's purpose.	**12.2.R.1** Students will summarize, paraphrase, and synthesize ideas, while maintaining meaning and a logical sequence of events, within and between texts. **12.2.R.2** Students will evaluate details in literary and non-fiction/informational texts to connect how genre supports the author's purpose.
Writing Students will develop and strengthen writing by engaging in a recursive process that includes prewriting, drafting, revising, editing, and publishing.	**11.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **11.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **11.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **11.2.W.4** Students will edit and revise multiple drafts for logical organization, enhanced transitions and coherence, sentence variety, and use of tone and point of view through specific rhetorical devices to establish meaningful texts. **11.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*	**12.2.W.1** Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing. **12.2.W.2** Students will plan *(e.g., outline)* and prewrite a first draft as necessary. **12.2.W.3** Students will develop drafts by choosing an organizational structure *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.)* and building on ideas in multi-paragraph essays. **12.2.W.4** Students will edit and revise multiple drafts for logical organization, enhanced transitions and coherence, sentence variety, and use of tone and point of view through specific rhetorical devices to establish meaningful texts. **12.2.W.5** Students will use resources to find correct spellings of words *(e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*

Standard 3

Critical Reading and Writing

Students will apply critical thinking skills to reading and writing.

Reading

Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.

Writing

Students will write for varied purposes and audiences in all modes, using fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice.

3: Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.	**PK.3.R.1** Students will describe the role of an author and illustrator, telling how they contribute to a story, with guidance and support. **PK.3.R.2** Students will describe characters in a story with guidance and support. **PK.3.R.3** Students will tell what is happening in a picture or illustration with guidance and support. **PK.3.R.4** Students will ask and answer basic questions *(e.g., who, what, where, and when)* about texts during shared reading or other text experiences with guidance and support.	**K.3.R.1** Students will name the author and illustrator, and explain the roles of each in a particular story. **K.3.R.2** Students will describe characters and setting in a story with guidance and support. **K.3.R.3** Students will tell what is happening in a picture or illustration. **K.3.R.4** Students will ask and answer basic questions *(e.g., who, what, where, and when)* about texts during shared reading or other text experiences with guidance and support	**1.3.R.1** Students will identify the author's purpose *(i.e., tell a story, provide information)* with guidance and support. **1.3.R.2** Students will describe who is telling the story *(i.e., point of view).* **1.3.R.3** Students will find textual evidence when provided with examples of literary elements and organization: • setting *(i.e., time, place)* • plot • main characters and their traits in a story **1.3.R.4** Students will ask and answer basic questions *(e.g., who, what, where, why,and when)* about texts. **1.3.R.5** Students will begin to locate facts that are clearly stated in a text.

	Pre-Kindergarten	Kindergarten	1st Grade
Writing Students will write for varied purposes and audiences in all modes, using fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice.	**PK.3.W** Students will use drawing, labeling, and dictating to express thoughts and ideas with guidance and support.	**K.3.W** Students will use drawing, labeling, dictating, and writing to tell a story, share information, or express an opinion with guidance and support.	**NARRATIVE** **1.3.W.1** Students will begin to write narratives incorporating characters, plot *(i.e., beginning, middle, end)*, and a basic setting *(i.e., time, place)* with guidance and support. **INFORMATIVE** **1.3.W.2** Students will begin to write facts about a subject in response to a text read aloud to demonstrate understanding with guidance and support. **OPINION** **1.3.W.3** Students will express an opinion in writing about a topic and provide a reason to support the opinion.

3: Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.

	2nd Grade	3rd Grade	4th Grade
Reading Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.	**2.3.R.1** Students will determine the author's purpose *(i.e., tell a story, provide information).*	**3.3.R.1** Students determine the author's stated and implied purpose *(i.e., entertain, inform, persuade)*.	**4.3.R.1** Students will determine the author's purpose *(i.e., entertain, inform, persuade)* and infer the difference between the stated and implied purpose.
	2.3.R.2 Students will infer whether a story is narrated in first or third person point of view in grade-level literary and/or informational text.	**3.3.R.2** Students will infer whether a story is narrated in first or third person point of view in grade-level literary and/or informational text.	**4.3.R.2** Students will infer whether a story is narrated in first or third person point of view in grade-level literary and/or informational text.
	2.3.R.3 Students will find textual evidence when provided with examples of literary elements and organization: • setting *(i.e., time, place)* • plot • characters • characterization	**3.3.R.3** Students will find textual evidence when provided with examples of literary elements and organization: • setting *(i.e., time, place)* • plot • characters • characterization • theme	**4.3.R.3** Students will describe key literary elements: • setting • plot • characters *(i.e., protagonist, antagonist)* • characterization • theme
	2.3.R.4 Students will find examples of literary devices: • simile • metaphor	**3.3.R.4** Students will find examples of literary devices: • simile • metaphor • personification • onomatopoeia • hyperbole	**4.3.R.4** Students will find examples of literary devices: • simile • metaphor • personification • onomatopoeia • hyperbole • imagery • symbolism* • tone* **Students will find textual evidence when provided with examples.*
	2.3.R.5 Students will locate facts that are clearly stated in a text.	**3.3.R.5** Students will distinguish fact from opinion in a text.	**4.3.R.5** Students will distinguish fact from opinion in a text and investigate facts for accuracy.

	2nd Grade	3rd Grade	4th Grade
Reading (Continued)	**2.3.R.6** Students will describe the structure of a text *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect)* with guidance and support. **2.3.R.7** Students will answer inferential questions *(e.g., how and why)* with guidance and support.	**3.3 R.6** Students will describe the structure of a text *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect)* with guidance and support. **3.3.R.7** Students will ask and answer inferential questions using the text to support answers with guidance and support.	**4.3.R.6** Students will describe the structure of a text *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect).* **4.3.R.7** Students will ask and answer inferential questions using the text to support answers.
Writing Students will write for varied purposes and audiences in all modes, using fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice.	**NARRATIVE** **2.3.W.1** Students will write narratives incorporating characters, plot *(i.e., beginning, middle, end)*, and a basic setting *(i.e., time, place)* with guidance and support. **INFORMATIVE** **2.3.W.2** Students will write facts about a subject and include a main idea with supporting details. **OPINION** **2.3.W.3** Students will express an opinion about a topic and provide reasons as support.	**NARRATIVE - Grade Level Focus** **3.3.W.1** Students will write narratives incorporating characters, plot, setting, point of view, and conflict *(i.e., solution and resolution).* **INFORMATIVE** **3.3.W.2** Students will write facts about a subject, including a main idea with supporting details, and use transitional and signal words. **OPINION** **3.3.W.3** Students will express an opinion about a topic and provide reasons as support.	**NARRATIVE** **4.3.W.1** Students will write narratives incorporating characters, plot, setting, point of view, conflict *(i.e., solution and resolution),* and dialogue. **INFORMATIVE - Grade Level Focus** **4.3.W.2** Students will write facts about a subject, including a clear main idea with supporting details, and use transitional and signal words. **OPINION** **4.3.W.3** Students will express an opinion about a topic and provide fact-based reasons as support.

3: Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.

	5th Grade	6th Grade	7th Grade
Reading Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.	**5.3.R.1** Students will determine an author's stated or implied purpose and draw conclusions to evaluate how well the author's purpose was achieved. **5.3.R.2** Students will determine the point of view and describe how it affects grade-level literary and/or informational text. **5.3.R.3** Students will describe and find textual evidence of key literary elements: • setting • plot • characters *(i.e., protagonist, antagonist)* • characterization • theme **5.3.R.4** Students will evaluate literary devices to support interpretations of literary texts: • simile • metaphor • personification • onomatopoeia • hyperbole • imagery • symbolism* • tone* **Students will find textual evidence when provided with examples.*	**6.3.R.1** Students will compare and contrast stated or implied purposes of authors writing on the same topic in grade-level literary and/or informational texts. **6.3.R.2** Students will evaluate how the point of view and perspective affect grade-level literary and/or informational text. **6.3.R.3** Students will analyze how key literary elements contribute to the meaning of the literary work: • setting • plot • characters *(i.e., protagonist, antagonist)* • characterization • theme • conflict *(i.e., internal and external)* **6.3.R.4** Students will evaluate literary devices to support interpretations of literary texts: • simile • metaphor • personification • onomatopoeia • hyperbole • imagery • symbolism* • tone* **Students will find textual evidence when provided with examples.*	**7.3.R.1** Students will compare and contrast stated or implied purposes of authors writing on the same topic in grade-level literary and/or informational texts. **7.3.R.2** Students will evaluate how the point of view and perspective affect grade-level literary and/or informational text. **7.3.R.3** Students will analyze how key literary elements contribute to the meaning of the literary work: • setting • plot • characters *(i.e., protagonist, antagonist)* • characterization • theme • conflict *(i.e., internal and external)* **7.3.R.4** Students will evaluate literary devices to support interpretations of literary texts: • simile • metaphor • personification • onomatopoeia • hyperbole • imagery • symbolism • tone • irony* **Students will find textual evidence when provided with examples.*

	5th Grade	6th Grade	7th Grade
Reading (Continued)	**5.3.R.5** Students will distinguish fact from opinion in non-fiction text and investigate facts for accuracy. **5.3.R.6** Students will distinguish the structures of texts *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect)* and content by making inferences about texts and use textual evidence to support understanding. **5.3.R.7** Students will compare and contrast texts and ideas within and between texts.	**6.3.R.5** Students will categorize facts included in an argument as *for* or *against* an issue. **6.3.R.6** Students will analyze the structures of texts *(e.g., description, compare/contrast, sequential, problem/solution, cause/effect)* and content by making inferences about texts and use textual evidence to support understanding. **6.3.R.7** Students will analyze texts and ideas within and between texts and provide textual evidence to support their inferences.	**7.3.R.5** Students will distinguish factual claims from opinions. **7.3.R.6** Students will analyze the structures of texts *(e.g., compare/contrast, problem/solution, cause/effect, claims/evidence)* and content by making inferences about texts and use textual evidence to draw simple logical conclusions. **7.3.R.7** Students will make connections *(e.g., thematic links)* between and across multiple texts and provide textual evidence to support their inferences.
Writing Students will write for varied purposes and audiences in all modes, using fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice.	**NARRATIVE** **5.3.W.1** Students will write narratives incorporating characters, plot, setting, point of view, conflict *(i.e., internal, external),* and dialogue. **INFORMATIVE - Grade Level Focus** **5.3.W.2** Students will introduce and develop a topic, incorporating evidence *(e.g., specific facts, examples, details)* and maintaining an organized structure. **OPINION** **5.3.W.3** Students will clearly state an opinion supported with facts and details. **5.3.W.4** Students will show relationships among facts, opinions, and supporting details.	**NARRATIVE** **6.3.W.1** Students will write narratives incorporating characters, plot, setting, point of view, conflict *(i.e., internal, external),* and dialogue. **INFORMATIVE** **6.3.W.2** Students will compose essays and reports about topics, incorporating evidence *(e.g., specific facts, examples, details)* and maintaining an organized structure. **OPINION - Grade Level Focus** **6.3.W.3** Students will clearly state an opinion supported with facts and details. **6.3.W.4** Students will show relationships among facts, opinions, and supporting details.	**NARRATIVE** **7.3.W.1** Students will write narratives incorporating characters, plot, setting, point of view, conflict, dialogue, and sensory details to convey experiences and events. **INFORMATIVE** **7.3.W.2** Students will compose essays and reports about topics, incorporating evidence *(e.g., specific facts, examples, details)* and maintaining an organized structure and a formal style. **ARGUMENT - Grade Level Focus** **7.3.W.3** Students will introduce a claim and organize reasons and evidence, using credible sources. **7.3.W.4** Students will show relationships among the claim, reasons, and evidence.

3: Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.	**8.3.R.1** Students will analyze works written on the same topic and compare the methods the authors use to achieve similar or different purposes and include support using textual evidence. **8.3.R.2** Students will evaluate points of view and perspectives and describe how this affects grade-level literary and/or informational text. **8.3.R.3** Students will analyze how authors use key literary elements to contribute to the meaning of a text: • setting • plot • characters *(i.e., protagonist, antagonist)* • characterization • theme • conflict *(i.e., internal and external)*	**9.3.R.1** Students will analyze works written on the same topic and compare the methods the authors use to achieve similar or different purposes and include support using textual evidence. **9.3.R.2** Students will evaluate points of view and perspectives in more than one grade-level literary and/or informational text and explain how multiple points of view contribute to the meaning of a work. **9.3.R.3** Students will analyze how authors use key literary elements to contribute to meaning and interpret how themes are connected across texts: • setting • plot • characters *(i.e., protagonist, antagonist)* • character development • theme • conflict *(i.e., internal and external)* • archetypes	**10.3.R.1** Students will evaluate the extent to which historical, cultural, and/or global perspectives affect authors' stylistic and organizational choices in grade-level literary and informational genres. **10.3.R.2** Students will evaluate points of view and perspectives in more than one grade-level literary and/or informational text and explain how multiple points of view contribute to the meaning of a work. **10.3.R.3** Students will analyze how authors use key literary elements to contribute to meaning and interpret how themes are connected across texts: • character development • theme • conflict *(i.e., internal and external)* • archetypes

	8th Grade	9th Grade - English I	10th Grade - English II
Reading (Continued)	**8.3.R.4** Students will evaluate literary devices to support interpretations of literary texts: • simile • metaphor • personification • onomatopoeia • hyperbole • imagery • tone • symbolism • irony	**9.3.R.4** Students will evaluate literary devices to support interpretations of texts, including comparisons across texts: • simile • metaphor • personification • onomatopoeia • hyperbole • imagery • tone • symbolism • irony	**10.3.R.4** Students will evaluate literary devices to support interpretations of texts, including comparisons across texts: • figurative language • imagery • tone • symbolism • irony
	8.3.R.5 Students will evaluate textual evidence to determine whether a claim is substantiated or unsubstantiated.	**9.3.R.5** Students will evaluate textual evidence to determine whether a claim is substantiated or unsubstantiated.	**10.3.R.5** Students will distinguish among different kinds of evidence *(e.g., logical, empirical, anecdotal)* used to support conclusions and arguments in texts.
	8.3.R.6 Students will analyze the structures of texts *(e.g., compare/contrast, problem/solution, cause/effect, claims/evidence)* and content by making complex inferences about texts to draw logical conclusions from textual evidence.	**9.3.R.6** Students will comparatively analyze the structures of texts *(e.g., compare/contrast, problem/solution, cause/effect, claims/counterclaims/evidence)* and content by inferring connections among multiple texts and providing textual evidence to support their inferences.	**10.3.R.6** Students will comparatively analyze the structures of texts *(e.g., compare/contrast, problem/solution, cause/effect, claims/counterclaims/evidence)* and content by inferring connections among multiple texts and providing textual evidence to support their inferences.
	8.3.R.7 Students will make connections *(e.g., thematic links, literary analysis)* between and across multiple texts and provide textual evidence to support their inferences.	**9.3.R.7** Students will make connections *(e.g., thematic links, literary analysis)* between and across multiple texts and provide textual evidence to support their inferences.	**10.3.R.7** Students will make connections *(e.g., thematic links, literary analysis)* between and across multiple texts and provide textual evidence to support their inferences.

	8th Grade	9th Grade - English I	10th Grade - English II
Writing Students will write for varied purposes and audiences in all modes, using fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice.	**NARRATIVE** **8.3.W.1** Students will write narratives incorporating characters, plot *(i.e., flashback and foreshadowing)*, setting, point of view, conflict, dialogue, and sensory details. **INFORMATIVE** **8.3.W.2** Students will compose essays and reports about topics, incorporating evidence *(e.g., specific facts, examples, details)* and maintaining an organized structure and a formal style. **ARGUMENT - Grade Level Focus** **8.3.W.3** Students will introduce a claim, recognize at least one claim from an opposing viewpoint, and organize reasons and evidences, using credible sources. **8.3.W.4** Students will show relationships among the claim, reasons, and evidence and include a conclusion that follows logically from the information presented.	**NARRATIVE - Grade Level Focus** **9.3.W.1** Students will write nonfiction narratives *(e.g., memoirs, personal essays)*. **INFORMATIVE - Grade Level Focus** **9.3.W.2** Students will compose essays and reports to objectively introduce and develop topics, incorporating evidence *(e.g., specific facts, examples, details, data)* and maintaining an organized structure and a formal style. **9.3.W.3** Students will elaborate on ideas by using logical reasoning and illustrative examples to connect evidences to claim(s). **ARGUMENT** **9.3.W.4** Students will introduce claims, recognize and distinguish from alternate or opposing claims, and organize reasons and evidences, using credible sources. **9.3.W.5** Students will show relationships among the claim, reasons, and evidence and include a conclusion that follows logically from the information presented and supports the argument. **9.3.W.6** Students will blend multiple modes of writing to produce effective argumentative essays.	**NARRATIVE** **10.3.W.1** Students will write narratives embedded in other modes as appropriate. **INFORMATIVE - Grade Level Focus** **10.3.W.2** Students will compose essays and reports to objectively introduce and develop topics, incorporating evidence *(e.g., specific facts, examples, details, data)* and maintaining an organized structure and a formal style. **10.3.W.3** Students will elaborate on ideas by using logical reasoning and illustrative examples to connect evidences to claim(s). **ARGUMENT - Grade Level Focus** **10.3.W.4** Students will introduce precise claims and distinguish them from counterclaims and provide sufficient evidences to develop balanced arguments, using credible sources. **10.3.W.5** Students will use words, phrases, and clauses to connect claims, counterclaims, evidence, and commentary to create a cohesive argument and include a conclusion that follows logically from the information presented and supports the argument. **10.3.W.6** Students will blend multiple modes of writing to produce effective argumentative essays.

3: Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.

	11th Grade - English III	12th Grade - English IV
Reading Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.	**11.3.R.1** Students will analyze the extent to which historical, cultural, and/or global perspectives affect authors' stylistic and organizational choices in grade-level literary and informational genres.	**12.3.R.1** Students will analyze the extent to which historical, cultural, and/or global perspectives affect authors' stylistic and organizational choices in grade-level literary and informational genres.
	11.3.R.2 Students will evaluate points of view and perspectives in more than one grade-level literary and/or informational text and explain how multiple points of view contribute to the meaning of a work.	**12.3.R.2** Students will evaluate points of view and perspectives in more than one grade-level literary and/or informational text and explain how multiple points of view contribute to the meaning of a work.
	11.3.R.3 Students will analyze how authors use key literary elements to contribute to meaning and interpret how themes are connected across texts: • theme • archetypes	**12.3.R.3** Students will analyze how authors use key literary elements to contribute to meaning and interpret how themes are connected across texts.
	11.3.R.4 Students will evaluate literary devices to support interpretations of texts, including comparisons across texts: • imagery • tone • symbolism • irony	**12.3.R.4** Students will evaluate literary devices to support interpretations of texts, including comparisons across texts.
	11.3.R.5 Students will evaluate how authors writing on the same issue reached different conclusions because of differences in assumptions, evidence, reasoning, and viewpoints.	**12.3.R.5** Students will evaluate how authors writing on the same issue reached different conclusions because of differences in assumptions, evidence, reasoning, and viewpoints.
	11.3.R.6 Students will comparatively analyze the structures of texts *(e.g., compare/contrast, problem/solution, cause/effect, claims/counterclaims/evidence)* and content by inferring connections among multiple texts and providing textual evidence to support their conclusions.	**12.3.R.6** Students will comparatively analyze the structures of texts *(e.g., compare/contrast, problem/solution, cause/effect, claims/counterclaims/evidence)* and content by inferring connections among multiple texts and providing textual evidence to support their conclusions.
	11.3.R.7 Students will make connections *(e.g., thematic links, literary analysis, authors' style)* between and across multiple texts and provide textual evidence to support their inferences.	**12.3.R.7** Students will make connections *(e.g., thematic links, literary analysis, authors' style)* between and across multiple texts and provide textual evidence to support their inferences.

	11th Grade - English III	12th Grade - English IV
Writing Students will write for varied purposes and audiences in all modes, using fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice.	**NARRATIVE** **11.3.W.1** Students will write narratives embedded in other modes as appropriate. **INFORMATIVE** **11.3.W.2** Students will compose essays and reports to objectively introduce and develop topics, incorporating evidence *(e.g., specific facts, examples, details, data)* and maintaining an organized structure and a formal style. **11.3.W.3** Students will elaborate on ideas by using logical reasoning and illustrative examples to connect evidences to claim(s). **ARGUMENT** **11.3.W.4** Students will (1) introduce precise, informed claims, (2) distinguish them from alternate or opposing claims, (3) organize claims, counterclaims, and evidence in a way that provides a logical sequence for the entire argument, and (4) provide the most relevant evidences to develop balanced arguments, using credible sources. **11.3.W.5** Students will use words, phrases, clauses, and varied syntax to connect all parts of the argument and create cohesion and include a conclusion that follows logically from the information presented and supports the argument. **11.3.W.6** Students will blend multiple modes of writing to produce effective argumentative essays.	**NARRATIVE** **12.3.W.1** Students will write narratives embedded in other modes as appropriate. **INFORMATIVE** **12.3.W.2** Students will compose essays and reports to objectively introduce and develop topics, incorporating evidence *(e.g., specific facts, examples, details, data)* and maintaining an organized structure and a formal style. **12.3.W.3** Students will elaborate on ideas by using logical reasoning and illustrative examples to connect evidences to claim(s). **ARGUMENT** **12.3.W.4** Students will (1) introduce precise, informed claims, (2) distinguish them from alternate or opposing claims, (3) organize claims, counterclaims, and evidence in a way that provides a logical sequence for the entire argument, and (4) provide the most relevant evidences to develop balanced arguments, using credible sources. **12.3.W.5** Students will use words, phrases, clauses, and varied syntax to connect all parts of the argument and create cohesion and include a conclusion that follows logically from the information presented and supports the argument. **12.3.W.6** Students will blend multiple modes of writing to produce effective argumentative essays.

Standard 4

Vocabulary

Students will expand their working vocabularies to effectively communicate and understand texts.

Reading

Students will expand academic, domain-appropriate, grade-level vocabularies through reading, word study, and class discussion.

Writing

Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.

4: Vocabulary - Students will expand their working vocabularies to effectively communicate and understand texts.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will expand academic, domain-appropriate, grade-level vocabularies through reading, word study, and class discussion.	**PK.4.R.1** Students will acquire new academic, content-specific, grade-level vocabulary and relate new words to prior knowledge with guidance and support. **PK.4.R.2** Students will begin to develop an awareness of context clues through read-alouds and other text experiences. **PK.4.R.3** Students will name and sort familiar objects into categories based on common attributes with guidance and support.	**K.4.R.1** Students will acquire new academic, content-specific, grade-level vocabulary and relate new words to prior knowledge with guidance and support. **K.4.R.2** Students will begin to develop an awareness of context clues through read-alouds and other text experiences. **K.4.R.3** Students will name and sort pictures of objects into categories based on common attributes with guidance and support.	**1.4.R.1** Students will acquire new academic, content-specific, grade-level vocabulary, relate new words to prior knowledge, and apply vocabulary in new situations. **1.4.R.2** Students will use word parts *(e.g., affixes, roots, stems)* to define unfamiliar words with guidance and support. **1.4.R.3** Students will use context clues to determine the meaning of words with guidance and support. **1.4.R.4** Students will name and sort words into categories based on common attributes. **1.4.R.5** Students will use a dictionary *(print and/or electronic)* to find words.
Writing Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.	**PK.4.W.1** Students will begin to use new vocabulary to produce and expand complete sentences in shared language activities. **PK.4.W.2** Students will begin to select appropriate language according to purpose.	**K.4.W.1** Students will use new vocabulary to produce and expand complete sentences in shared language activities with guidance and support. **K.4.W.2** Students will select appropriate language according to purpose with guidance and support.	**1.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing with guidance and support. **1.4.W.2** Students will select appropriate language according to purpose in writing with guidance and support.

4: Vocabulary - Students will expand their working vocabularies to effectively communicate and understand texts.

	2nd Grade	3rd Grade	4th Grade
Reading Students will expand academic, domain-appropriate, grade-level vocabularies through reading, word study, and class discussion.	**2.4.R.1** Students will acquire new academic, content-specific, grade-level vocabulary, relate new words to prior knowledge, and apply vocabulary in new situations. **2.4.R.2** Students will use word parts *(e.g., affixes, roots, stems)* to define and determine the meaning of new words. **2.4.R.3** Students will use context clues to determine the meaning of words with guidance and support. **2.4.R.4** Students will infer relationships among words, including synonyms, antonyms, and simple multiple-meaning words. **2.4.R.5** Students will use a dictionary or glossary *(print and/or electronic)* to determine or clarify the meanings of words or phrases.	**3.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **3.4.R.2** Students will use word parts *(e.g., affixes, roots, stems)* to define and determine the meaning of new words. **3.4.R.3** Students will use context clues to determine the meaning of words or distinguish among multiple-meaning words. **3.4.R.4** Students will infer relationships among words, including synonyms, antonyms, homographs, and homonyms. **3.4.R.5** Students will use a dictionary or glossary *(print and/or electronic)* to determine or clarify the meanings, syllabication, and pronunciation of words.	**4.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **4.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of new words. **4.4.R.3** Students will use context clues to determine the meaning of words or distinguish among multiple-meaning words. **4.4.R.4** Students will infer relationships among words with multiple meanings, including synonyms, antonyms, and more complex homographs and homonyms. **4.4.R.5** Students will use a dictionary or glossary *(print and/or electronic)* to determine or clarify the meanings, syllabication, and pronunciation of words.
Writing Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.	**2.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing. **2.4.W.2** Students will select appropriate language according to purpose in writing.	**3.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing. **3.4.W.2** Students will select appropriate language according to purpose in writing.	**4.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing. **4.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.

4: Vocabulary - Students will expand their working vocabularies to effectively communicate and understand texts.

	5th Grade	6th Grade	7th Grade
Reading Students will expand academic, domain-appropriate, grade-level vocabularies through reading, word study, and class discussion.	**5.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **5.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define new words and determine the meaning of new words. **5.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **5.4.R.4** Students will infer the relationships among words with multiple meanings, including synonyms, antonyms, analogies, and more complex homographs and homonyms. **5.4.R.5** Students will use a dictionary, glossary, or a thesaurus *(print and/or electronic)* to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.	**6.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **6.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of increasingly complex words. **6.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **6.4.R.4** Students will infer the relationships among words with multiple meanings, including synonyms, antonyms, analogies, and more complex homographs and homonyms. **6.4.R.5** Students will use a dictionary, glossary, or a thesaurus *(print and/or electronic)* to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.	**7.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **7.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of increasingly complex words. **7.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **7.4.R.4** Students will infer the relationships among words with multiple meanings and recognize the connotation and denotation of words. **7.4.R.5** Students will use a dictionary, glossary, or a thesaurus *(print and/or electronic)* to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.
Writing Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.	**5.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing clearly. **5.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.	**6.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing clearly. **6.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.	**7.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing clearly. **7.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.

4: Vocabulary - Students will expand their working vocabularies to effectively communicate and understand texts.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will expand academic, domain-appropriate, grade-level vocabularies through reading, word study, and class discussion.	**8.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **8.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of increasingly complex words. **8.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **8.4.R.4** Students will infer the relationships among words with multiple meanings and recognize the connotation and denotation of words. **8.4.R.5** Students will use a dictionary, glossary, or a thesaurus *(print and/or electronic)* to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.	**9.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **9.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of increasingly complex words. **9.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **9.4.R.4** Students will analyze the relationships among words with multiple meanings and recognize the connotation and denotation of words. **9.4.R.5** Students will use a dictionary, glossary, or a thesaurus *(print and/or electronic)* to determine or clarify the meanings, syllabication, pronunciation, synonyms, parts of speech, and etymology of words or phrases.	**10.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **10.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of increasingly complex words. **10.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **10.4.R.4** Students will analyze the relationships among words with multiple meanings and recognize the connotation and denotation of words. **10.4.R.5** Students will use a dictionary, glossary, or a thesaurus *(print and/or electronic)* to determine or clarify the meanings, syllabication, pronunciation, synonyms, parts of speech, and etymology of words or phrases.
Writing Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.	**8.4.W.1** Students will use domain-appropriate vocabulary to communicate ideas in writing clearly. **8.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.	**9.4.W.1** Students will use domain-appropriate vocabulary to communicate complex ideas in writing clearly. **9.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.	**10.4.W.1** Students will use domain-appropriate vocabulary to communicate complex ideas in writing clearly. **10.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.

4: Vocabulary - Students will expand their working vocabularies to effectively communicate and understand texts.

	11th Grade - English III	12th Grade - English IV
Reading Students will expand academic, domain-appropriate, grade-level vocabularies through reading, word study, and class discussion.	**11.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **11.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of increasingly complex words. **11.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **11.4.R.4** Students will analyze and evaluate the relationships among words with multiple meanings and recognize the connotation and denotation of words. **11.4.R.5** Students will use general and specialized dictionaries, thesauri, glossaries, histories of language, books of quotations, and other related references *(print and/or electronic)* as needed.	**12.4.R.1** Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. **12.4.R.2** Students will use word parts *(e.g., affixes, Greek and Latin roots, stems)* to define and determine the meaning of increasingly complex words. **12.4.R.3** Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. **12.4.R.4** Students will analyze and evaluate the relationships among words with multiple meanings and recognize the connotation and denotation of words. **12.4.R.5** Students will use general and specialized dictionaries, thesauri, glossaries, histories of language, books of quotations, and other related references *(print and/or electronic)* as needed.
Writing Students will apply knowledge of vocabularies to communicate by using descriptive, academic, and domain-appropriate abstract and concrete words in their writing.	**11.4.W.1** Students will use domain-appropriate vocabulary to communicate complex ideas in writing clearly. **11.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.	**12.4.W.1** Students will use domain-appropriate vocabulary to communicate complex ideas in writing clearly. **12.4.W.2** Students will select appropriate language to create a specific effect according to purpose in writing.

Standard 5

Language

Students will apply knowledge of grammar and rhetorical style to reading and writing.

Reading

Students will apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts.

Writing

Students will demonstrate command of Standard English grammar, mechanics, and usage through writing and other modes of communication.

5: Language - Students will apply knowledge of grammar and rhetorical style to reading and writing.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts.	**PK.5.R.1** Students will begin to understand the function of grammar through exposure to conversations, read-alouds, and interactive reading. **PK.5.R.2** Students will recognize concrete objects as persons, places or things *(i.e., nouns)* with guidance and support. **PK.5.R.3** Students will recognize words as actions *(i.e., verbs)* with guidance and support. **PK.5.R.4** Students will group pictures and movement, and determine spatial and time relationships such as up, down, before, and after with guidance and support.	**K.5.R.1** Students will begin to understand the function of grammar through exposure to conversations, read-alouds, and interactive reading. **K.5.R.2** Students will recognize concrete objects as persons, places or things *(i.e., nouns)* with guidance and support. **K.5.R.3** Students will recognize words as actions *(i.e., verbs)* with guidance and support. **K.5.R.4** Students will group pictures and movement, and determine spatial and time relationships such as up, down, before, and after with guidance and support.	**1.5.R.1** Students will recognize nouns as concrete objects *(i.e., people persons, places, and things)* and use the pronoun *"I."* **1.5.R.2** Students will recognize verbs as actions **1.5.R.3** Students will recognize color and number adjectives. **1.5.R.4** Students will recognize the prepositions *(e.g., The dog is on top of the doghouse)* through pictures and movement. **1.5.R.5** Students will recognize singular and plural nouns with correct verbs in simple sentences *(e.g. He sits; we sit).*
Writing Students will demonstrate command of Standard English grammar, mechanics, and usage through writing and other modes of communication.	*These standards begin in Kindergarten.*	**K.5.W.1** Students will capitalize, with guidance and support: • their first name • the pronoun *"I."* **K.5.W.2** Students will begin to compose simple sentences that begin with a capital letter and end with a period or question mark.	**1.5.W.1** Students will capitalize: • the first letter of a sentence • proper names • months and days of the week **1.5.W.2** Students will compose grammatically correct simple and compound sentences and questions (interrogatives) with appropriate end marks.

5: Language - Students will apply knowledge of grammar and rhetorical style to reading and writing.

	2nd Grade	3rd Grade	4th Grade
Reading Students will apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts.	**2.5.R.1** Students will recognize nouns, pronouns, and irregular plural nouns. **2.5.R.2** Students will recognize different types and tenses of verbs. **2.5.R.3** Students will recognize adjectives. **2.5.R.4** Students will recognize prepositions. **2.5.R.5** Students will recognize the subject and predicate of a sentence.	**3.5.R.1** Students will recognize pronouns and possessive nouns. **3.5.R.2** Students will recognize irregular and past participle verbs and verb tense to identify settings, times, and sequences in text. **3.5.R.3** Students will recognize adjectives, articles as adjectives, and adverbs. **3.5.R.4** Students will recognize prepositions and conjunctions. **3.5.R.5** Students will recognize the subject and verb agreement.	**4.5.R.1** Students will recognize pronouns and irregular possessive nouns. **4.5.R.2** Students will recognize present perfect verbs and verb tense to identify settings, times, sequences, and conditions in text. **4.5.R.3** Students will recognize comparative and superlative adjectives and adverbs. **4.5.R.4** Students will recognize prepositional phrases and conjunctions. **4.5.R.5** Students will recognize the subject and verb agreement.
Writing Students will demonstrate command of Standard English grammar, mechanics, and usage through writing and other modes of communication.	**2.5.W.1** Students will capitalize and appropriately punctuate: • the first letter of a quotation • holidays • product names • initials • months and days of the week **2.5.W.2** Students will use simple contractions *(e.g., isn't, aren't, can't).* **2.5.W.3** Students will compose grammatically correct simple and compound declarative, interrogative, imperative, and exclamatory sentences with appropriate end marks.	**3.5.W.1** Students will capitalize and appropriately punctuate: • titles of respect • appropriate words in titles • geographical names **3.5.W.2** Students will use complex contractions *(e.g., should've, won't).* **3.5.W.3** Students will compose and expand grammatically correct sentences and questions with appropriate commas, apostrophes, quotation marks, and end marks as needed for dialogue. **3.5.W.4** Students will compose simple, compound and complex declarative, interrogative, imperative, and exclamatory sentences.	**4.5.W.1** Students will capitalize • familial relations • proper adjectives • conventions of letter writing **4.5.W.2** Students will compose and expand grammatically correct sentences and questions with appropriate commas, end marks, apostrophes, and quotation marks as needed for dialogue. **4.5.W.3** Students will compose simple, compound, and complex sentences and questions, create sentences with an understood subject, and correct fragments and run-on sentences. **4.5.W.4** Students will compose declarative, interrogative, imperative, and exclamatory sentences.

5: Language - Students will apply knowledge of grammar and rhetorical style to reading and writing.

	5th Grade	6th Grade	7th Grade
Reading Students will apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts.	**5.5.R.1** Students will recognize conjunctions, prepositions, and interjections and explain their effect in particular sentences. **5.5.R.2** Students will recognize verb tense to signify various times, sequences, states, and conditions in text. **5.5.R.3** Students will recognize the subject and verb agreement.	**6.5.R.1** Students will recognize simple and compound sentences to signal differing relationships among ideas. **6.5.R.2** Students will recognize verb tense to signify various times, sequences, states, and conditions in text. **6.5.R.3** Students will recognize the subject and verb agreement.	**7.5.R.1** Students will recognize the correct use of prepositional phrases and dependent clauses. **7.5.R.2** Students will recognize simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas. **7.5.R.3** Students will recognize the subject and verb agreement. **7.5.R.4** Students will recognize and correct misplaced and dangling modifiers.
Writing Students will demonstrate command of Standard English grammar, mechanics, and usage through writing and other modes of communication.	**5.5.W.1** Students will write using correct mechanics with a focus on commas, apostrophes, and quotation marks as needed for dialogue and quoted material. **5.5.W.2** Students will compose simple, compound, and complex sentences and questions, create sentences with an understood subject, and correct fragments and run-on sentences. **5.5.W.3** Students will form and use the present and past verb tenses. **5.5.W.4** Students will form and use verb tense to convey various times, sequences, states, and conditions. **5.5.W.5** Students will recognize and correct inappropriate shifts in verb tense.	**6.5.W.1** Students will write using correct mechanics with a focus on commas, apostrophes, quotation marks, colons, and semi-colons. **6.5.W.2** Students will compose simple, compound, and complex sentences and questions to signal differing relationships among ideas. **6.5.W.3** Students will use intensive and reflexive pronouns. **6.5.W.4** Students will recognize and correct inappropriate shifts in pronoun number and person. **6.5.W.5** Students will recognize and correct vague pronouns *(i.e., ones with unclear or ambiguous antecedents).*	**7.5.W.1** Students will write using correct mechanics with a focus on commas, apostrophes, quotation marks, colons, and semi-colons. **7.5.W.2** Students will compose simple, compound, complex, and compound-complex sentences and questions to signal differing relationships among ideas. **7.5.W.3** Students will use prepositional phrases and clauses *(e.g., dependent and independent)* in writing.

5: Language - Students will apply knowledge of grammar and rhetorical style to reading and writing.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts.	**8.5.R.1** Students will recognize the use of verbals *(e.g., gerunds, participles, infinitives)* and clauses. **8.5.R.2** Students will recognize the use of active and passive voice. **8.5.R.3** Students will recognize and correct inappropriate shifts in verb tense. **8.5.R.4** Students will recognize the subject and verb agreement, and correct as necessary.	**9.5.R.1** Students will examine the function of parallel structures, various types of phrases, and clauses to convey specific meanings. **9.5.R.2** Students will recognize the use of active and passive voice. **9.5.R.3** Students will recognize and correct inappropriate shifts in verb tense. **9.5.R.4** Students will recognize the subject and verb agreement, and correct as necessary.	**10.5.R** Students will examine the function of parallel structures, various types of phrases, clauses, and active and passive voice to convey specific meanings and/or reflect specific rhetorical styles.
Writing Students will demonstrate command of Standard English grammar, mechanics, and usage through writing and other modes of communication.	**8.5.W.1** Students will write using correct mechanics with a focus on commas, apostrophes, quotation marks, colons, and semi-colons. **8.5.W.2** Students will compose simple, compound, complex, and compound-complex sentences and questions to signal differing relationships among ideas. **8.5.W.3** Students will use verbals *(e.g., gerunds, participles, infinitives)* in writing. **8.5.W.4** Students will form and use verbs in the active and passive voice. **8.5.W.5** Students will form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood.	**9.5.W.1** Students will write using correct mechanics with a focus on punctuation marks as needed. **9.5.W.2** Students will compose simple, compound, complex, and compound-complex sentences and questions to signal differing relationships among ideas. **9.5.W.3** Students will use parallel structure. **9.5.W.4** Students will use various types of phrases *(e.g., appositive, adjectival, adverbial, participial, prepositional)* and clauses *(e.g., independent, dependent, adverbial)* to convey specific meanings and add variety and interest to writing or presentations.	**10.5.W.1** Students will write using correct mechanics. **10.5.W.2** Students will compose simple, compound, complex, and compound-complex sentences and questions, to signal differing relationships among ideas. **10.5.W.3** Students will practice their use of Standard American English, grammar, mechanics, and usage through writing, presentations, and/or other modes of communication to convey specific meanings and interests.

5: Language - Students will apply knowledge of grammar and rhetorical style to reading and writing.

	11th Grade - English III	12th Grade - English IV
Reading Students will apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts.	**11.5.R** Students will apply their knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts, understanding that usage and convention change over time and using that understanding to manipulate style when appropriate.	**12.5.R** Students will apply their knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts, understanding that usage and convention change over time and using that understanding to manipulate style when appropriate.
Writing Students will demonstrate command of Standard English grammar, mechanics, and usage through writing and other modes of communication.	**11.5.W.1** Students will write using correct mechanics. **11.5.W.2** Students will compose simple, compound, complex, and compound-complex sentences and questions, including the use of phrases and clauses, to signal differing relationships among ideas. **11.5.W.3** Students will demonstrate command of Standard American English, grammar, mechanics, and usage through writing, presentations, and/or other modes of communication to convey specific meanings and interests.	**12.5.W.1** Students will write using correct mechanics. **12.5.W.2** Students will compose simple, compound, complex, and compound-complex sentences and questions, including the use of phrases and clauses, to signal differing relationships among ideas. **12.5.W.3** Students will demonstrate command of Standard American English, grammar, mechanics, and usage through writing, presentations, and/or other modes of communication to convey specific meanings and interests.

Standard 6

Research

Students will engage in inquiry to acquire, refine, and share knowledge.

Reading

Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.

Writing

Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.

6: Research - Students will engage in inquiry to acquire, refine, and share knowledge.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.	**PK.6.R** Students will begin to identify pictures, charts, grade-appropriate texts, or people as sources of information on a topic of interest.	**K.6.R.1** Students will identify relevant pictures, charts, grade-appropriate texts, or people as sources of information on a topic of interest. **K.6.R.2** Students will identify graphic features to understand a text including photos, illustrations, and titles to understand a text.	**1.6.R.1** Students will decide who can answer questions about their topic or what resources they will need to find the information. **1.6.R.2** Students will identify graphic features including photos, illustrations, titles, labels, headings, charts, and graphs to understand a text. **1.6.R.3** Students will identify the location and purpose of various visual and text reference sources.
Writing Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.	**PK.6.W** Students will generate topics of interest and decide if a friend, teacher, or expert can answer their questions with guidance and support.	**K.6.W.1** Students will generate topics of interest and decide if a friend, teacher, or expert can answer their questions with guidance and support. **K.6.W.2** Students will find information from provided sources during group research with guidance and support.	**1.6.W.1** Students will generate questions about topics of interest. **1.6.W.2** Students will organize information found during group or individual research, using graphic organizers or other aids with guidance and support. **1.6.W.3** Students will make informal presentations of information gathered.

6: Research - Students will engage in inquiry to acquire, refine, and share knowledge.

	2nd Grade	3rd Grade	4th Grade
Reading Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.	**2.6.R.1** Students will create their own questions to find information on their topic. **2.6.R.2** Students will use graphic features including photos, illustrations, titles, labels, headings, subheadings, charts, and graphs to understand a text. **2.6.R.3** Students will consult various visual and text reference sources to gather information.	**3.6.R.1** Students will use their own questions to find information on their topic. **3.6.R.2** Students will use graphic features including photos, illustrations, captions, titles, labels, headings, subheadings, italics, sidebars, charts, graphs, and legends to define a text. **3.6.R.3** Students will locate information in visual and text reference sources, electronic resources, and/or interviews. **3.6.R.4** Students will determine the relevance and reliability of the information for their specific topic of interest with guidance and support.	**4.6.R.1** Students will use their own viable research questions to find information about a specific topic. **4.6.R.2** Students will use graphic features including photos, illustrations, captions, titles, labels, headings, subheadings, italics, sidebars, charts, graphs, and legends to interpret a text. **4.6.R.3** Students will determine the relevance and reliability of the information gathered.
Writing Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.	**2.6.W.1** Students will generate a list of topics of interest and individual questions about one specific topic of interest. **2.6.W.2** Students will organize information found during group or individual research, using graphic organizers or other aids. **2.6.W.3** Students will organize and present their information in written and/or oral reports or display.	**3.6.W.1** Students will generate a list of topics of interest and individual questions about one specific topic of interest. **3.6.W.2** Students will organize information found during group or individual research, using graphic organizers or other aids. **3.6.W.3** Students will summarize and present information in a report.	**4.6.W.1** Students will generate a viable research question about a specific topic. **4.6.W.2** Students will organize information found during research, following a modified citation style *(e.g., author, title, publication date)* with guidance and support. **4.6.W.3** Students will summarize and present information in a report.

6: Research - Students will engage in inquiry to acquire, refine, and share knowledge.

	5th Grade	6th Grade	7th Grade
Reading Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.	**5.6.R.1** Students will use their own viable research questions to find information about a specific topic.	**6.6.R.1** Students will use their own viable research questions to find information about a specific topic.	**7.6.R.1** Students will use their own viable research questions and thesis statements to find information about a specific topic.
	5.6.R.2 Students will record and organize information from various print and/or digital sources.	**6.6.R.2** Students will record and organize information from various primary and secondary sources *(e.g., print and digital).*	**7.6.R.2** Students will follow ethical and legal guidelines for finding and recording information from a variety of primary and secondary sources *(e.g., print and digital).*
	5.6.R.3 Students will determine the relevance and reliability of the information gathered.	**6.6.R.3** Students will determine the relevance, reliability, and validity of the information gathered.	**7.6.R.3** Students will determine the relevance, reliability, and validity of the information gathered.
Writing Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.	**5.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*.	**6.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*.	**7.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*.
	5.6.W.2 Students will formulate a viable research question from findings.	**6.6.W.2** Students will refine and formulate a viable research question and/or topic from initial findings.	**7.6.W.2** Students will refine and formulate a viable research question and report findings clearly and concisely, using a thesis statement.
	5.6.W.3 Students will organize information found during research, following a modified citation style *(e.g., author, title, publication date)* with guidance and support.	**6.6.W.3** Students will organize information found during research, following a citation style *(e.g., MLA, APA, etc.)* with guidance and support.	**7.6.W.3** Students will quote, paraphrase, and summarize findings following an appropriate citation style *(e.g., MLA, APA, etc.)* and avoiding plagiarism.
	5.6.W.4 Students will summarize and present information in a report.	**6.6.W.4** Students will summarize and present information in a report.	**7.6.W.4** Students will summarize and present information in a report.

6: Research - Students will engage in inquiry to acquire, refine, and share knowledge.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.	**8.6.R.1** Students will use their own viable research questions and well-developed thesis statements to find information about a specific topic. **8.6.R.2** Students will follow ethical and legal guidelines for finding and recording information from a variety of primary and secondary sources *(e.g., print and digital).* **8.6.R.3** Students will determine the relevance, reliability, and validity of the information gathered.	**9.6.R.1** Students will use their own viable research questions and well-developed thesis statements to find information about a specific topic. **9.6.R.2** Students will follow ethical and legal guidelines for finding and recording information from a variety of primary and secondary sources *(e.g., print and digital).* **9.6.R.3** Students will evaluate the relevance, reliability, and validity of the information gathered.	**10.6.R.1** Students will use their own viable research questions and well-developed thesis statements to find information about a specific topic. **10.6.R.2** Students will synthesize the most relevant information from a variety of primary and secondary sources *(e.g., print and digital),* following ethical and legal citation guidelines. **10.6.R.3** Students will evaluate the relevance, reliability, and validity of the information gathered.
Writing Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.	**8.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*. **8.6.W.2** Students will refine and formulate a viable research question and report findings clearly and concisely, using a well-developed thesis statement. **8.6.W.3** Students will quote, paraphrase, and summarize findings following an appropriate citation style *(e.g., MLA, APA, etc.)* and avoiding plagiarism. **8.6.W.4** Students will summarize and present information in a report.	**9.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*. **9.6.W.2** Students will refine and formulate a viable research question, integrate findings from sources, and clearly use a well-developed thesis statement. **9.6.W.3** Students will quote, paraphrase, and summarize findings following an appropriate citation style *(e.g., MLA, APA, etc.)* and avoiding plagiarism. **9.6.W.4** Students will summarize and present information in a report.	**10.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*. **10.6.W.2** Students will refine and formulate a viable research question, integrate findings from sources, and clearly use a well-developed thesis statement. **10.6.W.3** Students will integrate into their own writing quotes, paraphrases, and summaries of findings following an appropriate citation style *(e.g., MLA, APA, etc.)* and avoiding plagiarism. **10.6.W.4** Students will synthesize and present information in a report.

6: Research - Students will engage in inquiry to acquire, refine, and share knowledge.

	11th Grade - English III	12th Grade - English IV
Reading Students will comprehend, evaluate, and synthesize resources to acquire and refine knowledge.	**11.6.R.1** Students will use their own viable research questions and well-developed thesis statements to find information about a specific topic. **11.6.R.2** Students will synthesize the most relevant information from a variety of primary and secondary sources *(e.g., print and digital),* following ethical and legal citation guidelines. **11.6.R.3** Students will evaluate the relevance, reliability, and validity of the information gathered.	**12.6.R.1** Students will use their own viable research questions and well-developed thesis statements to find information about a specific topic. **12.6.R.2** Students will synthesize resources to acquire and refine knowledge, following ethical and legal citation guidelines. **12.6.R.3** Students will evaluate the relevance, reliability, and validity of the information gathered.
Writing Students will summarize and paraphrase, integrate evidence, and cite sources to create reports, projects, papers, texts, and presentations for multiple purposes.	**11.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*. **11.6.W.2** Students will integrate findings from sources using a well-developed thesis statement. **11.6.W.3** Students will integrate into their own writing quotes, paraphrases, and summaries of findings following an appropriate citation style *(e.g., MLA, APA, etc.)* and avoiding plagiarism. **11.6.W.4** Students will synthesize and present information in a report.	**12.6.W.1** Students will write research papers and/or texts independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*. **12.6.W.2** Students will integrate findings from sources using a well-developed thesis statement. **12.6.W.3** Students will integrate into their own writing quotes, paraphrases, and summaries of findings following an appropriate citation style *(e.g., MLA, APA, etc.)* and avoiding plagiarism. **12.6.W.4** Students will synthesize and present information in a report.

Standard 7

Multimodal Literacies

Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

Reading

Students will evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments.

Writing

Students will create multimodal texts to communicate knowledge and develop arguments.

7: Multimodal Literacies - Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments.	**PK.7.R** Students will recognize formats of print and digital text with guidance and support.	**K.7.R.1** Students will recognize formats of print and digital text with guidance and support. **K.7.R.2** Students will explore how ideas and topics are depicted in a variety of media and formats.	**1.7.R.1** Students will use provided print and digital resources with guidance and support. **1.7.R.2** Students will explore and compare how ideas and topics are depicted in a variety of media and formats.
Writing Students will create multimodal texts to communicate knowledge and develop arguments.	**PK.7.W** Students will use appropriate technology to communicate with others with guidance and support.	**K.7.W.1** Students will use appropriate technology to communicate with others with guidance and support. **K.7.W.2** Students will use appropriate props, images, or illustrations to support verbal communication.	**1.7.W.1** Students will select and use appropriate technology or media to communicate with others with guidance and support. **1.7.W.2** Students will use visual displays to support verbal communication and clarify ideas, thoughts, and feelings.

7: Multimodal Literacies - Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

	2nd Grade	3rd Grade	4th Grade
Reading Students will evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments.	**2.7.R.1** Students will locate and use print and digital resources with guidance and support. **2.7.R.2** Students will explain how ideas and topics are depicted in a variety of media and formats.	**3.7.R.1** Students will locate, organize, and use information from a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal questions. **3.7.R.2** Students will compare how ideas and topics are depicted in a variety of media and formats	**4.7.R.1** Students will locate, organize, and analyze information from a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal and interpretive questions to create new understandings. **4.7.R.2** Students will compare and contrast how ideas and topics are depicted in a variety of media and formats.
Writing Students will create multimodal texts to communicate knowledge and develop arguments.	**2.7.W.1** Students will select and use appropriate technology or media to communicate with others with guidance and support. **2.7.W.2** Students will create a simple presentation using audio, visual, and/or multimedia tools to support communication and clarify ideas, thoughts, and feelings	**3.7.W.1** Students will create multimodal content that communicates an idea using technology or appropriate media. **3.7.W.2** Students will create presentations using video, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.	**4.7.W.1** Students will create multimodal content that effectively communicates an idea using technology or appropriate media. **4.7.W.2** Students will create presentations using videos, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.

7: Multimodal Literacies - Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

	5th Grade	6th Grade	7th Grade
Reading Students will evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments.	**5.7.R.1** Students will analyze the characteristics and effectiveness of a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal and interpretive questions to create new understandings. **5.7.R.2** Students will compare and contrast how ideas and topics are depicted in a variety of media and formats.	**6.7.R.1** Students will compare and contrast the effectiveness of a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal, interpretive, and applied questions to create new understandings. **6.7.R.2** Students will analyze the impact of selected media and formats on meaning.	**7.7.R.1** Students will compare and contrast the effectiveness of techniques used in a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal, interpretive, and applied questions to create new understandings. **7.7.R.2** Students will analyze the impact of selected media and formats on meaning.
Writing Students will create multimodal texts to communicate knowledge and develop arguments.	**5.7.W.1** Students will create multimodal content that effectively communicates an idea using technology and appropriate media. **5.7.W.2** Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.	**6.7.W.1** Students will create multimodal content that effectively communicates ideas using technologies and appropriate media. **6.7.W.2** Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.	**7.7.W.1** Students will select, organize, or create multimodal content to complement and extend meaning for a selected topic. **7.7.W.2** Students will utilize multimedia to clarify information and strengthen claims or evidence.

7: Multimodal Literacies - Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments.	**8.7.R.1** Students will determine the intended purposes of techniques used for rhetorical effects in written, oral, visual, digital, non-verbal, and interactive texts to generate and answer interpretive and applied questions to create new understandings. **8.7.R.2** Students will analyze the impact of selected media and formats on meaning.	**9.7.R.1** Students will analyze and evaluate the effectiveness of techniques used in a variety of written, oral, visual, digital, non-verbal, and interactive texts with a focus on persuasion and argument to generate and answer literal, interpretive, and applied questions to create new understandings. **9.7.R.2** Students will analyze the impact of selected media and formats on meaning.	**10.7.R.1** Students will analyze techniques used to achieve the intended rhetorical purposes in written, oral, visual, digital, non-verbal, and interactive texts to generate and answer interpretive and applied questions to create new understandings. **10.7.R.2** Students will analyze the impact of selected media and formats on meaning.
Writing Students will create multimodal texts to communicate knowledge and develop arguments.	**8.7.W.1** Students will select, organize, or create multimodal content that encompasses different points of view. **8.7.W.2** Students will utilize multimedia to clarify information and emphasize salient points.	**9.7.W.1** Students will create a variety of multimodal content to engage specific audiences. **9.7.W.2** Students will create engaging visual and/or multimedia presentations, using a variety of media forms to enhance understanding of findings, reasoning, and evidence for diverse audiences.	**10.7.W.1** Students will critique the sources of multimodal content. **10.7.W.2** Students will create visual and/or multimedia presentations using a variety of media forms to enhance understanding of findings, reasoning, and evidence for diverse audiences.

7: Multimodal Literacies - Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.

	11th Grade - English III	12th Grade - English IV
Reading Students will evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments.	**11.7.R.1** Students will analyze and evaluate the various techniques used to construct arguments in written, oral, visual, digital, non-verbal, and interactive texts, to generate and answer applied questions, and to create new understandings. **11.7.R.2** Students will analyze the impact of selected media and formats on meaning.	**12.7.R.1** Students will analyze and evaluate written, oral, visual, digital, non-verbal, and interactive texts in order to draw conclusions and defend arguments. **12.7.R.2** Students will analyze the impact of selected media and formats on meaning.
Writing Students will create multimodal texts to communicate knowledge and develop arguments.	**11.7.W.1** Students will design and develop multimodal content for a variety of purposes. **11.7.W.2** Students will construct engaging visual and/or multimedia presentations using a variety of media forms to enhance understanding of findings, reasoning, and evidence for diverse audiences.	**12.7.W.1** Students will create multimodal content to communicate knowledge and defend arguments. **12.7.W.2** Students will construct engaging visual and/or multimedia presentations using a variety of media forms to enhance understanding of findings, reasoning, and evidence for diverse audiences.

Standard 8

Independent Reading and Writing

Students will read and write for a variety of purposes including, but not limited to, academic and personal, for extended periods of time.

Reading

Students will read independently for a variety of purposes and for extended periods of time. Students will select appropriate texts for specific purposes.

Writing

Students will write independently for extended periods of time. Students will vary their modes of expression to suit audience and task.

8: Independent Reading and Writing - Students will read and write for a variety of purposes including, but not limited to, academic and personal.

	Pre-Kindergarten	Kindergarten	1st Grade
Reading Students will read independently for a variety of purposes and for extended periods of time. Students will select appropriate texts for specific purposes.	**PK.8.R** Students will demonstrate interest in books during read-alouds and shared reading, and interact independently with books.	**K.8.R** Students will demonstrate interest in books during read-alouds and shared reading, and interact independently with books.	**1.8.R** Students will select appropriate texts for academic and personal purposes and read independently for extended periods of time with guidance and support.
Writing Students will write independently for extended periods of time. Students will vary their modes of expression to suit audience and task.	**PK.8.W** Students will express their ideas through a combination of drawing and emergent writing with guidance and support.	**K.8.W** Students will express their ideas through a combination of drawing and emergent writing with guidance and support.	**1.8.W** Students will write independently for extended and shorter periods of time through a combination of emergent and conventional writing with guidance and support.

8: Independent Reading and Writing - Students will read and write for a variety of purposes including, but not limited to, academic and personal.

	2nd Grade	3rd Grade	4th Grade
Reading Students will read independently for a variety of purposes and for extended periods of time. Students will select appropriate texts for specific purposes.	**2.8.R** Students will select appropriate texts for academic and personal purposes and read independently for extended periods of time.	**3.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.	**4.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.
Writing Students will write independently for extended periods of time. Students will vary their modes of expression to suit audience and task.	**2.8.W** Students will write independently over extended periods of time *(e.g., time for reflection and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*.	**3.8.W** Students will write independently over extended periods of time *(e.g., time for reflection and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)* to communicate with different audiences for a variety of purposes.	**4.8.W** Students will write independently over extended periods of time *(e.g., time for reflection and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)* to communicate with different audiences for a variety of purposes.

8: Independent Reading and Writing - Students will read and write for a variety of purposes including, but not limited to, academic and personal.

	5th Grade	6th Grade	7th Grade
Reading Students will read independently for a variety of purposes and for extended periods of time. Students will select appropriate texts for specific purposes.	**5.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.	**6.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.	**7.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.
Writing Students will write independently for extended periods of time. Students will vary their modes of expression to suit audience and task.	**5.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)* to communicate with different audiences for a variety of purposes.	**6.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*, vary their modes of expression to suit audience and task, and explain how concepts relate to one another.	**7.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*, vary their modes of expression to suit audience and task, and discover different perspectives.

8: Independent Reading and Writing - Students will read and write for a variety of purposes including, but not limited to, academic and personal.

	8th Grade	9th Grade - English I	10th Grade - English II
Reading Students will read independently for a variety of purposes and for extended periods of time. Students will select appropriate texts for specific purposes.	**8.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.	**9.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.	**10.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.
Writing Students will write independently for extended periods of time. Students will vary their modes of expression to suit audience and task.	**8.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*, vary their modes of expression to suit audience and task, and analyze different perspectives.	**9.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*, vary their modes of expression to suit audience and task, and draw appropriate conclusions.	**10.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*, vary their modes of expression to suit audience and task, and draw and justify appropriate conclusions.

8: Independent Reading and Writing - Students will read and write for a variety of purposes including, but not limited to, academic and personal.

	11th Grade - English III	12th Grade - English IV
Reading Students will read independently for a variety of purposes and for extended periods of time. Students will select appropriate texts for specific purposes.	**11.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.	**12.8.R** Students will select appropriate texts for specific purposes and read independently for extended periods of time.
Writing Students will write independently for extended periods of time. Students will vary their modes of expression to suit audience and task.	**11.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*, vary their modes of expression to suit audience and task, and be able to apply new understandings in an original way.	**12.8.W** Students will write independently over extended periods of time *(e.g., time for research, reflection, and revision)* and for shorter timeframes *(e.g., a single sitting or a day or two)*, vary their modes of expression to suit audience and task, synthesize information across multiple sources, and articulate new perspectives.

Glossary

A

Academic vocabulary : refers to words associated with content knowledge. Within every discipline there is a specific set of words to represent its concepts and processes.

Abbreviation : a shortened or contracted form of a word or phrase, used to represent the whole, as Dr. for Doctor, U.S. for United States, and lb. for pound.

Active listening : the active pursuit of what another person is saying and feeling, as a way to improve mutual understanding. Active listening involves hearing content, listening for tone, observing body language, paraphrasing, summarizing, questioning, clarifying, and reflecting.

Affix : a morpheme or meaningful part of a word attached before or after a root to modify its meaning. Principal kinds of affixes are prefixes and suffixes. The prefix un- is an affix, which added to balanced, makes unbalanced. The suffix -ed is an affix which, added to wish, makes wished.

Alliteration : the repetition of the same initial consonant sound of each word in connected text (e.g., Harry the happy hippo hula-hoops with Henrietta).

Allusion : a brief and indirect reference to a person, place, thing, or idea of historical, cultural, literary, or political significance.

Analogy : a comparison of the similar aspects of two different things.

Annotation : a critical or explanatory note or body of notes added to a text.

Antagonist : the adversary of the hero or protagonist of a drama or other literary work.

Antonyms : words which have opposite meanings (e.g., hot and cold).

Appropriate technology : technology that students can use independently or with minimal scaffolding.

Archetype : a symbol, plot pattern, character type, or theme that recurs in many different cultures.

Argument essay : a genre of writing that requires the student to investigate a topic; collect, generate, and evaluate evidence; and establish and defend a position on the topic in a concise manner.

Argumentation : writing that seeks to influence through appeals that direct readers to specific goals or try to win them to specific beliefs.

Audience : writer's targeted reader or readers.

Author's craft : specific techniques that an author chooses to relay an intended message.

Automaticity : reading without conscious effort or attention to decoding.

B

Base : a free morpheme to which affixes can be added, usually of Anglo-Saxon origin.

Blending : the task of combining sounds rapidly to accurately represent the word.

C

Cause & effect : text structure that notes a relationship in which an event or events (the cause) make(s) another event or action happen (effect).

Citing sources : a quotation of or explicit reference to a source indicating where the paraphrased or quoted materials came. Examples of citation style include MLA (Modern Language Association) and APA (American Psychological Association).

Claim : an assertion of the truth of something.

Close reading : a strategy that requires a student to focus on and arrive at a deep understanding of individual texts by reading and re-reading. Fisher, Frey, and Lapp (2012) describe four reader roles that help the reader uncover meaning in a text:

1. Code Breaker: understanding the text at the surface level (i.e., alphabetic, structural)

2. Meaning maker: comprehending the text at the level intended by the author

3. Text user: analyzing the factors that influenced the author and the text, including a historical grounding of the context within which it was written

4. Text critic: understanding that the text is not neutral and that existing biases inform calls to action.

Closed syllable : a written syllable containing a single vowel and ending in one or more consonants; the vowel sound is short.

Coherence : continuity of meaning that enables others to make sense of a text.

Collaborative discussions : discussions that provide opportunities for speakers and listeners to use dialogue and interaction to raise issues, explore ideas, make claims, discover differences, and find ways to explore all aspects of ELA. These take many forms like a Socratic seminar, debate, or blog and combine students in small or large discourse communities.

Compare : find similarities between two or more texts or text elements.

Comparison : text structure in which ideas are related to one another on the basis of similarities and differences. The text presents ideas organized to compare, to contrast, or to provide an alternative perspective.

Compound word : a word made by putting two or more words together (e.g., cowboy).

Comprehension : understanding what one is reading, the ultimate goal of all reading activity.

Conflict : struggle or clash between opposing characters, forces, or emotions.

Connotation : a meaning that is implied by a word apart from the thing it describes explicitly. Words carry cultural and emotional associations or meanings in addition to their literal meanings or denotations.

Consonant blend : two or more consecutive consonants that retain their individual sounds (e.g., /bl/ in block; /str/ in string).

Consonant digraph : two consecutive consonants that represent one phoneme, or sound (e.g., /ch/, /sh/).

Consonant trigraph : a combination of three letters used to represent a single speech sound or phoneme*. (e.g.*/tch/)

Content-specific : vocabulary that includes technical words related to specific academic disciplines. *(See also academic and domain-specific vocabulary)*

Context : the parts of a written or spoken statement/text that precede or follow a specific word or passage, usually influencing its meaning or effect.

Context clue : the information from the textual setting that helps identify a word or word group.

Contraction : a short way to write two words as one by writing the two words together, leaving out one or more letters and replacing the missing letters with an apostrophe (e.g., cannot = can't).

Conventional writing : expressing thoughts and ideas with agreed upon symbols, like the alphabet.

Counterclaim : a claim made to rebut a previous claim.

D

Declarative sentence : the kind of sentence that makes a statement or "declares" something.

Decode : translate a word from print to speech, usually by employing knowledge of sound symbol correspondences; also the act of deciphering a new word by sounding it out.

Denotation : the literal or dictionary meaning of a word.

Description : text structure that presents a topic, along with the attributes, specifics, or setting information that describe that topic.

Detail : piece of information revealed by the author or speaker that supports the attitude or tone in a piece of poetry or prose. In informational text, details provide information to support the author's main point.

Diction : the choice and use of words by a speaker or a writer.

Digital media : media created, viewed, distributed, modified, and preserved on digital devices (e.g. computers, tablets, phones). Digital media include computer programs, digital videos, video games, web pages and websites, social media, databases, audio, and e-books. Digital media are contrasted with print media such as books, newspapers, magazines, pictures, film, and audiotape.

Domain-specific vocabulary : **"**relatively low-frequency, content-specific words that appear in textbooks and other instructional materials; for example, apex in math, escarpment in geography, and isobar in science" (Blachowicz, C. & Fisher, P., p.1). *(See also academic and content-specific vocabulary)*

E

Edit : to review writing to make sure that it is free of any grammatical errors or strange phrases that make it difficult for readers to understand the meaning.

Emergent writing : “means that children begin to understand that writing is a form of communication and their marks on paper convey a message” (Mayer, 2007, p. 35). Emergent writing progresses along a developmental continuum.

Ethical and legal guidelines for research : guidelines for correctly citing print and digital text when using primary and secondary sources for research. In addition, copying and pasting texts, purchasing essays online, using another author’s work, or violating copyright laws are unethical and could result in legal action.

Exclamatory sentence : a type of sentence that expresses strong feelings by making an exclamation.

F

Fiction : imaginative literary works representing invented rather than actual persons, places, or events.

Figurative language : writing or speech not meant to be taken literally but used to express ideas in vivid or imaginative ways. Figurative language includes simile, metaphor, personification, analogy, hyperbole, and idiom.

Flashback : scene that interrupts the action of a work to show a previous event.

Fluency : ability to read grade-level text accurately, with expression, and with automaticity. The combination of accuracy, automaticity, and prosody allow the reader to build comprehension.

Foreshadowing : use of hints or clues in a narrative to suggest future action.

G

Generalize : to make general or broad statements by inferring from text details.

Genre : a category used to classify literary and other works, usually by form, technique, or content. The novel, the short story, and the lyric poems are all examples of literary genres.

Grammar : rules of language.

Grapheme : a letter or letter combination that spells a phoneme; can be one, two, three, or four letters in English (e.g., e, ei, igh, eigh).

Graphic features : pictorial representation of data or ideas using columns, matrices, or other formats. Graphics can be simple or complex, present information in a straightforward way as in a list or pie graph, or embed or nest information within the document's structure. Graphics may be included in texts or be stand-alone documents.

H

High frequency Irregular words : words in print containing letters that stray from the most common sound pronunciation because they do not follow common phonic patterns (e.g., were, was, laugh, been).

High frequency words : a small group of words (300-500) that account for a large percentage of the words in print and can be regular or irregular words. Often, they are referred to as "sight words" since automatic recognition of these words is required for fluent reading.

Homographs : words that are spelled alike but have different sounds and meanings (e.g., bow used with an arrow vs. bow of a ship).

Homonyms : words that sound the same but have different spellings and meanings (e.g., bear, bare).

Hyperbole : obvious and deliberate exaggeration; an extravagant statement.

I

Idiom : an expression that does not mean what it literally says (e.g., to have the upper hand has nothing to do with the hands).

Imagery : multiple words or a continuous phrase that a writer uses to represent persons, objects, actions, feelings, or ideas descriptively by appealing to the senses.

Imperative sentence : a sentence that gives a command, makes a request, or expresses a wish.

Indent : to set in or back from the margin, as the first line of a paragraph.

Independent reading levels : the level at which a reader can read text with 95% accuracy (i.e., no more than one error per 20 words read). Independent reading level is relatively easy text for the reader.

Inference : act or process of deriving logical conclusions from premises known or assumed to be true; the conclusions drawn from this process.

Inferring : making a reasonable assumption about meaning that is not explicitly stated in the text.

Inflectional endings : in English, a suffix that expresses plurality or possession when added to a noun, tense when added to a verb, and comparison when added to an adjective and some adverbs; Added to verbs, nouns, or adjectives do not change the grammatical role or part of speech of the base words (-s, -es,-ing, ¬ed).

Informational : non-fiction books; also referred to as expository text, that contain facts and information.

Interactive texts : multimodal texts in which readers may determine the order and duration of reading. For example, interactive texts, may include hyperlinks to other pages containing embedded images, videos and audio.

Interrogative sentence : the kind of sentence that asks a question and uses a question mark.

Irony : the use of words to express something other than and especially the opposite of the literal meaning.

L

Legend : inscription or title on an object (e.g., a key to symbols used on a map).

Letter-sound correspondences : the matching of an oral sound to its corresponding letter or group of letters.

Lexile : a quantitative measure of text complexity and individual reading level that can be used to predict how well a reader will likely comprehend a text.

Literal : information directly from the text (e.g., on the line).

Literary nonfiction : text that conveys factual information. The text may or may not employ a narrative structure and characteristics such as dialogue.

M

Main idea : the central thought or premise of a reading passage.

Meaning vocabulary : application of one's understanding of word meanings to passage comprehension.

Memoir : type of autobiography that usually focuses on a single time period or historical event.

Metaphor : a direct comparison of two unlike things.

Modified citation style : using author, title, and publication date of sources to document research. This special style is used only at the fifth grade level to ease students into more stringent citation styles which are used in later grades.

Mood : atmosphere or predominant emotion in a literary work.

Morpheme : the smallest meaningful unit of the language.

Morphology : the study and description of how words are formed from prefixes, roots, and suffixes (e.g., mis-spell-ing), and how words are related to each other.

Multimodal : multiple + mode. A mode refers to a way of meaning-making or communicating. The New London Group (1996) outlines five modes through which meaning is made: Linguistic, Aural, Visual, Gestural, and Spatial. Any combination of modes makes a multimodal text, and all texts—every piece of communication that a human composes—use more than one mode. Thus, all writing is multimodal."All Writing is Multimodal**,"** Cheryl Ball and Colin Charlton, in *Naming What We Know: Threshold Concepts of Writing Studies*, Linda Adler- Kassner & Elizabeth Wardle (Eds.), forthcoming from Utah State University Press.

Multimodal content : content utilizing more than one mode (e.g. still images + words, words + video) to convey a meaning.

Multimodal literacy : "the interplay of meaning-making systems (alphabetic, oral, visual, etc.) that teachers and students should strive to study and produce." NCTE Position Statement on Multimodal Literacies.

Multisyllabic : these are words with more than one syllable. A systematic introduction of prefixes, suffixes, and multisyllabic words should occur throughout a reading program. The average number of syllables in the words students read should increase steadily throughout the grades.

N

Narrative writing : writing that tells a story. This writing is often anecdotal, experiential, and personal—allowing students to express themselves in creative and, quite often, moving ways.

Nonfiction : text that is factual and may be presented by detailed descriptions or examples; organization follows a logical pattern and may include textual aids.

Nonverbal cues : nonverbal messages that are a key aspect of speaking, for example, intonation, pauses, facial expressions, eye contact, gestures, and body language. Listeners should study these cues to determine a speaker's message, argument, and credibility.

Nonverbal texts : In place of words, nonverbal texts may include images, gestures, and movement.

O

Onomatopoeia : use of words that mimic the sounds they describe; imitative harmony.

Onset : all of the sounds in a syllable that come before the first vowel.

Opinion writing : writing that clearly states a view or judgment about a topic, supported by examples, and offering reasons for assertions and/or explaining cause and effect.

P

Parallel structure : repetition of words, phrases, or sentences that have the same grammatical structure or that restate a similar idea.

Paraphrase : to sum something up or clarify a statement by rephrasing it; to say something in other simpler words.

Personification : the bestowing of human qualities on animals, ideas, or things.

Persuasion : form of discourse whose function is to convince an audience or to prove or refute a point of view or an issue.

Phoneme : a speech sound that combines with others in a language system to make words.

Phonemic awareness : the ability to notice, think about, or manipulate the individual phonemes (sounds) in words. It is the ability to understand that sounds in spoken language work together to make words. This term is used to refer to the highest level of phonological awareness: awareness of individual phonemes in words.

Phonics : the study of the relationships between letters and the sounds they represent; also used to describe reading instruction that teaches sound-symbol correspondences. Sound-symbol correspondence are the rules and patterns by which letters and letter combinations represent speech sounds.

Phonological awareness : one's sensitivity to, or explicit awareness of, the phonological structure of words in one's language. This is an "umbrella" term that is used to refer to a student's sensitivity to any aspect of phonological structure in language. It encompasses awareness of individual words in sentences, syllables, and onset-rime segments, as well as awareness of individual phonemes.

Picture walk : a strategy for previewing a book prior to reading by looking at the cover and illustrations and asking questions that require students to make predictions about the text.

Plagiarism : using another person or source's words or ideas without giving credit or obtaining permission.

Plot : sequence of events or actions in a short story, novel, drama, or narrative poem.

Point of view : the way in which an author reveals a viewpoint or perspective. This can be done through characters, ideas, events, and narration.

Prefix : a morpheme that precedes a root and that contributes to or modifies the meaning of a word, as "re" in reprint.

Pre-reading strategies : strategies for preparing students to read a text prior to reading. Examples include: picture walk, brainstorming about the topic/text, advance organizers, activating prior knowledge, vocabulary previews, structural organizers, establishing a purpose for reading, etc.

Primary source : firsthand account of an event or a time period written or created during that time period (examples: *Diary of Anne Frank*, Dorothea Lange's photographs, newspaper article about Hurricane Katrina).

Print concepts : the ability of a child to know and recognize the ways in which print "works" for the purposes of reading, particularly with regard to books.

Prior knowledge : refers to schema, the knowledge and experience that readers bring to the text.

Problem/solution : text structure in which the main ideas are organized into two parts: a problem and a subsequent solution that responds to the problem, or a question and an answer that responds to the question.

Protagonist : central character of a short story, novel, or narrative poem. The antagonist is the character who stands directly opposed to the protagonist.

Purpose : specific reason or reasons for the writing. It conveys what the readers have to gain by reading the selection. Purpose is the objective or the goal that the writer wishes to establish.

Q

Quote : in research, to directly copy down the words from a source, set off in quotation marks.

R

R-controlled vowels : the modified sound of a vowel immediately preceding /r/ in the same syllable (e.g., care, never, sir, or).

Rate : the speed at which a person reads.

Recursive : moving back and forth through a text in either reading or writing, as new ideas are developed or problems encountered. In reading a text, recursive processes might include rereading earlier portions in light of later ones, looking ahead to see what topics are addressed or how a narrative ends, and skimming through text to search for particular ideas or events before continuing a linear reading. In creating a written composition, recursive processes include moving back and forth among the planning, drafting, and revising phases of writing.

Reenact : to act out the events of a text.

Retell : recall the content of what was read or heard.

Revise : the process of rereading a text and making changes (in content, organization, sentence structures, and word choice) to improve it; not to be confused with edit.

Rhetorical device : technique used by writers to persuade an audience. (e.g. alliteration, hyperbole, metaphor, etc.)

Rhyme : words that have the same ending sound.

Rime : a vowel plus the consonants that follow in a syllable; (e.g., -ame, -ick, -out).

Root : a bound morpheme, usually of Latin origin, that cannot stand alone but is used to form a family of words with related meanings.

S

Schema : refers to prior knowledge, the knowledge and experience that readers bring to the text.

Secondary source : an interpretation or analysis of a primary source (examples: book about diaries kept during the Holocaust, book about Great Depression photography, an op-ed about how New Orleans handled the Hurricane Katrina aftermath from a later date).

Segmenting : separating the individual phonemes, or sounds, of a word into discrete units.

Semantics : the study of meaning in language.

Semantic relationships : associations that exist between the meanings of words.

Sequential structure: text structure in which ideas are grouped on the basis of order or time.

Setting : time and place in which events in a short story, novel, drama, or narrative poem take place.

Shared reading : an interactive reading experience that occurs when students join in or share the reading of a big book or other enlarged text while guided and supported by a teacher or other experienced reader.

Simile : a combination of two things that are unlike, usually using the words like or as.

Stem : the base form of a word; also called the root word.

Structural analysis : a procedure for teaching students to read words formed with prefixes, suffixes, or other meaningful word parts.

Style : writer's characteristic manner of employing language.

Suffix : a derivational morpheme added to the end of root or base that often changes the word's part of speech and that modifies its meaning.

Summarize : reducing large selections of text to their base essentials: the gist, the key ideas, the main points that are worth noting and remembering.

Supporting details : reasons, examples, facts, steps, or other kinds of evidence that back up and explain a main idea. Details make up most of the information in what a person reads, but some details are more important than others.

Syllable : a unit of pronunciation that is organized around a vowel sound; it may or may not have consonants before or after the vowel.

Symbol : object, person, place, or action that has both a meaning in itself and that stands for something larger than itself, such as a quality, attitude, belief, or value.

Synonyms : words which have the same meaning. (e.g. example, instance, occurrence)

Syntax : arrangement of words and order of grammatical elements in a sentence.

Synthesize : creating original insights, perspectives, and understanding by reflecting on text(s) and merging elements from text and existing schema.

T

Text complexity : based on Fisher and Frey (2013), three inter-related aspects determine text complexity: quantitative evaluation, qualitative evaluation, and matching readers with texts and tasks.

1. **Quantitative evaluation**: readability measures and other scores of text complexity
2. **Qualitative evaluation**: levels of meaning, structure, language features, and knowledge demands
3. **Matching readers with texts and tasks**: reader variables (such as motivation, knowledge, and experiences) and task variables (such as purpose and the complexity generated by the task assigned and the questions posed) (p.7)

Theme : central meaning of a literary work. A literary work can have more than one theme. Most themes are not directly stated but rather are implied. A literary theme is not the same as a topic or main idea.

Thesis statement : the guiding, arguable statement or claim an essay attempts to prove through evidence and reasoning.

Tone : writer or speaker's attitude toward a subject, character, or audience conveyed through the author's choice of words and detail. Tone can be serious, humorous, sarcastic, objective, etc.

Topic : the subject of the entire paragraph/text selection; tells what the passage is mainly about.

Track print : look and process all the letters in order from left-to-right.

Trait : distinguishing feature, as of a person's character.

V

Verbal cues : words and phrases that speakers use to add emphasis, clarify organization, make connections, and create ethos. Listeners should be focusing on these cues as it helps listeners determine a speaker's message, argument, and credibility.

Vocabulary notebook : a teaching strategy used to help students learn new vocabulary.

Voice : distinctive style or manner of expression of an author or of a character.

Vowel digraph : two vowels together that represent one phoneme, or sound (e.g., ea, ai, oa).

Vowel diphthong : a sound made by combining two vowels, specifically when it starts as one vowel sound and proceeds to another, like the *oy* sound in *oil*.

W

Word study : the integration of phonics, spelling, and vocabulary instruction. This approach teaches students how to look closely at words to discover the regularities and conventions of English orthography, or spelling. The purpose is twofold: (1) develop a general knowledge of English spelling and discover generalizations about spelling, and (2) increase students' specific knowledge of words and their meanings.

Word family : group of words that share a rime (a vowel plus the consonants that follow; e.g., -ame, -ick, -out).

Word wall : a literacy tool used for displaying commonly used vocabulary and/or sight words in large print so that all students can read the words from their desks. The purpose of a word wall is to help students naturally gain familiarity with high frequency words, as well as to gain reinforcement of vocabulary.

Writing Modes : major types of writing. (Narrative, Opinion, Informational, Argumentation).

Writing process : steps contained in the writing process include prewriting, drafting, revising, editing, and publishing. This process is often recursive.

The 44* Phonemes of the English Language

Phoneme		Graphemes**	Examples	Phoneme		Graphemes**	Examples
Consonant Sounds:							
1	/**b**/	b, bb	big, ru**bb**er	14	/**t**/	t,tt,ed	**t**op,le**tt**er,stopp**ed**
2	/**d**/	d,dd,ed	**d**og, a**dd**, fill**ed**	15	/**v**/	v,ve	**v**et, gi**ve**
3	/**f**/	f,ph	**f**ish, **ph**one	16	/**w**/	w	**w**et, **w**in, s**w**im
4	/**g**/	g,gg	**g**o,e**gg**	17	/**y**/	y,i	**y**es, on**i**on
5	/**h**/	h	**h**ot	18	/**z**/	z,zz,ze,s,se,x	**z**ip, fi**zz**, snee**ze**, la**s**er,i**s**,wa**s**,plea**se**,**x**ylophone
6	/**j**/	j,g,ge,dge	**j**et,ca**g**e,bar**ge**,ju**dge**	**Consonant Digraphs:**			
7	/**k**/	c,k,ck,ch,cc,que	**c**at,**k**itten,du**ck**,s**ch**ool,o**cc**ur, anti**que**	19	/**th**/ (not voiced)	th	**th**umb, **th**in, thing
8	/**l**/	l.ll	**l**eg, be**ll**	20	/**th**/ (voiced)	th	**th**is, fea**th**er, **th**en
9	/**m**/	m,mm, mb	**m**ad, ha**mm**er, la**mb**	21	/**ng**/	ng,n	si**ng**, mo**n**key, si**n**k
10	/**n**/	n,nn,kn,gn	**n**o,di**nn**er,**kn**ee, **gn**ome	22	/**sh**/	sh,ss,ch,ti,ci	**sh**ip, mi**ss**ion, **ch**ef, mo**ti**on, spe**ci**al
11	/**p**/	p,pp	**p**ie, a**pp**le	23	/**ch**/	ch,tch	chip, ma**tch**
12	/**r**/	r,rr,wr	**r**un, ma**rr**y, **wr**ite	24	/**zh**/	ge,s	gara**ge**, mea**s**ure, divi**s**ion
13	/**s**/	s,se,ss,c,ce,sc	**s**un,mou**se**,dre**ss**,**c**ity,i**ce**, **sc**ience	25	/**wh**/ (with breath)	wh	**wh**at, **wh**en, **wh**ere, **wh**y

The 44* Phonemes of the English Language

	Phoneme	Graphemes**	Examples
	Short Vowel Sounds:		
26	/**a**/	a, au	h**a**t, l**au**gh
27	/**e**/	e, ea	b**e**d, br**ea**d
28	/**i**/	i	**i**f
29	/**o**/	o, a, au, aw, ough	h**o**t, w**a**nt, h**au**l, dr**aw**, b**ough**t
30	/**u**/	u, o	**u**p, t**o**n
	Long Vowel Sounds:		
31	/**ā**/	a, a_e, ay, ai, ey, ei	b**a**con, l**a**te, d**ay**, tr**ai**n, th**ey**, **ei**ght, v**ei**n
32	/**ē**/	e, e_e, ea, ee, ey, ie, y	m**e**, th**ese**, b**ea**t, f**ee**t, k**ey**, ch**ie**f, bab**y**
33	/**ī**/	i, i_e, igh, y, ie	f**i**nd, r**i**de, l**igh**t, fl**y**, p**ie**
34	/**ō**/	o, o_e, oa, ou, ow	n**o**, n**o**te, b**oa**t, s**ou**l, r**ow**
35	/**ū**/	u, u_e, ew	h**u**man, **u**se, f**ew**, ch**ew**
	Other Vowel Sounds:		
36	/**oo**/	oo,u,oul	b**oo**k, p**u**t, c**ould**
37	/**o͞o**/	oo,u,u_e	m**oo**n, tr**u**th, r**ule**

	Phoneme	Graphemes**	Examples
	Vowel Diphthongs:		
38	/**ow**/	ow, ou, ou_e	c**ow**, **ou**t, m**ou**se, h**ou**se
39	/**oy**/	oi, oy	c**oi**n, t**oy**
	Vowel Sounds Influenced by r:		
40	/**a(r)**/	ar	c**ar**
41	/**ā(r)**/	air, ear, are	**air**, ch**air**, f**air**, h**air**, b**ear**, c**are**
42	/**i(r)**/	irr, ere, eer	m**irr**or, h**ere**, ch**eer**
43	/**o(r)**/	or, ore, oor	**for**, c**ore**, d**oor**
44	/**u(r)**/	ur, ir, er, ear, or, ar	b**ur**n, **ir**st, f**er**n, h**ear**d, w**or**k, doll**ar**

Phoneme (speech sound)

Grapheme (letters or groups of letters representing the most common spellings for the individual phonemes

* The number of phonemes is different in some linguistics textbooks; this is evidence of the difficulty of classifying (Moats, 1998).

** This list does not include all possible graphemes for a given phoneme.

Source: Orchestrating Success in Reading by Dawn Reithaug (2002)

Genre Guidance

The following provides a broad index of appropriate genres. This index does not include all genres or subgenres that students are expected to read. The genres align with expectations of the Standard 3 Critical Reading and Writing: Reading Strand - *Students will comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres from a variety of historical, cultural, ethnic, and global perspectives.*

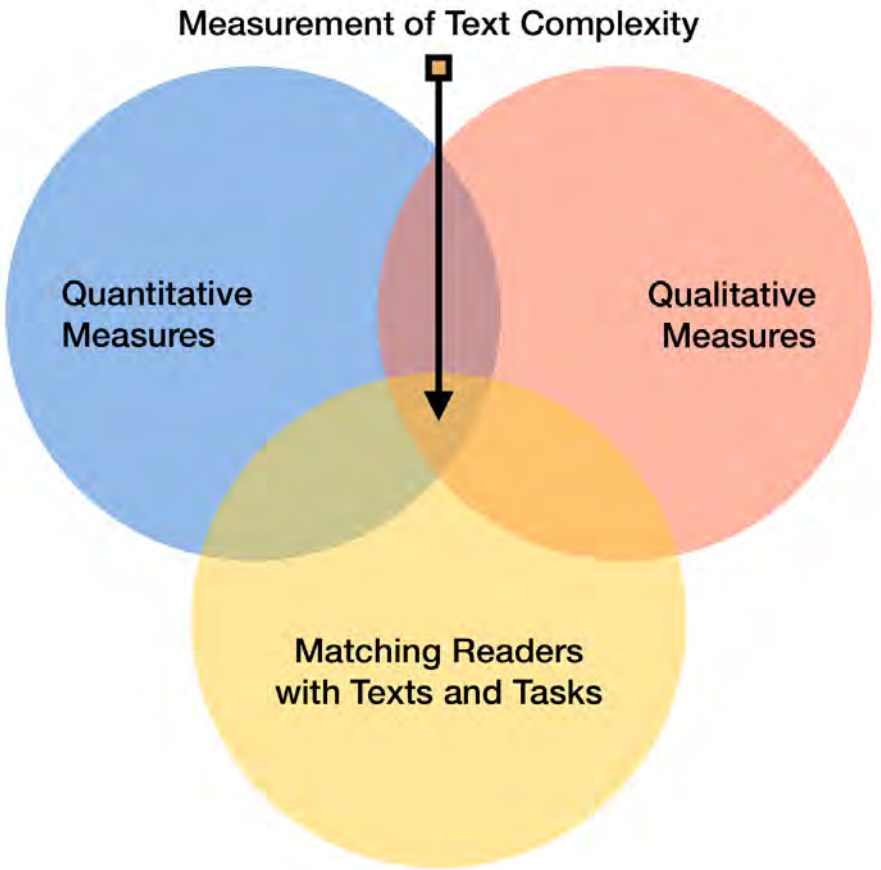
By end of **third grade,** students will have read grade-level appropriate texts in following:	By end of **fifth grade,** students will have read grade-level appropriate texts in following:	By end of **eighth grade,** students will have read grade-level appropriate texts in following:	By end of **English IV,** students will have read grade-level appropriate texts in following:
informational text	informational text	informational text	informational text
fiction	fiction	fiction	fiction
nonfiction	nonfiction	nonfiction	nonfiction
poetry	poetry	poetry	poetry
drama	drama	drama	drama
nursery rhyme	fable	fable	*Plus increasingly complex application of previous grades*
fable	legend	legend	
folk, fairy, and tall tale	fairy tale	fairy tale	
autobiography and biography	myth	myth	
	autobiography and biography	autobiography and biography	
	Plus increasingly complex application of previous grades	*Plus increasingly complex application of previous grades*	

Text Complexity Bands

In order to determine the complexity of a text, it is essential to consider three inter-related aspects: quantitative measures, qualitative measures, and reader-task considerations, (Fisher, Frey and Lapp, 2012).

Quantitative measures

Readability ranges (e.g. ATOS, Lexile Framework, Flesch-Kincaid) are available in order to measure the difficulty of the text. These ranges are created from an evaluation of word frequency and sentence length to determine text difficulty. Word frequency and sentence length are strong predictors of how difficult a text is to comprehend.



Qualitative measures

Readability ranges (quantitative measures) are not capable of assessing the subtleties of meaning, structure, language features and knowledge demands; therefore, Oklahoma educators will evaluate these qualitative measures using their professional judgment and expertise through a research- based rubric.

Matching readers with texts and tasks

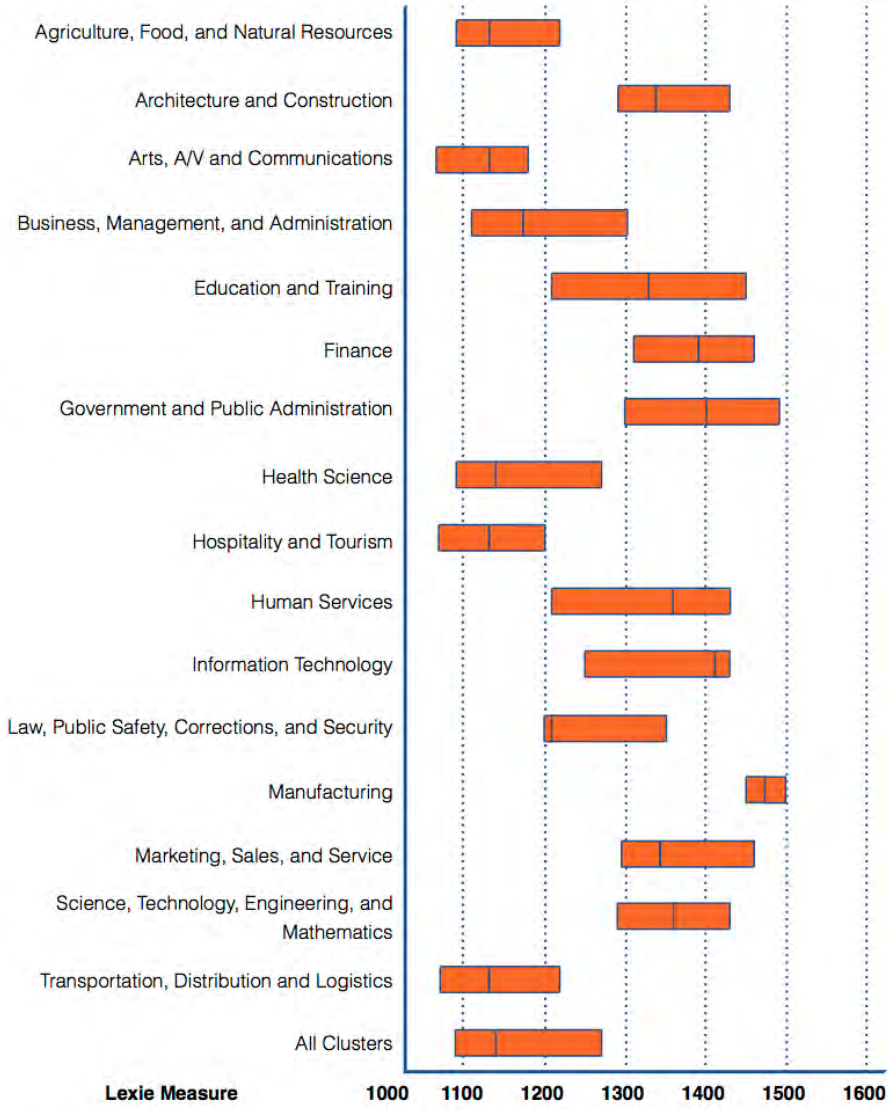
Input from parents, local classroom teachers, reading specialists, and/ or school librarians help determine the appropriateness of a text in regards to the reader's age, interests and the content of the text. Matching readers with texts and tasks are foremost in selecting appropriate texts for readers. Reader variables include motivation, knowledge, and experiences, and task variables consist of purpose and the complexity generated by the task assigned and the questions posed.

Prekindergarten through Kindergarten guidance

According to Dr. Douglas Fisher in *Text Complexity, Raising the Rigor in Reading*," text complexity is a staircase effect and the first steps on this staircase need to be carefully scaled so the youngest readers successfully acquire the fundamental of reading, which means that they are reading texts that allow for practice with decoding and fluency" (p. 37)

College- and Career-Readiness Reading Range

National Career Clusters® Framework
Text Complexity for 16 Career Clusters



Minimum reading range required for careers.

Typical Lexile Reader Measures, by Grade
lexile.com/about-lexile/grade-equivalent/grade-equivalent-chart

Grade	Lexie Reader Measures, Mid-Year 25th Percentile to 75th percentile (IQR)
1	Up to 300L
2	140L to 500L
3	330L 700L
4	445L to 810L
5	565L to 910L
6	665L to 1000L
7	735L to 1065L
8	805L to 1100L
9	855L to 1165L
10	905L to 1195L
11 and 12	940L to 1210L

If students read in the mid range and continue to progress through the grades, they should be effectively prepared for postsecondary education or the workforce.

Grammar Companion

Eight Parts of Speech

Noun - a word that names a person, place, thing, or idea.

- Proper Noun - the specific name of a particular person, place, or thing. These will always be capitalized.

  Ex: Mr. Smith, Riverdale Elementary, American

- Common noun - refers to a general group of persons, places, things, or ideas.

  Ex: teacher, school, citizen

- Concrete noun - these can be sensed by your five senses; they can be seen, touched, felt, tasted, heard, or smelled.

  Ex: apple, ball, telephone

- Abstract noun - represents a feeling, idea, or quality. These cannot be sensed by your five senses.

  Ex: hope, love, peace, hatred

- Collective noun - refers to things or people as a unit.

  Ex: team, family, class

Pronoun - a word that takes the place of a noun.

- Personal pronoun - refers to who is speaking, being spoken to, or spoken about.

	Personal Pronouns	
	Singular	**Plural**
First Person	I, me	we, us
Second Person	you	you
Third Person	he, him, she, it	they, them

- Possessive pronoun - a word that shows possession and defines who owns a particular object.

	Possessive Pronouns	
	Singular	**Plural**
First Person	my, mine	our, ours
Second Person	your, yours	your, yours
Third Person	his, her, hers, its	their, theirs

- Reflexive pronoun - a word that refers back to the subject of a sentence, clause, or phrase. It is formed by adding **–self** or **–selves** to a personal pronoun.

  Ex: myself, herself, himself, itself, ourselves, themselves

- Demonstrative pronoun - **this, that, these, those.** Points out a person, place, thing, or idea.

  Ex: This is my book. Those are my shoes. These are mine.

- Interrogative pronoun - **what, which, who, whom, whose.** Used at the beginning of a question.

- Antecedent - the noun the pronoun replaces.

    Ex: **Joann** placed **her** coat in the closet**. Joann** is the antecedent for **her**.

Verb - a word that expresses action or state of being.

- Action verb - a verb that expresses physical or mental action of the subject.

    Ex: Joe **walks** to school. The team **played** a great game. She is **talking** to me.

- Linking verb - **am, is, are, was, were, be, being, been.** These words are used to link the subject to some other word in the sentence that describes, identifies, or gives more information about it.

    Ex: John **was** sick for two days. (sick describes John) | John **is** hungry. (hungry describes John)

- Helping verb - used with the main verb to tell what happens or what exists.

may	am	do	should	have	will
might	is	does	could	had	can
must	are	did	would	has	shall
	was				
	were				
	be				
	being				
	been (also linking)				

    Ex: We **might win** the game tomorrow. (might is the helping verb and win is the main verb)

Adjectives - a word that modifies or describes a noun or pronoun. Adjectives tell **what kind, how many, how much,** and **which one**.

- Articles- **a, an, the,** are always adjectives.
- Adjectives tell What Kind. Ex: We stayed in a **large high-rise** hotel.
- Adjectives tell How Many. Ex: I have attended **four** schools.
- Adjectives tell How Much. Ex: We have **some** books to shelve in the library.
- Adjectives tell Which One. Ex: I live in **the blue** house.
    - Demonstrative Adjectives: **this, that, these, those.** When these words are used to describe a noun, they are adjectives. When they are used in place of a noun, they are demonstrative pronouns.

      Ex: This is my book. – demonstrative pronoun taking the place of book.

      This book is mine. – demonstrative adjective describing book.
- Adjectives that Compare - these are usually formed by adding **–er, -ier, -est, -iest.** Ex: **larger** hat, **angrier** than you, **biggest** car.
- Other comparative adjectives - better, best, more, most, little, less

Adverbs - a word that modifies or describes a verb, adjective, or other adverb. Adverbs tell **when, where, how, how often, how much, to what extent.** Common adverbs end in **–ly.**

- Adverbs tell **How**.

  Ex: The dolphin floated **gracefully** in the water.

  John finished the race **strong**.

- Adverbs tell **When**.

  Ex: Lisa will go **first**.

  Sometimes I eat cereal for dinner.

- Adverbs tell **Where**.

  Ex: Turn **left** at the stoplight.

  The dogs are **outside**.

- Adverbs modify other Adjectives and other Adverbs by showing the degree such as **almost, entirely, early, so, frequently, extremely, occasionally, too, awfully, completely, always, very.**

  Ex: It is **very** cold here. (The adverb *very* tells about the adjective *cold*.)

  I work **extremely** fast. (The adverb *extremely* tells about the adverb *fast.*)

Prepositions and Prepositional Phrases - a word or group of words linked to a noun or verb to describe direction or condition.

- One-word Prepositions - consists of one word

  Examples in sentences: The deer ran across the road. We stopped at the store down the street.

Common One-word Prepositions

about	at	but (meaning except)	in	out	under
above	before	by	inside	outside	underneath
across	behind	concerning	into	over	until
after	below	despite	like	past	unto
against	beneath	down	near	since	up
along	beside	during	of	through	upon
among	besides	except	off	throughout	with
around	between	for	on	toward	within
as	beyond	from	onto	to (unless a verb comes after it)	without

- Phrasal Prepositions- consist of more than one word.
  Example in a sentence: Water flowed in front of the rocks.

Common Phrasal Prepositions

according to	from among	in case of	in spite of	out of
along with	from between	in front of	instead of	next to
as for	in accordance with	in place of	on account of	with reference
except for	in addition to	in regard to	on top of	with regard to

Conjunction - a word that connects parts of a sentence.

- Coordinate conjunctions - **and, or, nor, for, so, but, yet -** connect equal parts of a sentence.

  Ex: I like to read **and** watch TV.

  We are going to go to a movie **and** we are going to go to dinner.

- Subordinate conjunctions - connect a dependent clause to an independent clause.

Common Subordinating Conjunctions

after	if	than	until	which
although	how	that	when	
as	since	though	where	
because	supposing	unless	whether	

- Correlative conjunctions - connect two ideas in pairs. **Neither…nor, either…or, not only…but also**

  Ex: **Not only** do I like football, **but** I **also** like baseball.

Interjection - a word or phrase that expresses emotion and often stands alone in a sentence.

Ex: wow, yes, well, please, yuck

Parts of the Sentence

Subject

The subject of a sentence is the person, place, or thing that is performing the action of the sentence. It is what or whom the sentence is about.

Ex: The young **man** built the family a the new house.

The simple subject is the subject and any modifiers.

Ex. **The young man** built the family a new house.

Predicate

The predicate of a sentence expresses the action or being within the sentence.

Ex: The young man **built** the family a new house.

The simple predicate contains the verb and words that modify the verb.

Ex: The young man **built the family a new house.**

Direct Object

The direct object receives the action of the sentence. It is usually a noun or pronoun.

Ex: The young man built the family a new **house**.

Indirect Object

The indirect object indicates to whom or for whom the action of the sentence is being done.

Ex: The young man built the **family** a new house.

Subject Complement

A subject complement either renames or describes the subject and is usually a noun, pronoun, or adjective. Subject complements follow a linking verb within the sentence.

Ex: The man is a good **father**. (father is the noun complement of man.) | The man seems **kind**. (kind is the adjective complement of man.)

Phrases - groups of words that do not contain both a subject and a verb.

Prepositional Phrase -made up of a preposition and its modifiers. It can function as an adjective or adverb in a sentence.

- Adjectival prepositional phrase: The store **around the corner** is green. (around the corner describes the noun store.)
- Adverbial prepositional phrase: Sally is coloring **outside the lines**. (outside the lines describes where the coloring takes place.)

Verbal Phrases - groups of words using verbs as other parts of the sentence. Infinitive, Gerund, and Participial

- **Infinitive Phrase - the word "to" plus a verb. Infinitive phrases can function as adjective, adverbs, or nouns**

  Ex: **To dance gracefully** is my ambition. (noun as the subject of a sentence)

  Her plan **to become a millionaire** fell through when the stock market crashed. (adjective describing plan)

  John went to college **to study engineering**. (adverb describing why he went)

- **Participial Phrase - a verb form functioning as an adjective.**

  Ex: **Swimming for his life**, John made it to shore. (swimming for his life describes John)

- **Gerund Phrase - an –ing verb form functioning as a noun.**

  Ex: **Walking the dog** is not my favorite task. (subject)

Appositive Phrase - renames or identifies a noun or pronoun. It is set off by commas if the added information is nonessential to the meaning of the sentence.

Ex: My teacher, **a woman with curly hair**, is very fun. (curly hair is nonessential to the teacher being fun)

The dog with the sharp teeth **Bowser** is the one who bit me. (Bowser is essential to identifying which dog bites)

Absolute Phrase - is a modifier, or a modifier and a few other words, that attaches to a sentence or a noun, with no conjunction. It cannot contain a finite verb.

Absolute phrases usually consist of a noun and a modifier that modifies this noun, NOT another noun in the sentence.

Absolute phrases are optional in sentences, i.e., they can be removed without damaging the grammatical integrity of the sentence. Since absolute phrases are optional in the sentence, they are often set off from the sentence with commas or, less often, with dashes. We normally explain absolute phrases by saying that they modify entire sentences, rather than one word.

Ex: **Their minds whirling from the events of the school day**, the students made their way to the parking lot.

His head pounding, his hands shaking, the young man knelt and proposed marriage to his girlfriend.

Clauses

Clauses - a group of related words that contains a subject and a verb. Independent clauses can stand alone as complete sentences. Dependent or subordinate clauses cannot stand alone and must be in the sentence with an independent clause.

Adjective Clauses - dependent clauses that describe nouns or pronouns. They begin with relative pronouns: **that, where, which, who, whose.**

Ex: The teacher **who left her papers on the desk** will be late turning in her grades.

Adverb Clauses - dependent clauses that describe verbs, adjectives, or adverbs. They begin with subordinating conjunctions.

Subordinating conjunctions to show time: **after, before, when, while, as , whenever, since, until, as soon as, as long as, once**

Subordinating conjunctions to show cause and effect: **because, since, now that, as, so, in order that**

Subordinating conjunctions to show condition: **if, unless, whether, providing**

Subordinating conjunctions to show contrast: **although, even though, though, whereas, while**

Examples:

Time: **After the family spent the day at the zoo,** they were very tired.

Cause and Effect: The family was very tired **since they spent the day at the zoo.**

Condition: **Unless you plan your trip to the zoo carefully,** you won't be able to see all the animals in one day.

Contrast: The family visited the park, **although they really wanted to spend the day at the zoo.**

Noun Clauses - dependent clauses that function as the subject, object, or compliment of a sentence.
They begin with subordinating conjunctions.

how	when	who
however	whenever	whoever
if	where	whom
that	wherever	whomever
what	which	whose
whether	whichever	why
whatever		

Examples:

Whatever you want for dinner is fine with me. (subject)

John will make **whatever you want for dinner.** (direct object)

I have dinner ready for **whoever wants to eat.** (object of the preposition)

Verb Tense

The tense of a verb is determined by when the action took place. The three tenses are:

- The Past Tense
- The Present Tense
- The Future Tense

Examples of Tenses

Here are some examples of verbs in different tenses:

- I walked to work. (The verb *walked* is in the **past tense**.)
- I walk to work. (The verb *walk* is in the **present tense**.)
- I will walk to work. (The verb *will walk* is in the **future tense**.)

Verbs do not just express actions. They can also express a state of being. For example:

- I was happy. (The verb *was* is in the **past tense**.)
- I am happy. (The verb *am* is in the **present tense**.)
- I will be happy. (The verb *will be* is in the **future tense**.)

Some of the verbs in the past tense are made up of more than one word. We need these different versions of the tenses because the tenses are further categorized depending on whether the action (or state of being) they describe is in progress or completed. For example, the different versions of the verb *to laugh* are:

- **Past Tense**: laughed, was/were laughing, had laughed, had been laughing
- **Present Tense**: laugh, am/is/are laughing, has/have laughed, has/have been laughing
- **Future Tense**: will laugh, will be laughing, will have laughed, will have been laughing

The Full List of Tenses

The table below shows the full list of the tenses:

The 4 Past Tenses	Example
simple past tense	I went
past progressive tense	I was going
past perfect tense	I had gone
past perfect progressive tense	I had been going
The 4 Present Tenses	**Example**
simple present tense	I go
present progressive tense	I am going
present perfect tense	I have gone
present perfect progressive tense	I have been going
The 4 Future Tenses	**Example**
simple future tense	I will go
future progressive tense	I will be going
future perfect tense	I will have gone
future perfect progressive tense	I will have been going

Sentence Structure

1. Simple - a simple sentence contains one independent clause.

Ex: Judy laughed.

2. Compound - a compound sentence contains two or more independent clauses joined by a conjunction.

Ex: Judy laughed and Jimmy cried.

3. Complex - a complex sentence contains an independent clause and at least one dependent clause.

Ex: Jimmy cried when Judy laughed.

4. Compound Complex - a compound-complex sentence contains two or more independent clauses and at least one dependent clause.

Ex: Judy laughed and Jimmy cried when the clowns ran past their seats.

Types of Sentences

1. Declarative sentences make a statement to relay information or ideas. They are punctuated with a simple period. Formal essays or reports are composed almost entirely of declarative sentences.

Ex: The concert begins in two hours. July 4th is Independence Day.

2. Imperative sentences issue commands or requests or they can express a desire or wish. They are punctuated with a simple period or they can be exclamations requiring an exclamation mark. It all depends on the strength of emotion you want to express. Imperative sentences can consist of a single verb or they can be more lengthy and complex.

Ex: Watch out for oncoming traffic. Please do your homework.

3. Exclamatory sentences express strong emotion. It doesn't really matter what the emotion is, an exclamatory sentence is the type of sentence needed to express it. Exclamatory sentences always end in an exclamation mark, so it's pretty easy to spot them.

Ex: The river is rising! I can't wait for the party!

4. Interrogative sentences are also easy to spot. That's because they always ask a question and end in a question mark.

Ex: Is it snowing? Have you had breakfast?

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SCIENCE

OKLAHOMA STATE DEPARTMENT OF EDUCATION

OKLAHOMA ACADEMIC STANDARDS

5-PS1-1 Matter and Its Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Develop a model to describe phenomena.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Properties of Matter:** • Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. • A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects.	**5-PS1-1** *Students who demonstrate understanding can:* **Develop a model to describe that matter is made of particles too small to be seen.** **Clarification Statement:** Examples of evidence that could be utilized in building models include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water. **Assessment Boundary:** Assessment does not include atomic-scale mechanism of evaporation and condensation or defining the unseen particles.

Crosscutting Concepts: Scale, Proportion, and Quantity
• Natural objects exist from the very small to the immensely large.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5TH GRADE

5-PS1-2 Matter and Its Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ **Using mathematics and computational thinking** **Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.** • **Measure and graph quantities such as weight to address scientific and engineering questions and problems.** ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Properties of Matter:** • The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. **Chemical Reactions:** • No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.)	**5-PS1-2** *Students who demonstrate understanding can:* **Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.** **Clarification Statement:** Examples of reactions or changes could include phase changes, dissolving, and mixing that forms new substances. **Assessment Boundary:** Assessment does not include distinguishing mass and weight.

Crosscutting Concepts: Scale, Proportion, and Quantity

• Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5-PS1-3 Matter and Its Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ **Planning and carrying out investigations** **Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.** • **Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.** ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Properties of Matter:** • Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.)	**5-PS1-3** *Students who demonstrate understanding can:* **Make observations and measurements to identify materials based on their properties.** **Clarification Statement:** Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property. **Assessment Boundary:** Assessment does not include density or distinguishing mass and weight.

Crosscutting Concepts: Scale, Proportion, and Quantity

• Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5TH GRADE

5-PS1-4 Matter and Its Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ **Planning and carrying out investigations** **Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.** **• Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.** ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Chemical Reactions:** • When two or more different substances are mixed, a new substance with different properties may be formed.	**5-PS1-4** *Students who demonstrate understanding can:* **Conduct an investigation to determine whether the mixing of two or more substances results in new substances.** **Clarification Statement:** Examples of interactions forming new substances can include mixing baking soda and vinegar. Examples of interactions not forming new substances can include mixing baking soda and water.

Crosscutting Concepts: Cause and Effect
• Cause and effect relationships are routinely identified, tested, and used to explain change.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5-PS2-1 Motion and Stability: Forces and Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument from evidence in 3-5 builds on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).** ❽ Obtaining, evaluating, and communicating information	**Types of Interactions:** • The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.	**5-PS2-1** *Students who demonstrate understanding can:* **Support an argument that the gravitational force exerted by the Earth is directed down.** **Clarification Statement:** "Down" is a local description of the direction that points toward the center of the spherical earth. Earth causes objects to have a force on them that point toward the center of the Earth, "down". Support for arguments can be drawn from diagrams, evidence, and data that are provided. **Assessment Boundary:** Mathematical representation of gravitational force is not assessed.

Crosscutting Concepts: Cause and Effect
• Cause and effect relationships are routinely identified, tested, and used to explain change.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5TH GRADE

5-PS3-1 Energy

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.** **• Use models to describe phenomena.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Energy in Chemical Processes and Everyday Life:** • The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). **Organization of Matter and Energy Flow in Organisms:** • Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion.	**5-PS3-1** *Students who demonstrate understanding can:* **Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.** **Clarification Statement:** Examples of models could include diagrams, and flow charts. **Assessment Boundary:** Assessment does not include cellular mechanisms of digestive absorption.

Crosscutting Concepts: Energy and Matter
• Energy can be transferred in various ways and between objects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5-LS1-1 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument from evidence in 3-5 builds on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world.** • **Support an argument with evidence, data, or a model.** ❽ Obtaining, evaluating, and communicating information	**Organization for Matter and Energy Flow in Organisms:** • Plants acquire their material for growth chiefly from air and water.	**5-LS1-1** *Students who demonstrate understanding can:* **Support an argument that plants get the materials they need for growth chiefly from air and water.** **Clarification Statement:** Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.

Crosscutting Concepts: Energy and Matter
• Matter is transported into, out of, and within systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5TH GRADE

5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ **Developing and using models**
Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.
- **Develop a model to describe phenomena.**

❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Interdependent Relationships in Ecosystems:
- The food of almost any kind of animal can be traced back to plants.
- Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants.
- Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers."
- Decomposition eventually restores (recycles) some materials back to the soil.
- Organisms can survive only in environments in which their particular needs are met.
- A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.
- Newly introduced species can damage the balance of an ecosystem.

Cycles of Matter and Energy Transfer in Ecosystems:
- Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.
- Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment.

Performance Expectations

5-LS2-1
Students who demonstrate understanding can:

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Clarification Statement:
Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.

Assessment Boundaries:
Assessment does not include molecular explanations.

Crosscutting Concepts: Systems and System Models

- A system can be described in terms of its components and their interactions.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5-LS2-2 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.** **• Use models to describe phenomena.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Interdependent Relationships in Ecosystems:** • Organisms can survive only in environments in which their particular needs are met. • A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. • Newly introduced species can damage the balance of an ecosystem.	**5-LS2-2** *Students who demonstrate understanding can:* **Use models to explain factors that upset the stability of local ecosystems.** **Clarification Statement:** Factors that upset an ecosystem's stability includes: invasive species, drought, human development, and removal of predators. Models could include simulations, and representations, etc. **Assessment Boundaries:** Assessment does not include molecular explanations.

Crosscutting Concepts: Systems and System Models
• A system can be described in terms of its components and their interactions.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5TH GRADE

5-ESS1-1 Earth's Place in the Universe

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).** • **Support an argument with evidence, data, or a model.** ❽ Obtaining, evaluating, and communicating information	**The Universe and Its Stars:** • The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth.	**5-ESS1-1** *Students who demonstrate understanding can:* **Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.** **Assessment Boundary:** Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).

Crosscutting Concepts: Scale, Proportion and Quantity
• Natural objects exist from the very small to the immensely large.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5-ESS1-2 Earth's Place in the Universe

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ **Analyzing and interpreting data** **Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.** • **Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.** ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Earth and the Solar System:** • The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year.	**5-ESS1-2** *Students who demonstrate understanding can:* **Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.** **Clarification Statement:** Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months. **Assessment Boundary:** Assessment does not include causes of seasons.

Crosscutting Concepts: Patterns

• Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5TH GRADE

5-ESS2-1 Earth's Systems

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 3-5 builds on K-2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.** **• Develop a model using an example to describe phenomena.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Earth Materials and System:** • Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. • The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. • Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.	**5-ESS2-1** *Students who demonstrate understanding can:* **Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.** **Clarification Statement:** Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system. **Assessment Boundary:** Assessment is limited to the interactions of two systems at a time.

Crosscutting Concepts: System and System Models
• A system can be described in terms of its components and their interactions.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5-ESS2-2 Earth's Systems

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ **Using mathematics and computational thinking** **Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.** • **Describe and graph quantities such as area and volume to address scientific questions.** ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**The Roles of Water in Earth's Surface Processes:** • Nearly all of Earth's available water is in the ocean. • Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.	**5-ESS2-2** *Students who demonstrate understanding can:* **Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.** **Assessment Boundary:** Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere. Only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.

Crosscutting Concepts: Scale, Proportion, and Quantity

• Standard units are used to measure and describe physical quantities such as weight and volume.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

5TH GRADE

5-ESS3-1 Earth and Human Activity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ **Obtaining, evaluating, and communicating information** **Obtaining, evaluating, and communicating information in 3– 5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.** • **Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.**	**Human Impacts on Earth Systems:** • Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.	**5-ESS3-1** *Students who demonstrate understanding can:* **Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.** **Clarification Statement:** Examples of information might include the use of natural fertilizers or biological pest control by farmers, replanting trees after cutting them by the logging industry, and the institution of recycling programs in cities. **Assessment Boundary:** N/A

Crosscutting Concepts: System and System Models
• A system can be described in terms of its components and their interactions.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-PS1-3 Matter and Its Interactions

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ Developing and using models
❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ **Obtaining, evaluating, and communicating information**
Obtaining, evaluating, and communicating information in 6–8 builds on K–5 and progresses to evaluating the merit and validity of ideas and methods.
- **Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.**

Disciplinary Core Ideas

Structure and Properties of Matter:
- Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.

Chemical Reactions:
- Substances react chemically in characteristic ways.
- In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.

** Connections to Engineering, Technology, and Application of Science*

Interdependence of Science, Engineering, and Technology:
- Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.

Interdependence of Science, Engineering, and Technology on Society and the Natural World:
- The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.

Performance Expectations

MS-PS1-3

Students who demonstrate understanding can:

Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.*

Clarification Statement:
Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.

Assessment Boundary:
Not assessed at state level*.

Crosscutting Concepts: Structure and Function

- Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-PS1-5 Matter and Its Interactions

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ **Developing and using models**
Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.
- **Develop a model to describe unobservable mechanisms.**

❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Chemical Reactions:
- Substances react chemically in characteristic ways.
- In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.
- The total number of each type of atom is conserved, and thus the mass does not change.

** Connections to Engineering, Technology, and Application of Science*

Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena:
- Laws are regularities or mathematical descriptions of natural phenomena.

Performance Expectations

MS-PS1-5

Students who demonstrate understanding can:

Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

Clarification Statement:
Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms, that represent atoms.

Assessment Boundary:
Assessment does not include the use of atomic masses or intermolecular forces.

Crosscutting Concepts: Energy and Matter

- Matter is conserved because atoms are conserved in physical and chemical processes.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-PS1-6 Matter and Its Interactions

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ Developing and using models
❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ **Constructing explanations (for science) and designing solutions (for engineering)**
Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories.
- **Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.**

❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Chemical Reactions:
- Some chemical reactions release energy, others store energy.

Developing Possible Solutions:
(secondary to MS-PS1-6)
- A solution needs to be tested, and then modified on the basis of the test results, in order to improve it.

Optimizing the Design Solution:
(secondary to MS-PS1-6)
- Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of the characteristics may be incorporated into the new design.
- The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution.

Performance Expectations

MS-PS1-6
Students who demonstrate understanding can:

Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.*

Clarification Statement:
Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.

Assessment Boundary:
Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device.

Crosscutting Concepts: Energy and Matter

- The transfer of energy can be tracked as energy flows through a designed or natural system.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-PS2-1 Motion and Stability: Forces and Interactions

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering) Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.** • **Apply scientific ideas or principles to design an object, tool, process or system.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Forces and Motion:** • For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's third law). ** Connections to Engineering, Technology, and Application of Science* **Interdependence of Science, Engineering, and Technology on Society and the Natural World:** • The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions.	**MS-PS2-1** *Students who demonstrate understanding can:* **Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.*** **Clarification Statement:** Examples of practical problems could include the impact of collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle. **Assessment Boundary:** Assessment is limited to vertical or horizontal interactions in one dimension.

Crosscutting Concepts: Systems and System Models

• Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-PS2-2 Motion and Stability: Forces and Interactions

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ Developing and using models
❸ **Planning and carrying out investigations**
Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions.
- **Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim.**

❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Forces and Motion:
- The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change.
- The greater the mass of the object, the greater the force needed to achieve the same change in motion.
- For any given object, a larger force causes a larger change in motion.

Performance Expectations

MS-PS2-2
Students who demonstrate understanding can:

Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

Clarification Statement:
Emphasis is on balanced (Newton's First Law) and unbalanced forces in a system, qualitative comparisons of forces, mass and changes in motion (Newton's Second Law), frame of reference, and specification of units.

Assessment Boundary:
Assessment is limited to forces and changes in motion in one-dimension in an inertial reference frame and to change in one variable at a time. Assessment does not include the use of trigonometry.

Crosscutting Concepts: Stability and Change

- Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-PS4-1 Waves and Their Applications in Technologies for Information Transfer

Science & Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. **Using mathematics and computational thinking**
   Mathematical and computational thinking at the 6–8 level builds on K–5 and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments.
   - **Use mathematical representations to describe and/or support scientific conclusions and design solutions.**
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Waves Properties:
- A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude.

Performance Expectations

MS-PS4-1

Students who demonstrate understanding can:

Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.

Clarification Statement:
Emphasis is on describing waves with both qualitative and quantitative thinking.

Assessment Boundary:
Assessment does not include electromagnetic waves and is limited to standard repeating waves.

Crosscutting Concepts: Patterns

- Graphs and charts can be used to identify patterns in data.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-PS4-2 Waves and Their Applications in Technologies for Information Transfer

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ **Developing and using models**
Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
- **Develop and use a model to describe phenomena.**

❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Waves Properties:
- A sound wave needs a medium through which it is transmitted.

Electromagnetic Radiation:
- When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light.
- The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends.
- A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. However, because light can travel through space, it cannot be a matter wave, like sound or water waves.

Performance Expectations

MS-PS4-2

Students who demonstrate understanding can:

Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

Clarification Statement:
Emphasis is on both light and mechanical waves. Examples of models could include drawings, simulations, and written descriptions.

Assessment Boundary:
Assessment is limited to qualitative applications pertaining to light and mechanical waves.

Crosscutting Concepts: Structure and Function

- Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-PS4-3 Waves and Their Applications in Technologies for Information Transfer

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ **Obtaining, evaluating, and communicating information** **Obtaining, evaluating, and communicating information in 6-8 builds on K-5 and progresses to evaluating the merit and validity of ideas and methods.** • **Integrate qualitative scientific and technical information in written text with that contained in media and visual displays to clarify claims and findings.**	**Information Technologies and Instrumentation:** • Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.	**MS-PS4-3** *Students who demonstrate understanding can:* **Integrate qualitative scientific and technical information to support the claim that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.*** **Clarification Statement:** Emphasis is on a basic understanding that waves can be used for communication purposes. Examples could include using fiber optic cable to transmit light pulses, radio wave pulses in wifi devices, and conversion of stored binary patterns to make sound or text on a computer screen. **Assessment Boundary:** Assessment does not include binary counting. Assessment does not include the specific mechanism of any given device.

Crosscutting Concepts: Structure and Function
• Structures can be designed to serve particular functions.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-LS1-7 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ **Developing and using models**
Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.
• Develop a model to describe unobservable mechanisms.
❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Organization for Matter and Energy Flow in Organisms:
• Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.

Energy in Chemical Processes and Everyday Life:
(secondary to MS-LS1-7)
• Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.

Performance Expectations

MS-LS1-7
Students who demonstrate understanding can:

Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

Clarification Statement:
Emphasis is on describing that molecules are broken apart and put back together and that in this process, energy is released.

Assessment Boundary:
Assessment does not include details of the chemical reactions for photosynthesis or respiration.

Crosscutting Concepts: Energy and Matter
• Matter is conserved because atoms are conserved in physical and chemical processes.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-LS4-1 Biological Unity and Diversity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ **Analyzing and interpreting data** **Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.** • **Analyze and interpret data to determine similarities and differences in findings.** ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Evidence of Common Ancestry and Diversity:** • The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.	**MS-LS4-1** *Students who demonstrate understanding can:* **Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.** **Clarification Statement:** Emphasis is on finding patterns of changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers. **Assessment Boundary:** Assessment does not include the names of individual species or geological eras in the fossil record.

Crosscutting Concepts: Patterns

• Graphs, charts, and images can be used to identify patterns in data.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-LS4-2 Biological Unity and Diversity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering) Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.** **• Apply scientific ideas to construct an explanation for real- world phenomena, examples, or events.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Evidence of Common Ancestry and Diversity:** • The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.	**MS-LS4-2** *Students who demonstrate understanding can:* **Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer ancestral relationships.** **Clarification Statement:** Emphasis is on explanations of the ancestral relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures. **Assessment Boundary:** N/A

Crosscutting Concepts: Patterns
• Patterns can be used to identify cause and effect relationships.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-ESS1-4 Earth's Place in the Universe

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering) Constructing explanations and designing solutions in 6– 8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.** **• Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**The History of Planet Earth:** • The geologic time scale interpreted from rock strata provides a way to organize Earth's history. • Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.	**MS-ESS1-4** *Students who demonstrate understanding can:* **Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's geologic history.** **Clarification Statement:** Emphasis is on analyses of rock formations and fossils they contain to establish relative ages of major events in Earth's history. Major events could include the formation of mountain chains and ocean basins, adaptation and extinction of particular living organisms, volcanic eruptions, periods of massive glaciation, and the development of watersheds and rivers through glaciation and water erosion. The events in Earth's history happened in the past continue today. Scientific explanations can include models. **Assessment Boundary:** Assessment does not include recalling the names of specific periods or epochs and events within them.

Crosscutting Concepts: Scale, Proportion, and Quantity

• Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-ESS2-1 Earth's Systems

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.** **• Develop and use a model to describe phenomena.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Earth's Materials and Systems:** • All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms.	**MS-ESS2-1** *Students who demonstrate understanding can:* **Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.** **Clarification Statement:** Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials. **Assessment Boundary:** Assessment does not include the identification and naming of minerals.

Crosscutting Concepts: Stability and Change

• Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-ESS2-2 Earth's Systems

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering) Constructing explanations and designing solutions in 6– 8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.** • **Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Earth's Materials and Systems:** • The planet's systems interact over scales that range from microscopic to global in size. These interactions have shaped Earth's history and will determine its future. **The Roles of Water in Earth's Surface Processes:** • Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations.	**MS-ESS2-2** *Students who demonstrate understanding can:* **Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.** **Clarification Statement:** Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of a large mountain ranges) or small (such as rapid landslides on microscopic geochemical reactions), and how many geoscience processes usually behave gradually but are punctuated by catastrophic events (such as earthquakes, volcanoes, and meteor impacts). Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.

Crosscutting Concepts: Scale, Proportion, and Quantity

• Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-ESS2-3 Earth's Systems

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ Developing and using models
❸ Planning and carrying out investigations
❹ **Analyzing and interpreting data**
Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.
- **Analyze and interpret data to provide evidence for phenomena.**

❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

The History of Planet Earth:
(Secondary to 8-ESS2-3)
- Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches.

Plate Tectonics and Large-Scale System Interactions:
- Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart.

Performance Expectations

MS-ESS2-3
Students who demonstrate understanding can:

Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

Clarification Statement:
Examples of data include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).

Assessment Boundary:
Paleomagnetic anomalies in oceanic and continental crust are not assessed.

Crosscutting Concepts: Patterns

- Patterns in rates of change and other numerical relationships can provide information about natural systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-ESS3-1 Earth and Human Activity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering) Constructing explanations and designing solutions in 6– 8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.** **• Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Natural Resources:** • Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. • Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. • These resources are distributed unevenly around the planet as a result of past geologic processes.	**MS-ESS3-1** *Students who demonstrate understanding can:* **Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.** **Clarification Statement:** Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).

Crosscutting Concepts: Cause and Effect

• Cause and effect relationships may be used to predict phenomena in natural or designed systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

8TH GRADE

MS-ESS3-2 Earth and Human Activity

Science & Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. **Analyzing and interpreting data**
   Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.
   - **Analyze and interpret data to provide evidence for phenomena.**
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Natural Hazards:
- Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events.

Performance Expectations

MS-ESS3-2

Students who demonstrate understanding can:

Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Clarification Statement:
Emphasis is on how some natural hazards, such as volcanic eruptions and severe weather, are preceded by phenomena that allow for reliable predictions, but others, such as earthquakes, occur suddenly and with no notice, and thus are not yet predictable. Examples of natural hazards can be taken from interior processes (such as earthquakes and volcanic eruptions), surface processes (such as mass wasting and tsunamis), or severe weather events (such as hurricanes, tornadoes, and floods). Examples of data can include the locations, magnitudes, and frequencies of the natural hazards. Examples of technologies can be global (such as satellite systems to monitor hurricanes or forest fires) or local (such as building basements in tornado-prone regions or reservoirs to mitigate droughts).

Crosscutting Concepts: Patterns

- Graphs, charts, and images can be used to identify patterns in data.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

MS-ESS3-4 Earth and Human Activity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument form evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).** • **Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or solution to a problem.** ❽ Obtaining, evaluating, and communicating information	**Human Impacts on Earth Systems:** • Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.	**MS-ESS3-4** *Students who demonstrate understanding can:* **Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.** **Clarification Statement:** Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.

Crosscutting Concepts: Cause and Effect

• Cause and effect relationships may be used to predict phenomena in natural or designed systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS1-1 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering)** **Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student- generated sources of evidence consistent with scientific ideas, principles, and theories.** • **Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Function:** • Systems of specialized cells within organisms help them perform the essential functions of life. • All cells contain genetic information in the form of DNA molecules. • Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.	**HS-LS1-1** *Students who demonstrate understanding can:* **Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.** **Clarification Statement:** Emphasis is on the conceptual understanding that DNA sequences determine the amino acid sequence, and thus, protein structure. Students can produce scientific writings, oral presentations and or physical models that communicate constructed explanations. **Assessment Boundary:** Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein structures and functions, or the biochemistry of protein synthesis.

Crosscutting Concepts: Structure and Function

- Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS1-2 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.** • **Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Function:** • Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.	**HS-LS1-2** *Students who demonstrate understanding can:* **Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.** **Clarification Statement:** Emphasis is on the levels of organization including cells, tissues, organs, and systems of an organism. **Assessment Boundary:** Assessment does not include interactions and functions at the molecular or chemical level.

Crosscutting Concepts: Systems and System Models

• Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions— including energy, matter, and information flows—within and between systems at different scales.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS1-3 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ **Planning and carrying out investigations** **Planning and carrying out investigations to answer questions or test solutions to problems in 9–12 builds on K–8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical and empirical models.** **• Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.** ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Function:** • Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Outside that range (e.g., at a too high or tool low external temperature, with too little food or water available) the organism cannot survive.	**HS-LS1-3** *Students who demonstrate understanding can:* **Plan and conduct an investigation to provide evidence of the importance of maintaining homeostasis in living organisms.** **Clarification Statement:** A state of homeostasis must be maintained for organisms to remain alive and functional even as external conditions change within some range. Examples of investigations could include heart rate response to exercise, stomate response to moisture and temperature, root development in response to water levels, and cell response to hyper and hypotonic environments. **Assessment Boundary:** Assessment does not include the cellular processes involved in the feedback mechanism.

Crosscutting Concepts: Stability and Change

• Feedback (negative or positive) can stabilize or destabilize a system.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS1-4 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.** **• Use a model based on evidence to illustrate the relationships between systems or between components of a system.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Growth and Development of Organisms:** • In multicellular organisms individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow. • The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells. • Cellular division and differentiation produce and maintain a complex organism, composed of systems of tissues and organs that work together to meet the needs of the whole organism.	**HS-LS1-4** *Students who demonstrate understanding can:* **Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.** **Clarification Statement:** Emphasis is on conceptual understanding that mitosis passes on genetically identical materials via replication, not on the details of each phase in mitosis. **Assessment Boundary:** Assessment does not include specific gene control mechanisms or rote memorization of the steps of mitosis.

Crosscutting Concepts: Systems and System Models

• Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions— including energy, matter, and information flows—within and between systems at different scales.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS1-5 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.** **• Use a model based on evidence to illustrate the relationships between systems or between components of a system.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Organization for Matter and Energy Flow in Organisms:** • The process of photosynthesis converts light energy to stored chemical energy by converting carbon dioxide plus water into sugars plus released oxygen.	**HS-LS1-5** *Students who demonstrate understanding can:* **Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.** **Clarification Statement:** Emphasis is on illustrating inputs and outputs of matter and the transfer and transformation of energy in photosynthesis by plants and other photosynthesizing organisms. Examples of models could include diagrams, chemical equations, conceptual models, and/or laboratory investigations. **Assessment Boundary:** The assessment should provide evidence of students' abilities to describe the inputs and outputs of photosynthesis, not the specific biochemical steps. (e.g. photosystems, electron transport, and Calvin cycle).

Crosscutting Concepts: Energy and Matter

• Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS1-6 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering)** **Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student- generated sources of evidence consistent with scientific ideas, principles, and theories.** • **Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Organization for Matter and Energy Flow:** • (Builds on HS-LS1-5) The sugar molecules thus formed contain carbon, hydrogen, and oxygen: their hydrocarbon backbones are used to make amino acids and other carbon-based molecules that can be assembled into large molecules that can be assembled into large molecules (such as proteins or DNA), used for example to form new cells. • As matter and energy flow through different organization levels of living systems, chemical elements are recombined in different ways to form different products.	**HS-LS1-6** *Students who demonstrate understanding can:* **Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.** **Clarification Statement:** Emphasis is on students constructing explanations for how sugar molecules are formed through photosynthesis and the components of the reaction (i.e., carbon, hydrogen, oxygen). This hydrocarbon backbone is used to make amino acids and other carbon-based molecules that can be assembled (anabolism) into larger molecules (such as proteins or DNA). **Assessment Boundary:** Assessment does not include the details of the specific chemical reactions or identification of macromolecules.

Crosscutting Concepts: Energy and Matter

• Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS1-7 From Molecules to Organisms: Structure and Processes

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ **Developing and using models** **Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.** **• Use a model based on evidence to illustrate the relationships between systems or between components of a system.** ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Organization for Matter and Energy Flow in Organisms:** (Builds on HS-LS1-6) • As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products. • As a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. • Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. • Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment.	**HS-LS1-7** *Students who demonstrate understanding can:* **Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.** **Clarification Statement:** Emphasis is on the conceptual understanding of the inputs and outputs of the process of cellular respiration. Examples of models could include diagrams, chemical equations, conceptual models, and/or laboratory investigations. **Assessment Boundary:** Assessment should not include identification of the steps or specific processes involved in cellular respiration (e.g. glycolysis and Kreb's Cycle).

Crosscutting Concepts: Energy and Matter

• Energy cannot be created or destroyed—it only moves between one place and another place, between objects and/or fields, or between systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ Developing and using models
❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ **Using mathematics and computational thinking**
Mathematical and computational thinking at the 9–12 level builds on K–8 and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.
- **Use mathematical and/or computational representations of phenomena or design solutions to support explanations.**

❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Interdependent Relationships in Ecosystems:
- Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. These limits result from such factors as the availability of living and nonliving resources and from such challenges such as predation, competition, and disease.
- Organisms would have the capacity to produce populations of great size were it not for the fact that environments and resources are finite. This fundamental tension affects the abundance (number of individuals) of species in any given ecosystem.

Performance Expectations

HS-LS2-1

Students who demonstrate understanding can:

Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

Clarification Statement:
Emphasis is on quantitative analysis and comparison of the relationships among interdependent factors including boundaries, resources, climate and competition. Examples of mathematical comparisons could include graphs, charts, histograms, or population changes gathered from simulations or historical data sets.

Assessment Boundary:
Assessment does not include deriving mathematical equations to make comparisons.

Crosscutting Concepts: Scale, Proportion, and Quantity
- The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. **Using mathematics and computational thinking**
   Mathematical and computational thinking at the 9–12 level builds on K–8 and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.
   - **Use mathematical representations of phenomena or design solutions to support and revise explanations.**
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Interdependent Relationships in Ecosystems:
- Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. These limits result from such factors as the availability of living and nonliving resources and from such challenges such as predation, competition, and disease.
- Organisms would have the capacity to produce populations of great size were it not for the fact that environments and resources are finite. This fundamental tension affects the abundance (number of individuals) of species in any given ecosystem.

Ecosystem Dynamics, Functioning, and Resilience:
- A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions.
- If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem.
- Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.

Performance Expectations

HS-LS2-2

Students who demonstrate understanding can:

Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

Clarification Statement:
Examples of mathematical representations include finding the average, determining trends, and using graphical comparisons of multiple sets of data.

Assessment Boundary:
Assessment is limited to provided data.

Crosscutting Concepts: Scale, Proportion, and Quantity
- Using the concept of orders of magnitude allows one to understand how a model at one scale relates to a model at another scale.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS2-3 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering)** **Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student- generated sources of evidence consistent with scientific ideas, principles, and theories.** **• Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Cycles of Matter and Energy Transfer in Ecosystems:** • Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes.	**HS-LS2-3** *Students who demonstrate understanding can:* **Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.** **Clarification Statement:** Emphasis is on conceptual understanding of the role of aerobic and anaerobic respiration in different environments (e.g., chemosynthetic bacteria, yeast, and muscle cells). **Assessment Boundary:** Assessment does not include the specific chemical processes of either aerobic or anaerobic respiration.

Crosscutting Concepts: Energy and Matter

• Energy drives the cycling of matter within and between systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS2-4 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ Developing and using models
❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ **Using mathematics and computational thinking**
Mathematical and computational thinking at the 9–12 level builds on K–8 and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.
- **Use mathematical representations of phenomena or design solutions to support claims.**

❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Cycles of Matter and Energy Transfer in Ecosystems:
- Plants or algae form the lowest level of the food web.
- At each link upward in a food web, only a small fraction of the matter consumed at the lower level is transferred upward, to produce growth and release energy in cellular respiration at the higher level.
- Given this inefficiency, there are generally fewer organisms at higher levels of a food web.
- Some matter reacts to release energy for life functions, some matter is stored in newly made structures, and much is discarded.
- The chemical elements that make up the molecules of organisms pass through food webs and into and out of the atmosphere and soil, and they are combined and recombined in different ways.
- At each link in an ecosystem, matter and energy are conserved.

Performance Expectations

HS-LS2-4

Students who demonstrate understanding can:

Use a mathematical representation to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.

Clarification Statement:
Emphasis is on using a mathematical model of stored energy in biomass to describe the transfer of energy from one trophic level to another and that matter and energy are conserved as matter cycles and energy flows through ecosystems. Emphasis is on atoms and molecules such as carbon, oxygen, hydrogen and nitrogen being conserved as they move through an ecosystem.

Assessment Boundary:
The assessment should provide evidence of students' abilities to develop and use energy pyramids, food chains, food webs, and other models from data sets.

Crosscutting Concepts: Energy and Matter
- Energy cannot be created or destroyed- it only moves between one place and another place, between objects and/or fields, or between systems.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS2-5 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ **Developing and using models**
Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.
- **Develop a model based on evidence to illustrate the relationships between systems or components of a system.**

❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ Constructing explanations (for science) and designing solutions (for engineering)
❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Cycles of Matter and Energy Transfer in Ecosystems:
- Photosynthesis and cellular respiration are important components of the carbon cycle, in which carbon is exchanged among the biosphere, atmosphere, oceans, and geosphere through chemical, physical, geological, and biological processes.

Energy in Chemical Processes:
(secondary to HS-LS2-5)
- The main way that solar energy is captured and stored on Earth is through the complex chemical process known as photosynthesis.

Performance Expectations

HS-LS2-5

Students who demonstrate understanding can:

Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

Clarification Statement:
Examples of models could include simulations and mathematical models (e.g., chemical equations that demonstrate the relationship between photosynthesis and cellular respiration.

Assessment Boundary:
Assessment does not include the specific chemical steps of photosynthesis and respiration.

Crosscutting Concepts: Systems and Models

- Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions— including energy, matter, and information flows—within and between systems at different scales.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS2-6 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument from evidence in 9-12 builds on K-8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about natural and designed worlds. Arguments may also come from current scientific or historical episodes in science.** • **Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.** ❽ Obtaining, evaluating, and communicating information	**Ecosystem Dynamics, Functioning, and Resilience:** • A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. • If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. • Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.	**HS-LS2-6** *Students who demonstrate understanding can:* **Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.** **Clarification Statement:** Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise. **Assessment Boundary:** The assessment should provide evidence of students' abilities to derive trends from graphical representations of population trends. Assessments should focus on describing drivers of ecosystem stability and change, not on the organismal mechanisms of responses and interactions.

Crosscutting Concepts: Stability and Change

• Much of science deals with constructing explanations of how things change and how they remain stable.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS2-8 Ecosystems: Interactions, Energy, and Dynamics

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument from evidence in 9-12 builds on K-8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about natural and designed worlds. Arguments may also come from current scientific or historical episodes in science.** • **Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.** ❽ Obtaining, evaluating, and communicating information	**Social Interactions and Group Behavior:** • Group behavior has evolved because membership can increase the chances of survival for individuals and their genetic relatives.	**HS-LS2-8** *Students who demonstrate understanding can:* **Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.** **Clarification Statement:** Emphasis is on advantages of grouping behaviors (e.g., flocking, schooling, herding) and cooperative behaviors (e.g., hunting, migrating, swarming) on survival and reproduction. **Assessment Boundary:** The assessment should provide evidence of students' abilities to: (1) distinguish between group versus individual behavior, (2) identify evidence supporting the outcomes of group behavior, and (3) develop logical and reasonable arguments based on evidence.

Crosscutting Concepts: Cause and Effect

• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS3-1 Heredity: Inheritance and Variation of Traits

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ **Asking questions (for science) and defining problems (for engineering) Asking questions and defining problems in grades 9–12 builds from grades K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.** **• Ask question that arise from examining models or a theory to clarify relationships** ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Structure and Function:** (secondary to HS-LS3-1) • All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins. **Inheritance of Traits:** • Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. • The instructions for forming species' characteristics are carried in DNA. • All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. • Not all DNA codes for protein, some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known functions.	**HS-LS3-1** *Students who demonstrate understanding can:* **Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.** **Clarification Statement:** Emphasis should be on asking questions and making predictions to obtain reliable information about the role of DNA and chromosomes in coding the instructions for traits (e.g., pedigrees, karyotypes, genetic disorders, Punnett squares). **Assessment Boundary:** Assessments may include codominance, incomplete dominance, and sex-linked traits, but should not include dihybrid crosses.

Crosscutting Concepts: Cause and Effect

• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS3-2 Heredity: Inheritance and Variation of Traits

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence** **Engaging in argument from evidence in 9-12 builds on K-8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about natural and designed worlds. Arguments may also come from current scientific or historical episodes in science.** • **Make and defend a claim based on evidence about the natural world that reflects scientific knowledge, and student-generated evidence.** ❽ Obtaining, evaluating, and communicating information	**Variation of Traits:** • In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. • Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also cause mutations in genes, and variables mutations are inherited. • Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in the population. Thus the variation and distribution of traits observe depends on both genetic and environmental factors.	**HS-LS3-2** *Students who demonstrate understanding can:* **Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.** **Clarification Statement:** Emphasis is on using data to support arguments for the way variation occurs. **Assessment Boundary:** Assessment does not include the phases of meiosis or the biochemical mechanisms of specific steps in the process.

Crosscutting Concepts: Cause and Effect

• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS3-3 Heredity: Inheritance and Variation of Traits

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ **Analyzing and interpreting data** **Analyzing data in 9–12 builds on K–8 and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.** • **Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.** ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Variation of Traits:** • Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in the population. Thus the variation and distribution of traits observed depends on both genetic and environmental factors.	**HS-LS3-3** *Students who demonstrate understanding can:* **Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.** **Clarification Statement:** Emphasis is on distribution and variation of traits in a population and the use of mathematics (e.g., calculations of frequencies in Punnett squares, graphical representations) to describe the distribution. **Assessment Boundary:** The assessment should provide evidence of students' abilities to use mathematical reasoning to explain the variation observed in a population as a combination of genetic and environmental factors. Hardy-Weinberg calculations are beyond the intent.

Crosscutting Concepts: Scale, Proportion and Quantity

• Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS4-1 Biological Unity and Diversity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ **Analyzing and interpreting data Analyzing data in 9-12 builds on K-8 experiences and progress to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.** **• Analyze and interpret data to determine similarities and differences in findings.** ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Evidence of Common Ancestry and Diversity:** • Genetic information provides evidence of common ancestry and diversity. DNA sequences vary among species, but there are many overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and embryological evidence.	**HS-LS4-1** *Students who demonstrate understanding can:* **Analyze and evaluate how evidence such as similarities in DNA sequences, anatomical structures, and order of appearance of structures during embryological development contribute to the scientific explanation of biological diversity.** **Clarification Statement:** Emphasis is on identifying sources of scientific evidence. **Assessment Boundary:** The assessment should provide evidence of students' abilities to evaluate and analyze evidence (e.g. cladograms, analogous/homologous structures, and fossil records).

Crosscutting Concepts: Patterns

• Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS4-2 Biological Unity and Diversity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ **Constructing explanations (for science) and designing solutions (for engineering)** **Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student- generated sources of evidence consistent with scientific ideas, principles, and theories.** • **Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.** ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Natural Selection:** • Natural selection occurs only if there is both (1) variation in the genetic information between organisms in a population and (2) variation in the expression of that genetic information—that is, trait variation—that leads to differences in performance among individuals.	**HS-LS4-2** *Students who demonstrate understanding can:* **Construct an explanation based on evidence that biological diversity is influenced by (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.** **Clarification Statement:** Emphasis is on using evidence to explain the influence each of the four factors has on number of organisms, behaviors, morphology, or physiology in terms of ability to compete for limited resources and subsequent survival of individuals and adaptation of species. Examples of evidence could include mathematical models such as simple distribution graphs and proportional reasoning. **Assessment Boundary:** Assessment does not include genetic drift, gene flow through migration, and co-evolution.

Crosscutting Concepts: Cause and Effect

• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS4-3 Biological Unity and Diversity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ **Analyzing and interpreting data** **Analyzing data in 9–12 builds on K–8 and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.** • **Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.** ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Natural Selection:** • Natural selection occurs only if there is both (1) variation in the genetic information between organisms in a population and (2) variation in the expression of that genetic information—that is, trait variation—that leads to differences in performance among individuals. • The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. **Adaptation:** • Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally, and physiologically well suited to survive and reproduce in a specific environment. That is, the differential survival and reproduction of organisms in a population that have an advantageous heritable trait leads to an increase in the proportion of individuals in future generations that have the trait and to a decrease in the proportion of individuals that do not. • Adaptation also means that the distribution of traits in a population can change when conditions change.	**HS-LS4-3** *Students who demonstrate understanding can:* **Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.** **Clarification Statement:** Emphasis is on analyzing shifts in numerical distribution of traits and using these shifts as evidence to support explanations for adaptations. **Assessment Boundary:** The assessment should provide evidence of students' abilities to analyze shifts in numerical distribution of traits as evidence to support explanations. Analysis is limited to basic statistical and graphical analysis, not gene frequency calculations.

Crosscutting Concepts: Patterns

- Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations and phenomena.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS4-4 Biological Unity and Diversity

Science & Engineering Practices

❶ Asking questions (for science) and defining problems (for engineering)
❷ Developing and using models
❸ Planning and carrying out investigations
❹ Analyzing and interpreting data
❺ Using mathematics and computational thinking
❻ **Constructing explanations (for science) and designing solutions (for engineering)**
Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student- generated sources of evidence consistent with scientific ideas, principles, and theories.
- **Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.**

❼ Engaging in argument from evidence
❽ Obtaining, evaluating, and communicating information

Disciplinary Core Ideas

Adaptation:
- Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally, and physiologically well suited to survive and reproduce in a specific environment.
- That is, the differential survival and reproduction of organisms in a population that have an advantageous heritable trait leads to an increase in the proportion of individuals in future generations that have the trait and to a decrease in the proportion of individuals that do not.
- Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline–and sometimes the extinction–of some species.

Performance Expectations

HS-LS4-4

Students who demonstrate understanding can:

Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

Clarification Statement:
Emphasis is on using data to provide evidence for how specific biotic and abiotic differences in ecosystems (such as ranges of seasonal temperature, long-term climate change, acidity, light, geographic barriers, or adaptation of other organisms) contribute to a change in gene frequency over time, leading to adaptation of populations. One example could be that as climate became more arid, grasses replaced forests, which led to adaptation in mammals over time (e.g. Increase tooth enamel and size of teeth in herbivores).

Assessment Boundary:
The assessment should measure students' abilities to differentiate types of evidence used in explanations.

Crosscutting Concepts: Cause and Effect

- Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

HS-LS4-5 Biological Unity and Diversity

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ Planning and carrying out investigations ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ **Engaging in argument from evidence Engaging in argument from evidence in 9-12 builds on K-8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about natural and designed worlds. Arguments may also come from current scientific or historical episodes in science.** • **Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments.** ❽ Obtaining, evaluating, and communicating information	**Adaptation:** • Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline–and sometimes the extinction–of some species. • Species become extinct because they can no longer survive and reproduce in their altered environment. If members cannot adjust to change that is too fast or drastic, the opportunity for the species' adaptation over time is lost.	**HS-LS4-5** *Students who demonstrate understanding can:* **Synthesize, communicate, and evaluate the information that describes how changes in environmental conditions can affect the distribution of traits in a population causing: 1) increases in the number of individuals of some species, 2) the emergence of new species over time, and 3) the extinction of other species.** **Clarification Statement:** Emphasis is on determining cause and effect relationships for how changes to the environment such as deforestation, fishing, application of fertilizers, drought, flood, and the rate of change of the environment affect distribution or disappearance of traits in species. **Assessment Boundary:** The assessment should provide evidence of students' abilities to explain the cause and effect for how changes to the environment affect distribution or disappearance of traits in species.

Crosscutting Concepts: Cause and Effect

• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

SOCIAL STUDIES

OKLAHOMA
ACADEMIC
STANDARDS

OKLAHOMA
STATE DEPARTMENT *of* EDUCATION

JOY HOFMEISTER

STATE SUPERINTENDENT *of* PUBLIC INSTRUCTION

NOTE: The Social Studies subject standards were last revised in 2012. These standards contain references to the Common Core Social Studies reading and writing literacy skills. In 2014, House Bill 3399 repealed Common Core standards for Oklahoma. By operation of law, the references to Common Core in the Social Studies subject standards are no longer in effect, but all other elements of the standards apply in their entirety.

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The Use of Coherency Storylines in the Development of Social Studies Standards of Learning and Curriculum Frameworks: *Adding Unity, Specificity, and Transcendency to Social Studies Curricular Decisions*

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Coherency Storylines

Coherency Storylines have been used for the first time in Oklahoma in designing the *Oklahoma Academic Standards for the Social Studies*. Coherency Storylines are a set of *storylines* selected to advance and develop the telling of a *curriculum story*. Coherency Storylines are very fine-grained *curriculum threads* that elaborate, illuminate, and illustrate a larger subject strand such as *Economic Opportunity in United States History*. Coherency Storylines may be used within a single grade level or course, across a grade band, within the spectrum of a multi-grade level subject like United States history, and/or across the entire curriculum framework Pre-K–12.

The purpose of Coherency Storylines is to provide a structure to design a curriculum framework. Coherency Storylines are more specific in nature than strands such as geography, history, etc. and finer-grained than content themes like *Power, Authority, and Governance*. They function as true curriculum threads within a discipline strand (history, geography, etc.), as well as the across the several social studies disciplines strands. They can be made very finely focused and even be thought of as *curriculum fibers*. Curriculum fibers when woven by purposeful design comprise a coherent curriculum strand. Coherency Storylines act as a *plumb line* by which the placement of Social Studies content expectations within the curriculum framework can be more objectively selected or omitted.

Coherency Storylines give *unity of story* within subject disciplines, strands, and courses. Coincidentally, Coherency Storylines allow transcendency of story across themes, strands, and the entire curriculum framework Pre-K–12. Coherency Storylines are threads that provide color, weave, and texture to the curriculum fabric. Taking the analogy of curriculum as a fabric, we can illustrate the concept by asserting that the Coherency Storylines function by giving function, pattern, and unity of design to the curriculum framework. They give purpose to the curriculum stories within and across grade levels and multi-grade content; and provide a *transcendency of design*.

An example of this is the Coherency Storyline of *Foundations, Formations, and Transformations of the American System* within United States History. This Coherency Storyline spans the U.S. History curriculum in Grade 5, Grade 8, and High School. This Coherency Storyline, when pulled through those three distinct parts of the U.S. history curriculum provides a plumb line by which specific U.S. history content may be included or excluded. The Coherency Storyline guides content selection based upon the discussion and decision of whether it *develops* the storyline or *distracts* from the storyline. This thread should be more finely focused only on the political aspects or the economic features of the American system making them a curriculum fiber, or these two fibers can be combined for a more specific Coherency Storyline bi-focus thereby creating a coherent strand.

This Coherency Storyline could function in the lower elementary level to introduce early learners to American civics and history topics like notable Americans, to guide the selection of high-interest non-fiction reading series of foundational, formational, and transformational events in American history, or even the selection of basic domain specific vocabulary terms. Additionally, this Coherency Storyline could guide the selection in the lower elementary grades of national symbols, national historic landmarks, national parks, patriotic music, and national holidays/observances.

What is essential in the use of Coherency Storylines is the parameter descriptor. The Coherency Storyline's purpose needs to be focused and tightly designed. It should tell specifically the kinds of content to be associated with the Coherency Storyline and what cannot be used as it would cause the Coherency Storyline to diverge from its storyline. Content expectation should be held to the standard of "Was the event, person, group, document, etc. *significant and key* to the founding of the nation, to the formation of the nation, and in the continuing transformation of the nation?" The main consideration to answer is *"Was this person or event systemic changing?"* If the specific content was key and significant, then it should be very seriously considered for inclusion in the standards/framework as it helps develop the historic storyline. Conversely, if it did not lead to system-wide change(s), then it should not be included as it is probably minor in comparison. It most likely distracts from the primary storyline. With that in mind, individuals, groups, events, documents, etc. may be interesting to study in their own right *but* should be included only for their significant and key impact upon the American system. To include any interesting person just because the standards do not have a person from a particular "demographic group" is insufficient cause for inclusion because it is *gratuitous inclusion*. It results in a weakened historic narrative. The use of

Coherency Storylines elevates the decision-making process to one of significance and relevance.

To follow this line of design reasoning, consider the following: in the formation and transformation of the United States, many treaties could be included in the curriculum framework. Treaties often covered several topics but often served a particular purpose such as the cessation of fighting, settling territorial disputes, trade rights, etc. Look at the top two treaties included in Figure 1.

Now, a series of questions need to be considered to help determine if this specific content should be added to the framework.

- In what ways was each event systemic changing?
- Should both treaties be included in the framework?
- Should both be excluded?
- Should one be included and the other excluded?
- If so which one?
- Why?

The decision should be justifiable with historic reasoning as to why the selected content was systemic changing.

Since the focus of the Coherency Storyline is the political foundation, formation, and transformation of the American system, the Louisiana Purchase of 1803 would be very appropriate, where as the Kellogg-Briand Pact of 1928 would not be nearly as appropriate as all major signators were at war with each other within a decade.

Consider the topic of events and treaties relating to the American Indian experience. There are so many treaties with all of the tribes spanning American history that selecting appropriate treaties is a real curriculum content challenge. Taking the line of reasoning from above and using Figure 1, which one should be included to support the primary storyline – the *Indian Removal Act of 1830* or the *Treaty of Dancing Rabbit Creek*? Many scholars would say that since the *Indian Removal Act* was the primary basis for all subsequent land cessions and removal treaties with the numerous American Indian nations that it was the signature transformative event in changing the American system for both whites and the American Indian nations. Based upon the use of the Coherency Storyline, the committee literally came to the conclusion as illustrated in Figure 2.

The Primary Coherency Storyline for the Oklahoma Academic Standards for the Social Studies

The Coherency Storyline, *The Foundation, Formation, and Transformation of the American System – Politically and Economically*, is THE storyline for the entire Social Studies framework as it operates as a plumb line that pulls the entire curriculum framework towards the goal of developing literate citizens. It provides unity of story for the entire framework and focuses on key ideas, events, people, groups, and concepts that laid the foundations for the 13 British colonies becoming the United States. This primary Coherency Storyline gives transcendency of the narrative across the grade levels and across the several social studies disciplines of History, Civics/Government, Geography, and Economics. This Coherency Storyline provides purpose, pattern, and unity of design to the entire *Oklahoma Academic Standards for the Social Studies* framework. The Coherency Storyline will be spun into a tighter "curriculum thread" by adding focused specificity through a bi-focus on the foundation, formation, and transformation of the American political and economic systems. This bi-focus does not preclude the strand of geography as historic geography is a presumed part of the historic narrative. The bi-focus on the political and economic systems does not ignore the social development of the 13 original British colonies, the beginning American nation, and country as it grew and changed over the past 400 plus years. In fact, political events, developments, and decisions had social implications and impact. The same is true in the economic realm.

Figure 1

Figure 2

Pre-Kindergarten SOCIAL STUDIES *Our America*

In Pre-Kindergarten, students begin to understand the foundations of the social studies strands; history, geography, civics, citizenship, and economics. Students begin their introduction to the United States through the study of American symbols and holidays. Civics provides students with an introduction to rules, traits, and responsibilities of citizenship. Basic economic concepts and their underlying principles as seen in the community are also introduced. Basic concepts of cultural and physical geography are presented.

The Social Studies Process and Literacy Skills (PALS) are to be integrated throughout the Pre-Kindergarten content standards and methods of instructional delivery.

PROCESS AND LITERACY SKILLS (PALS) FOR LEARNING

Process and Literacy Skills Standard 1: The student will develop and demonstrate Common Core informational text reading literacy skills.

A. Key Ideas and Details
1. With prompting and support, ask and answer questions about key details in a text.
2. With prompting and support, identify the main topic and retell key details of a text.
3. With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.

B. Craft and Structure
4. With prompting and support, ask and answer questions about unknown words in a text.

C. Integration of Knowledge and Ideas
7. With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).
9. With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).

Process and Literacy Skills Standard 2: The student will develop and demonstrate Common Core writing literacy skills.

A. Text Types and Purposes
1. Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book (e.g., "My favorite American symbol or holiday is . . .").
2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
3. Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

B. Production and Distribution of Writing
6. With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.

C. Research to Build and Present Knowledge
8. With guidance and support from adults recall information from experiences or gather information from provided sources to answer a question.

Process and Literacy Skills Standard 3: The student will develop and demonstrate Common Core speaking and listening skills.

A. Comprehension and Collaboration
1. Participate in collaborative conversations with diverse partners about Pre-Kindergarten Our America topics and texts with peers and adults in small and larger groups.
2. Confirm understanding of a social studies text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

B. Presentation of Knowledge and Ideas
4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.
5. Add social studies focused drawings or other visual displays to descriptions as desired to provide additional detail.

SOCIAL STUDIES CONTENT SKILLS

Citizenship Literacy
Content Standard 1: The student will exhibit traits of good citizenship.

1. Recognize the importance of rules and responsibilities as a member of the family, class, and school.
2. Identify the United States Flag as a symbol of the country including the learning of *The Pledge of Allegiance* and practicing appropriate flag etiquette.

Economic Literacy
Content Standard 2: The student will identify basic economic concepts.

1. Explain how various community people including police officers, firefighters, soldiers, school personnel, business professionals, and medical personnel impact his/her life.
2. Explain the relationship between work and earning money.
3. Describe the basic needs of food, clothing, and shelter that are common to all people.

Geography Literacy
Content Standard 3: The student will demonstrate knowledge of basic physical and human geographic concepts.

1. Explain that a map is a drawing of a place and the globe is a model of Earth.
2. Locate the United States on a world map and a globe.
3. Identify the state of Oklahoma on a map of the United States.
4. Describe family customs and traditions as basic elements of culture.

History Literacy
Content Standard 4: The student will understand that history relates to events and people of other times and places.

1. Recognize that commemorative holidays honor people and events of the past including Columbus Day, Veterans Day, Thanksgiving Day, Washington's Birthday, and Independence Day.
2. Identify important American symbols and explain their meanings including United States Flag, the Bald Eagle, the Statue of Liberty, and the Liberty Bell.
3. Use words and phrases related to chronology and time to explain how things change including before/after and today/tomorrow/yesterday.

Kindergarten
SOCIAL STUDIES
Symbols of America

In Kindergarten, students continue their understanding of the foundations of the social studies strands: history, geography, civics, citizenship, and economics. Students continue their examination of American symbols and holidays. Concepts of cultural and physical geography are developed. Civics provides students with a continued study of the traits of citizenship. Basic economic concepts are also introduced.

The Social Studies Process and Literacy Skills (PALS) are to be integrated throughout the Kindergarten content standards and methods of instructional delivery.

PROCESS AND LITERACY SKILLS (PALS) FOR LEARNING

Process and Literacy Skills Standard 1: The student will develop and demonstrate Common Core informational text reading literacy skills.

A. Key Ideas and Details
1. With prompting and support, ask and answer questions about key details in a text.
2. With prompting and support, identify the main topic and retell key details of a text.
3. With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.

B. Craft and Structure
4. With prompting and support, ask and answer questions about unknown words in a text.

C. Integration of Knowledge and Ideas
7. With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).
9. With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).

Process and Literacy Skills Standard 2: The student will develop and demonstrate Common Core writing literacy skills.

A. Text Types and Purposes
1. Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book (e.g., "My favorite American symbol or holiday is . . .").
2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
3. Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

B. Production and Distribution of Writing
6. With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.

C. Research to Build and Present Knowledge
8. With guidance and support from adults recall information from experiences or gather information from provided sources to answer a question.

Process and Literacy Skills Standard 3: The student will develop and demonstrate Common Core speaking and listening skills.

A. Comprehension and Collaboration
1. Participate in collaborative conversations with diverse partners about Kindergarten Symbols of America topics and texts with peers and adults in small and larger groups.
2. Confirm understanding of a social studies text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

B. Presentation of Knowledge and Ideas
4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.
5. Add social studies focused drawings or other visual displays to descriptions as desired to provide additional detail.

SOCIAL STUDIES CONTENT SKILLS

Civics Citizenship Literacy
Content Standard 1: The student will exhibit traits of good citizenship.

1. Recognize the importance of rules and responsibilities as a member of the family, class, and school.
2. Identify the United States Flag as a symbol of the country including learning *The Pledge of Allegiance* and practicing appropriate flag etiquette.

Economics Literacy
Content Standard 2: The student will identify basic economic concepts.

1. Explain how various community people including police officers, firefighters, soldiers, school personnel, business professionals, and medical personnel impact his/her life.
2. Explain the relationship between work and earning money.
3. Describe the basic needs of food, clothing, and shelter that are common to all people.

Geography Literacy
Content Standard 3: The student will demonstrate knowledge of basic physical and human geographic concepts.

1. Explain that a map is a drawing of a place and the globe is a model of Earth.
2. Locate the United States on a world map and a globe.
3. Identify the state of Oklahoma on a map of the United States.
4. Describe family customs and traditions as basic elements of culture.

History Literacy
Content Standard 4: The student will understand that history relates to events and people of other times and places.

1. Recognize that commemorative holidays honor people and events of the past including Columbus Day, Veterans Day, Thanksgiving Day, Martin Luther King, Jr. Day, Washington's Birthday, Flag Day, and Independence Day.
2. Identify important American symbols and explain their meanings including United States Flag, the Bald Eagle, the Statue of Liberty, and the Liberty Bell.
3. Use words and phrases related to chronology and time to explain how things change including before/after, past/present/future, and today/tomorrow/yesterday.

Grade 1
SOCIAL STUDIES
American Heroes

In First grade, students continue their study of the United States history through the contributions of notable historic figures. In the civics strand the student will learn characteristics and responsibilities of good citizenship. In the geography strand students explore basic geographic concepts. The economic strand continues the development of understanding basic economic concepts.

The Social Studies Process and Literacy Skills (PALS) are to be integrated throughout the Grade 1 content standards and methods of instructional delivery.

PROCESS AND LITERACY SKILLS (PALS) FOR LEARNING

Process and Literacy Skills Standard 1: The student will develop and demonstrate Common Core informational text reading literacy skills.

A. Ideas and Details
1. Ask and answer questions about key details in a text.
2. Identify the main topic and retell key details of a text.
3. Describe the connection between two individuals, events, ideas, or pieces of information in a text.

B. Text and Structure
4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
5. Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.

C. Integration of Knowledge and Ideas
7. Use the illustrations and details in a text to describe its key ideas.
9. Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).

Process and Literacy Skills Standard 2: The student will develop and demonstrate Common Core writing literacy skills.

A. Text Types and Purposes
1. Write opinion pieces in which they introduce the topic they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure.
2. Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
3. Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.

B. Production and Distribution of Writing
6. With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

C. Research to Build and Present Knowledge
7. Participate in shared research and writing projects (e.g., write a short step by step sequence of instructions for proper flag etiquette and/or proper behavior during the national anthem).
8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Process and Literacy Skills Standard 3: The student will develop and demonstrate Common Core speaking and listening skills.

A. Comprehension and Collaboration
1. Participate in collaborative conversations with diverse partners about Grade 1 American Heroes topics and texts with peers and adults in small and larger groups.
2. Ask and answer questions about key details in a social studies text read aloud or information presented orally or through other media.

B. Presentation of Knowledge and Ideas
4. Describe social studies related people, places, things, and events with relevant details, expressing ideas clearly.
5. Add social studies focused drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

SOCIAL STUDIES CONTENT SKILLS

Citizenship Literacy
Content Standard 1: The student will analyze his/her role as a citizen in a community.

1. Identify the main purpose of government, its rules and laws including the concept of consequences for one's actions when a law or rule is violated. (CCRIT 2)
2. Participate in patriotic traditions including the recitation of *The Pledge of Allegiance*, the singing of *My Country 'Tis of Thee*, and demonstration of appropriate flag etiquette and proper behavior during the playing of the national anthem.
3. Identify important American symbols and explain their meanings including United States Flag, the Bald Eagle, the Statue of Liberty, and the Liberty Bell.
4. Describe how historic figures display character traits of fairness, respect for others, stewardship of natural resources, courage, equality, hard work, self-discipline, and commitment to the common good.
5. Describe relationships between people and events of the past which are commemorated on Columbus Day, Veterans Day, Thanksgiving Day, Martin Luther King, Jr. Day, Washington's Birthday, Lincoln's Birthday, Flag Day, and Independence Day. (CCRIT 3)

Economics Literacy
Content Standard 2: The student will describe the characteristics of the American economic system.

1. Summarize the need for money, how money is earned, and how money and credit are used in order to meet needs and wants including the costs and benefits of spending and saving. (CCRIT 2)
2. Define and explain the roles of consumers and producers in the American economy.
3. Summarize how historic inventors and entrepreneurs contributed to the prosperity of the nation including Samuel F. B. Morse, John Deere, Alexander Graham Bell, Orville and Wilbur Wright, and Thomas Edison. (CCRIT 2)

Geography Literacy
Content Standard 3: The student will demonstrate knowledge of basic geographic concepts.

1. Define and compare the physical features of urban and rural communities.
2. Construct maps and identify cardinal directions of north, south, east, and west, and identify locations on the map of their community, Oklahoma, and the United States.
3. Locate on a map and globe the United States, the seven continents, and five oceans.

History Literacy
Content Standard 4: The student will examine important events and historic figures in the nation's past.

1. Understand chronological sequencing of events by creating basic timelines. (CCRIT 5)
2. Participate in shared research using biographies and informational text the contributions of historic figures in American history including Squanto, the Pilgrims, George Washington, Benjamin Franklin, Paul Revere, Thomas Jefferson, Meriwether Lewis, William Clark, Sacagawea, Daniel Boone, Abraham Lincoln, and George Washington Carver. (CCW 7)
3. Identify the significance of historic places and monuments and describe their connection to real events of the past including the Plimoth Plantation, Mount Vernon, Washington Monument, Lincoln Memorial. (CCRIT 3)
4. Commemorate the contributions to the American nation of significant groups including National Hispanic History Month, Native American Heritage Month, and Black History Month.

Grade 2
SOCIAL STUDIES
Our Democratic Heritage

Second grade students conclude their introduction to the United States in the citizenship strand through the study of the foundation of the American republic. The historic strand introduces selected Americans who have been important in securing and ensuring their rights. The geography strand develops the students' understanding of the nation's physical and political features. The economic strand continues a more advanced understanding of economic concepts.

The Social Studies Process and Literacy Skills (PALS) are to be integrated throughout the Grade 2 content standards and methods of instructional delivery.

PROCESS AND LITERACY SKILLS (PALS) FOR LEARNING

Process and Literacy Skills Standard 1: The student will develop and demonstrate Common Core informational text reading literacy skills.

A. Key Ideas and Details

1. Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
2. Identify the main topic of a multi-paragraph text (e.g., primary or secondary sources) as well as the focus of specific paragraphs within the text.
3. Describe the connection between a series of historic events or social studies concepts.

B. Craft and Structure

4. Determine the meaning of words and phrases in a social studies text.
5. Know and use various text features (e.g., maps, graphs, charts captions, bold print, subheadings, glossaries, indexes, electronic menus, and icons) to locate key facts or information in a text efficiently.
6. Identify the main purpose of a text, including what the author wants to answer, explain, or describe in primary and secondary informational texts.

C. Integration of Knowledge and Ideas

7. Explain how specific images (e.g., a diagram, landforms, satellite photos, maps, and charts) contribute to and clarify a text.
9. Compare and contrast the most important points presented by two texts on the same topic.

Process and Literacy Skills Standard 2: The student will develop and demonstrate Common Core writing literacy skills.

A. Text Types and Purposes

1. Write opinion pieces in which they introduce the topic they are writing about, state an opinion, supply reasons that support the opinion, use linking words to connect opinion and reasons, and provide a concluding statement or section.
2. Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.
3. Write narratives in which they recount a sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order (e.g., cause and effect relationships), and provide a sense of closure.

B. Production and Distribution of Writing

6. With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

C. Research to Build and Present Knowledge

7. Participate in shared research and writing projects (e.g., primary and secondary sources on a single topic).
8. Recall information from experiences or gather information from provided sources to answer a question.

Process and Literacy Skills Standard 3: The student will develop and demonstrate Common Core speaking and listening skills.

A. Comprehension and Collaboration

1. Participate in collaborative conversations with diverse partners about Grade 2 Our Democratic Heritage topics and texts with peers and adults in small and larger groups.
2. Recount or describe key ideas or details from a social studies text read aloud or information presented orally or through other media.
3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a social studies topic or issue.

B. Presentation of Knowledge and Ideas

4. Tell a social studies related story with appropriate facts and relevant, descriptive details, and speaking audibly in coherent sentences.

5. Create audio recordings of social studies stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.

CONTENT SKILLS

Citizenship Literacy

Content Standard 1: The student will explain the importance of the basic principles that provide the foundation of the American system of government.

1. Summarize the five key individual rights and liberties protected by the *First Amendment* to the *United States Constitution*. (CCRIT 2)
2. Identify the basic roles of national leaders including the President of the United States and the members of the United States Congress.
3. Identify important American symbols and explain their meanings including United States Flag, the Bald Eagle, the Statue of Liberty, Lady Justice, and the Liberty Bell.
4. Participate in patriotic traditions including the recitation of *The Pledge of Allegiance* and singing of *The Star Spangled Banner*, and demonstrate proper flag etiquette and appropriate behavior during both.
5. Describe relationships between people and events of the past which are commemorated on Columbus Day, Veterans Day, Thanksgiving Day, Martin Luther King, Jr. Day, Washington's Birthday, Lincoln's Birthday, Flag Day, and Independence Day. (CCRIT 3)

Economics Literacy

Content Standard 2: The student will understand basic economic concepts in the American economy.

1. Describes ways people are paid for their labor and how goods and services are purchased through means like check, cash, and credit cards, and provide examples of interdependence through trade/barter and purchase.
2. Describe the connection between taxes and community services including schools, sanitation and water, fire and police protection, libraries, and roads. (CCRIT 3)

Geography Literacy

Content Standard 3: The student will examine how humans modify their environment.

1. Construct basic maps using legends, scale, and intermediate directions including the introduction of latitude and longitude and the division of the Earth into four hemispheres.
2. Identify basic natural landforms and bodies of water and man-made environments including examples found in the community and the United States: plains, mountains, peninsulas, and islands; rivers, lakes, oceans, seas, gulfs, bays, and harbors; and highways, cities, airports, and railroads.
3. Locate on a physical map of the United States the major natural features including the Mississippi River, Colorado River, Rio Grande, Great Lakes, Rocky and Appalachian Mountain Ranges, the Great Plains, the Atlantic and Pacific Oceans, and the Gulf of Mexico.
4. Locate on a political map of the United States the state of Oklahoma and the six bordering states, and the major cities of Washington, D.C., New York City, Los Angeles, and Chicago.

History Literacy

Content Standard 4: The student will examine the lives of notable Americans who expanded peoples' rights and freedoms in the American system of government.

1. Participate in shared and individual research using biographies and informational text historic examples of honesty, courage, patriotism, self-sacrifice, and other admirable character traits seen in citizens and leaders including Abigail Adams, Francis Scott Key, Harriet Tubman, Abraham Lincoln, Chief Joseph, Eleanor Roosevelt, Fred Korematsu, Jackie Robinson, Dr. Martin Luther King, Jr., Rosa Parks, César Chávez, and Senator Daniel Inouye. (CCW 7)
2. Analyze the significance of historic places including the White House, the United States Capitol, the United States Supreme Court, the Washington Monument, and the Lincoln Memorial.
3. Commemorate months designated to the contributions the American nation of significant groups to the history of including National Hispanic History Month, Native American Heritage Month, Black History Month, Women's History Month, and Asian-Pacific American Heritage Month.
4. Understand chronological sequencing and the connection between historic events and individuals through the creation of basic timelines. (CCRIT 3)

Grade 3
SOCIAL STUDIES
Oklahoma Studies

In the third grade, students begin a focused study of the state of Oklahoma. The historic strand introduces selected Oklahomans who have been important in the development of the state and creates an appreciation for the many peoples who have settled in Oklahoma. In the geography strand students explore the physical and political features of the state including its natural resources. In civics students examine the structure of local governments and the state government. In the economic strand students explore how Oklahomans have used their natural resources to create a prosperous and growing economy.

The Social Studies Process and Literacy Skills (PALS) are to be integrated throughout the Grade 3 content standards and methods of instructional delivery.

PROCESS AND LITERACY SKILLS (PALS) FOR LEARNING

Process and Literacy
Skills Standard 1: The student will develop and demonstrate Common Core informational text reading literacy skills.

A. Key Ideas and Details

1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
2. Determine the main idea of a text; recount the key details and explain how they support the main idea.
3. Describe the relationship between a series of historic events or social studies concepts, using language that pertains to time, sequence, and cause/effect.

B. Craft and Structure

4. Determine the meaning of general academic and social studies domain-specific words and phrases in a text relevant to Grade 3 Oklahoma Studies.
5. Use text features and search tools (e.g., timelines, maps, charts, graphs, images, artwork, photographs, key words, sidebars, hyperlinks) to locate information relevant to a given topic.
6. Distinguish their own point of view from that of the author of a primary or secondary text.

C. Integration of Knowledge and Ideas

7. Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
8. Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).
9. Compare and contrast the most important points and key details presented in two texts on the same topic.

Process and Literacy
Skills Standard 2: The student will develop and demonstrate Common Core writing literacy skills.

A. Text Types and Purposes

1. Write opinion pieces on topics or texts, supporting a point of view with reasons.
2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
3. Write narratives based on historic Oklahomans and/or events using descriptive details and clear event sequences.

B. Production and Distribution of Writing

6. With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.

C. Research to Build and Present Knowledge

7. Conduct short research projects that build knowledge about a topic related to Oklahoma.
8. Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

D. Range of Writing

10. Write routinely over extended time frames and shorter time frames for a range of social studies tasks, purposes, and audiences.

Process and Literacy
Skills Standard 3: The student will develop and demonstrate Common Core speaking and listening skills.

A. Comprehension and Collaboration

1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on Grade 3 Oklahoma Studies topics and texts, building on others' ideas and expressing their own clearly.
2. Determine the main ideas and supporting details of a social studies text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Ask and answer questions about social studies information from a speaker, offering appropriate elaboration and detail.

B. Presentation of Knowledge and Ideas

4. Report on a social studies topic or text or tell a social studies related story with appropriate facts and relevant, descriptive details, and speaking clearly at an understandable pace.
5. Create engaging audio recordings of social studies stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.

CONTENT SKILLS

Citizenship Literacy
Content Standard 1: The student will analyze the traits of good citizens.

1. Commemorate Celebrate Freedom Week by recognizing the sacrifices and contributions to American freedom by veterans and by reciting the social contract selection from the *Declaration of Independence*:

   > We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

2. Examine and determine the main purposes of Oklahoma's state government and identify representative leaders of the state of Oklahoma and the three branches of government. (CCRIT 2)
3. Describe the connection between the historic significance of past events and people and the symbols of Oklahoma's history including the Oklahoma State Seal and the Oklahoma Flag. (CCRIT 3)
4. Describe relationships between people and events of the past which are commemorated on Columbus Day, Veterans Day, Thanksgiving Day, Martin Luther King, Jr. Day, Washington's Birthday, Lincoln's Birthday, Flag Day, and Independence Day. (CCRIT 3)

Economics Literacy
Content Standard 2: The student will identify and describe basic economic activities creating prosperity in the state of Oklahoma.

1. Summarize how scarcity and surplus require people to make choices about producing and consuming goods and services. (CCRIT 2)
2. Compare differences among human, natural, and capital resources used to produce goods and services.
3. Examine how the development of Oklahoma's major economic activities have contributed to the growth of the state including the oil and natural gas industry, agriculture and livestock, aviation, tourism, and military installations.

Geography Literacy
Content Standard 3: The student will examine Oklahoma's geography and how people of Oklahoma interact with their environment.

1. The student will examine Oklahoma's political and physical features using text features and search tools. (CCRIT 5)
   A. Distinguish among map symbols and identify relative location, direction, scale, size and shape using physical and political maps of Oklahoma including the use of latitude and longitude.
   B. Interpret thematic maps of Oklahoma with the essential map elements of title, legend, scale, and directional indicators.
   C. Identify Oklahoma's major landforms and bodies of water on a physical map including Arbuckle Mountains, Ozark Plateau, Wichita Mountains, Kiamichi Mountains, Black Mesa, Red River, Canadian River, Arkansas River, Lake Texoma, Lake Eufaula, and Lake Tenkiller, Grand Lake of the Cherokees, and the Great Salt Plains.
   D. Identify Oklahoma's major metropolitan centers and cities on a political map including Oklahoma City, Tulsa, Lawton, Stillwater, Norman, Muskogee, Woodward, McAlester, and Ponca City.

E. Describe the climate and various natural vegetation zones found in Oklahoma including the Great Plains and the Cross Timbers.

2. The student will examine through short research projects the interaction of the environment and the peoples of Oklahoma. (CCW 7)
   A. Describe how early Native Americans used Oklahoma's natural resources to survive including the use of the bison, fur trading, and farming.
   B. Describe how pioneers to Oklahoma adapted to and modified their environment including sod houses, wind mills, and crops.
   C. Summarize how contemporary Oklahomans affect and change their environments including the McClellan-Kerr Arkansas River Navigation System, creation of recreational lakes by the construction of dams, irrigation of croplands, and the establishment of wildlife refuges. (CCRIT 2)

History Literacy
Content Standard 4: The student will analyze the significant events and historic personalities contributing to the development of the state Oklahoma.

1. Understand and describe the relationship between historic events and chronology through the creation of basic timelines. (CCRIT 3)
2. Read and interpret primary sources related to key events in Oklahoma's past to demonstrate understanding of a text including Catlin's artwork, Sequoyah's syllabary, news accounts and photographs of the land openings, and the Dust Bowl, as well as the musical lyrics of *This Land is Your Land* and the state song, *Oklahoma*. (CCRIT 1)
3. Describe the many Native American cultures that have inhabited present-day Oklahoma including the Spiro Mound Builders, the Five Tribes, and the Plains Indians.
4. Describe early expeditions in Oklahoma including those of Coronado, Washington Irving, and George Catlin.
5. Describe the migrations and settlements by Native Americans including the Trail of Tears.
6. Describe cowboy life and cattle drives as typified by experiences along the Chisholm Trail.
7. Explain the opening of the Unassigned Lands and distinguish between the points of view of both Native Americans and settlers. (CCRIT 6)
8. Commemorate Statehood Day as the joining of Indian and Oklahoma Territories.
9. Summarize how the weather and the environment have impacted the economy of Oklahoma in events like the Dust Bowl. (CCRIT 2)
10. Conduct short research projects and examine notable historic and present-day Oklahomans utilizing biographies and informational texts to describe their significant contributions including Sequoyah, Bill Pickett, Jim Thorpe, the Kiowa Six (formerly the Kiowa Five), Will Rogers, Wiley Post, Woody Guthrie, Clara Luper, Wilma Mankiller, Gordon Cooper, Shannon Lucid, Mickey Mantle, Carl Albert, and the Five Ballerinas. (CCW 7)
11. Develop an understanding and appreciation of the historic and contemporary racial, ethnic, and cultural groups of Oklahoma.
12. Identify and describe the historic significance of state and local landmarks including the Buffalo Soldiers' Old Post at Fort Sill, the Nellie Johnstone Number 1, the Oklahoma Capitol, Route 66, and the Oklahoma City National Memorial.

Grade 4
UNITED STATES STUDIES
Regional Geography and History

In Grade 4, students will examine the physical, cultural, political, economic, and the historic development of the United States including early European contact with Native Americans. Students will use geographic tools to analyze the influence of the environment on the growth and development of all major regions of the United States.

The Social Studies Process and Literacy Skills (PALS) are to be integrated throughout the Grade 4 content standards and methods of instructional delivery.

PROCESS AND LITERACY SKILLS (PALS) FOR LEARNING

Process and Literacy Skills Standard 1: The student will develop and demonstrate Common Core informational text reading literacy skills.

A. Key Ideas and Details

1. Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
2. Determine the main idea of a text and explain how it is supported by key details; summarize the text.
3. Explain events, ideas, or historic and geographic concepts based on specific information in the text.

B. Craft and Structure

4. Determine the meaning of social studies-specific words or phrases in a text relevant to United States geography and history.
5. Describe the overall structure (e.g., comparison, cause/effect, geographic/historic problem/solution) of events, ideas, concepts, or information in a text.
6. Compare and contrast a firsthand (primary source) and secondhand account (secondary source) of the same event or topic.

C. Integration of Knowledge and Ideas

7. Interpret qualitative and quantitative information and explain how the information contributes to an understanding of the text.

Process and Literacy Skills Standard 2: The student will develop and demonstrate Common Core writing literacy skills.

A. Text Types and Purposes

1. Write opinion pieces on United States Regional and History topics or texts, supporting a point of view with reasons and information.
2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others.
7. Conduct short research projects that build knowledge through investigation of different aspects of United States regional geography and history.
8. Recall and gather relevant information from experiences or print and digital sources; take notes and categorize information, and provide a list of sources.
9. Draw evidence from literary or informational social studies texts to support analysis, reflection, and research.

C. Range of Writing

10. Write routinely over extended time frames and shorter time frames for a range of social studies tasks, purposes, and audiences.

Process and Literacy Skills Standard 3: The student will develop and demonstrate Common Core speaking and listening skills.

A. Comprehension and Collaboration

1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on Grade 4 United States Regional Geography and History topics and texts, building on others' ideas and expressing their own clearly.
2. Paraphrase portions of a social studies text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

3. Identify the reasons and evidence a speaker provides to support particular points regarding a social studies topic.

B. Presentation of Knowledge and Ideas

4. Report on a social studies topic or text, tell a social studies related story in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; and speak clearly at an understandable pace.
5. Add audio recordings and visual displays to social studies presentations when appropriate to enhance the development of main ideas or themes.

CONTENT SKILLS

Content Standard 1: The student will analyze the physical, cultural, political, economic, and the historic features and places of the regions of the United States.

1. The student will identify and locate both relative and absolute location (latitude and longitude), the physical features of the regions of the United States including bodies of water, major rivers and drainage systems, mountain ranges, and unique, natural geographic features.
   A. Locate landforms and bodies of water on a map of North America: the United States, the Atlantic and Pacific Oceans, and the Gulf of Mexico; the major river drainage systems including the Mississippi, Ohio, Missouri, Arkansas, Colorado, Columbia, and Rio Grande Rivers; the Great Lakes, the Great Salt Lake, and the Chesapeake Bay; the Great Plains and the Continental Divide; and the Appalachian, Rocky, Sierra Nevada, Cascade, and Brooks Mountain Ranges.
   B. Identify, locate, and describe unique, natural geographic features of the United States including Niagara Falls, the Everglades, Death Valley, the Petrified Forest, the Painted Desert, the Grand Canyon, the Great Salt Lake, the Great Basin, the Mojave Desert, the Redwood Forest, the Badlands in South Dakota, Yellowstone and Grand Teton National Parks, Yosemite National Park, and Hawaii Volcanoes National Park.
2. The student will identify and analyze the cultural and historic features of the United States.
   A. Locate the current boundaries of the United States including Alaska and Hawaii.
   B. Identify the states, state capitals, and major cities in each region.
   C. Identify the historic significance of major national monuments, historic sites, and landmarks including the Jefferson, Lincoln, and Washington Monuments, the White House, the United States Capitol, the United States Supreme Court, Mount Vernon, Monticello, Colonial Williamsburg, Jamestown Historic Site, Dr. Martin Luther King, Jr. National Historic Site in Atlanta, Ellis Island, the Statue of Liberty, the 9/11 memorials, Independence Hall, the Jefferson National Expansion Memorial/Gateway Arch in St. Louis, the Oklahoma City National Memorial, Mount Rushmore, Little Bighorn National Monument, the Golden Gate Bridge, and Pearl Harbor National Park.
   D. Describe the diverse but unified nature of the American people by identifying the distinctive contributions to American culture of Native Americans, African Americans, major European groups, major Spanish-speaking groups, and Asian Americans.
   E. Describe the purpose of local, state, tribal, and national governments in meeting the needs of American citizens including the basic structure of the national government centered in Washington, D.C.
   F. Commemorate Celebrate Freedom Week by recognizing the sacrifices and contributions to American freedom by veterans and by reciting the social contract selection from the *Declaration of Independence*:

      > We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

3. Compare and contrast the regional vegetation, climate, and spatial distribution and use of natural resources.
4. Analyze natural resources and how they impacted the economy of each region including fishing, farming, ranching, mining, manufacturing, tourism, and oil and gas, and their connections to global trade.
5. Summarize how people interact with their environment to resolve geographic challenges including housing, industry, transportation, communication, bridges, dams, tunnels, canals, freshwater supply, irrigation systems, and landfills. (CCRIT 2)

Standard 2: The student will examine Native American groups and European explorations and settlements impacting the development of the major regions of the United States.

1. Identify the major Native American groups and their ways of life in each region including traditional housing and economic activities, customs and storytelling, viewpoints on land usage and ownership, and their contributions to American culture and history.
2. Examine and summarize the reasons for the key expeditions of Spain, France, and England and their impact on the development of each region including the explorers Columbus, Ponce de León, Desoto, Coronado, Marquette and Jolliet, LaSalle, Cabot, Hudson, Drake, and Raleigh. (CCRIT 2)
3. Summarize how France, Spain, England, Russia, and the Netherlands culturally influenced different regions of the United States in which they settled including regional place names, architectural features, customs, and language. (CCRIT 2)
4. Identify and evaluate instances of both cooperation and conflict between Native American groups and European settlers arising from the Columbian Exchange including agriculture, trade, cultural exchanges, military alliances, wars, and control of territory.

Grade 5
UNITED STATES STUDIES
Creating the United States: The Foundation, Formation, and Transformation of the American Nation, 1607-1806

In the Grade 5 curriculum section of The Foundation, Formation, and Transformation of United States History, students will examine the inheritance of the British system and the practices of constitutionalism, self-government, individual rights, representative government, and separation of powers. The United States Studies will begin with the British settlement of Virginia at James Towne in 1607 and will conclude with the explorations of the Louisiana Purchase by Lewis and Clark.

The Social Studies Process and Literacy Skills (PALS) are to be integrated throughout the Grade 5 content standards and methods of instructional delivery.

ASSESSMENT NOTE: For the Grade 5 Criterion-Referenced Test (CRT) in Social Studies, the time frame is James Towne, 1607 through the ratification of the *United States Constitution* and the adoption of the *Bill of Rights* on December 15, 1791.

The Process and Literacy Standards 1-3 should be integrated throughout the content standards and used in teaching and assessing the course content at the classroom and district level. At the state level, the Process and Literacy Standards 1-3 will be measured and reported within each of the content standards 1, 2, 3, and 4 as appropriate. Only Content Standard 5 will not be assessed on the Grade 5 CRT. The Process and Literacy Skills (PALS) assessment items will be content-based and reported under each of the content standards. For assessment purposes, each Content Standard 1- 4 will have items using primary and secondary source documents, timelines, maps, charts, graphs, pictures, photographs, and/or political cartoons. There will be a balance of graphic and textual stimulus materials within the various United States History test forms. At least 50 percent of the assessment items will have appropriate pictorial and graphical representations.

An asterisk (*) has been used to identify Content Standard 5 and the following objectives that must be assessed by the local school district. All other skills may be assessed by the Oklahoma School Testing Program (OSTP).

PROCESS AND LITERACY SKILLS (PALS) FOR LEARNING

Process and Literacy Skills Standard 1: The student will develop and demonstrate Common Core informational text reading literacy skills.

A. Key Ideas and Details

1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
3. Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in United States history primary and/or secondary sources based on specific information in the texts.

B. Craft and Structure

4. Determine the meaning of social studies-specific words and phrases in a text relevant to United States history and government.
5. Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, historic problem/solution) of events, ideas, concepts, or information in two or more texts.
6. Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.

C. Integration of Knowledge and Ideas

7. Draw on information from multiple print or digital sources (e.g., timelines, maps, graphs, charts, political cartoons, images, artwork), demonstrating the ability to locate an answer to a question or to solve an historic problem.
8. Identify and explain how an author uses reasons and evidence to support particular points in a text.
9. Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Process and Literacy Skills Standard 2: The student will develop and demonstrate Common Core writing literacy skills.

A. Text Types and Purposes

1. Write opinion pieces on topics in United States history and government, supporting a point of view with reasons and information.
2. Write informative/explanatory texts to examine a topic in United States history and government.
3. Write historically-based narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development and organization are appropriate to the task, purpose, and audience.
6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others.

C. Research to Build and Present Knowledge

7. Conduct short research projects that use several primary and secondary sources to build knowledge through investigation of different aspects of United States history and government.
8. Gather and recall relevant information from experiences, print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

D. Range of Writing

10. Write routinely over extended time frames and shorter time frames for a range of United States history and government tasks, purposes, and audiences.

Process and Literacy Skills Standard 3: The student will develop and demonstrate Common Core speaking and listening skills.

A. Comprehension and Collaboration

1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on Grade 5 United States History topics and texts, building on others' ideas and expressing their own clearly.
2. Summarize a social studies text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.

B. Presentation of Knowledge and Ideas

4. Report on a United States History topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; and speak clearly at an understandable pace.
5. Include multimedia components (e.g., graphics, sound) and visual displays in United States History presentations when appropriate to enhance the development of main ideas or themes.

CONTENT SKILLS

Content Standard 1: The student will examine James Towne Settlement and Plimoth Plantation as the foundations of American culture and society. (CCRIT 3 and 8)

1. Examine the economic and political reasons and motivations for English exploration and settlement in Virginia as evidenced through the competition for resources and the gaining of national wealth and prestige at Roanoke and James Towne. (CCRIT 8)
2. Analyze the economic, political, and religious reasons and motivations of free immigrants and indentured servants from the British Isles who came to Virginia. (CCRIT 8)
3. Explain the contributions, relationships, and interactions of John Smith, Powhatan, and John Rolfe to the establishment and survival of the James Towne settlement including the Starving Times and the development of tobacco as Virginia's cash crop. (CCRIT 3)
4. Identify and explain the reasons for the English commitment to the permanent settlement of James Towne as evidenced through the foundational events of 1619 including the introduction of
   A. representative government with the meeting of the House of Burgesses,
   B. private ownership of land, and
   C. Africans as laborers; initially as indentured servants and later lifetime slavery. (CCRIT 8)

5. Use specific textual evidence from primary and secondary sources to summarize the successes and challenges the settlement of Plimoth Plantation experienced in regards to their approach to
   A. Religious motivations for migration,
   B. Governing institutions as established by the *Mayflower Compact*,
   C. Relationship with Native Americans, and
   D. The contributions of the Pilgrims, William Bradford, Chief Massasoit, and Squanto. (CCRIT 1 and 3)

Content Standard 2: The student will compare and contrast the developments of the New England Colonies, the Middle Colonies, and the Southern Colonies based on economic opportunities, natural resources, settlement patterns, culture, and institutions of self-government. (CCRIT 5, 6 and 7; CCW 9)

1. Compare and contrast the three colonial regions in regards to natural resources, agriculture, exports, and economic growth including the different uses of the labor systems use of indentured servants and slaves. (CCRIT 5 and CCRIT 6)
2. Analyze the similarities and differences of self-government in the three colonial regions including the role of religion in the establishment of some colonies, the House of Burgesses in Virginia, and town hall meetings in New England. (CCRIT 6)
3. Explain the international economic and cultural interactions occurring because of the triangular trade routes including the forced migration of Africans in the Middle Passage to the British colonies. (CCRIT 3)
4. Analyze and explain the relationships and interactions of ongoing encounters and conflicts between Native Americans and the British colonists involving territorial claims including King Phillip's War. (CCRIT 3)
5. Draw specific evidence using informational texts and analyze the contributions of important individuals and groups to the foundation of the American system including Roger Williams, the Puritans, William Penn and the Quakers, Lord Baltimore, and James Oglethorpe. (CCRIT 7 and CCW 9)
6. Analyze and compare the daily life in the colonies as experienced by different social classes including large landowners, craftsmen and artisans, farmers, women, enslaved and freed African Americans, indentured servants, merchants, and Native Americans, noting important similarities and differences in the points of view they represent. (CCRIT 6)

Content Standard 3: The student will examine the foundations of the American nation laid during the Revolutionary Era through the contributions of historic individuals and groups, the spreading of the ideals found within the *Declaration of Independence*, and the significant military and diplomatic events of the Revolutionary War that resulted in an independent United States. (CCRIT 1, 3, 5, 6, and CCW 7, 9)

1. Research and examine the causes and effects of significant events leading to armed conflict between the colonies and Great Britain drawing evidence from informational texts about the following events including (CCRIT 3, 5, 6 and CCW 7, 9)
   A. The *Proclamation of 1763* by King George III in restricting the perceived rights of the colonists to Native American lands which they believed they had earned by fighting during the French and Indian War,
   B. The *Sugar* and *Stamp Acts* as the first direct taxes levied by Parliament on the American colonists,
   C. The boycotts of British goods and the efforts of the Committees of Correspondence as economic means of protesting British policies the colonists thought were violating their rights to govern themselves including the right of self-taxation in hopes of getting the acts repealed,
   D. The *Quartering Act* as a way for the British government to share the costs of defending the colonies and of controlling the growing colonial discontent,
   E. The Boston Massacre as a sign the colonists were beginning to change protest tactics from peaceful means to direct, physical confrontation,
   F. Colonial arguments that there should be no taxation without representation in Parliament,
   G. The Boston Tea Party and issuance of the *Coercive Acts* (the Intolerable Acts) as punishment for destroying private property,
   H. The British raids on Lexington and Concord, which provoked colonial armed resistance resulting in the siege of the British in Boston, and
   I. The publication of Thomas Paine's pamphlet, *Common Sense*, which made a rational argument for colonial independence.

2. Draw evidence from the *Declaration of Independence* to identify and explain the colonial grievances which motivated the Second Continental Congress to make arguments for and to declare independence from Great Britain and establish the ideals in American society of equality, inalienable rights, and the consent of the governed. (CCRIT 8 and CCW 9)
3. Commemorate Celebrate Freedom Week by recognizing the sacrifices and contributions to American freedom by veterans and by reciting the social contract selection from the *Declaration of Independence*:

   > We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

4. Draw specific evidence from informational texts and analyze the formation, benefits, and weaknesses of the first American national system of government under the *Articles of Confederation* including conducting and winning the Revolutionary War and management of the western territories. (CCRIT 7 and CCW 9)
5. Analyze and explain the relationships of significant military and diplomatic events of the Revolutionary War including the leadership of General George Washington, the experiences at Valley Forge, the impact of the battles at Trenton, Saratoga, and Yorktown, as well as the recognition of an independent United States by Great Britain through the *Treaty of Paris*. (CCRIT 3)
6. Identify and explain the contributions and points of view of key individuals and groups involved in the American Revolution including Patrick Henry, Samuel Adams, John Adams, Abigail Adams, Paul Revere, Benjamin Franklin, Thomas Jefferson, Mercy Otis Warren, Phillis Wheatley, the Sons and Daughters of Liberty, patriots, and loyalists by drawing information from multiple sources. (CCRIT 7, 8 and CCW 7, 9)

Content Standard 4: The student will examine the formation of the American system of government following the American Revolution.

1. Draw specific evidence from informational texts and examine the issues and events encountered by the young nation that led to the Constitutional Convention in Philadelphia in 1787 including a weak national government, the *Northwest Ordinance*, and civil unrest as typified in Shays' Rebellion. (CCRIT 3 and CCW9)
2. Examine the contributions and leadership of George Washington, James Madison, George Mason, and Gouverneur Morris as evidenced in the great issues, debates, and compromises of the Constitutional Convention including the *Virginia Plan* and the *New Jersey Plan*, slavery, the Three-fifths Compromise, and the Great Compromise. (CCRIT 2)
3. Determine the main purposes of the United States government as expressed in the *Preamble* and as evidenced in the *United States Constitution* including the principles reflected in the separation of powers, checks and balances, and shared powers between the federal and state governments, and the basic responsibilities of the three branches of government. (CCRIT 2)
4. Explain the process of ratification of the *United States Constitution* as well as compare and contrast the viewpoints of the Federalists and Anti-Federalists over the addition of a bill of rights. (CCRIT 5)
5. Examine the *Bill of Rights* and summarize the liberties protected in all 10 amendments. (CCRIT 2)

*Content Standard 5: The student will compare and contrast the continued formation of the new nation under the leadership of Presidents Washington, Adams, and Jefferson. (CCRIT 5)

1. Analyze the formation of the new government and the presidential leadership qualities of George Washington including the precedent set by his decision not to seek a third term and the impact of his *Farewell Address*.
2. Explain the impact of the presidential election of 1800 regarding the peaceful transfer of political power from one party to another.
3. Examine the transformative impact of the *Louisiana Purchase* in 1803 upon the American system in regards to the explorations by Lewis and Clark and the concept of Manifest Destiny as America expanded westward.

An asterisk (*) has been used to identify Content Standard 5 and the following objectives that must be assessed by the local school district. All other skills may be assessed by the Oklahoma School Testing Program (OSTP).

Grade 6
WORLD GEOGRAPHY
Western Hemisphere: The Why of Where – Places, Patterns of Settlement, and Global Interactions

Geography is the study of spatial patterns of the human and physical characteristics of the world and its peoples. Students will use geographic knowledge as a tool for understanding the concepts of economics and the impact of recent history on contemporary events. Students will explore how spatial patterns form, change over time, and relate to one another through a two-year examination of the regions of the world with the Western Hemisphere being studied in Grade 6 followed by the Eastern Hemisphere in Grade 7. For practical uses the traditional designations of Eastern and Western Hemispheres have been followed. The Western Hemisphere is treated as the areas of North America, South America, and the Caribbean.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated across all of the content standards and used for instructional delivery of the content.

PROCESS AND LITERACY SKILLS

Literacy Skills Standard 1: The student will develop and demonstrate Common Core Social Studies reading literacy skills.

A. Key Ideas and Details
1. Cite specific textual evidence to support analysis of primary and secondary sources.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
3. Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

B. Craft and Structure
4. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
5. Describe how a text presents information (e.g., sequentially, comparatively, causally).
6. Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).

C. Integration of Knowledge and Ideas
7. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
8. Distinguish among fact, opinion, and reasoned judgment in a text.
9. Analyze the relationship between a primary and secondary source on the same topic.

D. Range of Reading and Level of Text Complexity
10. By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

Literacy Skills Standard 2: The student will develop and demonstrate Common Core Social Studies writing literacy skills.

A. Text Types and Purposes
1. Write arguments focused on discipline-specific content.
   a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
   b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
   c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
   d. Establish and maintain a formal style.
   e. Provide a concluding statement or section that follows from and supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/experiments, or technical processes.
   a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
   c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to inform about or explain the topic.

e. Establish and maintain a formal style and objective tone.
f. Provide a concluding statement or section that follows from and supports the information or explanation presented.

3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9. Draw evidence from informational texts to support analysis reflection, and research.

C. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will analyze data from a geographic perspective using the skills and tools of geography.

1. Cite specific geographic information to support analysis from primary and secondary sources located in texts, documents, newspapers, magazines, journals, political cartoons, and online news sources.
2. Integrate visual information, draw conclusions, and make predictions from geographic data and analyze spatial distribution and patterns by interpreting that data as displayed on globes, graphs, charts, satellite and other forms of visual imagery including data from bar and line graphs, pie charts, thematic maps, population pyramids, climagraphs, cartagrams, contour/relief maps, GIS systems, and diagrams.
3. Describe basic types of map projections and compare how they display information including Mercator, Peters, and Robinson, and apply the concepts of scale, distance, direction, relative location, absolute location, and latitude and longitude.
4. Integrate visual information and apply the skill of mental mapping of the political and physical features of Earth's surface and to organize information about people, places, and environments.
5. Conduct short research projects by investigating contemporary events and issues from political, economic, social, and geographic perspectives.
6. Commemorate Celebrate Freedom Week by recognizing the sacrifices and contributions to American freedom by veterans and by reciting the social contract selection from the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

Content Standard 2: The student will examine the cultural and physical characteristics of the major regions of the Western Hemisphere.

1. Define the concept of region and identify major political, physical, and economic regions of the Western Hemisphere including
   A. The political regions of North America, Central America, South America, and the Caribbean,

B. The physical regions including the Amazon rainforest and the North American Great Plains, and
C. The economic regions including commercial agriculture in North America and subsistence agriculture of Amazonian communities.

2. Describe specific political regions of the Western Hemisphere and identify on a political map the major urban centers and countries including
   A. All nations of North America, Central America, South America, and the Caribbean, and
   B. Major metropolitan areas including New York City, Los Angeles, Chicago, Houston, Washington, DC, Miami, Toronto, Montreal, Vancouver, Mexico City, Panama City, San Jose, Rio de Janeiro, Buenos Aires, Santiago, Caracas, Bogota, Sao Paulo, San Juan, and Havana.
3. Describe the characteristics and relative location of major cultural regions of the Western Hemisphere including
   A. the Maya civilization of Mesoamerica,
   B. the Inca civilization of Latin America,
   C. the Inuit indigenous peoples of the Arctic,
   D. Hispanic communities of the United States and indigenous peoples of North and South America, and
   E. French-speaking Quebec.
4. Explain and summarize how common characteristics can link as well as divide regions including
   A. The question of sovereignty for French-speaking Canadians,
   B. The free trade relationships established by NAFTA, and
   C. The establishment of *maquiladoras* on the United States-Mexican border.
5. Cite specific textual and visual evidence in order to analyze reasons for conflict and cooperation among groups, societies, countries, and regions of the Western Hemisphere including
   A. The bi-national construction of the St. Lawrence Seaway,
   B. Disputes between South American nations over fishing rights off the Pacific Coast,
   C. The strain on international relations caused by immigration, and
   D. Relief efforts of the United Nations following natural disasters.

Content Standard 3: The student will examine the interactions of physical systems that shape the patterns of Earth's surface.

1. Integrate visual information in order to identify on a physical map and describe the major landforms and bodies of water of the Western Hemisphere including
   A. Bodies of Water - Mississippi, Colorado, MacKenzie, Rio Grande, and Amazon Rivers, Gulf of Mexico, Hudson Bay, Straits of Magellan and the Bering Strait, Atlantic, Pacific, Arctic and Southern Oceans, the Great Lakes, and the concept of drainage systems and the Continental Divide.
   B. Landforms - the Appalachian, Rocky, Andes, and Cascade Mountain Ranges, the Atacama and Sonoran Deserts, the Hawaiian and Greater Antilles archipelagos, the Pampas and Great Plains, the Canadian Shield, the Yucatan Peninsula, the Isthmus of Panama, and the Great Basin.
2. Describe how the processes and factors of latitude, elevation, Earth-Sun relationship, prevailing winds, and proximity to bodies of water influence climate and how humans respond to regional climate patterns and events including drought and *El Niño*.
3. Analyze the impact of natural disasters on human populations including forced migration, scarcity of consumer goods, and loss of employment.

Content Standard 4: The student will analyze the human systems of the Western Hemisphere in the context of the world's peoples and cultures.

1. Identify and describe cultural traits of language, ethnic heritage, social systems, religion, and traditions including how cultural diffusion impacts societies.
2. Describe and compare examples of the market and command economic systems including how governments affect economic activities in such systems.
3. Describe the major political systems of representative governments (democracy, republic, constitutional monarchy) and authoritarian systems (dictatorship) including the role of the citizen in the selection of government officials, lawmaking, and the liberties guaranteed under different forms of government.
4. Cite specific textual and visual evidence to explain patterns of global economic interdependence and world trade including the concepts of balance of trade, supply and demand, and measures of economic growth including Gross Domestic Product (GDP).

5. Analyze the impact of geography on population location, growth, and change, applying geographic concepts of population density, the availability of resources, settlement patterns, and migrational push and pull factors including the twentieth century Asian and Caribbean refugee migration to North America or the pattern of Hispanic workers migrating to the United States.

Content Standard 5: The student will analyze the interactions of humans and their environment in the western hemisphere.

1. Integrate and compare visual information of the common characteristics of developed and developing countries including access to human and economic capital, the impact of education and technology; and analyze data used by geographers including literacy rate, life expectancy, and per capita income.
2. Summarize the impact of the distribution of major renewable and nonrenewable resources and evaluate how the three levels of economic activities (primary, secondary, and tertiary) contribute to the development of a country or region including
   A. The United States' and Canada's access to fossil fuels, water, iron, and arable soil,
   B. Agricultural development dependent on the natural aquifers of the Great Plains,
   C. The nationalized oil production in Venezuela and Mexico, and
   D. North America's access to iron and coal enabling a productive steel industry.
3. Evaluate the effects of human modification of and adaptation to the natural environment including
   A. Terraced farmland of the Andes,
   B. Construction of the Panama Canal,
   C. Clear-cutting of the boreal forests of North America, and
   D. Diversion of the Colorado River for irrigation and municipal water.
4. Analyze regional problems of the western hemisphere having spatial dimensions including
   A. Oil spills in the Gulf of Mexico,
   B. Deforestation of Amazonia,
   C. Air pollution and urban sprawl of Mexico City, and
   D. Water pollution from industrial run-off into the Great Lakes.
5. Summarize the role of citizens as responsible stewards of natural resources and the environment including
   A. Careful use of fertilizer and pesticides to avoid polluting the land and the water supply,
   B. Participation in recycling and anti-littering activities,
   C. Conservation of natural resources, and
   D. Support of alternative and sustainable energy sources.

Grade 7
WORLD GEOGRAPHY
Eastern Hemisphere
The Why of Where – Places, Patterns of Settlement, and Global Interactions

Geography is composed of the interrelated components of skills and content knowledge, both of which are necessary to being a geographically informed citizen. Students will use geographic knowledge as a tool for understanding the concepts of economics and the impact of recent history on contemporary events. Students will focus on spatial patterns of human and physical characteristics of the world and its peoples, and will explore how these patterns form, change over time, and relate to one another in the Eastern Hemisphere. This is the second half of the middle level geographic studies program. The Western Hemisphere was the focus of the Grade 6 portion. For practical uses the traditional designations of Eastern and Western Hemispheres have been followed. The Eastern Hemisphere is treated as the areas of Africa, Asia, Europe, Australia, and Oceania.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

ASSESSMENT NOTE: Standard 1 and 2 Social Studies Process and Literacy Skills should be integrated throughout the content standards and used in teaching and assessing the student's understanding of the course skills and content at the classroom and district level. At the state level, the Social Studies Process and Literacy Standards 1 and 2 will be measured and reported within each of the content standards. Process and Literacy Skills assessment items will be content-based and reported under each of the content standards. For assessment purposes, each standard will have items using maps, charts, graphs, pictures, and photographs. There will be a balance of graphic and textual stimulus materials within the various World Geography Eastern Hemisphere test forms. At least 50 percent of the assessment will have appropriate pictorial and graphical representations.

PROCESS AND LITERACY SKILLS
Literacy Skills Standard 1: The student will develop and demonstrate Common Core Social Studies reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
3. Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
5. Describe how a text presents information (e.g., sequentially, comparatively, causally).
6. Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).

C. Integration of Knowledge and Ideas

7. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
8. Distinguish among fact, opinion, and reasoned judgment in a text.
9. Analyze the relationship between a primary and secondary source on the same topic.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

Literacy Skills Standard 2: The student will develop and demonstrate Common Core Social Studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
   b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
   c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
   d. Establish and maintain a formal style.

e. Provide a concluding statement or section that follows from and supports the argument presented.

2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/ experiments, or technical processes.
   a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
   c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to inform about or explain the topic.
   e. Establish and maintain a formal style and objective tone.
   f. Provide a concluding statement or section that follows from and supports the information or explanation presented.
3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9. Draw evidence from informational texts to support analysis reflection, and research.

C. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/ explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will analyze data from a geographic perspective using the skills and tools of geography.

1. Cite specific geographic information to support analysis from primary and secondary sources located in texts, documents, newspapers, magazines, journals, political cartoons, and online news sources.
2. Integrate visual information, draw conclusions, and make predictions from geographic data and analyze spatial distribution and patterns by interpreting that data as displayed on globes, graphs, charts, satellite and other forms of visual imagery including data from bar and line graphs, pie charts, thematic maps, population pyramids, climagraphs, cartagrams, contour/relief maps, GIS systems, and diagrams.
3. Apply the concepts of scale, distance, direction, relative location, absolute location, and latitude and longitude.
4. Integrate visual information and apply the skill of mental mapping of the political and physical features of Earth's surface and to organize information about people, places, and environments.
5. Conduct short research projects by investigating contemporary events and issues from political, economic, social, and geographic perspectives.
6. Commemorate Celebrate Freedom Week by recognizing the sacrifices and contributions to American freedom by veterans and by reciting the social contract selection from the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

Content Standard 2: The student will examine the human and physical characteristics of the major regions of the Eastern Hemisphere.

1. Integrate visual information in order to describe specific political regions of the Eastern Hemisphere, and identify on a political map the major urban areas and countries including
   A. Europe – London/United Kingdom, Paris/France, Rome/Italy, Berlin/Germany, and Moscow/Russia,
   B. Southwest Asia – Mecca/Saudi Arabia, Jerusalem/Israel, Tehran/Iran, Beirut/Lebanon, and Bagdad/Iraq,
   C. South Asia – Mumbai/India, Pakistan, Afghanistan,
   D. East and Southeast Asia – Beijing/China, Seoul/South Korea, Tokyo/Japan, Indonesia, Vietnam, and Malaysia,
   E. Africa – Cairo/Egypt, Nairobi/Kenya, South Africa, Libya, Sudan, and Nigeria, and
   F. Oceania – Australia and New Zealand.
2. Integrate visual information in order to describe the characteristics and relative location of physical and cultural regions of the Eastern Hemisphere including
   A. Physical Regions –
      1) Sub-Saharan savannas and rainforests,
      2) Pacific Ring of Fire,
      3) Rhine-Danube industrial corridor, and
      4) The Himalayan Mountain Range.
   B. Cultural Regions –
      1) The Sahel's and Sahara's nomadic peoples,
      2) Jerusalem's religious significance to Judaism, Christianity, and Islam, and
      3) The cultural hearths of the Nile, Indus, Ganges, Hwang He River Valleys, and Mesopotamia.
3. Explain and summarize how common physical or human characteristics can link as well as divide regions including
   A. Extensive inland waterway systems of natural rivers and manmade canals that link European trading centers,
   B. Ural Mountains that physically divide Europe from Asia,
   C. Sahara Desert that physically and culturally divides North Africa from Sub-Sahara Africa,
   D. Multiple languages, religion, and the legacy of the caste system in India that present barriers to cultural unity, and
   E. Cultural differences resulting in civil war and genocide in Darfur and Rwanda.
4. Cite specific textual and visual evidence to analyze reasons for conflict and cooperation among groups, societies, countries, and regions of the Eastern Hemisphere and the involvement of multinational organizations of the United Nations and the North Atlantic Treaty Organization including
   A. Multinational peace-keeping efforts to stabilize Arab-Israeli relations,
   B. Roots of disputes between India and Pakistan resulting in the threat of conventional war and nuclear war,
   C. Impact of multiple ethnic groups on Nigerian political stability,
   D. Coordination of currency and free trade zones created by the European Union,
   E. Humanitarian relief efforts by the United Nations to address hunger in Africa, and
   F. The struggle for and achievement of civil liberties and economic opportunities in South Africa's post-apartheid era.
5. Explain and summarize how and why regions change over time through physical and human processes which operate to modify Earth's surface including the
   A. Cultural diffusion brought about by North Africa's location central to trade across multiple continents,
   B. Impact of overgrazing and drought leading to desertification in the Sahel,
   C. Results of the Green Revolution in Central Asia, and
   D. Effects of abundant oil supplies in the Persian Gulf region.

Content Standard 3: The student will examine the interactions of physical systems that shape the patterns of Earth's surface in the Eastern Hemisphere.

1. Integrate visual information to identify on a physical map and describe the major landforms and bodies of water including
   A. Landforms – the Iberian, Scandinavian, and Indochina Peninsulas; the Urals, Pyrenees, Alps, and Himalayan Mountain Ranges; the Sahara, Kalahari, and Gobi Deserts; and the Great Rift Valley.
   B. Bodies of water – Danube, Volga, Nile, Congo, Niger, Tigris, Euphrates, Indus, Ganges, and Yangtze Rivers; Mediterranean, Arabian and North Seas; Persian Gulf; Bay of Bengal; Strait of Gibraltar; Atlantic, Arctic, Indian, Pacific, and the Southern Oceans.
2. Analyze from multiple perspectives the impact of natural disasters on human populations resulting in forced migration, scarcity of consumer goods, and loss of employment including
   A. The impact of plate tectonics resulting in earthquakes, tsunamis, and volcanic eruptions on human and physical systems bordering the Pacific Ring of Fire,
   B. Frequent drought of northern Africa and Southwest Asia that creates stress on humans and wildlife,
   C. The impact of monsoon patterns and typhoon activity on agriculture and loss of life in South Asia, and
   D. Regular flooding of China's rivers resulting in the accumulation of loess.

Content Standard 4: The student will analyze the world's peoples and cultures in the context of the human systems in the Eastern Hemisphere.

1. Compare and contrast the common cultural traits including language, ethnic heritage, social systems, religions, and traditions and how cultural diffusion impacts societies.
2. Describe the world's major religions including Buddhism, Christianity, Daoism, Hinduism, Islam, and Judaism including the geographic origins, major beliefs, and customs of the six major world religions and the significance of religion in contemporary societies.
3. Integrate visual information to analyze data used by geographers to measure the human characteristics used to define developed versus developing countries including literacy rates, life expectancy, infant mortality rate, Gross National Product (GNP), and per capita income.
4. Compare and contrast the market and command economic systems and how governments affect economic activities in such systems including
   A. Economic reforms in China that are moving China from a command system toward a market system,
   B. The economic advantages and disadvantages of Sweden's mixed market system,
   C. The economic prosperity generated by Japan's market system, and
   D. The economic development limitations of North Korea's command economic system.
5. Compare and contrast the major political systems of representative governments (democracy, republic, and constitutional monarchy) and authoritarian systems (dictatorship and absolute monarchy) including the role of the citizen in the selection of government officials, lawmaking, and the liberties guaranteed under different forms of government.
   A. The symbolic role of the British crown in comparison to the absolute authority of the monarchy of Saudi Arabia.
   B. The transformation of the former Soviet Union from an authoritarian system to the limited representative democracy of Russia.
6. Integrate visual information to explain patterns of global economic interdependence and world trade focusing on the concepts of imports and exports, supply and demand, Gross Domestic Product (GDP), and balance of trade including
   A. The European Union's single currency and open single market that link economies and governments,
   B. The relative isolation of Japan and the United Kingdom that require extensive trade patterns for natural resources and markets,
   C. Outsourcing of technological and manufacturing jobs to developing regions of Asia, and
   D. Control over production and supply of global oil reserves as exercised by the Organization of the Petroleum Exporting Countries (OPEC).
7. Evaluate and summarize the impact of geography on population location, growth, change and density and on the availability of resources, settlement patterns, and migration including the
   A. Impact of push and pull factors on the rural migration to overcrowded urban centers in India,
   B. Challenges of under-population on the labor market in developed nations of Europe,
   C. Changing face of European cultures as a result of recent patterns of immigration, and
   D. Impact of China's one-child policy on population growth and culture.

Content Standard 5: The student will analyze the interactions of humans and their environment in the Eastern Hemisphere.

1. Cite specific textual and visual evidence to describe the relationship between the distribution of major renewable and nonrenewable resources and evaluate how the three levels of economic activities (primary, secondary, and tertiary) contribute to the development of a country or region including the
   A. Abundant energy resources driving China's rapid development,
   B. Reserves of valuable minerals responsible for South Africa's economic growth,
   C. Accessibility of coal and iron reserves contributing to steel industries of western Europe and Russia, and
   D. Value of North Sea petroleum reserves to developed nations' economies.
2. Evaluate the effects of human modification of and adaptation to the natural environment including the
   A. Deforestation of Indonesia's rainforests,
   B. Creation of living space through the drainage of seawater and the system of dikes in the Netherlands,
   C. Transformation of arid lands of the Arabian Peninsula through introduction of western irrigation methods,
   D. Use of terrace farming and double-cropping as solutions to food needs of East Asia, and
   E. Benefits and dangers of nuclear power generation as exemplified by the environmental disaster at Chernobyl.
3. Integrate visual information to analyze regional problems and policies having spatial dimensions in the Eastern Hemisphere including the
   A. Management of the Aral Sea's water resources,
   B. Impact of economic development on Russia's Arctic regions, and
   C. Transformation of the environment and population centers caused by the construction of the Three Gorges Dam in China.

Grade 8
UNITED STATES HISTORY
Creating the United States: The Foundation, Formation, and Transformation of the American Nation, 1754-1877

The focus of the course in United States History for Grade 8 is the American Revolution through the Civil War and Reconstruction Eras (1754–1877).

The student will describe and analyze the major causes, key events, and important personalities of the American Revolution. The student will examine in greater depth the factors, events, documents, significant individuals, and political ideas that led to the formation of the United States of America. These will be pursued through a chronological study of the early national period, westward expansion, and the Civil War and Reconstruction Eras. Citizenship skills will focus upon the historic development and understanding of constitutional government in the United States. The student will continue to develop and put to use a variety of Social Studies Process and Literacy Skills.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

ASSESSMENT NOTE: However, for the Grade 8 Criterion-Referenced Test over the History, Constitution and Government of the United States, the time frame is 1754-1865, or from approximately the *Albany Plan of Union* to the assassination of President Abraham Lincoln.

Standard 1 and 2 Social Studies Process and Literacy Skills should be integrated throughout the content standards and used in teaching and assessing the student's understanding of the course skills and content at the classroom and district level. At the state level, the Social Studies Process and Literacy Standards 1 and 2 will be measured and reported within each of the content standards 1, 2, 3, 4, and 5. Content Standard 6 is to be taught and assessed at the local district and classroom levels. Process and Literacy Skills assessment items will be content-based and reported under each of the content standards. For assessment purposes, each standard will have items using primary and secondary source documents, timelines, maps, charts, graphs, pictures, photographs, and/or political cartoons. There will be a balance of graphic and textual stimulus materials within the various United States History test forms. At least 50 percent of the assessment will have appropriate pictorial and graphical representations.

An asterisk (*) has been used to identify Content Standard 6 and the following objectives that must be assessed by the local school district. All other skills may be assessed by the Oklahoma School Testing Program (OSTP).

PROCESS AND LITERACY SKILLS

Literacy Skills Standard 1: The student will develop and demonstrate Common Core Social Studies reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
3. Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
5. Describe how a text presents information (e.g., sequentially, comparatively, causally).
6. Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).

C. Integration of Knowledge and Ideas

7. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
8. Distinguish among fact, opinion, and reasoned judgment in a text.
9. Analyze the relationship between a primary and secondary source on the same topic.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

Literacy Skills Standard 2: The student will develop and demonstrate Common Core Social Studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
   b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
   c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
   d. Establish and maintain a formal style.
   e. Provide a concluding statement or section that follows from and supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/ experiments, or technical processes.
   a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
   c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to inform about or explain the topic.
   e. Establish and maintain a formal style and objective tone.
   f. Provide a concluding statement or section that follows from and supports the information or explanation presented.
3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
9. Draw evidence from informational texts to support analysis reflection, and research.

C. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/ explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will analyze the foundations of the United States by examining the causes, events, and ideologies which led to the American Revolution.

1. Summarize the political and economic consequences of the French and Indian War on the 13 colonies including the imperial policies of requiring the colonies to pay a share of the costs of defending the British Empire and the precedent of the *Albany Plan of Union* as an early attempt to unify the colonies.
2. Cite specific textual and visual evidence to summarize the significance of British attempts to regulate colonial rights, as well as the colonial responses to these measures including
   A. The restriction of colonial rights as British subjects including colonial opposition and protests against taxation without representation, the boycotts of British goods, Patrick Henry's *Stamp Act Resolves,* the Committees of Correspondence, and the Boston Massacre,

B. The *Coercive Acts of 1774* (the Intolerable Acts) as British punishment for the Boston Tea Party and the convening of the First Continental Congress as a colonial response,
C. The Battles of Lexington and Concord as a rallying point of armed colonial resistance, and
D. Patrick Henry's *Give Me Liberty or Give Me Death* speech and Thomas Paine's pamphlet *Common Sense* advocating the defense of colonial rights and independence.

3. Cite specific textual and visual evidence to analyze the ideological and propaganda war between Great Britain and her North American colonies including the
   A. Points of views of the Patriots and the Loyalists about independence,
   B. Writings of Mercy Otis Warren and Phillis Wheatley,
   C. Use of Paul Revere's engraving of the Boston Massacre,
   D. Rejection of the *Olive Branch Petition* by King George III, and
   E. Grievances which motivated the Second Continental Congress to make arguments for and to declare independence from Great Britain thus creating the United States of America.
4. Determine the central ideas and grievances expressed in the *Declaration of Independence* and their intellectual origin including
   A. John Locke's theory of natural rights,
   B. The concept of the social contract,
   C. The ideals established in the American society of equality, inalienable rights, and the consent of the governed; and
   D. Evaluate the contributions of Thomas Jefferson and the Committee of Five in drafting the *Declaration of Independence*.
5. Commemorate Celebrate Freedom Week by recognizing the sacrifices and contributions to American freedom by veterans and by reciting the social contract selection from the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

Content Standard 2: The student will examine the foundations of the American nation laid during the Revolutionary Era through the contributions of significant individuals and groups involved in the key military and diplomatic events of the Revolutionary War that resulted in an independent nation.

1. Analyze the formation of the first American national system of government under the *Articles of Confederation* including the success of conducting and winning the Revolutionary War.
2. Compare and contrast the different motivations and choices that various colonial populations had regarding the War for Independence including
   A. Whether to fight for independence, remain loyal to the king, or to be neutral,
   B. The choices that free and enslaved African Americans had of escaping to freedom, or joining the British or Colonial forces, or remaining enslaved,
   C. The decisions Native Americans had as to which side to support in hopes of protecting their traditional cultures and native territories, and
3. Cite specific textual and visual evidence to summarize the impact of key military and diplomatic events including the
   A. Military leadership of General George Washington,
   B. Victories at Boston, Trenton, and Saratoga,
   C. French Alliance,
   D. Publication of Thomas Paine's *The Crisis*,
   E. Valley Forge Encampment, and
   F. Defeat of Lord Cornwallis's army at the Siege of Yorktown.

Content Standard 3: The student will examine the formation of the American system of government following the Revolutionary War that led to the creation of the *United States Constitution*.

1. Examine and summarize the issues encountered by the young nation that led to the Constitutional Convention in Philadelphia in 1787 including the
   A. Strengths and weaknesses of the *Articles of Confederation*,
   B. Lack of a common national currency,
   C. Lack of a common defense,
   D. Management of the war debts,
   E. Disputes over the western territories as resolved by the *Northwest Ordinance*, and
   F. Civil unrest as typified in Shays' Rebellion.
2. Analyze the significance of the Constitutional Convention, its major debates and compromises including the *Virginia Plan*, the *New Jersey Plan*, the Great Compromise, the Three-fifths Compromise, and the key contributions of George Washington, James Madison, George Mason, and Gouverneur Morris.

3. Cite specific textual and visual evidence to examine the arguments for and against the ratification of the *United States Constitution* as expressed in the *Federalist Papers Number 10 and Number 51*, as well as Anti-Federalist concerns over a strong central government and the omission of a bill of rights.
4. Explain the constitutional principles of popular sovereignty, consent of the governed, separation of powers, checks and balances, federalism, and judicial review.
5. Cite specific textual and visual evidence and summarize the rights and responsibilities all Americans possess under the *United States Constitution* as guaranteed in the *Bill of Rights* including the freedoms of religion, speech, press, assembly, petition, and the rights to due process and trial by jury.

Content Standard 4: The student will examine the political, economic, social, and geographic transformation of the United States during the early to mid-1800s.

1. Analyze the impact and consequences of major events and issues facing early presidential administrations including
   A. The suppression of the Whiskey Rebellion and establishment of the government's right to tax,
   B. President George Washington's advice for the new nation in his *Farewell Address*,
   C. The restriction of individual rights in the *Alien and Sedition Acts* and the responses of the Republican-Democrats in the *Virginia* and *Kentucky Resolutions,*
   D. The impact of the presidential election of 1800 and the peaceful transfer of political power from one party to another,
   E. The acquisition of territory through the *Louisiana Purchase* and the contributions of the explorations of the Lewis and Clark Corps of Discovery Expedition,
   F. How the Marshall Court's precedent-setting decisions in *Marbury v. Madison* and *McCulloch v. Maryland* interpreted the *United States Constitution* and established the Supreme Court as an independent and equal branch of the federal government.
   G. The War of 1812 which confirmed American independence and fueled a spirit of nationalism,
   H. The increased sectional tensions as the nation dealt with the expansion of slavery and attempts to limit it through the *Missouri Compromise*, and
   I. The *Monroe Doctrine* as an attempt to protect American interests and territory in the western hemisphere.
2. Summarize the significance and impact of the Jacksonian Era including the
   A. Election of Andrew Jackson as a victory for the common man,
   B. Nullification Crisis and the development of the states' rights debates as typified by the arguments put forth by Senator Daniel Webster and Senator John C. Calhoun, and
   C. Impact of government policies, non-adherence to treaties, and territorial expansion on Native American lands including the resistance and removal of the Five Tribes.
3. Cite specific textual and visual evidence to compare the sectional economic transformations including the concentration of population, manufacturing, shipping, and the development of the railroad system in the North as contrasted to the plantation system, the increased demand for cotton brought about by the invention of the cotton gin, and the reliance on a slave labor system in the South.
4. Analyze points of view from specific textual evidence to describe the variety of African American experiences, both slave and free, including Nat Turner's Rebellion, legal restrictions in the South, and efforts to escape via the Underground Railroad network including Harriet Tubman.
5. Analyze and summarize the significance of the Abolitionist and Women's Suffrage Movements including the influence of the Second Great Awakening and the *Declaration of Sentiments*, and the leadership of Frederick Douglass, William Lloyd Garrison, Sojourner Truth, Susan B. Anthony, and Elizabeth Cady Stanton to the respective movements.
6. Examine the concept of Manifest Destiny as a motivation and justification for westward expansion, including the
   A. Territorial growth resulting from the annexation of Texas, the *Mexican Cession*, and the *Gadsden Purchase*,
   B. Causes of the rapid settlement of Oregon and California,
   C. Impact upon Native American culture and tribal lands, and
   D. Growing sectional tensions regarding the expansion of slavery.

Content Standard 5: The student will analyze the social and political transformation of the United States as a result of the causes, course, and consequences of the American Civil War during the period of 1850 to 1865.

1. Cite specific textual and visual evidence to summarize the importance of slavery as a principal cause of increased sectional polarization as seen in the following significant events including the
   A. *Compromise of 1850* as a last attempt to reach a compromise regarding slavery,
   B. Publication of *Uncle Tom's Cabin* as fuel for anti-slavery sentiments,
   C. *Kansas-Nebraska Act* as it established the principle of popular sovereignty in new territories, repealed the *Missouri Compromise*, and led to factional feuds in Bleeding Kansas, and
   D. *Dred Scott v. Sanford* case which declared slaves as property and motivated John Brown's Raid on the federal arsenal at Harper's Ferry.
2. Cite specific textual and visual evidence to analyze the significance and results of the presidential election of 1860 including the
   A. Secession of South Carolina as expressed in the *Ordinance of Secession*,
   B. Goal of President Abraham Lincoln to preserve the Union,
   C. Formation of the Confederate States of America,
   D. Opening attack on Fort Sumter, and
   E. Rising tensions over the strategic Border States.
3. Compare the advantages and disadvantages of the Union and the Confederacy upon the eve of the war including the political/military leadership of President Lincoln to Confederate President Jefferson Davis and the military leadership of Union General Ulysses S. Grant to Confederate General Robert E. Lee.
4. Identify and summarize the consequences of the major turning points of the war including the
   A. Anaconda Plan and Total War Strategy,
   B. Battle of Antietam as a catalyst for the issuance of the *Emancipation Proclamation* and its role in expanding the goals of the war to include the ending of slavery,
   C. Battle of Gettysburg as inspiration for the *Gettysburg Address* and how Lincoln's speech clarified the Union's motivations for winning the war,
   D. Capture of Vicksburg in securing the Union's control of the Mississippi River,
   E. Excerpts from Lincoln's *Second Inaugural Address* of President Lincoln, calling for national reconciliation,
   F. Generosity of the North in terms of surrender demands as offered to General Lee at Appomattox Courthouse, and
   G. Impact of Lincoln's assassination and loss of his leadership on plans for reconstruction.

***Content Standard 6: The student will analyze the transformation of politics and society during the Reconstruction Era, 1865 to 1877.**

1. Compare and contrast the various policies and plans for the reconstruction of the Confederacy including those proposed by President Lincoln, President Andrew Johnson, and the Radical Republicans.
2. Cite specific textual and visual evidence to analyze the impact of the *13th, 14th, and 15th Amendments*, the Black Codes, the Freedmen's Bureau, and Jim Crow laws.
3. Identify points of view regarding the social changes following the Civil War including the role of carpetbaggers and scalawags, the rise of the Ku Klux Klan, elected Black officials, and sharecroppers.
4. Evaluate the impact of the *Homestead Act of 1862* and the resulting movement westward to free land including the impact of continued displacement of Native Americans.
5. Assess the impact of the presidential election of 1876 as an end to the reconstruction of the South.

An asterisk (*) has been used to identify Content Standard 6 and the following objectives that must be assessed by the local school district. All other skills may be assessed by the Oklahoma School Testing Program (OSTP).

High School ECONOMICS

In high school Economics, the student will learn and apply basic economic reasoning skills, concepts, and skills. The student will apply a variety of economic decision-making models to real-life economic situations. The student will examine the American free-market system as contrasted with other economic systems. The roles of economic systems, money, entrepreneurs, the United States Government, and the Federal Reserve will be examined as well.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

COMMON CORE STATE STANDARDS READING AND WRITING LITERACY IN HISTORY/SOCIAL STUDIES

The Common Core State Standards Reading and Writing Literacy Standards for Literacy in History/Social Studies in the high school contain two grade bands, 9-10 and 11-12. Since school districts have the option of scheduling high school social studies courses at any grade level 9-12, only the CCSS for Reading and Writing for Grades 9-10 have been included in each high school Social Studies course. If a course is taught at the 11th or 12th grade level, then the CCSS for Reading and Writing Grades 11-12 must be used for social studies literacy instruction. A copy of the CCSS for Reading and Writing Grades 11-12 are found in Appendix C.

Celebrate Freedom Week

In order to educate Oklahoma students about the sacrifices made for freedom on behalf of the country and the values on which this country was founded, November 11 has been designated "Veterans Day," and the week in which November 11 falls has been designated "Celebrate Freedom Week" for the public schools of Oklahoma. As part of a social studies class, during Celebrate Freedom Week or during another full school week as determined by the local board of education, appropriate instruction concerning the intent, meaning, and importance of the *Declaration of Independence* and the *United States Constitution*, including the *Bill of Rights*, in their historic contexts shall occur.

The study of the *Declaration of Independence* is to include the study and the relationship of ideas expressed in that document to subsequent American history.

Students in Grades 3-12 shall study and recite the following from the "social contract" selection of the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

The board of education of each public school district shall ensure that each school in its district will on Veterans Day conduct and observe an appropriate Veterans Day Assembly program of at least one class period that remembers and honors American veterans.

PROCESS AND LITERACY SKILLS

Process and Literacy Standard 1: Reading Skills. The student will develop and demonstrate social studies Common Core reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.
5. Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.
6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.

C. Integration of Knowledge and Ideas

7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
8. Assess the extent to which the reasoning and evidence in a text support the author's claims.
9. Compare and contrast treatments of the same topic in several primary and secondary sources.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.

Process and Literacy Standard 2: Writing Skills. The student will develop and demonstrate Common Core social studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
   b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
   c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   e. Provide a concluding statement or section that follows from or supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/ experiments, or technical processes.
   a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
   c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
   e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

C. Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
9. Draw evidence from informational texts to support analysis, reflection, and research.

D. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/ explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will develop and apply economic reasoning and decision-making skills.

1. Define and apply basic economic concepts of scarcity, surplus, choice, opportunity cost, cost/benefit analysis, risk/reward relationship, incentive, disincentive, and trade-off to a variety of economic situations.
2. Determine appropriate courses of economic actions using a variety of economic reasoning and decision-making models including the PACED Decision-Making Model by using the five step process of
   P = Stating the PROBLEM,
   A = Listing the ALTERNATIVES,
   C = Identifying the CRITERIA,
   E = EVALUATING the options, based on the criteria, and
   D = Making a DECISION.

Content Standard 2: The student will evaluate how societies answer the three basic economic questions: what goods and services to produce, how to produce them, and for whom are they produced.

1. Compare the world's basic economic systems of market (free enterprise), command, and mixed market economies identifying countries that have adopted each and comparing and contrasting the results those economic systems have produced in those countries as measured by GDP, national prosperity, and individual income and wealth.
2. Describe the role of the factors of production, land, labor, capital, entrepreneurship, and technology in economic systems.

Content Standard 3: The student will explain how prices are set in a market economy using supply and demand graphs and will determine how price provides incentives to buyers and sellers.

1. Analyze how price and non-price factors affect the demand and supply of goods and services available in the marketplace.
2. Explain what causes shortages and surpluses including government imposed price floors, price ceilings, and other government regulations and the impact they have on prices and people's decisions to buy or sell.

Content Standard 4: The student will evaluate how changes in the level of competition in different markets affect prices.

1. Explain how competition impacts the free market including the concepts that competition among sellers lowers costs and prices while encouraging increased production and competition among buyers increases prices and the allocation of goods and services to consumers willing and able to pay higher prices.
2. Explain how people's own self-interest, incentives and disincentives influence market decisions.

Content Standard 5: The student will describe the role of economic institutions including banks, labor unions, corporations, governments, and not-for-profits in a market economy.

1. Evaluate the impact of government ensuring the protection of private property rights and the rule of law in a market economy.
2. Describe how banks match savers with borrowers and allow people to pool their incomes and provide future income through investing in stocks.
3. Identify how labor unions, corporations, and not-for-profits influence a market economy.

Content Standard 6: The student will analyze how money makes it easier to trade, borrow, save, invest, and compare the value of goods and services.

1. Explain how individuals, businesses and the overall economy benefit from using and saving money.
2. Identify the components of the money supply, the different functions of money, and give examples of each.
3. Explain how the value of money is determined by the goods and services it can buy.

Content Standard 7: The student will evaluate how interest rates impact decisions in the market economy.

1. Analyze the relationship between interest rates and inflation rates.
2. Determine how changes in real interest rates impact people's decisions to borrow money and purchase goods in a market economy.

Content Standard 8: The student will analyze the role of entrepreneurs in a market economy.

1. Analyze the potential risks and potential gains of entrepreneurs opening new businesses or inventing a new product, and determine the financial and nonfinancial incentives that motivate them.
2. Identify an entrepreneur and describe how his/her decisions affect job opportunities for others.

Content Standard 9: The student will evaluate the economic role of government in a market economy.

1. Explain the role that government has in dealing with issues such as poverty, pollution, and medical research.
2. Describe the costs and benefits of government assistance programs, education, and other government funded services and projects.

Content Standard 10: The student will examine current economic conditions in the United States.

1. Determine how interest rates, unemployment, Consumer Price Index (CPI), individual savings and debt, government debt, labor supply, and inflation impact current economic conditions in the United States.
2. Explain how these conditions have an impact on consumers, producers, and government policymakers.

Content Standard 11: The student will identify Gross Domestic Product (GDP) and Gross National Product (GNP) as basic measures of a nation's economic output and income.

1. Explain GDP and GNP and how they are used to describe economic output over time and compare the GDP of various countries representing free-market, command, and mixed economies.
2. Describe the impact on the economy when GDP and GNP are growing or declining.

Content Standard 12: The student will explain the role of inflation and unemployment in an economic system.

1. Define inflation and determine how it is measured and the impact it has on different sectors of the United States economy.
2. Define the different types of unemployment and determine how it is measured and the impact it has on different sectors of the United States economy.

Content Standard 13: The student will identify the potential economic impact of policy changes by the Federal Reserve and the federal government.

1. Compare and contrast fiscal and monetary policy and their impact on the economy.
2. Evaluate the conditions under which the federal government and the Federal Reserve implement expansionary or contractionary policies.

High School
OKLAHOMA HISTORY AND GOVERNMENT: *The Foundation, Formation, and Transformation of Oklahoma*

In Oklahoma History and Government, the student will examine the people and events that have formed and transformed the landscape and cultures of the place and peoples that have become Oklahoma. The student will examine important political and ideological movements, as well as economic, cultural, and political accomplishments of state, national, and world significance. The learning of Oklahoma History and Government should lead students to link Oklahoma's history to local, national, and global contexts.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

COMMON CORE STATE STANDARDS READING AND WRITING LITERACY IN HISTORY/SOCIAL STUDIES

The Common Core State Standards Reading and Writing Literacy Standards for Literacy in History/Social Studies in the high school contain two grade bands, 9-10 and 11-12. Since school districts have the option of scheduling high school social studies courses at any grade level 9-12, only the CCSS for Reading and Writing for Grades 9-10 have been included in each high school Social Studies course. If a course is taught at the 11th or 12th grade level, then the CCSS for Reading and Writing Grades 11-12 must be used for social studies literacy instruction. A copy of the CCSS for Reading and Writing Grades 11-12 are found in Appendix C.

Celebrate Freedom Week

In order to educate Oklahoma students about the sacrifices made for freedom on behalf of the country and the values on which this country was founded, November 11 has been designated "Veterans Day," and the week in which November 11 falls has been designated "Celebrate Freedom Week" for the public schools of Oklahoma. As part of a social studies class, during Celebrate Freedom Week or during another full school week as determined by the local board of education, appropriate instruction concerning the intent, meaning, and importance of the *Declaration of Independence* and the *United States Constitution*, including the *Bill of Rights*, in their historic contexts shall occur.

The study of the *Declaration of Independence* is to include the study and the relationship of ideas expressed in that document to subsequent American history

Students in Grades 3-12 shall study and recite the following from the "social contract" selection of the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

The board of education of each public school district shall ensure that each school in its district will on Veterans Day conduct and observe an appropriate Veterans Day Assembly program of at least one class period that remembers and honors American veterans.

PROCESS AND LITERACY SKILLS

Process and Literacy Standard 1: Reading Skills. The student will develop and demonstrate social studies Common Core reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.
5. Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.
6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.

C. Integration of Knowledge and Ideas

7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
8. Assess the extent to which the reasoning and evidence in a text support the author's claims.
9. Compare and contrast treatments of the same topic in several primary and secondary sources.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.

Process and Literacy Standard 2: Writing Skills. The student will develop and demonstrate Common Core social studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
   b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
   c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   e. Provide a concluding statement or section that follows from or supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/experiments, or technical processes.
   a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
   c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
   e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
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C. Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
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9. Draw evidence from informational texts to support analysis, reflection, and research.

D. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will describe the state's geography and the historic foundations laid by Native American, European, and American cultures.

1. Integrate visual information to identify and describe the significant physical and human features including major trails, railway lines, waterways, cities, ecological regions, natural resources, highways, and landforms.
2. Summarize the accomplishments of prehistoric cultures including the Spiro Mound Builders.
3. Compare and contrast the goals and significance of early Spanish, French, and American expeditions including the impact of disease, interactions with Native Americans, and the arrival of the horse and new technologies.
4. Compare and contrast cultural perspectives of Native Americans and European Americans regarding land ownership and trading practices.

Content Standard 2: The student will evaluate the major political and economic events that transformed the land and its people prior to statehood.

1. Summarize and analyze the role of river transportation to early trade and mercantile settlements including Chouteau's Trading Post at Three Forks.
2. Describe the major trading and peacekeeping goals of early military posts including Fort Gibson.
3. Integrate visual and textual evidence to explain the reasons for and trace the migrations of Native American peoples including the Five Tribes into present-day Oklahoma, the *Indian Removal Act of 1830*, and tribal resistance to the forced relocations.
4. Summarize the impact of the Civil War and Reconstruction Treaties on Native American peoples, territories, and tribal sovereignty including the
   A. Required enrollment of the Freedmen,
   B. Second Indian Removal and the role of the Buffalo Soldiers,
   C. Significance of the Massacre at the Washita,
   D. Reasons for the reservation system, and
   E. Establishment of the western military posts of Fort Sill, Fort Supply, and Fort Reno.
5. Cite specific visual and textual evidence to assess the impact of the cattle and coal mining industries on the location of railroad lines, transportation routes, and the development of communities.
6. Analyze the influence of the idea of Manifest Destiny on the Boomer Movement including the official closing of the frontier in 1890.
7. Compare and contrast multiple points of view to evaluate the impact of the *Dawes Act* which resulted in the loss of tribal communal lands and the redistribution of lands by various means including land runs as typified by the Unassigned Lands and the Cherokee Outlet, lotteries, and tribal allotments.

Content Standard 3: The student will analyze the formation and development of constitutional government in Oklahoma.

1. Compare and contrast the development of governments among the Native American tribes, the movement for the state of Sequoyah, the proposal for an all-Black state, and the impact of the *Enabling Act* on single statehood.
2. Describe and summarize attempts to create a state constitution joining Indian and Oklahoma Territories including the impact of the Progressive and Labor Movements resulting in statehood on November 16, 1907.
3. Compare and contrast Oklahoma's state government to the United States' national system of government including the branches of government, their functions, and powers.
4. Describe the division, function, and sharing of powers among levels of government including city, county, tribal, and state.
5. Identify major sources of local and state revenues and the services provided including education, infrastructure, courts, and public safety.
6. Describe state constitutional provisions including the direct primary, initiative petition, referendum, and recall.

Content Standard 4: The student will examine the transformation of Oklahoma during times of boom and bust of the 1920s through the 1940s.

1. Compare and contrast the successes and failures of the United States policy of assimilation of the Native Americans in Oklahoma including the passage of the *Indian Citizenship Act of 1924* and the effects of the Indian boarding schools (1880s-1940s) upon Native Americans' identity, culture, traditions, and tribal government and sovereignty.

2. Examine multiple points of view regarding the historic evolution of race relations in Oklahoma including *Senate Bill 1* establishing Jim Crow laws, the growth of all-Black towns, the Tulsa Race Riot, and the resurgence of the Ku Klux Klan.
3. Summarize the impact of the national Socialist movement and organized labor on various segments of Oklahoma society including agriculture, mining, and state politics.
4. Examine how the economic cycles of boom and bust of the oil industry affected major sectors of employment, mining, and the subsequent development of communities, as well as the role of entrepreneurs including J.J. McAlester, Frank Phillips, E.W. Marland, and Robert S. Kerr.
5. Cite specific textual and visual evidence to evaluate the impact of the boom and bust cycle of Oklahoma's agricultural production as a response to the needs of World War I, and its effect as a precursor of the Great Depression.
6. Cite specific textual and visual evidence of the environmental conditions and the impact of human mismanagement of resources resulting in the Dust Bowl including the migration of the Okies, the national perceptions of Oklahomans as shaped by *The Grapes of Wrath*, and the New Deal policies regarding conservation of natural resources.
7. Describe the contributions of Oklahomans in 1920s and 1930s including Deep Deuce and African-American jazz musicians, Will Rogers's and Woody Guthrie's political and social commentaries, Wiley Post's aviation milestones, and the artwork of the Kiowa Six (formerly the Kiowa Five).
8. Summarize and analyze the impact of mobilization for World War II including the establishment of military bases and prisoner of war installations and the contributions of Oklahomans to the war effort including the Native American code talkers and the 45th Infantry Division.

Content Standard 5: The student will investigate how post-war social, political, and economic events continued to transform the state of Oklahoma during the 1950s through the present.

1. Cite specific textual and visual evidence to evaluate the progress of race relations and actions of civil disobedience in the state including the
   A. Judicial interpretation of the equal protection clause of the *14th Amendment* which ultimately resulted in the desegregation of public facilities, and public schools and universities,
   B. Landmark Supreme Court cases of *Sipuel v. Board of Regents of the University of Oklahoma* (1948) and *McLaurin v. Oklahoma Board of Regents for Higher Education* (1950),
   C. Lunch counter sit-ins organized by Clara Luper and the NAACP, and
   D. Leadership of Governor Gary in the peaceful integration of the public common and higher education systems.
2. Analyze the impact of economic growth in various sectors including the
   A. Impact of rural to urban migration,
   B. Development of water and timber resources,
   C. Emergence of the tourism as an industry,
   D. Discovery of new fossil fuel resources, Tulsa's designation as Oil Capital of the World, and the opening of the Anadarko Basin, and
   E. Improvement of the state's transportation infrastructures and the McClellan-Kerr Arkansas River Navigation System.
3. Cite specific textual and visual evidence to describe the artistic contributions of Oklahomans in the fields of music, art, literature, theater and dance including Ralph Ellison and the Five Indian Ballerinas as well as the perceptions of Oklahoma by the rest of the nation because of the musical *Oklahoma*.
4. Summarize the impact of Oklahoma's leadership on state and national politics including the rise of viable two party elections, Governor Henry Bellmon, and United States Representative Carl Albert.
5. Analyze the evolving relationship between state and tribal governments impacting tribal self-determination and control over Native American lands and resources including issues of joint jurisdiction, taxation, and gaming.
6. Cite specific textual and visual evidence to analyze the oil and gas boom of the 1970s and the subsequent bust of the energy industry during the 1980s including the impact of the Penn Square Bank Collapse on the state's economy, employment, and banking.
7. Describe the contemporary role the state's agriculture plays in feeding the nation and the world including the wheat, corn, cattle, pork, and chicken industries.
8. Explain the leadership of Oklahoma and its people in the field of aeronautics including the Federal Aviation Administration, NASA space program, and the influence of weather research on national disaster preparedness.
9. Examine major cultural and ethnic groups' contributions to the social and economic transformation of the modern state of Oklahoma.
10. Cite specific textual and visual evidence to analyze the causes and effects of the domestic terrorist attack on the Murrah Federal Building in Oklahoma City including the responses of Oklahomans to the event, the concept of the "Oklahoma Standard" and the creation of the Oklahoma City National Memorial and Museum.

High School PSYCHOLOGY *Foundations and Formations of Human Development*

Psychology is the study of human social behavior from an individual perspective including the foundations of psychology as an empirical social science, the structure and functions of the brain, human development, and how individuals adapt to their environment. Students will examine principles of motivation, how a person's culture and society influence the individual, psychological disorders, and the promotion of mental health.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

COMMON CORE STATE STANDARDS READING AND WRITING LITERACY IN HISTORY/SOCIAL STUDIES

The Common Core State Standards Reading and Writing Literacy Standards for Literacy in History/Social Studies in the high school contain two grade bands, 9-10 and 11-12. Since school districts have the option of scheduling high school social studies courses at any grade level 9-12, only the CCSS for Reading and Writing for Grades 9-10 have been included in each high school Social Studies course. If a course is taught at the 11th or 12th grade level, then the CCSS for Reading and Writing Grades 11-12 must be used for social studies literacy instruction. A copy of the CCSS for Reading and Writing Grades 11-12 are found in Appendix C.

Celebrate Freedom Week

In order to educate Oklahoma students about the sacrifices made for freedom on behalf of the country and the values on which this country was founded, November 11 has been designated "Veterans Day," and the week in which November 11 falls has been designated "Celebrate Freedom Week" for the public schools of Oklahoma. As part of a social studies class, during Celebrate Freedom Week or during another full school week as determined by the local board of education, appropriate instruction concerning the intent, meaning, and importance of the *Declaration of Independence* and the *United States Constitution*, including the *Bill of Rights*, in their historic contexts shall occur.

The study of the *Declaration of Independence* is to include the study and the relationship of ideas expressed in that document to subsequent American history

Students in Grades 3-12 shall study and recite the following from the "social contract" selection of the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

The board of education of each public school district shall ensure that each school in its district will on Veterans Day conduct and observe an appropriate Veterans Day Assembly program of at least one class period that remembers and honors American veterans.

PROCESS AND LITERACY SKILLS

Process and Literacy Standard 1: Reading Skills. The student will develop and demonstrate social studies Common Core reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.
5. Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.
6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.

C. Integration of Knowledge and Ideas

7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
8. Assess the extent to which the reasoning and evidence in a text support the author's claims.
9. Compare and contrast treatments of the same topic in several primary and secondary sources.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.

Process and Literacy Standard 2: Writing Skills. The student will develop and demonstrate Common Core social studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
   b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
   c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   e. Provide a concluding statement or section that follows from or supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/ experiments, or technical processes.
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D. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/ explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will examine the foundations of psychology and its origins as a separate social science discipline.

1. Analyze the definition of psychology in the context of psychology as an empirical science and the major approaches to psychology including behavioral, psychoanalytical, cognitive, and humanistic.
2. Evaluate the origins of psychology based on significant historic figures including Wilhelm Wundt, William James, John B. Watson, and Karen Horney.
3. Classify the various subfields in psychology including vocational applications such as counseling, industrial, clinical, experimental, and educational psychology.

Content Standard 2: The student will examine the development of psychology as an empirical science by describing the scientific method, explaining research strategies and identifying ethical issues.

1. Describe the scientific method as the framework for research and apply the principles of research design to an appropriate experiment.
2. Compare and contrast quantitative and qualitative research strategies including experiments, surveys, focus groups, and narratives as the foundation of research in psychology.
3. Identify ethical standards psychologists must address regarding research with human and non-human participants.
4. Explore the various modes of psychological testing including personality, intelligence, and projective while assessing the reliability of each.

Content Standard 3: The student will investigate the structure, biochemistry and circuitry of the brain and the nervous system to understand their roles in affecting behavior.

1. Identify and describe the structure and function of the brain including the hypothalamus, prefrontal lobe, corpus callosum, hemispheres, and amygdala.
2. Examine the structure and function of the nervous and endocrine system and how they affect behavior.
3. Identify the parts of a neuron and explain neurotransmission including the role and impact of various neurotransmitters.
4. Explain the processes of sensation and perception, as well as the capabilities and limitations of sensory processes including the visual, auditory, kinesthetic, olfactory, and gustatory sensory systems.
5. Describe the interaction of a person and the environment in determining perception including Gestalt principles and how one's experiences and expectations influence perception.
6. Identify various states of consciousness including sleep and dreams, hypnosis, meditation, and psychoactive drugs.

Content Standard 4: The student will analyze physical, social, emotional, moral, and cognitive development from conception through the latter stages of adulthood.

1. Explain the interaction of environmental and biological factors in human development including the role of the brain in all aspects of development.
2. Compare the theories of Jean Piaget, Sigmund Freud, Lawrence Kohlberg, Carl Jung, and Erik Erikson regarding human development.

Content Standard 5: The student will understand how organisms adapt to their environment through learning and cognition.

1. Identify and explain the major theories of learning including Ivan Pavlov's classical conditioning, B.F. Skinner's, and Albert Bandura's Operant conditioning, and Bandura's observational learning.
2. Describe the process, organization, and factors that influence memory and recall.
3. Analyze strategies and impediments involved in problem solving and decision making and how this knowledge could be applied to daily life.

Content Standard 6: The student will understand the principles of motivation and emotion.

1. Compare the predominant theories of motivation and emotion including the biological, social-cognitive, humanistic, and cultural theories.
2. Analyze the biological and environmental influences on positive and negative emotion.

Content Standard 7: The student will understand how society and culture influence a person's behavior and mental processes.

1. Evaluate the factors that lead to conformity, obedience, and nonconformity as demonstrated in experiments including the Stanford Prison Experiment, Milgram Experiment, or Solomon Asch's studies.
2. Explain how bias, discrimination, and use of stereotypes influence behavior with regard to gender, race, sexual orientation, and ethnicity as demonstrated in the studies of the Brown Eyed/Blue Eyed Experiment and the Clark Doll Experiment.
3. Examine influences on aggression and conflict including the factors associated with the bystander effect as demonstrated in such cases as the Kitty Genovese murder.

Content Standard 8: The student will examine how psychological disorders are diagnosed, classified and treated.

1. Analyze the methods of determining abnormal behavior and the tools used to diagnose and classify disorders.
2. Describe symptoms and causes of major categories of psychological disorders including schizophrenic, mood, anxiety, personality, somatoform, and dissociative disorders.
3. Compare available treatment options and how they evolved through history and among different cultures.

Content Standard 9: The student will evaluate the many factors that promote mental health.

1. Identify and explain potential sources of stress, effects of stress, and various coping strategies for dealing with stress.
2. Describe the characteristics of and factors that promote resilience and optimism.
3. Analyze the relationship between psychological health and physiological health.

High School SOCIOLOGY
Formations and Patterns of Group Behavior

Sociology is the study of human social behavior from a group perspective including recurring patterns of attitudes, actions and reactions, and how these patterns vary in social groups, among cultures, and across time. Students will examine diverse societies, group behavior and social structures, as well as the impact of cultural change on society and using scientific method of sociological thought. As in other social science disciplines, sociology guides students to continue to develop skills in thinking, inquiry and research, and participation in a culturally diverse, democratic society in an interdependent world.

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CONTENT SKILLS

Content Standard 1: The student will recognize sociology as a social science, identify methods and strategies of research, and examine the contributions of sociology to the understanding of social issues.

1. Describe the development of the field of sociology as a social science.
2. Identify the contributions of leading theorists within sociology including Auguste Comte, Emile Durkheim, Harriet Martineau, Herbert Spencer, Max Weber, C. Wright Mills, Karl Marx, and W.E.B. Dubois.
3. Evaluate different sociological research methods including participant observation, natural observation, library research, questionnaires, experiments, interviews, and case studies.
4. Conduct research on an issue using the scientific method of inquiry including developing a hypothesis, gathering and interpreting data, and drawing conclusions.

Content Standard 2: The student will examine the influence of culture and the way cultural transmission is accomplished.

1. Examine how relationships, structures, patterns, and processes influence culture.
2. Recognize the key components of a culture including knowledge, language and communication, customs, values, and physical artifacts.
3. Explain the differences between a culture and a society.
4. Analyze the influences of genetic inheritance and culture on human behavior including the debate over nature versus nurture.
5. Compare and contrast various subcultures including counter culture, pop culture, ethnic cultures, and religious cultures.
6. Describe factors that have led to cultural diversity within the United States.

Content Standard 3: The student will identify how social status influences individual and group behaviors.

1. Describe how social status affects social order including upper class, middle class, lower class, white-collar professionals, blue-collar workers, and the unemployed.
2. Recognize how role expectations can lead to conflict including gender, age, racial groups, and ethnic groups within different societies.

Content Standard 4: The student will examine how social groups are composed of people who share common characteristics including interests, beliefs, behaviors, and feelings.

1. Examine why individuals become members of or associate with different social groups.
2. Compare and contrast various types of norms including folkways, mores, laws, and taboos, and explain why rules of behavior are considered important to society.
3. Evaluate the characteristics of primary groups including small size, intimate settings, and enduring relationships and how members' behaviors are influenced by the primary groups.
4. Evaluate the characteristics of secondary groups including less permanence, less personal, and having a special purpose, and how members' behaviors are influenced by the secondary groups.
5. Investigate stereotypes of different groups including gangs, baby boomers, immigrants, and the homeless.

Content Standard 5: The student will identify the effects of social institutions on individual and group behavior, and how these institutions influence the development of the individual.

1. Analyze the impact of social institutions on individuals, groups, and organizations within society, and how these institutions transmit the values of society including familial, religious, educational, economic, and political.
2. Examine rites of passage within various social institutions including religious ceremonies, school proms, quinceañeros, graduation, marriage, and retirement.
3. Define ethnocentrism and xenophobia, and analyze how they can be beneficial or destructive to a culture.

Content Standard 6: The student will examine social change over time and the various factors that lead to these changes.

1. Examine environmental, political, economic, scientific and technological influences upon immediate and long-term social change.
2. Describe how collective behavior can influence and change society including sit-ins, organized demonstrations, and the use of social media.

Content Standard 7: The student will analyze social problems that affect large numbers of people or result from imbalances within a social system.

1. Distinguish between characteristics of a social problem as compared to an individual problem.
2. Analyze patterns of behavior found within social problems and their implications for society including juvenile crime, drug addiction, and long-term unemployment.
3. Examine individual and group response and potential resolutions to social problems as well as the consequences of such solutions.

Content Standard 8: The student will explore both individual and collective behavior.

1. Describe the traditions, roles and expectations necessary for a society to continue and flourish.
2. Examine factors that can lead to the breakdown and disruption of a society.
3. Differentiate the impact of individual leaders of different social and political movements including Mohandas K. Gandhi, Adolf Hitler, Dr. Martin Luther King, Jr., Osama Bin Laden, and Susan B. Anthony.
4. Interpret how social behavior is influenced by propaganda, the news media, and advertising.
5. Investigate the impact of rumor, gossip, and other inaccurate communications upon group behavior.

High School
UNITED STATES GOVERNMENT
Freedom for All: Securing Rights and Defining Responsibilities

Students of American government will examine the philosophical foundations of the American republican system, the formation of governmental institutions and practices, and their transformations since the founding era as a basis of preparing students to become informed, responsible, engaged, and literate citizens who are committed to the ideas and values of democracy and use them in their daily lives, as well as make informed decisions about how their government should protect individual liberties and address the common good.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

COMMON CORE STATE STANDARDS READING AND WRITING LITERACY IN HISTORY/SOCIAL STUDIES

The Common Core State Standards Reading and Writing Literacy Standards for Literacy in History/Social Studies in the high school contain two grade bands, 9-10 and 11-12. Since school districts have the option of scheduling high school social studies courses at any grade level 9-12, only the CCSS for Reading and Writing for Grades 9-10 have been included in each high school Social Studies course. If a course is taught at the 11th or 12th grade level, then the CCSS for Reading and Writing Grades 11-12 must be used for social studies literacy instruction. A copy of the CCSS for Reading and Writing Grades 11-12 are found in Appendix C.

Celebrate Freedom Week

In order to educate Oklahoma students about the sacrifices made for freedom on behalf of the country and the values on which this country was founded, November 11 has been designated "Veterans Day," and the week in which November 11 falls has been designated "Celebrate Freedom Week" for the public schools of Oklahoma. As part of a social studies class, during Celebrate Freedom Week or during another full school week as determined by the local board of education, appropriate instruction concerning the intent, meaning, and importance of the *Declaration of Independence* and the *United States Constitution* including the *Bill of Rights*, in their historic contexts shall occur.

The study of the *Declaration of Independence* is to include the study and the relationship of ideas expressed in that document to subsequent American history

Students in Grades 3-12 shall study and recite the following from the "social contract" selection of the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

The board of education of each public school district shall ensure that each school in its district will on Veterans Day conduct and observe an appropriate Veterans Day Assembly program of at least one class period that remembers and honors American veterans.

PROCESS AND LITERACY SKILLS

Process and Literacy Standard 1: Reading Skills. The student will develop and demonstrate social studies Common Core reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.
5. Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.
6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.

C. Integration of Knowledge and Ideas

7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
8. Assess the extent to which the reasoning and evidence in a text support the author's claims.

9. Compare and contrast treatments of the same topic in several primary and secondary sources.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.

Process and Literacy Standard 2: Writing Skills. The student will develop and demonstrate Common Core social studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
   b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
   c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   e. Provide a concluding statement or section that follows from or supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/experiments, or technical processes.
   a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
   c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
   e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

C. Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
9. Draw evidence from informational texts to support analysis, reflection, and research.

D. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will compare the formation of contemporary governments in terms of access, use, and justification of power.

1. Contrast the essential characteristics of limited versus unlimited governments with an understanding that the United States' constitutional system establishes legal restraints on governmental power.
2. Cite specific textual and visual evidence to compare and contrast historic and contemporary examples of unlimited governments, known as authoritarian or totalitarian systems including dictatorships, theocracies, and absolute monarchies to examples of limited systems including direct democracies, representative democracies, constitutional monarchies, and republics.
3. Summarize and explain how the American system is a representative republic in which the citizenry is sovereign.
4. Compare the advantages and disadvantages of the major ways governmental power is distributed, shared, and structured in unitary, federal, and confederal systems in terms of effectiveness, prevention of abuse of power, and responsiveness to the popular will.
5. Compare and contrast the property and due process rights in the United States free-market economy which are protected by the *United States Constitution* to the restricted property and due process rights existing/non-existing under command economic systems.

Content Standard 2: The student will describe the historic and philosophical foundations of the United States republican system of government.

1. Cite specific textual and visual evidence and compare points of view to examine the philosophical contributions of the Enlightenment including the writings of Montesquieu, Locke, and Thomas Jefferson; the early experiences of colonial self-government; and the influence of religious texts including *The Bible* to the foundation of American political thought.
2. Cite specific textual and visual evidence and summarize the impact of major historic events of the Revolutionary Era and major documents contributing to the formation of constitutional government in the United States including the *Mayflower Compact* (1620), the *Fundamental Orders of Connecticut* (1639), the *English Bill of Rights* (1689), the *Albany Plan of Union* (1754), the *Virginia Declaration of Rights* (1776), the *Articles of Confederation* (1781), and the colonial/revolutionary writings of Patrick Henry, Thomas Paine, and James Otis.
3. Determine the central ideas and importance of the concept of inalienable rights, the social contract or compact, the 27 grievances as stated in the *Declaration of Independence*, and the discussions of enumerated versus implied powers; and cite specific textual and visual evidence to explain how the protection of these rights were incorporated in the *United States Constitution* and the federal *Bill of Rights* as a fundamental purpose of the government.
4. Evaluate the necessity for a written constitution to set forth the organization of government and to distribute powers among the three different branches of government and the states, or the people.
5. Analyze the events and major conflicts, beliefs, and arguments which led to the addition of the *Bill of Rights* to the *United States Constitution;* and compare the points of view as expressed in *Federalist Papers Number 10 and Number 51* and the writings of the Anti-Federalists including Patrick Henry and George Mason.
6. Analyze the steps of the constitutional amendment process including examples of recent attempts to amend the *United States Constitution* as exemplified in the issues of the *Equal Rights Amendment* and flag desecration.

Content Standard 3: The student will analyze the fundamental principles of the American system of government.

1. Explain the concept of popular sovereignty as exercised by the nation's people who possess the ultimate source of authority.
2. Examine the American system of federalism and evaluate the changes that have occurred in the relationship between the states and the national government over time.
3. Analyze the enumerated powers delegated to the federal government by the states in the *United States Constitution*, the limits placed on the powers of the national government, and the powers of the states including the reserved and concurrent powers.
4. Summarize and explain the relationships and the responsibilities between national and state governments including tribal and local governments.
5. Cite specific textual and visual evidence and summarize how power is separated as well as shared under the American system including the separation of powers and checks and balance, which is designed to prevent abuse of power by any government body at the local, state, tribal, and federal levels.
6. Evaluate the importance of the rule of law and on the sources, purposes, and functions of government, and explain how the rule of law provides for the protection of individual liberties, public order, management of conflict, and assurance of domestic and national security.

7. Analyze the United States government's responsibility to protect minority rights while legitimizing majority rule including the rights of due process and equality under the law.
8. Cite specific textual and visual evidence and compare points of view regarding the shared values and ideals of American political culture as set forth in basic documents and speeches including the *Declaration of Sentiments*, Abraham Lincoln's *Gettysburg Address*, Franklin Roosevelt's *Four Freedoms* speech, and Dr. Martin Luther King, Jr.'s *Letter From Birmingham Jail*.

Content Standard 4: The student will examine the *United States Constitution* by comparing the legislative, executive, and judicial branches of government as they form and transform American society.

1. Cite specific textual and visual evidence to explain the purposes expressed in the *Preamble* and how the *United States Constitution* preserves those core principles of American society.
2. Examine the makeup, organization, functions, and authority exercised by the executive, legislative, and judicial branches of government.
   A. Identify constitutional qualifications for holding public office, the terms of office, and the expressed powers delegated to each branch of the national government including the numbers of members comprising the United States Congress and United States Supreme Court.
   B. Evaluate the extent to which each branch of government reflects the people's sovereignty including current issues concerning representation such as term limitations and legislative redistricting.
   C. Describe the process in which public policy is formulated into law including both the constitutional and operational procedures utilized in the modern legislative process.
   D. Explain why certain provisions of the *United States Constitution* result in tensions among the three branches, and evaluate how the functions of the national government have changed over time through executive actions and judicial interpretation of the necessary and proper clause.
   E. Compare and contrast the structure of the national branches of government to Oklahoma's state government.
   F. Apply the principles of limited government, federalism, checks and balances, and separation of powers to the workings of the three branches of government in real world situations including current issues and events.
   G. Identify the issues behind and explain the changes resulting from landmark United States Supreme Court decisions including *Marbury v. Madison* (1803), *McCulloch v. Maryland* (1819), *Plessy v. Ferguson* (1896), *Brown v. Board of Education of Topeka, Kansas* (1954), *Mapp v. Ohio* (1961), *Engel v. Vitale* (1962), *Miranda v. Arizona* (1966), *Furman v. Georgia* (1972), *Roe v. Wade* (1973), *United States v. Nixon* (1974), and *Bush v. Gore* (2000).
3. Analyze steps of the political process and its role in the United States' representative government.
   A. Evaluate the role of political parties, interest groups including organized labor and the media in influencing the public agenda, public opinion, and the actions of government.
   B. Describe the electoral process including the components of national campaigns, the nominative process, campaign funding, and the Electoral College.
4. Explain the role of the national government in formulating and carrying out domestic policy.
   A. Identify major sources of revenues for the federal government and how revenue is budgeted.
   B. Analyze significant policy issues and how they reflect the nation's interests and principles including entitlements and environmental concerns.
5. Investigate the role government plays in the growth and stability of the economy including the inseparable relationship between political and economic freedoms.
   A. Describe the steps of the budget process including examples of economic trade-offs that occur when addressing competing public needs.
   B. Determine how the government influences economic growth by using the tools of fiscal and monetary policy.
   C. Explain how legislation, executive departments, and regulatory agencies affect both economic sectors and individual citizens.
6. Summarize and explain the major responsibilities of the national government in formulating and carrying out foreign policy.
   A. Evaluate the effectiveness of cooperative efforts exercised through international alliances and organizations from the perspective of the United States including the United Nations, the North Atlantic Treaty Organization, and the *North American Free Trade Agreement*.
   B. Examine issues of national sovereignty and human rights on contemporary decisions of foreign policy.

Content Standard 5: Students will be able to evaluate the significance of civic participation in order to insure the preservation of constitutional government.

1. Distinguish between civic life and private life by defining civic virtue and explaining the individual's duty and responsibility to participate in civic life by voting, serving on juries, volunteering within the community, running for office, serving on a political campaign, paying taxes for governmental services, and respecting lawful authority.
2. Analyze how the structures of government provide citizens opportunities to monitor and influence the actions of the government and hold elected officials accountable.
3. Evaluate historic and contemporary examples of American citizens who have attempted to make the values and principles of the *United States Constitution* a reality.
   A. Analyze the rights and liberties guaranteed to all citizens in and protected by the *Bill of Rights*, how they are applied and protected within the states through the *14th Amendment*, and sustained through the actions of individual citizens.
   B. Explain the impact on American politics, both historically and presently, of the racial, religious, socioeconomic, and ethnic diversity of American society including the importance of adhering to constitutional values in managing conflicts over diversity.

High School
UNITED STATES HISTORY
The United States: The American Nation in Transformation, 1878 to the Present

In United States History, the student will describe and analyze effects of the Reconstruction Era amendments to the *United States Constitution*, examine the impact of immigration and the settlement of the American West on American society, and evaluate the economic effects of the industrialization and the changing role of the United States in world affairs at the turn of the twentieth century. The student will also describe the social, cultural, and economic events between the World Wars, investigate and analyze the Great Depression, and the causes, events and effects of World War II, and assess the foreign and domestic policies of the United States since World War II. The student will also examine the 9/11 attacks on New York City and Washington, DC.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

ASSESSMENT NOTE: High schools students in United States History for Grades 9-12 will study the time frame of 1878 to the present. However, for the high school ACE United States History End-of-Instruction Examination (EOI), the time frame is approximately 1878-2002, or approximately from the Reconstruction amendments through the terrorist attacks of September 11, 2001 and the immediate effects of those events.

Standard 1 and 2 Social Studies Process and Literacy Skills should be integrated throughout and across the content standards, as well as being used in teaching and assessing the course content at the classroom and district level. At the state level, Standard 1 and 2 Social Studies Process and Literacy Skills be measured and reported within each of the Content Standards 1, 2, 3, 4, 5, and 6. Process skill assessment items will be content-based and reported under each of the content standards. For assessment purposes, each standard will have items using primary and secondary source documents, timelines, maps, charts, graphs, pictures, photographs, and/or political cartoons. There will be a balance of graphic and textual stimulus materials within the various United States History test forms. At least 50 percent of the assessment items will have appropriate pictorial and graphical representations.

An asterisk (*) has been used to identify Content Standard 7and the following objectives under that standard that must be assessed by the local school district. All other skills may be assessed by the Oklahoma School Testing Program (OSTP).

COMMON CORE STATE STANDARDS READING AND WRITING LITERACY IN HISTORY/SOCIAL STUDIES

The Common Core State Standards Reading and Writing Literacy Standards for Literacy in History/Social Studies in the high school contain two grade bands, 9-10 and 11-12. Since school districts have the option of scheduling high school social studies courses at any grade level 9-12, only the CCSS for Reading and Writing for Grades 9-10 have been included in each high school Social Studies course. If a course is taught at the 11th or 12th grade level, then the CCSS for Reading and Writing Grades 11-12 must be used for social studies literacy instruction. A copy of the CCSS for Reading and Writing Grades 11-12 are found in Appendix C.

Celebrate Freedom Week

In order to educate Oklahoma students about the sacrifices made for freedom on behalf of the country and the values on which this country was founded, November 11 has been designated "Veterans Day," and the week in which November 11 falls has been designated "Celebrate Freedom Week" for the public schools of Oklahoma. As part of a social studies class, during Celebrate Freedom Week or during another full school week as determined by the local board of education, appropriate instruction concerning the intent, meaning, and importance of the *Declaration of Independence* and the *United States Constitution* including the *Bill of Rights* in their historic contexts shall occur.

The study of the *Declaration of Independence* is to include the study and the relationship of ideas expressed in that document to subsequent American history

Students in Grades 3-12 shall study and recite the following from the "social contract" selection of the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

The board of education of each public school district shall ensure that each school in its district will on Veterans Day conduct and observe an appropriate Veterans Day Assembly program of at least one class period that remembers and honors American veterans.

PROCESS AND LITERACY SKILLS

Process and Literacy Standard 1: Reading Skills. The student will develop and demonstrate social studies Common Core reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.
5. Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.
6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.

C. Integration of Knowledge and Ideas

7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
8. Assess the extent to which the reasoning and evidence in a text support the author's claims.
9. Compare and contrast treatments of the same topic in several primary and secondary sources.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.

Process and Literacy Standard 2: Writing Skills. The student will develop and demonstrate Common Core social studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
   b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
   c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   e. Provide a concluding statement or section that follows from or supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/experiments, or technical processes.
   a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
   c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
   e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

C. Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
9. Draw evidence from informational texts to support analysis, reflection, and research.

D. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will analyze the transformation of the United States through its civil rights struggles, immigrant experiences, settlement of the American West, and the industrialization of American society in the Post-Reconstruction through the Progressive Eras, 1865 to 1900.

1. Cite specific textual and visual evidence to analyze the post-Reconstruction civil rights struggles.
   A. Examine the purposes and effects of the *13th, 14th, and 15th Amendments*.
   B. Assess the impact of the Black Codes, Jim Crow laws, and the actions of the Ku Klux Klan.
2. Integrate specific textual and visual evidence to analyze the impact of Westward Movement and immigration on migration, settlement patterns in American society, economic growth, and Native Americans.
   A. Summarize the reasons for immigration, shifts in settlement patterns, and the immigrant experience including the *Chinese Exclusion Act*, the impact of Nativism, Americanization, and the immigrant experiences at Ellis Island.
   B. Examine the rationale behind federal policies toward Native Americans including the establishment of reservations, attempts at assimilation, the end of the Indian Wars at Wounded Knee, and the impact of the *Dawes Act* on tribal sovereignty and land ownership.
   C. Compare the contrasting view points of Native American leadership's resistance to United States Indian policies as evidenced by Red Cloud and his Cooper Union speech, Seattle, Quanah Parker, and Chief Joseph as expressed in his *I Will Fight No More Forever* speech.
3. Evaluate the impact of industrialization on the transformation of American society, economy, and politics.
   A. Analyze the impact of leading industrialists as "robber barons" and as "philanthropists" including John D. Rockefeller and Andrew Carnegie and his *Gospel of Wealth* essay on American society.
   B. Identify the impact of new inventions and industrial production methods including new technologies by Thomas Edison, Alexander G. Bell, and the Bessemer process.
   C. Evaluate the contributions of muckrakers including Ida Tarbell and Upton Sinclair that changed government policies regarding child labor, working conditions, and the *Sherman Antitrust Act*.
   D. Analyze major social reform movements including the Women's Suffrage and Temperance Movement and their significant leaders including Susan B. Anthony, Alice Paul, and Jane Addams.
   E. Evaluate the significance of the Labor Movement on the organization of workers including the impact of the Pullman strikes, the Haymarket Riot, and the leadership of Eugene V. Debs.
   F. Evaluate the rise and reforms of the Progressive Movement including the
      1. Direct primary, initiative petition, referendum, and recall,
      2. Impact of William Jennings Bryan and his *Cross of Gold* speech on the political landscape, and
      3. Conservation of the environment under the leadership of Theodore Roosevelt.

4. Analyze the series of events leading to and the effects of the *16th, 17th, 18th, 19th, and 21st Amendments* to the *United States Constitution*.

G. Assess and summarize changing race relations as exemplified in the *Plessy v. Ferguson* case.

H. Cite specific textual and visual evidence to compare and contrast early civil rights leadership including the viewpoints of Booker T. Washington, W.E.B. DuBois, and Marcus Garvey in response to rising racial tensions, and the use of poll taxes and literacy tests to disenfranchise blacks and poor whites.

Content Standard 2: The student will analyze the expanding role of the United States in international affairs as America was transformed into a world power in the late 19th and early 20th centuries, 1890 to 1920.

1. Cite specific textual and visual evidence to evaluate the impact of American imperialism on international relations and explain its impact on developing nations.
   A. Compare and contrast the economic, religious, social, and political rationales for American imperialism including the concept of "white man's burden," the annexation of Hawaii, the impact of Admiral Alfred T. Mahan, and the actions of the Anti-Imperialist League.
   B. Assess the role of yellow journalism in inciting American desire to go to war with Spain.
   C. Examine how the Spanish-American War resulted in the rise of the United States as a world power, and led to new territorial acquisitions and national insurrections in Cuba and the Philippines.
   D. Compare and contrast the foreign policies of Presidents Theodore Roosevelt, William Howard Taft, and Woodrow Wilson including Big Stick Diplomacy, Dollar Diplomacy, Missionary Diplomacy the *Roosevelt Corollary*, military interventionism, and the territorial acquisition and construction of the Panama Canal.
2. Analyze and summarize the 1912 presidential election including the key personalities of President William Howard Taft, Theodore Roosevelt, Woodrow Wilson and Eugene V. Debs; the key issues of dealing with the trusts, the right of women to vote, and trade tariffs; and the impact of the "Bull Moose Party" on the outcome of the election.
3. Evaluate the long-term impact of America's entry into World War I on national politics, the economy, and society.
   A. Summarize the transformation of the United States from a position of neutrality to engagement in World War I including the *Zimmerman Note* and the threats to international trade caused by unrestricted submarine warfare.
   B. Analyze the experiences of the war's homefront including the use of propaganda, women's increased role in industry, the marshaling of industrial production, the Great Migration, the institution of a draft, and the suppression of individual liberties resulting in the First Red Scare.
   C. Cite specific textual and visual evidence to examine Wilson's foreign policy as proposed in his *Fourteen Points* and the reasons for the nation's return to isolationism including the rejection of the League of Nations.

Content Standard 3: The student will analyze the cycles of boom and bust of the 1920s and 1930s on the transformation of American government, the economy, and society.

1. Examine the economic, political, and social transformations between the World Wars.
   A. Cite specific textual and visual evidence to describe modern forms of cultural expression including the Harlem Renaissance, the Jazz Age, and "talkies" (movies).
   B. Describe the rising racial tensions in American society including the resurgence of the Ku Klux Klan, increased lynchings, race riots as typified by the Tulsa Race Riot, and the use of poll taxes and literacy tests to disenfranchise blacks and poor whites.
   C. Examine growing labor unrest and industry's reactions including the use of sit-down strikes and court injunctions, and why socialism and communism appealed to labor.
   D. Describe the booming economy based upon access to and easy credit through installment buying of appliances and inventions of modern conveniences including the automobile.
   E. Assess the impact of the *Indian Citizenship Act of 1924* upon the various Native American tribes.
2. Cite specific textual and visual evidence to analyze the effects of the destabilization of the American economy.
   A. Identify causes contributing to an unstable economy including the overproduction of agriculture products, greater speculation and buying on margin in the Stock Market, and the government's laissez-faire policy.

B. Examine the role of the Stock Market Crash and bank failures in weakening both the agricultural and manufacturing sectors of the economy leading to the Great Depression.
C. Analyze how President Herbert Hoover's financial policies and massive unemployment as exemplified by the Bonus Army March and Hoovervilles impacted the presidential election of 1932.
D. Cite specific textual and visual evidence to compare points of view regarding the economic and social impact of the Great Depression on individuals, families, and the nation.

3. Analyze the impact of the New Deal in transforming the federal government's role in domestic economic policies.
A. Assess changing viewpoints regarding the expanding role of government as expressed in President Franklin Roosevelt's *First Inaugural Address* and the *Four Freedoms* speech.
B. Examine how national policies addressed the economic crisis including deficit spending, Roosevelt's court packing plan, and the new federal agencies of the Social Security Administration, Federal Deposit Insurance Corporation, Works Progress Administration, and Tennessee Valley Authority.
C. Cite specific textual and visual evidence to summarize the causes and impact of the Dust Bowl including the government's responses.

Content Standard 4: The student will analyze the United States role in international affairs by examining the major causes, events, and effects of the nation's involvement in World War II, 1933 to 1946.

1. Cite specific textual and visual evidence to examine the transformations in American society and government policy as the nation mobilized for entry into World War II.
A. Examine the roles of appeasement and isolationism in the United States' reluctance to respond to Fascist military aggression in Europe and Asia including the *Neutrality Acts* and the Lend-Lease program.
B. Evaluate the mobilization for war as stated in President Roosevelt's *Day Which Will Live in Infamy* speech including the role of women and minorities in the war effort, rationing, the internment of Japanese-Americans and the *Korematsu v. United States* decision, and the internment of Americans of German and Italian descent.
2. Cite specific textual and visual evidence to analyze the series of events affecting the outcome of World War II including major battles, military turning points, and key strategic decisions in both the European and Pacific Theaters of operation including Pearl Harbor, the D-Day Invasion, development and use of the atomic bomb, the island-hopping strategy, the Allied conference at Yalta, and the contributions of Generals MacArthur and Eisenhower.
3. Summarize American reactions to the events of the Holocaust resulting in United States participation in the Nuremburg Trials, which held Nazi leaders accountable for war crimes.

Content Standard 5: The student will analyze foreign and domestic policies during the Cold War, 1945 to 1975.

1. Cite specific textual and visual evidence to analyze the origins of international alliances and efforts at containment of Communism following World War II.
A. Identify the origins of Cold War confrontations between the Soviet Union and the United States including the leadership of President Harry Truman, the postwar division of Berlin, the Berlin Blockade and Airlift, the fall of the Iron Curtain, and the Marshall Plan.
B. Describe the role of the United States in the formation of the United Nations, NATO and the resulting Warsaw Pact, and the dividing of the political world into the Western and Soviet spheres of influence.
C. Assess the impact and successes of the *Truman Doctrine* including the American military response to the invasion of South Korea.
D. Compare and contrast the domestic and international goals of President Kennedy's administration as expressed in his *Inaugural Address* to the subsequent building of the Berlin Wall, the Bay of Pigs Invasion, the Cuban Missile Crisis, and the establishment of the Peace Corps.
2. Cite specific textual and visual evidence to describe events which changed domestic policies during the Cold War and its aftermath.
A. Summarize the reasons for the public fear of communist influence within the United States and how politicians capitalized on these threats including the leadership of President Dwight D. Eisenhower, the Army-McCarthy hearings, the Second Red Scare, and the Rosenbergs' spy trials.

B. Examine the impact of the proliferation of nuclear weapons and the resulting nuclear arms race, the concept of brinkmanship, the doctrine of mutually assured destruction (MAD), and the launching of *Sputnik* and the space race.

3. Cite specific textual and visual evidence to analyze the series of events and long term foreign and domestic consequences of the United States' military involvement in Vietnam including the Domino Theory, the *Gulf of Tonkin Resolution*, the Tet Offensive, the presidential election of 1968, university student protests, expanded television coverage of the war, the *War Powers Act,* and the *26th Amendment*.
4. Cite specific textual and visual evidence to analyze the major events, personalities, tactics, and effects of the Civil Rights Movement.
   A. Assess the effects of President Truman's decision to desegregate the United States armed forces, and the legal attacks on segregation by the NAACP and Thurgood Marshall, the United States Supreme Court decisions in the cases of Ada Lois Sipuel Fisher and George McLaurin, and the differences between *de jure* and *de facto* segregation.
   B. Compare and contrast segregation policies of "separate but equal," disenfranchisement of African Americans through poll taxes, literacy tests, and violence; and the sustained attempts to dismantle segregation including the *Brown v. Board of Education* decision, Rosa Parks and the Montgomery Bus Boycott, the desegregation of Little Rock Central High School, the Oklahoma City lunch counter sit-ins led by Clara Luper, the Freedom Rides, the March on Washington, the Birmingham church bombing, the adoption of the *24th Amendment*, the passage of the *Civil Rights Act of 1964* and the *Voting Rights Act of 1965*, the Selma to Montgomery marches, and the assassination of Dr. Martin Luther King, Jr.
   C. Compare and contrast the view points and the contributions of civil rights leaders and organizations linking them to events of the movement including Dr. Martin Luther King, Jr. and his *I Have a Dream* speech, Malcolm X, NAACP, SCLC, CORE, SNCC, and the tactics used at different times including civil disobedience, non-violent resistance, sit-ins, boycotts, marches, and voter registration drives.
   D. Evaluate the effects the Civil Rights Movement had on other contemporaneous social movements including the Women's Liberation Movement, the United Farm Workers and César Chávez, and the American Indian Movement.
5. Cite specific textual and visual evidence to analyze the ongoing social and political transformations within the United States.
   A. Summarize and examine the United States Supreme Court's use of the incorporation doctrine in applying the *Bill of Rights* to the states, thereby securing and further defining individual rights and civil liberties.
   B. Assess the lasting impact of President Lyndon Johnson's civil rights initiatives, the war on poverty, and the Great Society.
   C. Describe the goals and effectiveness of the Native American movement on tribal identity and sovereignty including the American Indian Movement (AIM), and the Siege at Wounded Knee.
   D. Cite specific textual and visual evidence to compare and contrast the changing roles of women from the Post-war Era through the 1970s including the goals of the Women's Liberation Movement, the National Organization of Women (NOW), the attempts to ratify the *Equal Rights Amendment* (ERA), and the United States Supreme Court's ruling in *Roe v. Wade*.
   E. Analyze the political and economic impact of President Nixon's foreign policies including *détente* and the opening of China.
   F. Evaluate the impact of the Watergate Scandal on executive powers including the role of the media, the *Pentagon Papers*, the first use of the *25th Amendment*, and President Ford's decision to pardon former President Nixon.

Content Standard 6: The student will analyze the foreign and domestic policies in the contemporary era, 1977 to the present.

1. Cite specific textual and visual evidence to evaluate President Carter's foreign policy in the Middle East including the *Camp David Accords*, the OPEC oil embargo, and the response to the 1979 Iranian hostage crisis.
2. Analyze the economic and political impact of President Reagan's domestic and foreign policies including Reaganomics, the Iran-Contra Scandal, and Reagan's *Tear Down This Wall* speech in West Berlin.
3. Summarize the series of events leading to the emergence of the United States as the sole superpower following the fall of the Berlin Wall, the reunification of Germany, and the collapse of the Soviet Empire.
4. Describe the goal of President H.W. Bush's foreign policy in forming an international coalition to counter Iraqi aggression in the Persian Gulf.

5. Describe and evaluate the continuing global influence of the United States under the leadership of President Bill Clinton including NAFTA and the NATO interventions to restore stability to the former Yugoslav republics.
6. Evaluate the rise of terrorism and its impact on the United States including the 1995 bombing of the Murrah Federal Building, the first attack on the World Trade Center Towers in 1993, the attacks on September 11, 2001, the *PATRIOT ACT*, and the creation of the Department of Homeland Security.

***Content Standard 7: The student will examine contemporary challenges and successes in meeting the needs of the American citizen and society, 2002 to the present.**

1. Cite specific textual and visual evidence to assess the causes, conduct, and consequences of the United States led wars in Afghanistan and Iraq including President George W. Bush's leadership, the efforts to counter and combat terrorism, and the impact of President Barack Obama's election on the course of the wars.
2. Examine the ongoing issues of immigration, employment, climate change, environmental pollution, globalization, population growth, race relations, women's issues, healthcare, civic engagement, education, and the rapid development of technology.

An asterisk (*) has been used to identify Content Standard 7 and the following objectives under that standard that must be assessed by the local school district. All other skills may be assessed by the Oklahoma School Testing Program (OSTP).

High School
WORLD HISTORY:
Cultural Connections, Turning Points, and Transformation of the World into the Modern Era

The student will examine the enduring philosophical and religious contributions from the ancient and classical eras to the modern world. The student will examine the impact of the European Renaissance and Reformation, various revolutionary movements, the Industrial Revolution, and the world that the World Wars helped create, the transformation of societies in the Post-World War Two Era, and recent contemporary events and issues.

COMMON CORE STATE STANDARDS READING AND WRITING LITERACY IN HISTORY/SOCIAL STUDIES

The Common Core State Standards Reading and Writing Literacy Standards for Literacy in History/Social Studies in the high school contain two grade bands, 9-10 and 11-12. Since school districts have the option of scheduling high school social studies courses at any grade level 9-12, only the CCSS for Reading and Writing for Grades 9-10 have been included in each high school Social Studies course. If a course is taught at the 11th or 12th grade level, then the CCSS for Reading and Writing Grades 11-12 must be used for social studies literacy instruction. A copy of the CCSS for Reading and Writing Grades 11-12 are found in Appendix C.

The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

Celebrate Freedom Week

In order to educate Oklahoma students about the sacrifices made for freedom on behalf of the country and the values on which this country was founded, November 11 has been designated "Veterans Day," and the week in which November 11 falls has been designated "Celebrate Freedom Week" for the public schools of Oklahoma. As part of a social studies class, during Celebrate Freedom Week or during another full school week as determined by the local board of education, appropriate instruction concerning the intent, meaning, and importance of the *Declaration of Independence* and the *United States Constitution*, including the *Bill of Rights*, in their historic contexts shall occur.

The study of the *Declaration of Independence* is to include the study and the relationship of ideas expressed in that document to subsequent American history

Students in Grades 3-12 shall study and recite the following from the "social contract" selection of the *Declaration of Independence*:

> We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. – That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.

The board of education of each public school district shall ensure that each school in its district will on Veterans Day conduct and observe an appropriate Veterans Day Assembly program of at least one class period that remembers and honors American veterans.

PROCESS AND LITERACY SKILLS

Process and Literacy Standard 1: Reading Skills. The student will develop and demonstrate social studies Common Core reading literacy skills.

A. Key Ideas and Details

1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

B. Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.
5. Analyze how a text uses structure to emphasize key points or advance an explanation or analysis.
6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.

C. Integration of Knowledge and Ideas

7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.
8. Assess the extent to which the reasoning and evidence in a text support the author's claims.

9. Compare and contrast treatments of the same topic in several primary and secondary sources.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.

Process and Literacy Standard 2: Writing Skills. The student will develop and demonstrate Common Core social studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
   a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
   b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
   c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   e. Provide a concluding statement or section that follows from or supports the argument presented.
2. Write informative/explanatory texts, including the narration of historic events, scientific procedures/experiments, or technical processes.
   a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
   c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
   e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
   f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).
3. (See note; not applicable as a separate requirement)

B. Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

C. Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
9. Draw evidence from informational texts to support analysis, reflection, and research.

D. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will analyze and summarize the impact on the modern world of the major world religions and the philosophical political principles of ancient and classical societies.

1. Cite specific textual and visual evidence to evaluate the impact of geography and various trade networks connecting Asia, Europe, and Africa on the spread of religions, philosophies, and political beliefs.
2. Examine the origins, traditions, beliefs, and impact of Judaism on ancient and modern societies including the religious concept of monotheism and its influence into the modern eras.
3. Compare using specific textual evidence the contributions of Greek and Roman philosophers to political ideas using selections from Plato's *Republic*, Aristotle's *Politics*, Cicero's *On the Republic* and *On the Laws*, and their impact on later political thought in Western societies.
4. Examine the origins, traditions, and beliefs of Hinduism and Buddhism, and explain their influence on the civilizations of India, China, and Southeast Asia, and their influence into the modern eras.
5. Examine the origins, traditions, beliefs, and impact of Christianity including its spread under the Roman Empire; its preservation by the Roman Catholic Church; the Byzantines and the Orthodox churches; and its influence into the modern eras.
6. Examine the origins, traditions, beliefs, and impact of Confucianism and Daoism including how those ideas and beliefs influenced Asian civilizations into the modern eras.
7. Examine the origins, traditions, beliefs, and impact of Islam including the religious, political, and economic causes and effects of the Crusades on the spread of Islam, and the influence of Islam into the modern eras.

Content Standard 2: The student will analyze patterns of social, economic, political, and cultural changes of the Renaissance and Reformation.

1. Cite specific textual and visual evidence to assess the significance of the Renaissance on politics and artistic creativity as exemplified by Machiavelli, Michelangelo, and daVinci.
2. Summarize how the theological movements during the Reformation transformed society by comparing the impact of the ideas of Martin Luther and John Calvin.
3. Analyze migration, settlement patterns, and cultural diffusion caused by the competition for resources among European nations during the Age of Exploration including the impact of the Columbian Exchange and the Atlantic slave trade.

Content Standard 3: The student will evaluate modern revolutionary movements influenced by the European Age of Absolutism and the Enlightenment including political, economic, and social transformations.

1. Summarize the establishment and authority exercised by absolute monarchies including Louis XIV, Frederick the Great, and Peter the Great.
2. Compare how scientific theories and technological discoveries including those made by Newton, Copernicus, and Galileo brought about social and cultural changes.
3. Cite specific textual and visual evidence to analyze the impact of the Enlightenment including the theories of John Locke and Adam Smith on modern government and economic institutions.
4. Compare and contrast the causes and lasting impact of England's Glorious Revolution, the American Revolution, and the French Revolution on the decline of monarchy and on the rise of representative government including the impact of the Napoleonic Wars and the resulting Congress of Vienna.
5. Summarize the influence and global impact of emerging democratic ideals on the Latin American and Caribbean revolutions including Haiti, Mexico, and Bolivia.

Content Standard 4: The student will evaluate the global transformation brought about by the Industrial Revolution and the World Wars.

1. Summarize the impact of massive social and economic changes as a result of industrialization including Marxist criticisms of capitalism.
2. Cite specific textual and visual evidence to explain the rationales and consequences of imperialism on Asia, Africa, and the Americas including colonization and the exploitation of natural resources and peoples.
3. Analyze socialism, communism, and the Bolshevik Revolution as responses to market economies.
4. Evaluate the forces of nationalism and militarism, as well as the systems of alliances as causes of World War I.
5. Examine the causes of World War II including the failure of the *Treaty of Versailles*, the impact of the Great Depression, and the rise of totalitarian regimes in the Soviet Union, Germany, Italy, and Japan.
6. Cite specific textual and visual evidence to analyze World War II including the leadership of Winston Churchill, Franklin Roosevelt, Josef Stalin, Adolf Hitler, Benito Mussolini, and Hideki Tōjō, the key strategic decisions, and the war's significant turning points.
7. Evaluate the effects of World War II including military and economic power shifts, purposes of the United Nations and NATO, and the origins and escalation of the Cold War.
8. Cite specific textual and visual evidence to examine the causes, course, and effects of the Holocaust; and compare and contrast eyewitness accounts of camp inmates, survivors, liberators, and perpetrators; and, summarize world responses resulting in the Nuremberg Trials and the move to establish a Jewish homeland in Palestine.

Content Standard 5: The student will evaluate post World War II regional events leading to the transformations of the modern world.

1. Cite specific textual and visual evidence to describe the creation of the modern state of Israel, the ongoing regional disputes with its Arab neighbors, the continuing hostilities between Iran and Iraq, and the impact of significant regional leaders including Golda Meir, Anwar Sadat, Yasser Arafat, Saddam Hussein, and the Ayatollah Khomeini.
2. Compare the Chinese Communist Revolution under the leadership of Mao Zedong, the effects of the Great Leap Forward and the Cultural Revolution to recent attempts toward economic and democratic reforms including the Tiananmen Square demonstrations, limited privatization, and foreign investments.
3. Cite specific textual and visual evidence to examine the origins of India as a modern world power by tracing the struggle for independence achieved through Mohandas K. Gandhi's non-violent civil disobedience movement, the development of India's industrial and service-oriented economy, and the ongoing threat of nuclear warfare between India and Pakistan.
4. Evaluate the effects of Poland's Solidarity Movement, Soviet President Mikhail Gorbachev's policies of the *perestroika* and *glasnost*, the fall of the Berlin Wall, the reunification of Germany, the collapse of Communism and the breakup of the Soviet Union that resulted in new independent countries.
5. Assess the impact of continuing African independence movements on human rights and the global expansion of democracy including the effects of Pan-Africanism on changing political boundaries, Kwame Nkrumah's struggle for self-government in Ghana, and South Africa dismantling its apartheid system under the leadership of Nelson Mandela and Desmond Tutu.
6. Compare and contrast multiple perspectives to examine the religious, ethnic and political origins, as well as the lasting impact of modern genocide and conflicts including Northern Ireland's Troubles, acts of genocide by the Khmer Rouge in Cambodia, ethnic-cleansing in the Balkans, Rwanda's mass murders, and the ethnic and religious crisis in Darfur.

Content Standard 6: The student will evaluate contemporary global issues and challenges.

1. Describe the ongoing impact of interdependence on the world's economies resulting in the creation and growth of multinational organizations including the challenges faced by the European Economic Community, the cooperative efforts of OPEC, the emergence of the Pacific Rim economy, and the roles of the World Bank and World Trade Organization.
2. Cite specific textual and visual evidence to examine the changing patterns of population growth, the cycle of disease and poverty, the impact of the Green Revolution on future food supplies, and the status of women in developing regions.
3. Cite specific textual and visual evidence to describe the impact of ongoing cultural diffusion as a result of the development of mass communication, social media, transportation systems, and global trade.
4. Describe the rise of international terrorism including the causes and effects of the attacks on the World Trade Center Towers in 1993, the attacks on 9/11 in 2001, and other acts of international terrorism including London, Madrid, and Mumbai, and analyze the policies and actions of world powers to counter and combat terrorism including the wars in Afghanistan and Iraq.

High School
WORLD HUMAN GEOGRAPHY
The Why of Where: Places, Patterns of Settlement, and Global Interactions

Human Geography is the study of spatial patterns of the human and physical dimensions of the world. Students will explore, describe, analyze, and seek to understand the spatial arrangement of objects and people on Earth's surface. Students will use the skills and tools of geography to examine the world and its inhabitants from a spatial perspective, solve problems of geographic dimensions and make informed decisions based upon solid research.

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The Common Core History/Social Studies Reading and Writing Literacy Skills are to be integrated throughout all of the content standards and used for instructional delivery of the content.

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Students in Grades 3-12 shall study and recite the following from the "social contract" selection of the *Declaration of Independence*:

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4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.
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6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.

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8. Assess the extent to which the reasoning and evidence in a text support the author's claims.

9. Compare and contrast treatments of the same topic in several primary and secondary sources.

D. Range of Reading and Level of Text Complexity

10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.

Process and Literacy Standard 2: Writing Skills. The student will develop and demonstrate Common Core social studies writing literacy skills.

A. Text Types and Purposes

1. Write arguments focused on discipline-specific content.
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   b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
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   d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
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   a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
   b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.
   c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.
   d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
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B. Production and Distribution of Writing

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C. Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
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D. Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historic import.

CONTENT SKILLS

Content Standard 1: The student will cite textual and visual evidence including maps and other geographic representations, tools and technologies to acquire, research, process, and solve problems from a spatial perspective.

1. Analyze key concepts underlying the geographical perspectives of location, space, place, scale, pattern, regionalization, and globalization.
2. Utilize geographic skills to understand and analyze the spatial organization of people, places, and environments on the Earth's surface.
3. Define regions and evaluate the regionalization process to characterize and analyze changing interconnections among places.
4. Utilize geographic technologies of GIS, remote sensing, and GPS sources of geographical data including census data, population pyramids, climagraphs, cartagrams, and satellite imagery.

Content Standard 2: The student will evaluate specific textual and visual evidence to analyze how human population is organized geographically in order to understand the cultural, political, and economic systems of the world.

1. Analyze geographic data measuring population including density; distribution; patterns of composition: age, sex, race, and ethnicity; and population trends and projections.
2. Describe and summarize the push and pull theory of migration and its impact on human capital and demographic transitions including the research of major voluntary and involuntary migrations.
3. Compare and contrast the impact of population policies on the patterns of fertility, mortality, and health.

Content Standard 3: The student will evaluate textual and visual evidence to analyze the components and regional variations of cultural patterns and processes.

1. Assess the spatial dimensions of culture as defined by language, religion, race, ethnicity, and gender.
2. Analyze and summarize the role the environment plays in determining a region's culture.
3. Explain the processes of cultural diffusion, acculturation, assimilation, and globalization regarding their impact on defining a region.
4. Compare and contrast the world's major cultural landscapes to analyze cultural differences, cultural identity, social mores and sets of beliefs which determine a sense of place.
5. Summarize the impact of the world's major religions of Buddhism, Christianity, Daoism, Hinduism, Islam, and Judaism on modern societies.

Content Standard 4: The student will evaluate specific textual and visual evidence to explain the political organization of space.

1. Describe and summarize the different forces that shape the evolution of the contemporary world's political map including the rise of nation-states.
2. Analyze the concept of territoriality, the nature and meaning of boundaries, and their influence on identity, interaction, and exchange.
3. Compare and contrast the world's political patterns of organization including federal and unitary states.
4. Examine changes and challenges to political/territorial arrangements, the changing nature of sovereignty, and evolution of contemporary political patterns.
5. Evaluate how the forces of cooperation and conflict among people influence the division and control of territory and resources.

Content Standard 5: The student will evaluate specific textual and visual evidence to analyze agricultural and rural land use.

1. Examine the origin and diffusion of agriculture including the Neolithic Revolution and the Green Revolution.
2. Describe and summarize the characteristics of modern commercial agriculture including major production regions, variations within major zones, and effects of markets.
3. Analyze settlement patterns associated with major agricultural regions and linkages among regions of food production and consumption.
4. Research and describe the impact of agricultural practices including irrigation, conservation, desertification, deforestation, organic farming, pesticides and herbicides, and genetic modification on the environment and the quality of life.
5. Examine common characteristics of rural communities including the impact of the environment on location; the political, economic, and cultural functions of rural communities; the types of transportation, communication, and trade linkages among rural areas; and the impact of modern migration to urban centers.

Content Standard 6: The student will evaluate specific textual and visual evidence to analyze the impact of industrialization on economic development.

1. Examine the changing roles of natural resources, energy, and technology that resulted in the Industrial Revolution.
2. Evaluate the impact of industrialization and government policies of both market and command economic systems on the availability and use of natural resources, environmental concerns, and sustainable development.
3. Compare and contrast contemporary patterns of industrialization and development in selected regions of the world including the Pacific Rim, Central Asia, and the Middle East.
4. Analyze why some economies achieve rapid growth while other economies with similar resources struggle to reach developed status.
5. Summarize common characteristics of developed nations including variations in levels of development, modern patterns of deindustrialization and economic restructuring, globalization, and international division of labor.

Content Standard 7: The student will evaluate specific textual and visual evidence to analyze cities and urban land use.

1. Examine the origin, development, and character of cities including the impact of the environment on location; the political, economic, and cultural functions of cities; historical distribution of cities; and the types of transportation, communication, and trade linkages among cities.
2. Analyze contemporary patterns of rural migration upon urban development including the concept of suburbanization, edge cities, megacities, and global cities.
3. Describe the factors that impact cities over time including uneven development, changing economic and demographic structures, transportation and infrastructure, housing, and urban planning.

SOCIAL STUDIES

OKLAHOMA
ACADEMIC
STANDARDS

OKLAHOMA
STATE DEPARTMENT *of* EDUCATION
JOY HOFMEISTER
STATE SUPERINTENDENT *of* PUBLIC INSTRUCTION

OKLAHOMA

STATE DEPARTMENT *of* EDUCATION

JOY HOFMEISTER

STATE SUPERINTENDENT *of* PUBLIC INSTRUCTION

APPENDIX B—COMMITTEE MEMBERSHIP

•OKLAHOMA TECHNICAL ADVISORY COMMITTEE

The Oklahoma Technical Advisory Committee is comprised of five leading, national experts in the fields of large scale assessment and educational research. Each member provides Oklahoma with sound input to assure validity and reliability of all technical and policy procedures throughout development and implementation of the Oklahoma School Testing Program assessments. The committee provides additional oversight of testing contractors and input to the State Board of Education on state-of-the-art technical/statistical information on assessment and accountability issues and trends.

John M. Keene (Committee Member since March 2003)

Dr. Keene is the owner of *Assessment and Evaluation Services* which provide assessment and evaluation services and consultation to states and large school districts. His work is primarily with large scale testing programs. Dr. Keene has also served as the Vice President, Director of Measurement and Development for the *Riverside Publishing* Company, Director, Test Development for *Science Research Associates,* and Director, Psychometric and Applied Research Group with the *Psychological Corporation.* Dr. Keene received a Ph.D. in Educational Psychology from Indiana University.

Robert A. Terry (Committee Member since March 2003)

Dr. Terry is a professor of psychology at the University of Oklahoma. He has served as an active member of the American Educational Research Association review panel. Dr. Terry is currently researching measurement and methodological issues in sociometry as well as longitudinal data analysis. He has written and edited several published articles pertaining to statistics and testing, developmental psychology, and applied psychological measurement. Dr. Terry received a Ph.D. in Quantitative Psychology from the University of North Carolina at Chapel Hill.

H. Gary Cook (Committee Member since January 2013)

Dr. H. Gary Cook directs research for the WIDA Consortium and is a research scientist attached to the Wisconsin Center for Education Research. Dr. Cook received his Ph.D. in Measurement and Quantitative Methods from Michigan State University. He has a Masters in Teaching English as a Second Language and a Bachelor's in linguistics from the University of Hawai'i at Manoa. He has served in educational leadership or research positions in private industry, in an urban public school district, in a state department of education, and at the university level. He is an experienced Federal Peer Reviewer for *NCLB* and serves on several state and national technical advisory committees. His recent research and publication interests have focused on the relationship between English language proficiency and content assessments, standards alignment, policy issues associated with Title III accountability, and applying growth modeling techniques to address key educational questions for English language learners.

John F. Olson (Committee Member since January 2013)

Dr. John F. Olson is the chair of the committee. Dr. Olson is President of the consulting business he founded in 2006, Olson Educational Measurement & Assessment Services (OEMAS), which provides technical assistance and support to states, school districts, the U.S. Department of Education, Ministries of Education in other countries, CCSSO, Caveon Test Security, testing companies, researchers, and others. He has more than 30 years of experience providing consulting on a variety of measurement and statistical issues for international, national, state, and local assessment programs. Dr. Olson also currently serves as senior partner for the Assessment Solutions Group (ASG), which he co-founded in 2008. The mission of ASG is to help states and local districts maximize value throughout the assessment procurement and implementation process via service offerings in RFP preparation, bid analysis and proposal evaluation, cost analysis, price negotiations, and ongoing program and contract management. Previously, he has served as Vice President for Psychometrics and Research Services at Harcourt Assessment, Director of Assessment for CCSSO and the SCASS projects, Deputy Director of the Center for Education Assessment at American Institutes for Research (AIR), Senior Research Scientist with the Education Statistics Services Institute (ESSI), and in a number of leadership roles for NAEP at the Educational Testing Service (ETS). Olson holds a Ph.D. in educational statistics and measurement from the University of Nebraska – Lincoln.

Marianne Perie (Committee Member since January 2013)

Dr. Marianne Perie is the Director of the Center for Assessment and Accountability Research and Design (CAARD), formed in 2016 at the University of Kansas. This Center is evaluating the use of learning maps to build formative tools for teachers, researching the comparability of various devices used in computer-based testing, and designing accountability systems under the Every Student Succeeds Act. Previously, Dr. Perie served as the Director for Center for Educational Testing and Evaluation (CETE) for three years. In that role she oversaw the Kansas Assessment Program, the Alaska Measures of Progress, the Career Pathways Assessment, two grants, and provided technical support on the Dynamic Learning Maps consortium. She currently serves on five state technical advisory committees (TACs) and the research advisory committee for the College Board. Additionally, she coordinates the state collaborative on Technical Issues in Large Scale Assessment for CCSSO. Previously, she was a Senior Associate with the National Center for the Improvement of Educational Assessment, providing technical assistance to over 16 states and territories on accountability and assessment issues related to Federal policy (2006–2013). Prior to joining the Center, she worked on multiple state and district assessments, the National Assessment of Educational Progress (NAEP), and international assessments as an employee of the American Institutes for Research (1995–2003) and the Educational Testing Service (2003–2006).

APPENDIX C—TEST BLUEPRINTS

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2016-2017 GRADE 3

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
46%	23	**NUMBER AND OPERATIONS**
	6	3.N.1 Number Sense
	11	3.N.2 Number Operations (8) 3.N.4 Money (3)
	6	3.N.3 Fractions
14%	7	**ALGEBRAIC REASONING AND ALGEBRA**
	7	3.A.1 Numerical and Geometric Patterns (4) 3.A.2 Equations (3)
28%	14	**GEOMETRY AND MEASUREMENT**
	7	3.GM.1 Describe and Create Shapes (4) 3.GM.3 Time (3)
	7	3.GM.2 Measurement
12%	6	**DATA AND PROBABILITY**
	6	3.D.1 Data Analysis
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS
2016-2017 GRADE 4

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
44%	22	**NUMBER AND OPERATIONS**
	9	4.N.1 Number Operations
	13	4.N.2 Rational Numbers (10) 4.N.3 Money (3)
16%	8	**ALGEBRAIC REASONING AND ALGEBRA**
	8	4.A.1 Numerical Patterns (4) 4.A.2 Equations (4)
28%	14	**GEOMETRY AND MEASUREMENT**
	6	4.GM.1 Polygons and Polyhedra
	8	4.GM.2 Measurement (5) 4.GM.3 Time (3)
12%	6	**DATA AND PROBABILITY**
	6	4.D.1 Data Analysis
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2016-2017 GRADE 5

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
46%	23	**NUMBER AND OPERATIONS**
	7	5.N.1 Division of Multi-digit Numbers
	8	5.N.2 Fractions and Decimals
	8	5.N.3 Add and Subtract Rational Numbers
18%	9	**ALGEBRAIC REASONING AND ALGEBRA**
	9	5.A.1 Numerical Patterns and Graphs (4) 5.A.2 Equations and Inequalities (5)
24%	12	**GEOMETRY AND MEASUREMENT**
	12	5.GM.1 Polygons and Polyhedra (4) 5.GM.2 Volume and Surface Area (4) 5.GM.3 Angles (4)
12%	6	**DATA AND PROBABILITY**
	6	5.D.1 Data Analysis
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2016-2017 GRADE 6

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
40%	20	**NUMBER AND OPERATIONS**
	7	6.N.1 Number Sense of Integers and Rational Numbers (3)
	7	6.N.2 Addition and Subtraction of Integers(4)
	6	6.N.3 Ratios
		6.N.4 Multiplication and Division of Rational Numbers
22%	11	**ALGEBRAIC REASONING AND ALGEBRA**
	11	6.A.1 Algebraic Representations (4)
		6.A.2 Algebraic Expressions (4)
		6.A.3 Equations and Inequalities (3)
24%	12	**GEOMETRY AND MEASUREMENT**
	6	6.GM.1 Area of Parallelograms and Triangles (3)
	6	6.GM.2 Angle Relationships on Intersecting Lines (3)
		6.GM.3 Units of Measurement and Unit Conversions (2)
		6.GM.4 Congruency and Symmetry of Transformations (4)
14%	7	**DATA AND PROBABILITY**
	7	6.D.1 Data Analysis (4)
		6.D.2 Probability (3)
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2016-2017 GRADE 7

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
20%	10	**NUMBER AND OPERATIONS**
	10	7.N.1 Representation and Comparison of Rational Numbers (4) 7.N.2 Number Operations and Absolute Value (6)
30%	15	**ALGEBRAIC REASONING AND ALGEBRA**
	9	7.A.1 Proportional Relationships (4) 7.A.2 Proportions, Rates and Ratios (5)
	6	7.A.3 Linear Equations and Inequalities (4) 7.A.4 Order of Operations (2)
30%	15	**GEOMETRY AND MEASUREMENT**
	9	7.GM.1 Surface Area and Volume of Rectangular Prisms (2) 7.GM.2 Trapezoids and Composite Figures (2)
	6	7.GM.3 Circles (5) 7.GM.4 Transformations
20%	10	**DATA AND PROBABILITY**
	10	7.D.1 Data Analysis (6) 7.D.2 Probability (4)
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2016-2017 GRADE 8

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
18%	9	**NUMBER AND OPERATIONS**
	9	PA.N.1 Real Number Operations
46%	23	**ALGEBRAIC REASONING AND ALGEBRA**
	6	PA.A.1 Linear and Non-Linear Functions
	8	PA.A.2 Linear Function Representations and Problem Solving
	9	PA.A.3 Algebraic Expressions (4) PA.A.4 Equations and Inequalities (5)
20%	10	**GEOMETRY AND MEASUREMENT**
	10	PA.GM.1 Pythagorean Theorem (4) PA.GM.2 Surface Area and Volume (6)
16%	8	**DATA AND PROBABILITY**
	8	PA.D.1 Data Analysis and Scatter Plots (4) PA.D.2 Probability (4)
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2016-2017 GRADE 10

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
10%	6	**NUMBER AND OPERATIONS**
	6	A1.N.1 Number Operations and Roots
40%	24	**ALGEBRAIC REASONING AND ALGEBRA**
	6	A1.A.1 Linear, Absolute Value and Systems of Equations
	6	A1.A.2 Linear, Compound and Systems of Inequalities
	6	A1.A.3 Expressions and Sequences
	6	A1.A.4 Slope and Linear Equations
30%	18	**FUNCTIONS**
	6	A1.F.1 Functions, Relations and Function Notation
	6	A1.F.2 Linear and Non-Linear Families of Functions
	6	A1.F.3 Operations and Evaluation of Functions
10%	6	**DATA AND PROBABILITY**
	6	A1.D.1 Data Analysis (3) A1.D.2 Probability (3)
10%	6	**GEOMETRY**
	6	G.2D.1 Two-Dimensional Shapes
100%	60	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2017-2018 GRADE 3

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
46%	23	**NUMBER AND OPERATIONS**
	6	3.N.1 Number Sense
	11	3.N.2 Number Operations (8) 3.N.4 Money (3)
	6	3.N.3 Fractions
14%	7	**ALGEBRAIC REASONING AND ALGEBRA**
	7	3.A.1 Numerical and Geometric Patterns (4) 3.A.2 Equations (3)
28%	14	**GEOMETRY AND MEASUREMENT**
	7	3.GM.1 Describe and Create Shapes (4) 3.GM.3 Time (3)
	7	3.GM.2 Measurement
12%	6	**DATA AND PROBABILITY**
	6	3.D.1 Data Analysis
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2017-2018 GRADE 4

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
44%	22	**NUMBER AND OPERATIONS**
	9	4.N.1 Number Operations
	13	4.N.2 Rational Numbers (10) 4.N.3 Money (3)
16%	8	**ALGEBRAIC REASONING AND ALGEBRA**
	8	4.A.1 Numerical Patterns (4) 4.A.2 Equations (4)
28%	14	**GEOMETRY AND MEASUREMENT**
	6	4.GM.1 Polygons and Polyhedra
	8	4.GM.2 Measurement (5) 4.GM.3 Time (3)
12%	6	**DATA AND PROBABILITY**
	6	4.D.1 Data Analysis
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2017-2018 GRADE 5

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
46%	23	**NUMBER AND OPERATIONS**
	7	5.N.1 Division of Multi-digit Numbers
	8	5.N.2 Fractions and Decimals
	8	5.N.3 Add and Subtract Rational Numbers
18%	9	**ALGEBRAIC REASONING AND ALGEBRA**
	9	5.A.1 Numerical Patterns and Graphs (4) 5.A.2 Equations and Inequalities (5)
24%	12	**GEOMETRY AND MEASUREMENT**
	12	5.GM.1 Polygons and Polyhedra (4) 5.GM.2 Volume and Surface Area (4) 5.GM.3 Angles (4)
12%	6	**DATA AND PROBABILITY**
	6	5.D.1 Data Analysis
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2017-2018 GRADE 6

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
40%	20	**NUMBER AND OPERATIONS**
	7	6.N.1 Number Sense of Integers and Rational Numbers (3)
	7	6.N.2 Addition and Subtraction of Integers (4)
	6	6.N.3 Ratios
		6.N.4 Multiplication and Division of Rational Numbers
22%	11	**ALGEBRAIC REASONING AND ALGEBRA**
		6.A.1 Algebraic Representations (4)
	11	6.A.2 Algebraic Expressions (4)
		6.A.3 Equations and Inequalities (3)
24%	12	**GEOMETRY AND MEASUREMENT**
	6	6.GM.1 Area of Parallelograms and Triangles (3)
		6.GM.2 Angle Relationships on Intersecting Lines (3)
	6	6.GM.3 Units of Measurement and Unit Conversions (2)
		6.GM.4 Congruency and Symmetry of Transformations (4)
14%	7	**DATA AND PROBABILITY**
	7	6.D.1 Data Analysis (4)
		6.D.2 Probability (3)
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2017-2018 GRADE 7

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
20%	10	**NUMBER AND OPERATIONS**
	10	7.N.1 Representation and Comparison of Rational Numbers (4) 7.N.2 Number Operations and Absolute Value (6)
30%	15	**ALGEBRAIC REASONING AND ALGEBRA**
	9	7.A.1 Proportional Relationships (4) 7.A.2 Proportions, Rates and Ratios (5)
	6	7.A.3 Linear Equations and Inequalities (4) 7.A.4 Order of Operations (2)
30%	15	**GEOMETRY AND MEASUREMENT**
	9	7.GM.1 Surface Area and Volume of Rectangular Prisms (2) 7.GM.2 Trapezoids and Composite Figures (2)
	6	7.GM.3 Circles (5) 7.GM.4 Transformations
20%	10	**DATA AND PROBABILITY**
	10	7.D.1 Data Analysis (6) 7.D.2 Probability (4)
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT MATHEMATICS 2017-2018 GRADE 8

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
18%	9	**NUMBER AND OPERATIONS**
	9	PA.N.1 Real Number Operations
46%	23	**ALGEBRAIC REASONING AND ALGEBRA**
	6	PA.A.1 Linear and Non-Linear Functions
	8	PA.A.2 Linear Function Representations and Problem Solving
	9	PA.A.3 Algebraic Expressions (4) PA.A.4 Equations and Inequalities (5)
20%	10	**GEOMETRY AND MEASUREMENT**
	10	PA.GM.1 Pythagorean Theorem (4) PA.GM.2 Surface Area and Volume (6)
16%	8	**DATA AND PROBABILITY**
	8	PA.D.1 Data Analysis and Scatter Plots (4) PA.D.2 Probability (4)
100%	50	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT ENGLISH LANGUAGE ARTS 2017-2018 GRADE 3

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STANDARDS
40%	20	**STANDARD 2: READING AND WRITING PROCESS**** Students will use a variety of recursive reading and writing processes.
12%	6	**STANDARD 3: CRITICAL READING AND WRITING** Students will apply critical thinking skills to reading and writing.
24%	12	**STANDARD 4: VOCABULARY**** Students will expand their working vocabularies to effectively communicate and understand texts.
12%	6	**STANDARD 5: LANGUAGE** Students will apply knowledge of grammar and rhetorical style to reading and writing.
12%	6	**STANDARD 6: RESEARCH** Students will engage in inquiry to acquire, refine, and share knowledge.
		**Reading Comprehension and Vocabulary standards applied to determine RSA Status
100%	50	TOTAL

*Standard 8: Independent Reading and Writing is assessed throughout the test and dually aligned to each standard.
Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT ENGLISH LANGUAGE ARTS
2017-2018 GRADE 4

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STANDARDS
32%	16	**STANDARD 2: READING AND WRITING PROCESS** Students will use a variety of recursive reading and writing processes.
20%	10	**STANDARD 3: CRITICAL READING AND WRITING** Students will apply critical thinking skills to reading and writing.
24%	12	**STANDARD 4: VOCABULARY** Students will expand their working vocabularies to effectively communicate and understand texts.
12%	6	**STANDARD 5: LANGUAGE** Students will apply knowledge of grammar and rhetorical style to reading and writing.
12%	6	**STANDARD 6: RESEARCH** Students will engage in inquiry to acquire, refine, and share knowledge.
100%	50	TOTAL

*Standard 8: Independent Reading and Writing is assessed throughout the test and dually aligned to each standard.
Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT ENGLISH LANGUAGE ARTS 2017-2018 GRADE 5

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF MC ITEMS	IDEAL NUMBER OF ITEMS	STANDARDS
32%	16	**STANDARD 2: READING AND WRITING PROCESS** Students will use a variety of recursive reading and writing processes.
24%	12	**STANDARD 3: CRITICAL READING AND WRITING** Students will apply critical thinking skills to reading and writing.
20%	10	**STANDARD 4: VOCABULARY** Students will expand their working vocabularies to effectively communicate and understand texts.
12%	6	**STANDARD 5: LANGUAGE** Students will apply knowledge of grammar and rhetorical style to reading and writing.
12%	6	**STANDARD 6: RESEARCH** Students will engage in inquiry to acquire, refine, and share knowledge.
90% OF OVERALL SCORE	50 MC ITEMS	
10% OF OVERALL SCORE	1 PROMPT 5 POINTS	**WRITING SECTION** Standard 2: Reading and Writing Process Standard 3: Critical Reading and Writing Standard 4: Vocabulary Standard 5: Language Standard 6: Research Standard 8: Independent Reading and Writing
100%	51 ITEMS 55 POINTS	TOTAL

*Standard 8: Independent Reading and Writing is assessed throughout the test and dually aligned to each standard.
Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT ENGLISH LANGUAGE ARTS 2017-2018 GRADE 6

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STANDARDS
36%	18	**STANDARD 2: READING AND WRITING PROCESS** Students will use a variety of recursive reading and writing processes.
20%	10	**STANDARD 3: CRITICAL READING AND WRITING** Students will apply critical thinking skills to reading and writing.
20%	10	**STANDARD 4: VOCABULARY** Students will expand their working vocabularies to effectively communicate and understand texts.
12%	6	**STANDARD 5: LANGUAGE** Students will apply knowledge of grammar and rhetorical style to reading and writing.
12%	6	**STANDARD 6: RESEARCH** Students will engage in inquiry to acquire, refine, and share knowledge.
100%	50	TOTAL

*Standard 8: Independent Reading and Writing is assessed throughout the test and dually aligned to each standard.
Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT ENGLISH LANGUAGE ARTS
2017-2018 GRADE 7

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STANDARDS
36%	18	**STANDARD 2: READING AND WRITING PROCESS** Students will use a variety of recursive reading and writing processes.
20%	10	**STANDARD 3: CRITICAL READING AND WRITING** Students will apply critical thinking skills to reading and writing.
16%	8	**STANDARD 4: VOCABULARY** Students will expand their working vocabularies to effectively communicate and understand texts.
12%	6	**STANDARD 5: LANGUAGE** Students will apply knowledge of grammar and rhetorical style to reading and writing.
16%	8	**STANDARD 6: RESEARCH** Students will engage in inquiry to acquire, refine, and share knowledge.
100%	50	TOTAL

*Standard 8: Independent Reading and Writing is assessed throughout the test and dually aligned to each standard.
Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT ENGLISH LANGUAGE ARTS 2017-2018 GRADE 8

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF MC ITEMS	IDEAL NUMBER OF ITEMS	STANDARDS
28%	14	**STANDARD 2: READING AND WRITING PROCESS** Students will use a variety of recursive reading and writing processes.
28%	14	**STANDARD 3: CRITICAL READING AND WRITING** Students will apply critical thinking skills to reading and writing.
16%	8	**STANDARD 4: VOCABULARY** Students will expand their working vocabularies to effectively communicate and understand texts.
14%	7	**STANDARD 5: LANGUAGE** Students will apply knowledge of grammar and rhetorical style to reading and writing.
14%	7	**STANDARD 6: RESEARCH** Students will engage in inquiry to acquire, refine, and share knowledge.
88% OF OVERALL SCORE	50 MC ITEMS	
12% OF OVERALL SCORE	1 PROMPT 7 POINTS	**WRITING SECTION** Standard 2: Reading and Writing Process Standard 3: Critical Reading and Writing Standard 4: Vocabulary Standard 5: Language Standard 6: Research Standard 8: Independent Reading and Writing
100%	51 ITEMS 57 POINTS	TOTAL

*Standard 8: Independent Reading and Writing is assessed throughout the test and dually aligned to each standard.
Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT SCIENCE
2016-2017 GRADE 5

The blueprint describes the content and structure of the operational test and defines the target number of test items by reporting category for the Grade 5 Science assessment.

REPORTING CATEGORIES[1] (OKLAHOMA ACADEMIC STANDARDS FOR SCIENCE)	TARGET NUMBER OF MC ITEMS	TARGET PERCENTAGE OF TOTAL ITEMS / SCORE POINTS[2]	TARGET NUMBER OF CLUSTERS[3]
PHYSICAL SCIENCES	12-15	27-33%	4-5
5-PS1-1			
5-PS1-2			
5-PS1-3			
5-PS1-4			
LIFE SCIENCES	12-15	27-33%	4-5
5-LS1-1			
5-LS2-1			
5-LS2-2			
5-PS3-1[a]			
EARTH AND SPACE SCIENCES	15-18	33-40%	5-6
5-ESS1-1			
5-ESS1-2			
5-ESS2-1			
5-ESS2-2			
5-PS2-1[a]			
TOTAL OPERATIONAL TEST	45	100% (45 TOTAL SCORE POINTS)	15

(Please note this blueprint does not include items that may be field-tested.)

[1] Reporting category names are taken from the three content domain names in the OAS-Science.

[a] The physical science performance expectations 5-PS3-1 and 5-PS2-1 are being reported in Life Sciences and Earth and Space Sciences, respectively. Their placement in these reporting categories reflects the way that these performance expectations would typically be incorporated into units in classroom instruction.

[2] A minimum of 12 points is required to report results for a reporting category for Grade 5 Science.

[3] Performance expectations will be assessed using a cluster-based format: a set of three multiple-choice items linked with a common stimulus. Each cluster will align to a single performance expectation. The Grade 5 Science operational test will contain a total of 15 clusters.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT SCIENCE
2016-2017 GRADE 8

The blueprint describes the content and structure of the operational test and defines the target number of test items by reporting category for the Grade 8 Science assessment.

REPORTING CATEGORIES[1]	TARGET NUMBER OF MC ITEMS	TARGET NUMBER OF TE ITEMS[2]	TARGET RANGE OF SCORE POINTS[3] (PERCENTAGE OF TOTAL)
PHYSICAL SCIENCES MS-PS1-5 MS-PS1-6 MS-PS2-1 MS-PS2-2 MS-PS4-1 MS-PS4-2	14-17	1	16-19 (33-40%)
LIFE SCIENCES MS-LS1-7 MS-LS4-1 MS-LS4-2	8-11	1	10-13 (21-27%)
EARTH AND SPACE SCIENCES MS-ESS1-4 MS-ESS2-1 MS-ESS2-2 MS-ESS2-3 MS-ESS3-1 MS-ESS3-2 MS-ESS3-4	17-20	1	19-22 (40-46%)
TOTAL OPERATIONAL TEST		3	

(Please note this blueprint does not include items that may be field-tested.)

possibly be introduced in future operational cycles. For a paper accommodation, the TEIs will be replaced by paired MC items (two linked multiple-choice questions), also worth two score points.

[3] A minimum of 10 points is required to report results for a reporting category for Grade 8 Science.

[4] Performance expectations will be assessed using a cluster-based format: a set of three multiple-choice items linked with a common stimulus or a set of two multiple-choice items and a technology-enhanced item linked with a common stimulus. Each cluster will align to a single performance expectation. The Grade 8 Science operational test will contain a total of 15 clusters.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT SCIENCE
2016-2017 GRADE 10

The blueprint describes the content and structure of the operational test and defines the target number of test items by reporting category for the Grade 10 Science assessment.

REPORTING CATEGORIES[1] (OKLAHOMA ACADEMIC STANDARDS FOR SCIENCE)		TARGET NUMBER OF MC ITEMS	TARGET NUMBER OF TE ITEMS[2]	TARGET RANGE OF SCORE POINTS[3] (PERCENTAGE OF TOTAL)	TARGET NUMBER OF CLUSTERS[4]
STRUCTURE AND FUNCTION		11-14	1	13-16 (27-33%)	4-5
HS-LS1-1	HS-LS1-5				
HS-LS1-2	HS-LS1-6				
HS-LS1-3	HS-LS1-7				
HS-LS1-4					
ECOSYSTEM DYNAMICS		11-14	1	13-16 (27-33%)	4-5
HS-LS2-1	HS-LS2-5				
HS-LS2-2	HS-LS2-6				
HS-LS2-3	HS-LS2-8				
HS-LS2-4					
HEREDITY, VARIATION, & DIVERSITY		14-17	1	16-19 (33-40%)	5-6
HS-LS3-1	HS-LS4-1				
HS-LS3-2	HS-LS4-2				
HS-LS3-3	HS-LS4-3				
	HS-LS4-4				
	HS-LS4-5				
TOTAL OPERATIONAL TEST		42	3	100% (48 TOTAL SCORE POINTS)	15

(Please note this blueprint does not include items that may be field-tested.)

[1] Reporting category names are abbreviated from the topic names in the OAS-Science.

[2] Technology-enhanced items (TE items/TEIs) may be used to more authentically address some aspects of the performance expectations (PEs). Each TEI will have a value of two score points. At this time, it is expected that each reporting category will include one TEI. More TEIs may possibly be introduced in future operational cycles. For a paper accommodation, the TEIs will be replaced by paired MC items (two linked multiple-choice questions), also worth two score points.

[3] A minimum of 13 points is required to report results for a reporting category for Grade 10 Science.

[4] Performance expectations will be assessed using a cluster-based format: a set of three multiple-choice items linked with a common stimulus or a set of two multiple-choice items and a technology-enhanced item linked with a common stimulus. Each cluster will align to a single performance expectation. The Grade 10 Science operational test will contain a total of 15 clusters.

OKLAHOMA SCHOOL TESTING PROGRAM

TEST BLUEPRINT U.S. HISTORY
2016-2017 HIGH SCHOOL

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STANDARDS AND OBJECTIVES
13-15%	8	**1.0 TRANSFORMATION OF THE UNITED STATES FROM POST-RECONSTRUCTION TO THE PROGRESSIVE ERA, 1878-1900**
	2-4	1.1 Post-Reconstruction Amendments
	2-4	1.2 Immigration, Westward Movement and Native American Experiences
	2-4	1.3 Impact of Industrialization on Society, Economics and Politics
10%	6	**2.0 EXPANDING ROLE OF THE UNITED STATES IN INTERNATIONAL AFFAIRS**
13-15%	8	**3.0 CYCLES OF ECONOMIC BOOM AND BUST IN THE 1920s AND 1930s**
	3-5	3.1 Economic, Political & Social Transformation Between the World Wars
	3-5	3.2, 3.3 Economic Destabilization and the Great Depression/New Deal
13-15%	8	**4.0 ROLE OF THE U.S. IN INTERNATIONAL AFFAIRS AND WORLD WAR II, 1933-1946**
	3-5	4.1 Mobilization for World War II
	3-5	4.2, 4.3 World War II and U.S. Reaction to the Holocaust
30%	18	**5.0 U.S. FOREIGN AND DOMESTIC POLICIES DURING THE COLD WAR, 1945-1975**
	4-5	5.1, 5.2 The Cold War - Foreign and Domestic
	4-5	5.3 The Vietnam War Era
	4-6	5.4 The African American Civil Rights Movement
	4-5	5.5 Social and Political Transformation
20%	12	**6.0 U.S. FOREIGN AND DOMESTIC POLICIES, 1976 TO THE PRESENT**
	4-8	6.1, 6.2, 6.3 End of the Cold War
	4-8	6.4, 6.5, 6.6 Post-Cold War World
100%	60	**TOTAL**

Please note this blueprint does not include items that may be field-tested.
A minimum of 6 items is required to report a standard, and a minimum of 4 items is required to report results for an objective.

OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

APPENDIX D— PLD TABLES

Grades 3-4

Mathematics

Performance Level Descriptors

Grade 3 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically complete complex addition, subtraction, and multiplication problems and model division facts. Students order fractions using models and compose and decompose fractions related to the same whole. Students extend patterns and generate real-world situations to represent number sentences. Students determine volume and elapsed time. Students summarize complex data sets and analyze the data to solve problems. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically compare and order whole numbers. Students complete addition, subtraction, and multiplication problems and recognize the relationship between multiplication and division. Students construct and compare fractions using models. Students select the fewest number of coins for a given amount of money. Students determine rules to describe basic patterns. Students determine unknowns in equations and apply number properties. Students classify angles. Students sort three-dimensional figures and determine the perimeter of polygons. Students determine the area of two-dimensional figures. Students read and analyze length, temperature, and time. Students summarize a data set and analyze the data to solve problems. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level represent whole numbers. Students complete simple addition, subtraction, and multiplication problems. Students read and write fractions. Students determine the value of a set of coins or bills. Students determine rules to describe simple patterns. Students determine unknowns in simple equations. Students identify right angles. Students choose an appropriate instrument to measure an object. Students read and write time from a digital clock.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

Grade 4 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically estimate and solve complex mathematical problems and determine the unknown in non-equivalent expressions. Students compare decimals and fractions. Students solve complex money problems. Students determine a rule and extend a complex pattern. Students determine and represent unknown values in complex problems. Students determine volume. Students solve complex measurement problems. Students represent complex data sets and solve problems involving the data. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically estimate and solve mathematical problems. Students use models to determine equivalent fractions, compare and order fractions, and add and subtract fractions. Students read and write decimals and make connections between decimals and fractions. Students determine change using coins. Students determine rules and extend patterns. Students determine unknown values in mathematical problems. Students describe parts of geometrical figures and identify similarities in three-dimensional figures. Students decompose and determine the area of polygons. Students solve measurement problems. Students represent data sets and solve problems involving the data. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level demonstrate the ability to estimate and solve simple mathematical problems. Students use models to determine simple equivalent fractions, compare and order whole numbers and simple fractions, and decompose fractions. Students read and write simple decimals and compare and order whole numbers and decimals. Students determine change using whole dollars. Students determine a rule and extend a simple pattern. Students determine unknown values in simple mathematical problems. Students identify quadrilaterals and determine the area of simple polygons. Students identify appropriate units and tools to measure. Students solve simple problems given a data set.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

Grades 5-6

Mathematics

Performance Level Descriptors

Grade 5 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically interpret the remainder of division problems within the context of the problem. Students order decimals, fractions, and whole numbers. Students evaluate complex expressions, equations, and inequalities. Students construct geometric figures and identify them in various contexts. Students compare the volume, perimeter, or surface area of geometric figures. Students analyze complex graphs. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically estimate and solve division problems with the remainder represented as a fraction or decimal. Students generate equivalent decimals and fractions, represent whole numbers or decimals, and compare fractions and decimals, including mixed numbers. Students estimate, add, and subtract decimals and fractions. Students describe patterns of change and graph these patterns as ordered pairs on a coordinate plane. Students evaluate expressions, equations, and inequalities. Students solve volume and perimeter problems and simple surface area problems. Students determine reasonable values for the perimeter of shapes with curves. Students compare angles. Students recognize relationships within a measurement system. Students determine the mean, median, mode, and range of a data set and analyze simple graphs. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level estimate and solve division problems with remainders and solve addition and subtraction real-world problems. Students recognize basic equivalent decimals and fractions, represent whole numbers, and compare and order fractions or decimals. Students add and subtract decimals and fractions with like denominators. Students describe simple patterns of change and identify ordered pairs on a coordinate plane. Students evaluate simple equivalent numerical expressions or equations. Students describe and classify geometric figures. Students solve simple volume and perimeter problems. Students choose an appropriate instrument to measure objects and read and analyze the length of objects. Students read and analyze the measure of angles. Students read simple graphs.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

Grade 6 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically estimate and solve complex problems requiring unit conversions. Students use the distance between points and transformations to solve complex problems involving congruent figures. Students analyze the differences between two outcomes of simple experiments. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level estimate, illustrate, and simplify the addition and subtraction of integers and assess the reasonableness of an answer. Students solve ratio and unit rate problems. Students estimate and illustrate the multiplication and division of non-negative rational numbers. Students evaluate the validity of the value of a variable. Students generate expressions, equations, and inequalities. Students interpret the solution of an equation and assess the reasonableness of the solution. Students determine the area of polygons and composite figures. Students use relationships between angles and the triangle sum theorem to solve problems. Students estimate and solve problems requiring unit conversion. Students predict transformations, analyze lines of symmetry, and use the distance between points and transformations to solve problems involving congruent figures. Students explain and justify which measure of central tendency provides the most descriptive information for a data set. Students create and analyze box-and-whisker plots and explain and compare possible outcomes of simple experiments. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level read, order, represent, and explain rational numbers expressed as fractions, decimals, percents, and ratios. Students write positive integers as products of factors. Students illustrate or simplify the addition and subtraction of integers. Students identify and compare quantities, determine unit rates, and find equivalent fractions and percents. Students multiply and divide non-negative rational numbers. Students graph ordered pairs in all quadrants. Students represent reflective relationships between varying quantities. Students evaluate the value of a variable in expressions, equations, and inequalities. Students use number sense and properties of operations to solve equations and graph the solution. Students determine the area of parallelograms and triangles. Students identify angle relationships by name. Students identify and display the effect of transformations. Students identify lines of symmetry. Students calculate measures of central tendency, determine the sample space of simple experiments, and identify possible outcomes.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

Grades 7-8

Mathematics

Performance Level Descriptors

Grade 7 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically interpret equations and inequalities involving variables and rational numbers. Students make connections between circumference and area to solve problems involving circles. Students analyze, apply, and display the effect of dilations and multiple transformations. Students use central tendencies and range, predict data and select an appropriate data display, and predict theoretical probability. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically estimate solutions of problems involving rational numbers and assess the reasonableness of the solutions. Students differentiate between proportional and inversely proportional relationships and identify the constant of proportionality. Students represent proportional relationships in a variety of ways. Students use representations to identify and compare unit rates. Students solve problems involving proportional relationships and assess the reasonableness of solutions. Students represent, solve, and write equations. Students solve simple inequalities. Students generate and evaluate equivalent expressions with justification of steps. Students interpret theoretical probability and draw conclusions. Students apply the effect of dilations and transformations. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level recognize, compare, and order rational numbers. Students create equivalent representations of rational numbers. Students calculate and model mathematical problems involving rational numbers and exponents. Students calculate the absolute value of a rational number. Students describe and identify a proportional relationship. Students identify and solve problems involving ratios and unit rates. Students represent, solve, and write simple equations. Students represent, write, and graph simple inequalities. Students evaluate expressions using the order of operations. Students determine the surface area and volume of rectangular prisms and calculate the area and perimeter of trapezoids. Students calculate the circumference and area of circles. Students describe the effect of dilations and transformations. Students calculate the measures of central tendencies and range and determine appropriate data displays. Students calculate theoretical probability.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

Grade 8 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically generate, simplify, and evaluate complex equivalent expressions. Students make connections between volume and surface area to solve problems involving solids and compare the volume and surface area of different solids. Students describe the impact on central tendencies of a data set with multiple outliers and when inserting or deleting multiple data points. Students solve complex and non-routine real-world problems, draw logical conclusions and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically generate, simplify, and evaluate equivalent expressions. Students classify and explain operational closure of rational and irrational numbers. Students distinguish between a linear and nonlinear function. Students identify independent and dependent variables. Students describe, analyze, and represent linear functions with two variables and translate between representations. Students use and apply the Pythagorean Theorem. Students describe the impact on central tendencies of a data set with an outlier and when inserting or deleting a data point. Students interpret a scatterplot, determine the rate of change, and use a line of best fit to make predictions. Students calculate, interpret, and predict experimental probability and generalize samples to populations. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level simplify and generate simple equivalent expressions, including expressions in scientific notation. Students translate between standard form and scientific notation. Students identify and compare real numbers. Students recognize if a graph represents a linear function. Students identify intercepts and slope from the graph of a line. Students identify the effect on the graph of a linear function when characteristics are changed. Students solve and graph equations and inequalities. Students use the Pythagorean Theorem to identify right triangles and to find the length of the hypotenuse. Students calculate the surface area and volume of solids. Students identify the outliers of a data set. Students identify the line of best fit from a given scatterplot and determine if the rate of change is positive or negative. Students calculate the experimental probability of single events, identify sample spaces, and classify events as independent or dependent.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

Grade 10

Mathematics

Performance Level Descriptors

Grade 10 Mathematics Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level perform multiple operations to simplify square roots. Students multiply and factor higher order polynomial expressions. Students apply complex counting procedures to determine sample space size and justify their reasoning. Students calculate experimental probabilities of multiple complex events, interpreting the results and making predictions. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level simplify cube roots and perform operations on square roots. Students multiply binomials, factor quadratic expressions, and evaluate expressions using nonstandard operations. Students represent, solve, and graph linear equations and systems, linear inequalities and systems, absolute value equations, and inequalities. Students solve literal equations, recognize and extend arithmetic and geometric sequences, and interpret geometric sequences. Students calculate, interpret, and compare characteristics of lines, write the equation of a line, translate between various representations, and interpret, evaluate, and graph functions and identify their characteristics. Students predict the effects of transformations on parent graphs. Students perform operations on functions. Students analyze data sets. Students determine regression lines and correlation coefficients to make predictions and assess the reliability of those predictions. Students calculate, evaluate, and apply probability concepts. Students use coordinate geometry to analyze line segments and polygons and apply the properties and theorems of lines, angles, and polygons to solve problems. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level simplify, add, and subtract square roots. Students add and subtract polynomials and functions, multiply a monomial by a polynomial, and factor common monomial factors from polynomial expressions. Students evaluate linear, absolute value, rational, and radical expressions. Students solve and graph linear equations and systems, linear inequalities and systems, compound inequalities, and absolute value equations. Students solve simple literal equations. Students extend arithmetic and geometric sequences. Students calculate the slope and the intercepts of a line using a graph, an equation, two points, or a set of data points. Students solve mathematical problems involving lines that are parallel, perpendicular, horizontal, or vertical. Students convert equations of a line to slope intercept form. Students write the equation of a line in point slope form given a point and slope. Students identify a graph given a situation described qualitatively. Students identify characteristics of a function given a table or graph. Students read the graph of a linear piecewise function and evaluate a function algebraically at a given point in its domain. Students describe, calculate, and make predictions using data sets and calculate simple probabilities and determine sample space size. Students use coordinate geometry to represent line segments and polygons.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

Grades 3-4
English Language Arts
Performance Level Descriptors

Grade 3 English Language Arts Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level consistently choose the best summary of the text and identify the main idea and key details. Students compare and contrast details in literary and nonfiction/informational texts to describe genres. Students frequently identify literary elements, literary devices, and author's purpose and frequently distinguish fact from opinion. Students consistently infer whether a text is written in first or third person point of view. Students consistently engage in a recursive writing process to create organized written works with a purpose that is clearly communicated for an appropriate audience. Students skillfully use details that support the writing task. Students skillfully use vocabulary knowledge and resources to analyze complex text through word parts, word relationships, and context clues. Students consistently use appropriate and meaningful vocabulary to enhance clarity and effectiveness in their writing. Students consistently identify and apply appropriate use of grammar and mechanics to provide clarity and enhance communication. Students generate a question on a specific topic and consistently locate and use information, including graphic features, to understand the text. Students determine the relevance and reliability of information. Students clearly summarize and present information in an organized and cohesive way.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically choose the best summary of the text and identify the main idea and key details. Students compare and contrast details to classify genres. Students identify literary elements, literary devices, and author's purpose and distinguish fact from opinion. Students infer whether a text is written in first or third person point of view. Students engage in a recursive writing process to create organized written works. Students create written works for specific purposes and audiences using details that support the writing task. Students use vocabulary knowledge and resources to interpret text through word parts, word relationships, and context clues. Students use appropriate vocabulary to write clearly and effectively. Students frequently identify and apply appropriate use of grammar and mechanics to provide clarity and enhance communication. Students generate a question on a specific topic and locate and use information, including graphic features, to understand the text. Students summarize and present information in an organized way.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level inconsistently choose the best summary of the text and have difficulty identifying main ideas and key details. Students compare and contrast but inconsistently classify genres. Students inconsistently identify literary elements, literary devices, author's purpose, or points of view or inconsistently distinguish fact from opinion. Students

inconsistently engage in a recursive writing process to create written works that lack organization. Students write for a specific purpose but seldom consider the audience. Students inconsistently support their ideas with details. Students inconsistently use vocabulary knowledge and resources to interpret text through word parts, word relationships, or context clues. Students inconsistently use appropriate vocabulary in written works. Students inconsistently identify and apply appropriate use of grammar and mechanics. Students generate a question on a topic but ineffectively locate and use information, or imprecisely use graphic features, to understand the text. Students provide an incomplete summary and present information with lack of clarity.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive reading instruction.

Grade 4 English Language Arts Performance Level Descriptors

***Advanced*:** Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level consistently choose the best summary of the text and explain how the details support the main idea. Students compare and contrast details in literary and nonfiction/informational texts to describe and analyze genres. Students consistently recognize the paraphrase of original text. Students consistently identify and describe literary elements, literary devices, author's purpose, accuracy of facts, and text structure in various texts. Students consistently infer meaning from increasingly complex text including author's purpose and points of view. Students consistently engage in a recursive writing process to create purposeful and organized written works. Students create fully developed and engaging written works for specific purposes and audiences using details that support the writing task. Students efficiently use vocabulary knowledge and resources to analyze complex text through word parts, word relationships, and context clues. Students consistently use appropriate and meaningful vocabulary to enhance clarity and effectiveness in their writing. Students consistently identify and apply appropriate use of grammar and mechanics to provide clarity and enhance communication. Students generate a viable research question on a specific topic and consistently locate and use information, including graphic features, to interpret the text. Students organize and synthesize relevant and reliable information in order to present findings.

***Proficient*:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically choose the best summary of the text and identify the details that support the main idea. Students compare and contrast details in literary and nonfiction/informational texts to classify genres. Students recognize the paraphrase of original text most of the time. Students identify and describe literary elements, literary devices, author's purpose, accuracy of facts, and text structure in various texts. Students infer meaning from a text including author's purpose and points of view. Students engage in a recursive writing process to create purposeful written works. Students select and apply the organizational structure that best fits the mode, purpose, and audience. Students use vocabulary knowledge and resources to interpret text through word parts, word relationships, and context clues. Students use appropriate vocabulary to write clearly and effectively. Students frequently identify and apply appropriate use of grammar and mechanics to provide clarity and enhance communication. Students generate a viable research question on a specific topic and adequately locate and use information, including graphic features, to interpret the text. Students organize relevant and reliable information in order to present findings.

***Limited Knowledge*:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level inconsistently choose

the best summary of the text and have difficulty differentiating main ideas from details. Students compare and contrast details in literary and nonfiction/informational texts but inconsistently classify genres. Students seldom identify the paraphrase of original text. Students inconsistently identify and describe literary elements, literary devices, author's purpose, points of view, or accuracy of fact. Students inconsistently engage in a recursive writing process to create written works. Students' writing lacks organizational structure. Students create underdeveloped written works for specific purposes and audiences with inconsistent use of details. Students inconsistently use vocabulary knowledge and resources to interpret text through word parts, word relationships, or context clues. Students inconsistently use appropriate vocabulary in written works. Students inconsistently identify and apply appropriate use of grammar and mechanics. Students generate a research question on a topic but ineffectively locate and use information, or imprecisely use graphic features, to interpret the text.

***Unsatisfactory*:** Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive reading instruction.

Grades 5-6
English Language Arts
Performance Level Descriptors

Grade 5 English Language Arts Performance Level Descriptors

***Advanced*:** Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level analyze how summaries reflect a meaningful, text- based sequence of the main idea and supporting details. Students compare and contrast details in literary and nonfiction/informational texts to describe and analyze genres. Students consistently recognize the paraphrase of original text. Students evaluate and analyze literary devices, author's purpose, point of view, and accuracy of fact to interpret the meaning of the text as a whole. Students consistently compare and contrast texts, and ideas within and between texts, to support inferences. Students consistently engage in a recursive writing process to create purposeful and organized written works. Students create thoroughly organized and engaging written works by selecting and applying the organizational structure that best fits the mode, purpose, and audience. Students skillfully use vocabulary knowledge and resources to analyze complex text through word parts, word relationships, and context clues. Students consistently use appropriate and meaningful vocabulary to enhance clarity and effectiveness in their writing. Students consistently identify and apply appropriate use of grammar and mechanics to provide clarity and enhance communication. Students consistently locate, record, and organize relevant and reliable information on a topic in order to synthesize and clearly present findings.

***Proficient*:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically identify objective text-based summaries that include main idea, supporting details, and a logical sequence of events. Students compare and contrast details in literary and nonfiction/informational texts to classify genres. Students recognize the paraphrase of original text most of the time. Students explain how literary elements, literary devices, author's purpose, point of view, accuracy of facts, and text structure contribute to the meaning of the text. Students compare and contrast texts and ideas within and between texts. Students engage in a recursive writing process to create purposeful written works. Students select and apply the organizational structure that best fits the mode, purpose, and audience. Students use vocabulary knowledge and resources to interpret text through word parts, word relationships, and context clues. Students use appropriate vocabulary to write clearly and effectively. Students frequently identify and apply appropriate use of grammar and mechanics to provide clarity and enhance communication. Students adequately locate, record, and organize relevant and reliable information on a topic in order to present findings.

***Limited Knowledge*:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level inconsistently choose the best summary of the text and have difficulty differentiating main ideas from details. Students compare and contrast details in literary and nonfiction/informational texts but inconsistently classify genres.

Students seldom identify the paraphrase of original text. Students identify literary elements, literary devices, author's purpose, point of view, or accuracy of fact. Students inconsistently compare and contrast texts and ideas within or between texts. Students inconsistently engage in a recursive writing process to create written works. Students create written works for various purposes and audiences but inconsistently select and apply an organizational structure that fits the writing task. Students inconsistently use vocabulary knowledge and resources to interpret text through word parts, word relationships, or context clues. Students inconsistently use appropriate vocabulary in written works. Students inconsistently identify and apply appropriate use of grammar and mechanics. Students ineffectively locate, record, and organize information on a topic in order to present findings.

***Unsatisfactory*:** Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive reading instruction.

Grade 6 English Language Arts Performance Level Descriptors

***Advanced*:** Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the **A**dvanced level will thoroughly comprehend, interpret, evaluate, and respond to a variety of increasingly complex texts of all literary and informational genres. Students skillfully create an objective summary including main idea and supporting details. Students effectively paraphrase main ideas with supporting details in a text. Students thoroughly compare and contrast stated or implied purposes of authors' writing. Students thoroughly evaluate literary devices, points of view, and perspectives, and they explicitly analyze how authors use key literary elements to contribute to the meaning of the text. Students consistently categorize facts included in an argument. Students analyze and evaluate complex textual evidence to support inferences and understanding within and between varied texts. Students effectively engage in a recursive writing process to compose narrative, informative, and argumentative responses for varied purposes and audiences. In opinion writing, students strategically state an opinion supported with facts and details. Students use fully developed, complex ideas, thorough organization, purposeful word choice, a variety of fluent sentences, and appropriate voice. Students skillfully use context clues, word parts, and reference tools to determine or clarify the meaning of words. Students infer complex relationships among words with multiple meanings. Students select precise vocabulary to communicate ideas in writing and to create a specific effect according to a purpose. Students intentionally apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts in reading and writing. Students demonstrate a strong command of Standard English grammar, mechanics, and usage. Students recognize viable research questions and well-developed thesis statements to find information on a specific topic. Students thoroughly comprehend, evaluate, and synthesize resources. Students skillfully summarize and paraphrase, integrate evidence, and cite sources to create written works for multiple purposes.

***Proficient*:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically comprehend, interpret, evaluate, and respond to a variety of complex texts of all literary and informational genres. Students create an objective summary including main idea and supporting details. Students paraphrase main ideas with supporting details in a text. Students compare and contrast stated or implied purposes of authors' writing. Students evaluate literary devices, points of view, and perspectives, and they analyze how authors use key literary elements to contribute to the meaning of the text. Students categorize facts included in an argument. Students analyze textual evidence to support inferences and understanding within and between texts. Students engage in a recursive writing process to compose narrative, informative, and argumentative responses for varied purposes and audiences. In argumentative writing, students introduce a claim and

organize reasons and evidence. Students use fully developed ideas, strong organization, well-chosen words, fluent sentences, and appropriate voice. Students use context clues, word parts, and reference tools to determine or clarify the meaning of words. Students infer the relationships among words with multiple meanings. Students select vocabulary to communicate ideas in writing and to create a specific effect according to a purpose. Students apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts in reading and writing. Students demonstrate a command of Standard English grammar, mechanics, and usage. Students recognize viable research questions to find information on a topic. Students record and organize information from various sources. Students comprehend, evaluate, and synthesize resources. Students summarize and integrate information following a citation style with guidance and support. Students summarize and present information in a report.

***Limited Knowledge*:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level partially comprehend, interpret, evaluate, and respond to literary and informational texts, applying limited critical thinking skills. Students create a summary including main idea and limited supporting details. Students inconsistently paraphrase main ideas with limited supporting details in a text. Students inconsistently compare and contrast stated or implied purposes of authors' writing. Students inconsistently identify literary devices, points of view, and perspectives, and they describe how authors use key literary elements. Students inconsistently categorize facts included in an argument. Students inconsistently identify limited textual evidence to support inferences between texts. Students inconsistently engage in a writing process to compose narrative, informative, and argumentative responses for varied purposes and audiences. In opinion writing, students inconsistently state an opinion supported with limited facts and details. Students use partially developed ideas, weak organization, and ineffective word choice, sentences, and voice. Students ineffectively use context clues, word parts, and reference tools to determine the meaning of words. Students may or may not infer the relationships among words with multiple meanings. Students use a limited vocabulary to communicate ideas in writing and to create an effect according to a purpose. Students inconsistently apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts in reading and writing. Students demonstrate a limited command of Standard English grammar, mechanics, and usage. Students may not recognize viable research questions and well-developed thesis statements to find information on a specific topic. Students partially comprehend, evaluate, and synthesize resources. Students ineffectively summarize and paraphrase, integrate evidence, and cite sources to create written works for multiple purposes.

***Unsatisfactory*:** Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive reading instruction.

Grade 10
English Language Arts
Performance Level Descriptors

Grade 10 English Language Arts Performance Level Descriptors

***Advanced*:** Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically thoroughly comprehend, analyze, and make connections within and between literary and informational texts while skillfully summarizing, paraphrasing, and synthesizing to maintain meaning and connect genre to author's purpose. Students skillfully apply critical thinking skills through interpretation and evaluation of a variety of literary genres. Students thoroughly evaluate how differing perspectives, points of view, literary elements, literary devices, and structures contribute to the meaning of texts. Students purposefully distinguish among different types of evidence to support conclusions and inferences. Students effectively engage in a recursive writing process to create focused, organized, and coherent texts for multiple purposes. Students skillfully embed narratives within other modes for a precise effect. Students compose objective, informational texts using strong evidence, logical reasoning, and compelling, illustrative examples. Students compose well-balanced, cohesive arguments using credible sources. Students skillfully use context clues, word parts, and reference tools to determine or clarify the precise meaning of words. Students thoroughly analyze the relationships among words with multiple meanings. Students select precise vocabulary to communicate complex ideas in writing and to create a specific effect according to a purpose. Students intentionally apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts in reading and writing. Students demonstrate a strong command of Standard English grammar, mechanics, and usage. Students recognize viable research questions and concise thesis statements. Students thoroughly evaluate the reliability and validity of evidence from a variety of sources and then synthesize the most relevant information. Students skillfully and purposefully integrate quotes, paraphrases, and summaries of findings following an appropriate citation style.

***Proficient*:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically comprehend, analyze, and make connections within and between literary and informational texts while summarizing, paraphrasing, and synthesizing to maintain meaning and connect genre to author's purpose. Students apply critical thinking skills through interpretation and evaluation of a variety of literary genres. Students evaluate how differing perspectives, points of view, literary elements, literary devices, and structures contribute to the meaning of texts. Students distinguish among different types of evidence to support conclusions and inferences. Students engage in a recursive writing process to create focused, organized, and coherent texts for multiple purposes. Students embed narratives within other modes. Students compose objective, informational texts using evidence, logical reasoning, and illustrative examples. Students compose balanced, cohesive arguments using credible sources. Students use context clues, word parts, and

reference tools to determine or clarify the meaning of words. Students analyze the relationships among words with multiple meanings. Students select vocabulary to communicate complex ideas in writing and to create a specific effect according to a purpose. Students apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts in reading and writing. Students demonstrate a command of Standard English grammar, mechanics, and usage. Students recognize viable research questions and well-developed thesis statements. Students evaluate the reliability and validity of evidence from a variety of sources and then synthesize relevant information. Students integrate quotes, paraphrases, and summaries of findings following an appropriate citation style.

***Limited Knowledge*:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level inconsistently comprehend, analyze, or make connections within and between literary and informational texts while attempting to summarize, paraphrase, and synthesize to maintain meaning and connect genre to author's purpose. Students may apply critical thinking skills through inadequate interpretation and evaluation of a variety of literary genres. Students may insufficiently evaluate how differing perspectives, points of view, literary elements, literary devices, and structures contribute to the meaning of texts. Students may attempt to distinguish among different types of evidence to support conclusions and inferences. Students inconsistently engage in a writing process to create texts which may lack focus, organization, or coherency. Students may ineffectively embed narratives within other modes. Students compose informational texts which may lack objectivity; texts may use inadequate evidence, illogical reasoning, or irrelevant examples. Students compose arguments which may lack balance, cohesiveness, or credible sources. Students ineffectively use context clues, word parts, or reference tools to determine or clarify the meaning of words. Students may inadequately analyze the relationships among words with multiple meanings. Students use limited vocabulary to communicate complex ideas in writing and attempt to create a specific effect according to a purpose. Students inconsistently apply knowledge of grammar and rhetorical style to analyze and evaluate a variety of texts in reading and writing. Students demonstrate a limited command of Standard English grammar, mechanics, and usage. Students may not recognize viable research questions and well-developed thesis statements. Students ineffectively evaluate the reliability and validity of evidence from a variety of sources and then may attempt to synthesize relevant information. Students ineffectively integrate quotes, paraphrases, and summaries of findings and attempt to follow an appropriate citation style.

***Unsatisfactory*:** Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive reading instruction.

Oklahoma Grade 5 Science

Performance Level Descriptor Tables

5PS1-1 **5PS3-1** **5LS2-1** **5LS2-2** **5ESS2-1**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Develop and Use Models **DCI** • PS1.A Structure and Properties of Matter • PS3.D Energy in Chemical Processes • LS1.C Organization of Matter and Energy Flow in Organisms • LS2.A Interdependent Relationships in Ecosystems • LS2.B Cycles of Matter and Energy Transfer in Ecosystems • ESS2.A: Earth Materials and Systems **CCC** • Scale, Proportion and Quantity • Energy and Matter • Systems and System Models		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will Identify basic models to represent common features of matter and/or energy, ecosystems and/or Earth's systems.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will describe, use and/or develop basic models at various scales to explain the movement of matter and energy between organisms, ecosystems and Earth's systems and the outcomes of these interactions.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically predict, modify, and extend complex models at various scales to analyze the movement of matter and energy between organisms, ecosystems and Earth's systems and the outcomes of these interactions.**

PS1-2 **ESS 1-2** **ESS2-2**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Using Mathematics and Computational Thinking, Analyzing and Interpreting Data **DCI** • PS1.A Structure and Properties of Matter • PS1.B Chemical Reactions • ESS1.B Earth and the Solar System • ESS2.C The Roles of Water in Earth's Surface Processes **CCC** • Scale, Proportion, and Quantity • Patterns		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will recognize scale, proportion, quantity or patterns when performing basic computations with data as it pertains to distribution of water on Earth, conservation of matter, and/or Earth's relationship with the sun, moon and stars.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will apply scale, proportion, quantity and/or patterns when performing computational thinking to data as it pertains to distribution of water on Earth, conservation of matter, and Earth's relationship with the sun, moon and stars.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically analyze scale, proportion, quantity and patterns when performing computational thinking to complex data as it pertains to distribution of water on Earth, conservation of matter, and Earth's relationship with the sun, moon and stars.**

PS2-1 **LS 1-1** **ESS 1-1**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Engaging in Argument from Evidence **DCI** • PS2.B: Types of Interactions • LS1.C Organization for Matter and Energy Flow in Organisms • ESS1.A: The Universe and Its Stars **CCC** • Cause and Effect • Energy and Matter • Scale, Proportion, and Quantity		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will identify evidence, data or models to distinguish relationships between an object and Earth's gravity, or how basic scale and proportion affect the brightness of the sun and other stars, or how plants use air and water.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will use evidence, data and/or models to engage in argument to explain the cause and effect relationships between an object and Earth's gravity, or how scale and proportion affect the apparent brightness of the sun and other stars, or how plants use matter (chiefly air and water) to grow.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically analyze and compare evidence, data and models to engage in argument to explain the cause and effect relationships between an object and Earth's gravity; how scale and proportion affect the apparent brightness of the sun and other stars; and/or how plants use matter (chiefly air and water) to grow.**

PS1-3 **PS1-4**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Planning and Carrying Out Investigations **DCI** • PS1.A: Structure and Properties of Matter • PS1.B: Chemical Reactions **CCC** • Patterns • Cause and Effect		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will observe or measure phenomenon to recognize patterns of materials. Identify basic relationships when mixing substances within an investigation framework.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will observe and measure phenomenon to identify patterns that classify materials based on properties. Describe cause and effect relationships when mixing substances within an investigation framework.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically observe and measure phenomenon to interpret and evaluate patterns that classify materials based on properties. Describe complex cause and effect relationships when mixing substances within an investigation framework.**

Oklahoma Grade 8 Science

Performance Level Descriptor Tables

PS1-5 **PS4-1** **PS4-2** **LS1-7** **ESS2-1**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Develop and Use Models, Using Mathematics and Computational Thinking **DCI** • PS1.B Chemical Reactions • PS4.A Wave Properties • PS4.B Electromagnetic Radiation • LS1.C Organization for Matter and Energy Flow in Organisms • PS3.D Energy in Chemical Processes and Everyday Life • ESS2.A Earth's Materials and Systems **CCC** • Energy and matter • Patterns • Structure function • Stability and change		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will identify or describe basic components or concept(s) of a model involving conservation of matter in chemical reactions, patterns in the structure and function of waves, or stability and change at varying scales in Earth's systems.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will make predictions about, describe, develop, or use a given model involving conservation of matter in chemical reactions, patterns in the structure and function of waves, or stability and change at varying scales in Earth's systems.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically evaluate, revise, or develop a model from evidence, or apply models to complex concepts involving conservation of matter in chemical reactions, patterns in the structure and function of waves, or stability and change at varying scales in Earth's systems.**

LS4-1 **ESS2-3** **ESS3-2** **PS2-2**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Planning and Carrying Out Investigations, Analyzing and Interpreting Data **DCI** • LS4.A Evidence of Common Ancestry and Diversity • ESS1.C The History of Planet Earth • ESS2.B Plate tectonics and Large Scale System Interactions • ESS3.B Natural Hazards • PS2.A Forces and Motion **CCC** • Patterns • Stability and change		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will identify or describe basic steps or processes within investigations about stability and change of forces and motion, or identify and define patterns in data about common ancestry and diversity of organisms, the geologic history of Earth, or natural hazards.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will identify, describe, or explain how to plan or perform investigations about stability and change of forces and motion, or identify and apply patterns in data about common ancestry and diversity of organisms, the geologic history of Earth, or natural hazards.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically design, evaluate, or modify investigations about stability and change of forces and motion, or analyze and draw conclusions from patterns in data about common ancestry and diversity of organisms, the geologic history of Earth, or natural hazards.**

PS1-6 **PS2-1**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Designing Solutions **DCI** • PS1.B Chemical Reactions • PS2.A Forces and Motion **CCC** • Energy and matter • System and system models		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will identify components of a design solution or describe simple relationships within a design solution in various systems involving energy transfer in chemical reactions or forces in collisions.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will use, describe, or explain a design solution, or identify evidence of relationships within a design solution in various systems involving energy transfer in chemical reactions or forces in collisions.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically modify, synthesize, or apply a design solution, or evaluate evidence of relationships within a design solution in various systems involving energy transfer in chemical reactions or forces in collisions.**

LS4-2 **ESS1-4** **ESS2-2** **ESS3-1** **ESS3-4**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Engaging in Argument from Evidence, Constructing Explanations **DCI** • LS4.A Evidence of Common Ancestry and Diversity • ESS1.C The History of Planet Earth • ESS2.A Earth's Materials and Systems • ESS2.C The Roles of Water in Earth's Surface Processes • ESS3.A Natural Resources • ESS3.C Human Impacts on Earth Systems **CCC** • Structure-function • Scale, proportion and quantity • Cause and effect		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will identify or describe basic relationships shown in evidence of anatomy and common ancestry of organisms, or aspects of Earth systems, including geologic history, materials and processes, natural resources, or human impacts on those systems using the concept of patterns in cause and effect relationships or the concept of scale and proportion.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will construct explanations by identifying, describing, or comparing evidence of anatomy and common ancestry of organisms, or aspects of Earth systems including geologic history, materials and processes, natural resources, or human impacts on those systems using the concept of patterns in cause and effect relationships or the concept of scale and proportion.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically will analyze, infer, relate, or identify complex relationships within a system to construct or evaluate explanations for evidence of anatomy and common ancestry of organisms, or aspects of Earth systems including geologic history, materials and processes, natural resources, or human impacts on those systems using the concept of patterns in cause and effect relationships or the concept of scale and proportion.**

Oklahoma Grade 10 Science

Performance Level Descriptor Tables

LS1-2 **LS1-4** **LS1-5** **LS1-7** **LS2-5**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Develop and Use Models **DCI** • LS1.A Structure and function • LS1.B Growth and Development of Organisms • LS1.C Organization for Matter and Energy Flow in Organisms • LS2.B Cycles of matter and Energy Transfer In Ecosystems • PS3.D Energy in Chemistry Processes **CCC** • Systems and System Models • Energy and matter		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will identify or describe basic components or relationships among components within systems and system models related to structure, function, growth and/or development of organisms, organization for matter and energy flow in organisms, cycles of matter and energy transfer in ecosystems, or energy in chemistry processes.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will develop, and use models describing components and relationships among components of a system, related to structure and function, growth and development of organisms, organization for matter and energy flow in organisms, cycles of matter and energy transfer In ecosystems, and energy in chemistry processes, including hierarchical structures and inputs and outputs of a system. Use the models to represent basic aspects of phenomena that result from changes of energy and matter.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically will develop and use models to interpret and evaluate components and relationships among components within and between complex systems and system models related to structure, function, growth and/or development of organisms, organization for matter and energy flow in organisms, cycles of matter and energy transfer in ecosystems, and/or energy in chemistry processes.**

LS1-3 **LS2-1** **LS2-2** **LS2-4** **LS3-3** **LS4-1** **LS4-3**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Planning and Carrying Out Investigations, Using Mathematics and Computational Thinking, Analyzing and Interpreting Data **DCI** • LS1.A Structure and Function • LS2.A Interdependent Relationships in Ecosystems • LS2.B Cycles of Matter and Energy Transfer in Ecosystems • LS2.C Ecosystem Dynamics, Functioning and Resilience • LS3.B Variation of Traits • LS4.A Evidence of Common Ancestry and Diversity • LS4.B Natural Selection		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will conduct investigations to produce data, use provided data to support explanations or claims about the stability related to structure and function of organisms, interdependent relationships in ecosystems at different scales, the cycling of matter and flow of energy among organisms in an ecosystem, effect variation of traits have in a population, patterns that show evidence of common ancestry and diversity, natural selection, or adaptation.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will plan and conduct investigations to produce reliable data, analyze and interpret provided data to support explanations or claims about the stability related to structure and function of organisms, interdependent relationships in ecosystems at different scales, the cycling of matter and flow of energy among organisms in an ecosystem, effect variation of traits have in a population, patterns that show evidence of common ancestry and diversity, natural selection, or adaptation.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically plan and conduct investigations produce reliable data considering the types, amounts and accuracy of data needed, analyze and interpret complex data sets to support explanations or claims about the stability related to structure and function of organisms, interdependent relationships in ecosystems at different scales, the cycling of matter and flow of energy among organisms in an ecosystem, effect variation of traits have in a population, patterns that show evidence of common ancestry and diversity, natural selection, or adaptation.**

• LS4.C Adaptation **CCC** • Patterns • Scale, Proportion, Quantity • Energy and matter • Stability and Change				

LS2-6 **LS2-8** **LS3-1** **LS3-2** **LS4-5**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Asking Questions, Engaging in Argument from Evidence (make and defend a claim, evaluate a claim) **DCI** • LS2.C Ecosystem dynamics, functioning and resilience • LS2.D Social interactions and group behavior • LS3.A Inheritance of traits • LS1.A Structure and function • LS3.B Variation of traits • LS4.C Adaptation **CCC** • Stability and change • Cause and effect		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level will ask questions to identify relationships how cause of structure and function affect inheritance of traits or describe arguments based on evidence as students communicate understandings about stability and change in ecosystem dynamics, function and resilience, the cause and effect relationships of social interactions, group behaviors, adaptation, and variation of traits.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will ask questions to clarify relationships how cause of structure and function effect inheritance of traits or evaluate arguments based on evidence as students synthesize and communicate understandings about stability and change in ecosystem dynamics, function and resilience, the cause and effect relationships of social interactions, group behaviors, adaptation, and variation of traits.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically ask questions to analyze relationships how cause of structure and function affect inheritance of traits or support, evaluate and defend arguments based on evidence as students synthesize and communicate understandings about stability and change in ecosystem dynamics, function and resilience, the cause and effect relationships of social interactions, group behaviors, adaptation, and variation of traits.**

LS1-1 **LS1-6** **LS2-3** **LS4-2** **LS4-4**	**Unsatisfactory:** Students have not performed at least at the Limited Knowledge level.	**Limited Knowledge:** Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.	**Proficient:** Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.	**Advanced:** Students demonstrate superior performance on challenging subject matter.
Constructing Explanations **DCI** • LS1.A Structure and function • LS1.C Organization for matter and energy flow in organisms • LS2.B Cycles of matter and energy transfer in ecosystems • LS4.B Natural selection • LS4.C Adaptation **CCC** • Structure and function • Energy and matter • Cause and effect		**Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level identify and describe basic relationships based on evidence of the cause and effect relationships in natural selection, adaptation, and how the structure of DNA determines protein structure and impacts the function of the cell or identify and describe explanations from evidence for how matter and energy is organized, cycled, and transferred within an organism or ecosystem.**	**Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will construct an explanation based on valid and reliable evidence from sources of the cause and effect relationships in natural selection, adaptation, and how the structure of DNA determines protein structure and impacts the function of the cell or construct and revise explanations from evidence from sources for how matter and energy is organized, cycled, and transferred within an organism or ecosystem.**	**Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically construct, evaluate or make inferences for an explanation based on valid and reliable evidence from a variety of sources of the cause and effect relationships in natural selection, adaptation, and how the structure of DNA determines protein structure and impacts the function of the cell or evaluate or refine explanations from evidence from a variety of sources for how matter and energy is organized, cycled, and transferred within an organism or ecosystem.**

Oklahoma School Testing Program
Performance-Level Descriptors
End-of-Instruction ACE U.S. History

ADVANCED: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level will integrate and link social, political, and economic concepts. Students will

- analyze and evaluate complex historical points-of-view of major events and issues related to U.S. history
- critique and differentiate between social, political, and economic concepts that transformed the United States, 1865-2001
- analyze and evaluate the United States' social, political, and economic development over time
- integrate newly developed concepts with previous historical misconceptions
- apply concepts to solve problems as related to U.S. history
- evaluate historical justifications and interpretations through the examination of multiple and varied sources
- apply content knowledge in multiple contexts to make historical connections and evaluate changes over time

PROFICIENT: Students demonstrate appropriate course-level knowledge and skills in subject matter and readiness for the next course or level of education. Students scoring at the Proficient level perform above the Limited Knowledge level and will consistently be able to

- analyze the transformation of the United States from the Post-Reconstruction period through the Progressive Era
- explain the expanding role of the United States in international affairs as the nation transformed into a world power in the late 19th and early 20th centuries
- explain the impact of the cycles of boom and bust of the 1920s and 1930s on the transformation of the United States' government, economy, and society
- evaluate the major causes, events, and effects of the United States' involvement in World War II, 1933-1946, both foreign and domestic
- describe and interpret the role of the United States in significant foreign and domestic affairs during the Cold War period, 1946-1975
- interpret the impact of the United States' significant foreign and domestic policies, 1976-2001

LIMITED KNOWLEDGE: Students demonstrate partial mastery of the essential course-level knowledge and skills. Students at the Limited Knowledge level will

- recall and identify significant individuals, events, and issues in U.S. history, 1865-2001
- define appropriate social studies terminology and vocabulary
- demonstrate partial competency to analyze textual and visual evidence
- demonstrate partial competency to draw conclusions, analyze, evaluate, interpret, and/or integrate concepts as related to U.S. history

UNSATISFACTORY: Students have not performed at least at the Limited Knowledge level. Students at the Unsatisfactory level have not demonstrated course-level knowledge and skills.

APPENDIX E— ALIGNMENT REVIEW OF OSTP

2016 No. 089

HumRRO
HUMAN RESOURCES RESEARCH ORGANIZATION

Independent Alignment Review of the Oklahoma School Testing Program (OSTP) English Language Arts, Mathematics, and Science Tests

Final Report

Prepared for: Oklahoma State Department of Education
2500 North Lincoln Boulevard
Oklahoma City, Oklahoma 73105

Prepared under: Contract # S17-04 (MP-2015 IQC)
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Date: March 7, 2017

Independent Alignment Review of the Oklahoma School Testing Program (OSTP) English Language Arts, Mathematics, and Science Tests

Table of Contents

List of Tables

List of Figures

Independent Alignment Review of the Oklahoma School Testing Program (OSTP) English Language Arts, Mathematics, and Science Tests

Executive Summary

Scope of Work

The Human Resources Research Organization (HumRRO) was contracted by Measured Progress on behalf of the Oklahoma State Department of Education (OSDE) to conduct an external, independent alignment study of the Oklahoma School Testing Program (OSTP) English language arts (ELA), mathematics, and science tests. The alignment study included a review and analysis of the ELA tests administered at grades 3-8 and 10; mathematics tests administered at grades 3-8, and 10; and science tests administered at grades 5, 8, and 10, to the Oklahoma Academic Standards (OAS) for ELA, mathematics, and science, respectively.

The alignment study was requested in order to meet both state and federal accountability requirements related to OSDE use of the OSTP. The federal requirement of the U.S. Department of Education (USDE) stems from the Elementary and Secondary Education Act (ESEA). ESEA challenges each state to establish a coherent assessment system based on solid academic standards. This law calls for states to provide independent evidence of the validity of their assessments used to calculate academic status and growth. All states receiving Title I funds must present evidence that their assessment system is consistent and fair, that it is based on rigorous standards with sufficient alignment between standards and assessments, and that it generates high-quality educational results. States are required to submit this information as part of the federal peer review process.

An alignment review can provide one form of evidence supporting the validity of the state assessment system. Alignment results should demonstrate that the assessments represent the full range of the content standards and that the assessments measure student knowledge in the same manner and at the same level of complexity as specified in the content standards.

Methodology

To conduct the study, HumRRO facilitated a review of the alignment between the OSTP ELA, mathematics, and science items and the OAS for ELA, mathematics, and science by nine panels (one per grade band per content area) of Oklahoma educators. Following the reviews and examination of the alignment, HumRRO analyzed the results for presentation in this report.

Review of Content Alignment

HumRRO convened panels of Oklahoma educators to review the extent of the alignment between the ELA, mathematics, and science OSTP tests and the standards they are intended to assess. The review involved two major tasks for panelists to complete: (a) providing depth-of-knowledge (DOK) ratings for the OAS at the objective or performance expectation level for ELA, mathematics, and science, and (b) evaluating ELA, mathematics, and science test items by matching them to grade level objectives or performance expectations, providing an item DOK rating, and selecting a rating of the overall alignment between item and standard. To maintain the independent and external nature of the study, OSDE did not take part in this process.

Representatives from OSDE were, however, available to help answer questions regarding the assessment system itself.

Measured Progress, with the assistance of OSDE, recruited Oklahoma teachers to fill the nine review panels. Every effort was made to produce panels consisting of teachers reflecting the population of students who take the assessments. Once selected, the panels were convened at the Sheraton Oklahoma City Downtown Hotel, OK on November 15-17, 2016. Panels included 4-5 reviewers, referred to as panelists.

The content alignment review was based on the Webb (2005) alignment method. This methodology, developed by Dr. Norman Webb, is comprised of four indicators (or statistics) using data provided by the review panelists. These statistics describe how well the test items, regardless of item type and point value, cover the content standards in terms of content breadth and depth. The alignment indicators include:

- Categorical concurrence – determines the degree of overall content coverage by the assessment for each content strand (i.e., grade level expectation). Webb recommends a minimum of six test questions to adequately assess each content strand.
- Range-of-knowledge correspondence – indicates the specific content expectations (i.e., evidence outcome) assessed within each content strand. Webb recommends at least 50% of the content expectations per strand are linked with items.
- Balance of knowledge representation – provides a statistical index reflecting the distribution of assessed content within each content strand (i.e., how evenly the content is assessed). Webb recommends a minimum index of 70 for a single content strand.
- Depth-of-knowledge consistency – compares the cognitive complexity ratings of the items with the complexity ratings of each content standard. Webb recommends that at least 50% of the items should have complexity ratings at or above the level corresponding to content expectations as determined by panelists.

Summary of Results

Key Findings and Conclusions

The cumulative results provide validity evidence to support that the content of OSTP ELA, mathematics, and science test items match the intended content as specified in the standards. Expert panelists from each content areas tended to agree that items were measuring the intended objectives or performance expectations. They also tended to rate items as fully aligned to the Oklahoma Academic Standards.

Across the subjects, there were some issues identified in the cognitive complexity of the test forms. Across the ELA and science assessments many of the objectives or performance expectations were found to target higher cognitive complexity levels than the items used to assess them. Examination of the grade level assessment standards found this tended to occur in instances where the majority of objectives for a standard targeted the higher cognitive complexity levels of 3 and 4.

Alignment of OSTP ELA to Oklahoma Academic Standards

Table 1 provides summary conclusions on the alignment of the OSTP ELA test to the Oklahoma Academic Standards per grade tested. The conclusions are based on the following decision criteria (Webb, 2005):

- Fully aligned – assessments align to all content standards (91%–100%),
- Highly aligned – assessments align to the majority of standards (70%–90%),
- Partially aligned – assessments align well to some standards (50%–69%),
- Weakly aligned – assessments align to less than half the standards (below 50%).

Webb's alignment method does not allow for a *single* judgment of overall alignment across the four alignment indicators. However, one can get a sense of overall alignment between the assessments and standards by looking at all of the alignment indicators together.

Table 1. Summary Alignment Outcomes on Each Webb Criterion by Grade for ELA OSTP

	Percentage of Standards that Met Webb Criteria				
Grade	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence[a]		Balance of knowledge Representation
			Initial Objectives	Reduced Objectives	
3	Highly aligned (86.7%)	Weakly aligned (46.7%)	Weakly aligned (26.7%)	Highly aligned (73.3%)	Fully aligned (100%)
4	Highly aligned (80.0%)	Highly aligned (86.7%)	Highly aligned (80.0%)	Highly aligned (80.0%)	Fully aligned (100%)
5	Partially aligned (66.7%)	Fully aligned (100%)	Weakly aligned (26.7%)	Highly aligned (80.0%)	Fully aligned (100%)
6	Highly aligned (80.0%)	Partially aligned (66.7%)	Weakly aligned (13.3%)	Highly aligned (73.3%)	Fully aligned (93.3%)
7	Fully aligned (100%)	Partially aligned (60.0%)	Weakly aligned (40.0%)	Highly aligned (80.0%)	Highly aligned (86.7%)
8	Fully aligned (100%)	Partially aligned (60.0%)	Weakly aligned (26.7%)	Partially aligned (66.7%)	Fully aligned (93.3%)
10	Highly aligned (80.0%)	Weakly aligned (40.0%)	Weakly aligned (20.0%)	Highly aligned (73.3%)	Highly aligned (86.7%)

[a]The initial objective counts are based on the information provided in the test blueprint and standards. The reduced objective counts are based on feedback from OSDE about objectives which were intentionally not assessed by multiple choice items.

As shown in Table 1, nearly all grade level ELA assessments were highly to fully aligned on the categorical concurrence criterion and balance of knowledge representation criteria. Only the grade 5 forms did not meet the categorical concurrence criterion for more than 30% of the standards. In these cases, the standards generally fell just below the criterion of having 6 items aligned to each standard.

The majority of grade levels exhibited partial to weak DOK consistency. In general, many of the ELA objectives targeted higher cognitive complexity levels than the items used to assess them on a number of standards. An examination of the grade level objectives found that this tended to occur in instances where the majority of objectives for a standard targeted the higher cognitive complexity levels of 3 and 4.

Based on the initial objective list (obtained from the test blueprint and the standards documents), the test forms did not capture the breadth of the content in the standards. The majority of the standards on a test form generally were assessed by items that covered less than half of the content within the standard. Examination of the test blueprint and the number of objectives suggest that there may be too many objectives to sufficiently capture the breadth in the standards using the current target item counts specified in the blueprint and, therefore, may be difficult to increase the content coverage of the test forms enough to satisfy Webb's criteria.

The range-of-knowledge results improved when the reduced objective list, provided by OSDE, were used in the analysis (see Range of knowledge Correspondence, page 14). OSDE may consider reviewing their testing documentation to make it more explicit which objectives are assessed by the grade-level assessments.

Alignment of OSTP Mathematics to Oklahoma Academic Standards

Table 2 provides summary conclusions on the alignment of the OSTP mathematics test to the Oklahoma Academic Standards per grade tested, using the same criteria described above. It is important to note that the terminology is different for math. The comparable standard level is referred to as strand.

Table 2. Summary Alignment Outcomes on Each Webb Criterion by Grade for Mathematics OSTP

	Percentage of Strands that Met Webb Criteria			
Grade	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence	Balance of knowledge Representation
3	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (91.7%)
4	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (100%)
5	Fully aligned (91.7%)	Highly aligned (75.0%)	Fully aligned (100.0%)	Fully aligned (100%)
6	Fully aligned (100.0%)	Fully aligned (91.7%)	Fully aligned (100.0%)	Fully aligned (91.7%)
7	Fully aligned (100.0%)	Highly aligned (75.0%)	Highly aligned (83.3%)	Fully aligned (100%)
8	Fully aligned (100.0%)	Fully aligned (91.7%)	Fully aligned (100.0%)	Fully aligned (100%)
10	Highly aligned (80.0%)	Partially aligned (53.3%)	Highly aligned (80.0%)	Fully aligned (100%)

The alignment results suggest the OSTP math assessments generally capture breadth, depth, and cognitive complexity of the OAS Math Standards. As shown in Table 2, nearly all grade level math assessments were highly to fully aligned on each of the four Webb alignment criteria. Only the grade 10 forms did not meet the DOK consistency criterion for more than 30% of the strands. Examination of the cognitive complexity levels of the corresponding objectives suggest that additional items targeting a DOK level of 2 and 3 are needed in grade 10, particularly for items aligned to the Data and Probability and Geometry strands. In addition, although the range-knowledge correspondence indicator was considered highly aligned for the grade 10 results, none of the forms met the Webb criterion of having 50% of the objectives assessed for the Geometry strand. Thus the alignment could be further improved through greater coverage of the objectives in the Geometry strand.

Alignment of OSTP Science to Oklahoma Academic Standards

Table 3 provides summary conclusions on the alignment of the OSTP science test to the Oklahoma Academic Standards per grade tested, using the same criteria described above. It is important to note that the terminology is different for science. The comparable standard level is referred to as reporting category.

Table 3. Summary Alignment Outcomes on Each Webb Criterion by Grade for Science OSTP

	Percentage of Reporting Categories that Met Webb Criteria			
Grade	Categorical Concurrence	Depth-of-Knowledge Consistency	Categorical Concurrence	Balance of knowledge Representation
5	Fully aligned (100.0%)	Partially aligned (66.7%)	Fully aligned (100.0%)	Fully aligned (100.0%)
8	Fully aligned (100.0%)	Weakly aligned (33.3%)	Fully aligned (100.0%)	Fully aligned (100.0%)
10	Fully aligned (100.0%)	Partially aligned (50.0%)	Fully aligned (100.0%)	Fully aligned (100.0%)

As shown in Table 3, all of the grade level science assessments were fully aligned on the categorical concurrence, range-of-knowledge, and balance of knowledge representation criteria. These results suggest that the science assessments capture the breadth and depth in the reporting categories and have sufficient counts to accurately report scores at that level.

All of the grade levels exhibited partial to weak alignment on the DOK consistency criterion. In general, many of the science performance expectations targeted higher cognitive complexity levels than the items used to assess them on a number of reporting categories. An examination of the grade level performance expectations found that this tended to occur in instances where the majority of performance expectations for a standard targeted the higher cognitive complexity levels of 3 and 4.

Recommendations

- ***Review ELA, Math, and Science items' depth-of-knowledge.*** The DOK consistency review showed that the items did not adequately reflect the cognitive complexity of the standards for all the grade level ELA and Science assessments and for the Math grade 10 assessment. There were items of varying DOKs, but a substantial percentage were lower than their associated objective or performance expectation. OSDE may consider reviewing the item pool and determining whether additional items that target a higher DOK are needed. Additionally, if OSDE has particular targets they would like to meet in regard to the distribution of items by cognitive complexity, they may consider adding the targets to their test blueprint.
- ***Review ELA and Science standards' language.*** Across the grade levels, a number of the ELA and Science objectives or performance expectations were evaluated by panelists as requiring higher levels of cognitive complexity. OSDE might review the language of the objectives or performance expectations to determine if it is sufficiently specific to allow educators to determine the cognitive complexity at which the content is intended to be taught and learned. Vague or broad objectives or performance

expectations may lead educators (and panelists) to assume a higher cognitive complexity level than intended.

- ***Review ELA, Math, and Science standards' depth-of-knowledge.*** A number of the assessed objectives or performance expectations were identified as having higher levels of cognitive complexities than the corresponding items. In addition, the ELA assessments did not assess the breadth of knowledge represented in the content standards. One potential way to reduce both of these issues is to review the content standards and determine whether any may be better assessed locally. In particular, OSDE may focus on reviewing some of the objectives or performance expectations that target higher complexity levels to determine whether local assessments may be better equipped to assess the content than a multiple-choice exam. Reducing the number of objectives or performance expectations that target high DOK levels would improve the alignment in cognitive complexity and could also improve the breadth of content coverage as fewer standards (strands or reporting categories) would be assessed at the state level.
- ***Review ELA content coverage.*** The ELA assessments did not meet the range-of-knowledge criterion which specifies 50% of the objectives within each standard should be assessed by a test form. Although OSDE may not be able to increase the content coverage of the test forms enough to satisfy Webb's criteria due to blueprint constraints, they may review their item bank to make sure most or all objectives are covered in the item pool. Any objectives that are not covered sufficiently may be flagged for future item development efforts.

Independent Alignment Review of the Oklahoma School Testing Program (OSTP) English Language Arts, Mathematics, and Science Tests

Chapter 1: Introduction

The Human Resources Research Organization (HumRRO) was contracted by Measured Progress on behalf of the Oklahoma State Department of Education (OSDE) to conduct an external, independent alignment study of the Oklahoma School Testing Program (OSTP) English language arts (ELA), mathematics, and science tests. The alignment study included a review and analysis of the English language arts tests administered at grades 3-8 and 10; mathematics tests administered at grades 3-5, 6-8, and 10; and science tests administered at grades 5, 8, and 10, to the Oklahoma Academic Standards (OAS) for ELA, mathematics, and science, respectively.

The alignment study was requested in order to meet both state and federal accountability requirements related to OSDE use of the OSTP. The federal requirement of the U.S. Department of Education (USDE) stems from the Elementary and Secondary Education Act (ESEA). ESEA challenges each state to establish a coherent assessment system based on solid academic standards. This law calls for states to provide independent evidence of the validity of their assessments used to calculate academic status and growth. All states receiving Title I funds must present evidence that their assessment system is consistent and fair, that it is based on rigorous standards with sufficient alignment between standards and assessments, and that it generates valid and reliable scores. States are required to submit this information as part of the federal peer review process.

An alignment review can provide one form of evidence supporting the validity of the state assessment system. Alignment results should demonstrate that the assessments represent the full range of the content standards and that the assessments measure student knowledge in the same manner and at the same level of complexity as specified in the content standards.

Organization and Contents of the Report

This report contains five chapters. Chapter 2 explains the alignment methodologies used in the study and Chapters 3, 4, and 5 provide alignment results for ELA, mathematics, and science, respectively. Chapter 6 summarizes the results and provides recommendations.

Additional information is provided in the appendices of this report. Appendix A contains tables with additional details for each Webb (1997) indicator regarding the content alignment results for each ELA test and panelist consensus ratings for standard objectives, Appendix B contains tables with additional details for each Webb indicator regarding the content alignment results for each mathematics test and panelist consensus ratings for standard objectives, Appendix C contains tables with additional details for each Webb indicator regarding the content alignment results for each science test and panelist consensus ratings for standard performance expectations, and Appendix D provides examples of rating forms and training materials used in the alignment workshops.

Chapter 2: Alignment Study Design and Methodology

In this section, we discuss key concepts related to assessment alignment research. This discussion is followed by a description of the alignment evaluations and methods used for this study.

Alignment of Assessments and Standards on Content

Alignment studies, at their heart, answer one vital question related to the validity of an assessment, "Does the assessment content adequately reflect the content that students are expected to learn as provided in the state standards?" School curriculum must include appropriate content to meet the goals specified by the state standards and consequently assessments must also measure the same content.

In general, alignment evaluations for any Kindergarten to grade 12 educational assessments in the United States reveal (a) the breadth, or scope, of knowledge and (b) the depth-of-knowledge, or cognitive processing, expected of students by the state's content standards. In addition to the question related to assessment validity, alignment analyses help to answer questions such as the following:

- How much and what type of content is covered by the assessment?
- Are students asked to demonstrate this knowledge at the same level of rigor as expected in the content standards?

Content Alignment and Accessibility

Several methods of alignment are in current use (e.g., Porter, 2002; Webb, 1997, 1999, 2005). These methods involve panelists subjectively evaluating several aspects of the assessment items relative to the content standards. The data from the evaluations are analyzed statistically to determine the extent of alignment. HumRRO used the alignment method developed by Norman Webb to evaluate the OSTP. Webb's alignment methodology is the most widely used in the United States.

Webb Alignment Method

The Webb alignment method (1997; 1999; 2005) was originally designed for use with standard large-scale assessments. Dr. Norman Webb has researched and refined this method over time, and his approach is supported by the Council of Chief State School Officers (CCSSO).

The Webb method includes four major indicators to evaluate alignment. These indicators link with statistical procedures used to assess how well items on the assessment, regardless of item type and point value, and the state's standards document actually match. The four alignment indicators are: categorical concurrence, depth-of-knowledge consistency, range-of-knowledge correspondence, and balance of knowledge representation.

Categorical concurrence is a basic measure of alignment between content standards and test items. This term refers to the proportion of overlap between the content stated in the standards document and that assessed by items on the test.

Depth-of-knowledge (DOK) measures the type of cognitive processing required by items and content standards. For example, is a student expected to simply identify or recall basic facts or

use reason to manipulate information, or to strategize how to best solve a complex problem? Using Science as an example, a student may be asked to identify the planets of our solar system among several answer choices. This task should be less complex than trying to compare and contrast the composition of the planets in preparation of landing unmanned probes.

The purpose of using DOK as a measure of alignment is to determine whether a test item and its corresponding standard are written at the same level of cognitive complexity. Panelists make two separate judgments about cognitive complexity, one rating for the standard and one rating for the item. These two judgments are compared to determine whether the item is written at the same level as the standard to which it is linked. Webb (1997) refers to this comparison as *Depth-of-Knowledge consistency*.

Range-of-knowledge correspondence examines the range-of-knowledge correspondence between the assessment and content standards. The range-of-knowledge correspondence measure looks in greater detail at the breadth of knowledge represented by test items. Categorical concurrence simply notes whether a sufficient number of items on the test covers each general content topic (i.e., grade level expectation). However, states usually lay out more specific content objectives (i.e., evidence outcomes), under each strand. The range-of-knowledge correspondence indicates the number of content objectives assessed by items.

Balance of knowledge representation focuses on content coverage in yet more detail. In this case, the number of items matched to the content objective does matter. The balance of representation determines whether the assessment measures the content objectives equitably within each content topic using only the content objectives identified by panelists and not all content objectives eligible to be assessed. Based on Webb's (1997) method, items should be distributed evenly across the objectives per content topic for good balance. The balance of knowledge representation is determined by calculating an index, or score, for each content topic. Each should meet or surpass a minimum index level to demonstrate adequate balance.

It is important to note that OSDE uses different terminology for the level at which sub-scores are reported across each of the OSTP assessments. For ELA the sub-score reporting level is called *standard*, for math it is *strand*, and for science it is *reporting category*.

Scope of Alignment Evaluations for OSTP ELA, Mathematics and Science Tests

The alignment evaluation performed for this study involved a comparison of the OSTP ELA, mathematics, and science test items to the Oklahoma Academic Standards (OAS). Oklahoma educators highly familiar with the content standards and the assessment provided alignment ratings for the evaluation. To maintain the independent and external nature of the study, OSDE did not take part in this process. Representatives from OSDE were, however, available to help answer questions regarding the assessment system itself.

Review of Content Alignment

For the content alignment review, HumRRO convened panels of Oklahoma educators to review grades 3-8, and 10 OSTP ELA standards and test items, grades 3-8 and 10 OSTP mathematics standards and test items, and grades 5, 8, and 10 OSTP science standards and test items. The review involved two major tasks for panelists to complete: (a) providing depth-of-knowledge (DOK) ratings for each OSTP ELA, mathematics, and science objective or performance expectation and (b) evaluating the ELA, mathematics, and science items by providing an item DOK rating, matching them to a grade level objective or performance expectation and selecting a

rating of the quality of alignment between the item and the matched objective or performance expectation.

Panelists

Measured Progress, with OSDE assistance, recruited the nine review panels. Every effort was made to produce panels consisting of teachers reflecting the population of students who take the assessments. Once selected, the panels were convened at the Sheraton Oklahoma City Downtown Hotel, OK on November 15-17, 2016. Panels included 4-5 reviewers, referred to as panelists. Table 2.1 presents the characteristics of the panels by content area and grade level.

Table 2.1. Professional Characteristics of Panelists

	English Language Arts			Mathematics				Science		
		Education			Education				Education	
Professional Position	# Panelists	Avg. # Years in Education	Additional Certifications	# Panelists	Avg. # Years in Education	Additional Certifications	Professional Position	# Panelists	Avg. # Years in Education	Additional Certifications
Grades 3-5							**Grade 5**			
Teacher	5	6.6	1.0	5	11.4	2.0	Teacher	5	13	2.0
Administrator	0	---	---	0	---	---	Administrator	0	---	---
Grades 6-8							**Grade 8**			
Teacher	4	8.0	1.0	4	14.5	5.0	Teacher	4	11.5	2.0
Administrator	0	---	---	1	13.0	1.0	Administrator	0	---	---
Grade 10							**Grade 10**			
Teacher	4	16.0	2.0	3	15.3	0.0	Teacher	4	10.5	0.0
Administrator	0	---	---	1	22	0.0	Administrator	0	---	---

Note. Demographic data were not available for all participants.

Table 2.2. Demographic Characteristics of Panelists

Oklahoma Regions Covered in Alignment	# Panelists
Northeast	15
Southeast	5
Northwest	7
Southwest	13
Total	**40**

Training

A critical component when conducting alignment workshops is the training provided to the panel group facilitators. Even when using experienced facilitators, each alignment study will be different in focus, panelist rating definitions, and process; therefore, HumRRO conducted a 2-hour internal training session prior to the workshop. The facilitator training consisted of a review of the OSDE assessments, standards, and terminology; our alignment process; an in-depth review and discussion of the panelist tasks, facilitator procedures and guidance, rating forms and item examples; and data security procedures.

All panelists received a common introductory training prior to participating in the study. During this large group session, HumRRO provided general alignment study information, roles and responsibilities, key alignment concepts, security and confidentiality concerns, and the alignment workshop procedures. Panelists then moved into content-specific breakout groups in which they were assigned to a specific grade level. In the breakout rooms, panelists signed non-disclosure agreements and received additional training on the alignment task processes and associated support materials needed to complete their alignment tasks.

Materials

During the alignment workshop, panelists evaluated the alignment of the OSTP items with the OAS. Hard copies of test items were provided to panelists. All rating forms were completed electronically in Excel®. The item presentation and rating forms are discussed in further detail below.

Test Items. Panelists evaluated OSTP operational items. Table 2.3 lists the number of test items for each grade level test. The OSTP tests are administered online with the exception of ELA grades 3-4. Because the assessment delivery system was not yet operational, panelists reviewed portable document format (PDF) copies of the online test items. For the test items with interactive components, a description of what the students will see and how they interact was provided. Because the test items are operational, the item copies remained in a secure location throughout the workshop. When finished with the items, they were placed in a secured recycle bin for sensitive materials and later destroyed. This report does not include any examples of items or references to specific item content.

Table 2.3. Number of OSTP Items Reviewed

Subject	Grade	Total Items
English Language Arts	3-5	397
	6-8	397
	10	151
Mathematics	3-5	423
	6-8	426
	10	161
Science	3-5	66
	6-8	66
	10	66

Rating Forms and Instructions. Panelists were given a Panelist Instruction document describing the rating tasks and the definitions of the rating codes to be used. Additionally, panelists were supplied laptops with Excel® documents in which panelists' entered their ratings. Panelists completed two rating forms, the first was a paper form to record individual depth-of-knowledge (DOK) ratings of the content objectives or performance expectations that were used to establish a group consensus rating. The second was an Excel® item rating form in which panelists entered their individual ratings. Samples of the workshop materials are found in Appendix E.

Procedures

HumRRO conducted the alignment study at the Sheraton Oklahoma City Downtown Hotel on November 15-17, 2016. The workshop began with a general session that included introductions of staff and observers followed by a brief review of the agenda for the three-day workshop. Panelists then moved to content area breakout rooms to receive more targeted alignment task training before starting to work. Within each breakout room, panelists were seated at grade-specific tables, with 4-5 panelists per group. One HumRRO staff member served as a facilitator in each breakout room. A third HumRRO staff member moved between the rooms and provided assistance as needed. Prior to beginning their review, panelists read and signed affidavits of nondisclosure for the secure materials they would be reviewing during the workshop.

Before each of the rating tasks, a HumRRO facilitator trained panelists on the task procedures, answered questions on the rating criteria, and conducted a short calibration activity to ensure panelists were comfortable applying ratings. HumRRO facilitators provided general suggestions and comments when appropriate; however, they emphasized to panelists that staff would not give explicit direction on how to rate standards or items because panelists were the content experts. Each panelist was assigned a workstation with rating forms already uploaded on their assigned laptop computer. HumRRO facilitators provided instructions as needed for working with the electronic rating forms.

Panelists began with DOK evaluations of the content objectives or performance expectations. Panelists started this process by independently assigning a DOK level to one objective or performance expectation and then discussing their individual ratings with the group until a consensus rating was reached. When all panelists felt comfortable with the task, groups followed a similar process in which they provided independent ratings for each objective prior to identifying a group consensus rating. A volunteer scribe within each group recorded the consensus ratings.

For the second task, panelists received specific instructions for rating the items. As a calibration activity, HumRRO facilitators asked panelists to rate the first two items individually and then discuss the ratings as a group. Once panelists were comfortable using the ratings, they continued the item rating activity individually. Panelists rated the individual items on the test forms on the following dimensions: (a) depth-of-knowledge required by the item, (b) content match to the objectives in the OAS, (c) and the degree of alignment (i.e., how well the item links to the identified objective). For the content match, panelists assigned a *primary objective* or *performance expectation* to an item based on a judgment that an item clearly measured this content, see Figure 1. Panelists could also assign an additional objective or performance expectation if the item assessed additional content than their primary selection. Again, these were individual ratings, not consensus.

	Oklahoma Alignment Item Review: Math Grade 6							
Item	Item Number	Enter Depth of Knowledge (DOK) Rating	Objective - Primary	Quality of Content Match	Secondary Objective	Explanation	Additional Objective	Explanation
		1 - Recall 2 - Skill/Concept 3 - Strategic Thinking 4 - Extended Thinking	Select the objective that best matches the content that the item measures	0 - No match 1 - Partially matched 2 - Fully matched	If the match is 0 or 1, provide a secondary objective, if appropriate.	If you list a secondary objective, state specifically what content the item measures that is NOT part of the primary objective listed.	If the match is 0 or 1, provide an additional objective, if appropriate.	If you list a secondary objective, state specifically what content the item measures that is NOT part of the primary and secondary objective listed.
Form A								
1	161493A							
2	479041							
3	148642A							
4	147412A							
5	147578A							
6	151782A							

Figure 1. Panelist item rating form.

All panelists finished their rating tasks within the 3 days allotted for the workshop. Once panelists finished the alignment tasks, they completed an overall alignment debriefing questionnaire as well as an alignment workshop process questionnaire and were dismissed.

Chapter 3: Results: English Language Arts Content Alignment

The content alignment evaluation analyses discussed in this chapter are based on panelists' ratings of the OSTP ELA items for grades 3-8 and 10. The current chapter reviews reliability results and the Webb alignment statistics for the OSTP ELA assessments.

Reliability Results

In this section, we report on the comparison of panelists' ratings of content match and depth-of-knowledge (DOK) to the item bank's documentation. In other words, do panelists assign the same objective and DOK to an item as the item writer during item development?

Panelist-Test Developer Analyses

This analysis examined the agreement outcomes between the objective and DOK assigned to an item by panelists, and the objective and DOK assigned to an item as noted in the item bank. Table 3.1 presents the average agreement outcomes between panelists and the item bank on the content and DOK assessed by items. Agreement in content was evaluated at two levels of specificity: (1) an exact match of the objective and (2) a higher-level match in the standard assigned. Similarly, DOK was also evaluated at two levels: (1) an exact match in the DOK, and (2) a matching or adjacent DOK, which means the panelist assigned a DOK that was either matching or one level above or below the DOK in the item bank. Please note, Table 3.1 only summarizes unique ratings and thus it will not equal total by form or grade reported later as some items appear on multiple forms.

Table 3.1. Mean Agreement between Panelists and Item Bank on Content and DOK

		Content		DOK	
Grade	Total Number of Items Rated by a Panelist	Exact Match	Standard Match	Exact Match	Matching or Adjacent
3	132	77.1%	85.7%	70.8%	99.8%
4	131	77.9%	92.3%	73.4%	99.8%
5	131	77.4%	88.8%	61.1%	98.9%
6	132	76.8%	92.7%	64.8%	98.9%
7	131	75.9%	93.2%	67.9%	100.0%
8	132	71.5%	88.7%	68.0%	100.0%
10	150	45.8%	68.8%	52.8%	98.8%

Note. The above results include ratings for items identified as replacement items in the testmap. These items are removed from all further analyses as they do not contribute to student scores.

As Table 3.1 indicates, panelists reviewing grade 3-8 items were fairly consistent with the item bank in identifying the content of items. Panelists identified an exact match for 72-78% of the items and a content match at the standard level for 86-93% of the items. Panelists reviewing the grade 10 items were a less consistent, with 46% of the items assigned objectives that matched those in the item bank and 69% assigned matching standards. Based on discussion during the workshop, the grade 10 panelists felt that the grade level standards were broad and created to overlap. They had a number of discussions during the alignment study about content coverage and agreed that a number of items could fit within multiple objectives and even within different standards. Overall these findings suggest that the majority of ELA items do measure the intended content.

Across all grades, the panelists' ratings of DOK were fairly consistent with the item bank. On average, panelists assigned 53-73% of the items DOK levels that matched those in the item bank. The DOKs that did not match those in the item bank were generally found to be a level above or below that provided in the item bank. In general, these results suggest that the majority of ELA items are at the intended cognitive complexity. In addition, any difference in interpretation of DOK by the panelists is accounted for through the Webb alignment methodology. Panelists provided DOK ratings for both items and objectives and thus comparison of the two sets of DOKs helps attenuate any subjectivity that may have been introduced into the ratings.

Webb Alignment Results

In this section, we review the general outcomes of item analyses for ELA on the four Webb alignment indicators. The alignment indicators are all generally calculated in a similar manner. First, mean ratings for a particular indicator are calculated for each panelist based on item ratings. Next, the panelists' mean ratings for the indicator are averaged to provide the final measure of the indicator, a measure which represents the mean alignment indicator across panelists. For ELA, the results are presented at the standard level. In this way the results evaluate the alignment of the OSTP ELA assessment by standard assessed.

Categorical Concurrence

Categorical concurrence describes the extent to which the OSTP items, regardless of item type and point value, cover the Oklahoma Academic Standards. Webb (1997, 1999, 2005) recommends a minimum of six test questions to adequately assess each grade level standard. This criterion serves as a guideline for reasonable content coverage based on earlier research on the reliability of tests based on the number of items included (Subkoviak, 1988). Table 3.2 summarizes the OSTP alignment results for categorical concurrence for each grade level at the standard level. Results that do not meet the criterion are presented in bold and highlighted in light blue.

Table 3.2. Summary of Categorical Concurrence Results for OSTP ELA

		Mean Number of Items per Standard					
Grade	Form	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research	Standards with at Least Six Items
3	A	17.30	8.50	11.50	6.00	**5.10**	4 of 5
	B	15.50	9.60	11.80	6.00	**5.30**	4 of 5
	C	15.30	10.10	11.40	6.00	6.00	5 of 5
4	A	17.30	8.90	12.00	**5.80**	6.00	4 of 5
	B	14.90	11.10	12.20	6.00	**5.80**	4 of 5
	C	18.30	8.90	12.00	**4.80**	6.00	4 of 5
5	A	16.70	11.20	10.20	**5.90**	**3.60**	3 of 5
	B	16.60	11.40	10.40	**5.60**	**3.20**	3 of 5
	C	15.80	13.20	10.00	6.00	**4.20**	4 of 5

(continued)

Table 3.2. Summary of Categorical Concurrence Results for OSTP ELA (continued)

		Mean Number of Items per Standard					
Grade	Form	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research	Standards with at Least Six Items
6	A	15.75	11.50	10.75	6.00	**5.63**	4 of 5
	B	16.25	11.00	10.50	6.00	**5.75**	4 of 5
	C	16.50	10.75	11.13	6.00	**5.00**	4 of 5
7	A	15.00	13.50	7.50	6.00	7.63	5 of 5
	B	16.25	12.25	7.50	6.00	7.63	5 of 5
	C	14.25	14.25	7.50	6.00	7.63	5 of 5
8	A	11.25	16.00	7.00	7.00	7.13	5 of 5
	B	13.25	15.13	7.50	7.00	6.13	5 of 5
	C	12.00	14.25	8.75	7.25	6.75	5 of 5
10	A	19.21	19.13	9.00	7.66	**4.00**	4 of 5
	B	16.38	19.25	7.50	9.79	**4.75**	4 of 5
	C	18.75	18.29	8.50	7.88	**5.38**	4 of 5
Standards with at Least Six Items							89 of 105

As Table 3.2 indicates, all of the grade 7 and 8 forms met the criterion for categorical concurrence. The forms for grades 3-6 and 10 generally fell just below the criterion for one of the five standards. For these forms, only 3.2-5.9 items were aligned by panelists to the Language or Research standard. Only two grade 5 form failed to meet the criterion for both the Language and Research standards. These results suggest that most standards were adequately assessed by the forms.

In addition to identifying the content assessed by each item, we asked panelists to indicate *how well* the item assessed the content. Panelists subjectively rated the quality of content match on a 3-point scale ranging from 'no match' to 'fully matched'. Table 3.3 presents the mean percent of items (across panelists) at each level of alignment.

Table 3.3. Panelist Overall Item Alignment Ratings on ELA

Grade	Test Form	No Match	Partially Matched	Fully Matched
3	A	0.00%	6.40%	93.60%
	B	0.00%	6.40%	93.60%
	C	0.00%	4.80%	95.20%
4	A	0.00%	3.20%	96.80%
	B	0.00%	2.80%	97.20%
	C	0.00%	2.40%	97.60%
5	A	0.00%	0.80%	99.20%
	B	0.00%	0.80%	99.20%
	C	0.00%	1.20%	98.80%

(continued)

Table 3.3. Panelist Overall Item Alignment Ratings on ELA (continued)

Grade	Test Form	No Match	Partially Matched	Fully Matched
6	A	0.00%	1.50%	98.50%
	B	0.00%	2.00%	98.00%
	C	0.00%	2.50%	97.50%
7	A	0.00%	1.00%	99.00%
	B	0.00%	1.00%	99.00%
	C	0.00%	0.50%	99.50%
8	A	0.00%	7.50%	92.50%
	B	0.00%	6.00%	94.00%
	C	0.00%	5.00%	95.00%
10	A	0.00%	12.92%	87.08%
	B	0.42%	15.88%	83.70%
	C	0.42%	17.08%	82.50%

For each grade level, panelists found the items to be well aligned to the objectives they assigned. In grades 3-8, 94-99% of the 50 items on a form were rated by panelists as being 'Fully Matched'. The remaining 1%-6% of items were found to be 'Partially Matched'. The grade 10 forms had slightly lower ratings of content match with 83%-87% of the 60 items on the forms evaluated by panelists as 'Fully Matched' and 13%-17% identified as 'Partially Matched'.

Panelist comments indicate that in grade 10 there are several items identified by at least two of the panelists that ask students to answer content that is not found in the objectives or that are addressed in more than one objective. For example, panelists identified: (1) four items that involve modes of writing or genre, (2) five items that involve students' own writing or work, (3) five items that involve grammar or usage mechanics, and (4) three items involving making inferences. Across all of the grades and forms, no specific items were identified by the majority of panelists as not matching any objective.

Depth-of-Knowledge Consistency

The *depth-of-knowledge (DOK) consistency* indicator evaluates the type of cognitive processing required of students to correctly answer an item compared to the processing required to master an objective. In general, it is expected that the DOK requirements implied by the objectives are matched by the assessment items. Webb's (1997) suggested criterion for this alignment indicator is that at least 50% of the items should have complexity ratings at or above the level of the corresponding objective.

To evaluate the DOK consistency between items and standards, panelists were asked to assign DOKs to the ELA objectives and the items separately. Panelists used a rating scale (adapted from Webb, 2005) with four levels of cognitive complexity to make their ratings.

- Level 1 Recognition – simple recall of information (i.e., facts, terms); sequencing; more automatic.
- Level 2 Skills/Concepts – beyond habitual response; applying concepts; problem-solving.

- Level 3 Strategic Thinking – requires basic reasoning, planning, or use of evidence; generating hypotheses.
- Level 4 Extended Thinking – complex reasoning; evaluation of multiple sources or independent pieces of evidence; often over an extended period of time.

Table 3.4 summarizes the percentage of items with complexity ratings at or above the corresponding objective based on panelists' ratings. Because panelists evaluated the DOK at the most specific level of the ELA standards document (objectives), the table refers to consistency in DOK between the items and the objectives to which they were matched. Results are summarized at the standard level for ease of presentation. The percentages of standards that did not reach the 50% criterion are bolded and highlighted in light blue.

Table 3.4. Summary of Depth-of-Knowledge Results for OSTP ELA

		% of Items at or above the complexity of the standard					
Grade	Form	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research	Number of Standards Assessed Adequately
3	A	89.56%	**49.62%**	79.31%	**46.67%**	**22.30%**	2 of 5
	B	92.21%	**34.67%**	87.42%	**46.67%**	**35.82%**	2 of 5
	C	94.84%	**49.88%**	80.28%	83.33%	**22.38%**	3 of 5
4	A	87.42%	**46.20%**	70.00%	72.67%	50.00%	4 of 5
	B	81.13%	52.74%	78.97%	66.67%	51.33%	5 of 5
	C	83.68%	55.05%	71.67%	75.00%	**26.67%**	4 of 5
5	A	72.48%	71.05%	60.36%	76.67%	100.00%	5 of 5
	B	83.33%	68.45%	75.45%	96.67%	93.33%	5 of 5
	C	88.61%	63.07%	60.00%	90.00%	73.00%	5 of 5
6	A	92.16%	53.54%	95.00%	95.83%	**13.89%**	4 of 5
	B	87.29%	**33.66%**	92.50%	87.50%	**24.40%**	3 of 5
	C	85.15%	**44.99%**	97.50%	83.33%	**12.14%**	3 of 5
7	A	96.15%	**38.33%**	100.00%	95.83%	**3.13%**	3 of 5
	B	88.53%	**16.59%**	100.00%	100.00%	**13.22%**	3 of 5
	C	82.21%	**28.45%**	100.00%	100.00%	**3.13%**	3 of 5
8	A	61.50%	**17.91%**	100.00%	96.43%	**4.55%**	3 of 5
	B	70.02%	**10.30%**	100.00%	100.00%	**3.57%**	3 of 5
	C	56.73%	**13.32%**	100.00%	92.86%	**7.14%**	3 of 5
10	A	**32.21%**	**27.61%**	79.38%	63.43%	**0.00%**	2 of 5
	B	**32.14%**	**16.93%**	83.73%	86.91%	**21.67%**	2 of 5
	C	**35.87%**	**20.08%**	79.51%	88.89%	**33.33%**	2 of 5
Standards Assessed Adequately							69 of 105

As displayed in Table 3.4, a number of the standards, across the grades and forms, did not meet the DOK criterion. Only the forms in grade 4 and 5 met the criterion for all but one of the standards. Across the other grades, the forms generally failed to meet the criterion on the Critical Reading and Writing standard and the Research standard. In addition, the grade 3 forms tended

to not meet the criterion on the Language standard and the grade 10 forms failed to meet the criterion on the Reading and Writing Process standard.

In order to further understand why some grades and forms did not meet the DOK criterion for particular standards, we examined the cognitive complexity levels of the grade level objectives. Since the objectives are the base point of comparison for this statistic, examination of their DOK distribution will help identify the necessary DOK level of items in order to meet this criterion. For example, if the DOK levels of objectives within a standard are all level 3, then the majority of items would need to be at a level 3 for Webb's cognitive complexity criterion to be met. Thus the distribution of item DOKs may need to be different by standard in order to satisfy Webb's criterion. Table 3.5 presents the distribution of the DOK ratings that panelists assigned to the objectives, presented by corresponding standard. The DOK distribution for grade level standards that did not meet the cognitive complexity criterion (for at least one form) are bolded and highlighted in light blue.

Table 3.5. Summary of Depth-of-Knowledge Ratings for ELA Objectives

Grade	DOK Level	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research
3	DOK 1	15.4%	**0.0%**	14.3%	**77.8%**	**14.3%**
	DOK 2	69.2%	**50.0%**	71.4%	**22.2%**	**71.4%**
	DOK 3	15.4%	**50.0%**	14.3%	**0.0%**	**0.0%**
	DOK 4	0.0%	**0.0%**	0.0%	**0.0%**	**14.3%**
	Total Objective N	*13*	*10*	*7*	*9*	*7*
4	DOK 1	16.7%	**20.0%**	14.3%	66.7%	**0.0%**
	DOK 2	58.3%	**30.0%**	71.4%	33.3%	**50.0%**
	DOK 3	25.0%	**50.0%**	14.3%	0.0%	**16.7%**
	DOK 4	0.0%	**0.0%**	0.0%	0.0%	**33.3%**
	Total Objective N	*12*	*10*	*7*	*9*	*6*
5	DOK 1	0.0%	9.1%	14.3%	75.0%	0.0%
	DOK 2	62.5%	18.2%	85.7%	25.0%	42.9%
	DOK 3	37.5%	63.6%	0.0%	0.0%	14.3%
	DOK 4	0.0%	9.1%	0.0%	0.0%	42.9%
	Total Objective N	*8*	*11*	*7*	*8*	*7*
6	DOK 1	12.5%	**0.0%**	57.1%	37.5%	**0.0%**
	DOK 2	50.0%	**0.0%**	42.9%	62.5%	**42.9%**
	DOK 3	37.5%	**90.9%**	0.0%	0.0%	**14.3%**
	DOK 4	0.0%	**9.1%**	0.0%	0.0%	**42.9%**
	Total Objective N	*8*	*11*	*7*	*8*	*7*
7	DOK 1	12.5%	**0.0%**	57.1%	71.4%	**0.0%**
	DOK 2	50.0%	**9.1%**	42.9%	28.6%	**14.3%**
	DOK 3	37.5%	**81.8%**	0.0%	0.0%	**42.9%**
	DOK 4	0.0%	**9.1%**	0.0%	0.0%	**42.9%**
	Total Objective N	*8*	*11*	*7*	*7*	*7*

(continued)

Table 3.5. Summary of Depth-of-Knowledge Ratings for ELA Objectives (continued)

Grade	DOK Level	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research
8	DOK 1	12.5%	**0.0%**	57.1%	33.3%	**0.0%**
	DOK 2	37.5%	**0.0%**	42.9%	66.7%	**14.3%**
	DOK 3	50.0%	**72.7%**	0.0%	0.0%	**42.9%**
	DOK 4	0.0%	**27.3%**	0.0%	0.0%	**42.9%**
	Total Objective N	*8*	*11*	*7*	*9*	*7*
10	DOK 1	**14.3%**	**0.0%**	28.6%	50.0%	**0.0%**
	DOK 2	**14.3%**	**7.7%**	42.9%	25.0%	**0.0%**
	DOK 3	**57.1%**	**38.5%**	28.6%	25.0%	**42.9%**
	DOK 4	**14.3%**	**53.9%**	0.0%	0.0%	**57.1%**
	Total Objective N	*7*	*13*	*7*	*4*	*7*

As displayed in Table 3.5, the standards that did not meet the cognitive complexity criterion were generally composed of objectives with higher cognitive complexity. Among the grade 4-10 standards that did not meet the criterion, at least 50% of the objectives were assigned cognitive complexities of 3 or 4. It can be very difficult to write multiple-choice items that target a DOK level of 4 and such items may be less appropriate for younger students.

Although it may not be possible or advisable to completely satisfy Webb's cognitive complexity criterion for each standard across the test forms, there are a few things OSDE may consider to improve the alignment. First, OSDE might review the language of the objectives to determine if it is sufficiently specific to allow educators to determine the cognitive complexity at which the content is intended to be taught and learned. Vague or broad objectives may lead educators (and panelists) to assume a higher cognitive complexity level than intended. Second, OSDE could review the objectives across the grades to determine if any would be better assessed at a local level, particularly those that are of higher cognitive complexity. Teachers are better equipped to assess such objectives through use of projects, reports, or other extended assessment events. Third, OSDE may consider reviewing their item bank to evaluate whether there are items that assess higher cognitive complexity levels within the standards flagged above. If there are not many items at these levels, OSDE may consider creating new items or revising old items to target those complexity levels. Finally, OSDE may consider adding DOK targets to the test blueprint to take cognitive complexity into consideration during form construction.

Range-of-knowledge Correspondence

The *range-of-knowledge correspondence* measure examines in greater detail the breadth of knowledge covered by the assessment. In addition to evaluating which standards are assessed, we must look at how many of the objectives within a standard are represented by items. Each objective should be linked with at least one item. Webb's (1997) minimum level of acceptability for range-of-knowledge correspondence is that at least 50% of objectives per standard should link with items. Table 3.6 summarizes the range-of-knowledge results for each grade level OSTP ELA test form. The results for standards that do not meet Webb's indicator criterion for the initial objectives'[1] percentages are presented first and are in bold with light blue highlighting. The

[1] The initial objectives are based on the number of objectives in the test blueprint and standard documents, with the exception of the Grade 3 and 4 speaking and listening objectives within the tested ELA Standard 2. They were removed per OSDE because those objectives are not included in the test specifications.

reduced objectives' percentages are based on the number of objectives identified by OSDE as being tested by multiple choice items on the OSTP. The reduced list was provided to HumRRO by OSDE with two reasons for exclusion of the objectives from analysis: (1) "The content standard is best measured by constructed response items" and (2) "…there are no items assessing this content standard on the Oklahoma State Testing Program" (C. Walker, personal communication, 28 February 2017). See Appendix F, Reduce Objectives by Content Standard, for a complete list.

Table 3.6. Summary of Range-of-Knowledge Results for OSTP ELA

		Percentage of Initial and Reduced Objectives per Standard[a]					
Grade	Form	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research	Initial/Reduced No. of Standards Assessed Adequately
3	A	**42.9**/100.0	50.0/71.4	57.1/80.0	**44.4/44.4**	**14.3/25.0**	2/3 of 5
	B	**42.9**/100.0	50.0/71.4	**28.6/40.4**	**44.4/44.4**	**28.6**/50.0	1/3 of 5
	C	**42.9**/100.0	**40.0**/57.1	**42.9**/60.0	55.6/55.6	**42.9**/75.0	1/5 of 5
4	A	**50.0**/100.0	50.0/71.4	57.1/80.0	**22.2/22.2**	50.0/100.0	4/4 of 5
	B	**50.0**/100.0	50.0/71.4	57.1/80.0	**33.3/33.3**	50.0/100.0	4/4 of 5
	C	**62.5**/100.0	50.0/71.4	57.1/80.0	**22.2/22.2**	66.7/100.0	4/4 of 5
5	A	**37.5**/100.0	**45.5**/71.4	**42.9**/60.0	50.0/50.0	**14.3/33.3**	1/4 of 5
	B	**37.5**/100.0	**45.5**/71.4	**28.6/40.0**	50.0/50.0	**14.3/33.3**	1/3 of 5
	C	**37.5**/100.0	54.6/85.7	**42.9**/60.0	50.0/50.0	**28.6**/66.7	2/5 of 5
6	A	**37.5**/100.0	**36.4**/57.1	**28.6/40.0**	**37.5/37.5**	**28.6**/66.7	0/3 of 5
	B	**37.5**/100.0	**36.4**/57.1	**28.6/40.0**	62.5/62.5	**28.6**/66.7	1/4 of 5
	C	**37.5**/100.0	**36.4**/57.1	**42.9**/60.0	62.5/62.5	**14.3/33.3**	1/4 of 5
7	A	**37.5**/100.0	63.6/100.0	57.1/80.0	71.4/75.0	**14.3/33.3**	3/4 of 5
	B	50.0/100.0	**36.4**/57.1	**42.9**/60.0	**42.9**/50.0	**28.6/33.3**	1/4 of 5
	C	**37.5**/100.0	54.6/85.7	**42.9**/60.0	57.1/75.0	**28.6/33.3**	2/4 of 5
8	A	**37.5**/100.0	63.6/100.0	**28.6/40.0**	66.7/66.7	**28.6**/66.7	2/4 of 5
	B	**37.5**/100.0	54.6/85.7	**28.6/40.0**	**44.4/44.4**	**28.6**/66.7	1/3 of 5
	C	**37.5**/100.0	63.6/100.0	**42.9**/60.0	**33.3/33.3**	**28.6/33.3**	1/3 of 5
10	A	**42.9**/100.0	**46.2**/85.7	**28.6/40.0**	75.0/75.0	**14.3/25.0**	1/3 of 5
	B	**42.9**/100.0	**46.2**/85.7	**28.6/40.0**	75.0/75.0	**14.3/25.0**	1/3 of 5
	C	**42.9**/100.0	**46.2**/85.7	**42.9**/60.0	50.0/50.0	**28.6**/50.0	1/5 of 5
						Standards Assessed Adequately	35/79 of 105

[a]The percentages based on the initial objective list are presented first, followed by a slash and the percentage based on the reduced objective list. The reduced objective percentages are based on OSDE feedback removing objectives which were intentionally not assessed by the multiple choice items.

Across all grades, no forms were found to meet the range-of-knowledge criterion for all of the standards. In fact, based on the initial results, the majority of forms only met this criterion for one or two standards out of the five assessed. The results improved when the reduced set of objectives were considered, but most forms still did not meet this criterion for one or two standards. These results are not that unexpected nor uncommon. States frequently have more objectives (the lowest level of the standards) than is feasible to assess on a single end-of-year exam.

In order to further understand why forms did not meet the range-of-knowledge criterion, we examined the content coverage specified in the test blueprint. The test blueprint provides target counts for the number of items that should assess each standard on any given test form. If the target counts are relatively small in comparison to the number of objectives that are assessed, it may be difficult to meet this criterion. Table 3.7 summarizes the target counts of items and the number of objectives, by standard, for the grade 3-10 tests. Both the initial and reduced objective counts are provided.

Table 3.7. Objective and Target Item Counts for ELA

Grade	Count	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research
3	Blueprint Target Items	20	6	12	6	6
	Initial Objectives	7	10	7	9	7
	Reduced Objectives	3	7	5	9	4
4	Blueprint Target Items	16	10	12	6	6
	Initial Objectives	8	10	7	9	6
	Reduced Objectives	4	7	5	9	3
5	Blueprint Target Items	16	12	10	6	6
	Initial Objectives	8	11	7	8	7
	Reduced Objectives	3	7	5	8	3
6	Blueprint Target Items	18	10	10	6	6
	Initial Objectives	8	11	7	8	7
	Reduced Objectives	3	7	5	8	3
7	Blueprint Target Items	18	10	8	6	6
	Initial Objectives	8	11	7	7	7
	Reduced Objectives	3	7	5	4	3
8	Blueprint Target Items	14	14	8	7	7
	Initial Objectives	8	11	7	9	7
	Reduced Objectives	3	7	5	9	3
10	Blueprint Target Items	16-20	17-20	8-10	8-10	8-10
	Initial Objectives	7	13	7	4	7
	Reduced Objectives	2	7	5	4	4

Note. The initial objective counts are based on the information provided in the test blueprint and standards. The reduced objective counts are based on feedback from OSDE about objectives which were intentionally not assessed by the multiple choice items.

Across the grades, the ELA assessment evaluates between 38 to 46 objectives, using 50 to 60 items. The Language and Research standards for grades 3-8 generally have more objectives than could be assessed by the target number of items in the blueprint. Although Webb's criterion only asks for half of the objectives with in a standard to be assessed, it can still be a difficult criterion to meet if there are additional blueprint and form construction conditions that must be met (e.g., item difficulty targets, DOK targets). Although OSDE may not be able to increase the content coverage

of the test forms enough to satisfy Webb's criteria, there are still some steps they may consider. They may review their item bank to make sure most or all objectives are covered in the pool and construct new items for any objectives that are not covered. They may also review the objectives that are assessed in each grade level to see if any of them may be better assessed at a local level.

Balance of knowledge Representation

The fourth measure of alignment included in the Webb (1997) method is *balance of knowledge representation*. This measure describes the distribution of items linked to each objective within each standard. The number of items should be distributed rather evenly between the objectives to achieve good balance.

The content balance is determined by calculating an index, or score, for each standard[2]. According to Webb (1997), the minimum acceptable index for a single content strand is 70 (on a scale of 0 to 100, with 100 representing perfect balance). An index of 70 or higher suggests that items broadly assess the objectives for a standard instead of clustering around one or two objectives.

Two cautions should be noted regarding the balance index when interpreting the results. First, only those objectives actually matched to items by the panelists are included in calculations of the balance index. A given standard may include more objectives than are actually linked to items by panelists. For example, if a particular standard includes eight objectives in the state content standards document but panelists found items matching to just three objectives, only these three objectives are evaluated for item distribution. Recognizing this feature of the balance index is important in cases when the range measure and balance measure produce seemingly contrasting results. And second, when states choose to emphasize particular content objectives over others, the balance statistic becomes uninterpretable.

Table 3.8 summarizes the results on balance-of-content representation per grade for the OSTP ELA tests. The standards that did not meet Webb's (1997) indicator criterion are in bold and highlighted in light blue. In general, the forms in grades 3, 4, and 5 surpassed the minimum level of acceptability (index of 70) for demonstrating good content balance for each standard. One to two forms in grades 6-8 and 10 did not meet the criterion for one of the five standards assessed. In each case, the balance statistic was not far below the criterion. Overall, these results suggest the OSTP ELA assessment has good balance of knowledge among the objectives that are assessed.

[2]The exact formula for calculating the balance index is explained in detail in Webb's (2005) alignment training manual: http://www.wcer.wisc.edu/WAT/index.aspx.

Table 3.8. Summary of Balance of knowledge Representation Results OSTP ELA

		Balance Index per Standard					
Grade	Form	Reading and Writing Process	Critical Reading and Writing	Vocabulary	Language	Research	Number of Standards with Adequate Balance
3	A	87.16	73.01	81.30	75.00	100.00	5 of 5
	B	92.52	75.42	78.97	76.72	73.26	5 of 5
	C	86.39	71.74	80.65	90.00	91.95	5 of 5
4	A	74.13	77.50	74.17	85.71	85.19	5 of 5
	B	78.02	84.81	76.23	90.80	96.30	5 of 5
	C	72.24	77.21	81.36	91.67	83.33	5 of 5
5	A	94.38	77.25	90.20	96.43	100.00	5 of 5
	B	94.38	75.77	94.58	96.43	100.00	5 of 5
	C	85.65	78.79	91.41	95.45	73.81	5 of 5
6	A	84.13	90.48	89.53	86.27	70.51	5 of 5
	B	84.10	82.56	71.95	96.19	77.27	5 of 5
	C	80.30	88.95	**55.28**	96.19	100.00	4 of 5
7	A	86.67	82.63	76.67	100.00	100.00	5 of 5
	B	82.31	96.74	80.00	90.48	**63.11**	4 of 5
	C	87.72	87.18	93.33	88.10	**68.87**	4 of 5
8	A	89.39	78.79	**68.52**	93.59	72.64	4 of 5
	B	94.97	81.62	83.33	83.33	79.27	5 of 5
	C	87.50	82.14	86.67	88.89	84.78	5 of 5
10	A	76.21	74.94	**68.18**	90.40	100.00	4 of 5
	B	72.77	76.85	75.00	92.36	100.00	5 of 5
	C	76.67	77.60	**67.20**	91.51	81.25	4 of 5
Standards Assessed Adequately							99 of 105

Summary and Discussion on Webb Alignment Indicators

The overall alignment results provide overall support for the content validity of the OSTP ELA tests. Summary alignment judgments are based on Webb (2005). These summary judgments focus on the percentage of content standards represented well by the assessment. Webb outlined a scale with a range of potential alignment outcomes applied to each of the four indicators:

- Fully aligned – assessments align to all standards (91%–100%),
- Highly aligned – assessments align to the majority of standards (70%–90%),
- Partially aligned – assessments align well to some standards (50%–69%),
- Weakly aligned – assessments align to less than half the standards (below 50%).

Webb's (1997) alignment method does not allow for a *single* judgment of overall alignment across the four alignment indicators. However, one can get a sense of overall alignment between the assessments and standards by looking at all of the alignment indicators together.

Table 3.9 presents the summary alignment outcomes for the OSTP ELA tests based on the above scale. The table includes a summary judgment for each Webb alignment indicator per grade level based on the percentage of standards that met the minimum alignment criteria.

Table 3.9. Summary Alignment Outcomes on Each Webb Criterion by Grade for OSTP ELA

	Percentage of Standards that Met Webb Criteria				
Grade	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence[a]		Balance of knowledge Representation
			Initial Objectives	Reduced Objectives	
3	Highly aligned (86.7%)	Weakly aligned (46.7%)	Weakly aligned (26.7%)	Highly aligned (73.3%)	Fully aligned (100%)
4	Highly aligned (80.0%)	Highly aligned (86.7%)	Highly aligned (80.0%)	Highly aligned (80.0%)	Fully aligned (100%)
5	Partially aligned (66.7%)	Fully aligned (100%)	Weakly aligned (26.7%)	Highly aligned (80.0%)	Fully aligned (100%)
6	Highly aligned (80.0%)	Partially aligned (66.7%)	Weakly aligned (13.3%)	Highly aligned (73.3%)	Fully aligned (93.3%)
7	Fully aligned (100%)	Partially aligned (60.0%)	Weakly aligned (40.0%)	Highly aligned (80.0%)	Highly aligned (86.7%)
8	Fully aligned (100%)	Partially aligned (60.0%)	Weakly aligned (26.7%)	Partially aligned (66.7%)	Fully aligned (93.3%)
10	Highly aligned (80.0%)	Weakly aligned (40.0%)	Weakly aligned (20.0%)	Highly aligned (73.3%)	Highly aligned (86.7%)

Note. Fully Aligned and Highly Aligned indicators are in green as both indicate strong alignment.
[a]The initial objective counts are based on the information provided in the test blueprint and standards. The reduced objective counts are based on feedback from OSDE about objectives which were intentionally not assessed.

As shown in Table 3.9, nearly all grade level ELA assessments were highly to fully aligned on the categorical concurrence criterion and balance of knowledge representation criteria. Only the grade 5 forms did not meet the categorical concurrence criterion for more than 30% of the standards. In these cases, the standards generally fell just below the criterion of having 6 items aligned to each standard.

The majority of grade levels exhibited partial to weak DOK consistency. In general, many of the ELA objectives targeted higher cognitive complexity levels than the items used to assess them on a number of standards. An examination of the grade level objectives found that this tended to occur in instances where the majority of objectives for a standard targeted the higher cognitive complexity levels of 3 and 4. Although it may not be possible or advisable to completely satisfy Webb's cognitive complexity criterion for the assessments, there are a few things OSDE may consider to improve the alignment. First, OSDE might review the language of the objectives to determine if it is sufficiently specific to allow educators to determine the cognitive complexity at which the content is intended to be taught and learned. Vague or broad objectives may lead educators (and panelists) to assume a higher cognitive complexity level than intended. Second, OSDE could review the objectives across the grades to determine if any would be better assessed at a local level, particularly those that are of higher cognitive complexity. Teachers are better equipped to assess such objectives through use of projects, reports, or other extended assessment events. Third, OSDE may consider reviewing their item bank to evaluate whether there are items that assess higher cognitive complexity levels within the standards flagged above. If there are not many items at these levels, OSDE may consider creating new items or revising old items to target those complexity levels. Finally, OSDE may consider adding DOK targets to the test blueprint to take cognitive complexity into consideration during form construction.

The majority of the grade levels also exhibited weak range-of-knowledge correspondence based on the initial objective list. The majority of the standards on a test form generally were assessed by items that covered less than half of the content within the standard. Examination of the test blueprint and the number of objectives suggest that there may be too many objectives to sufficiently capture the breadth in the standards using the current target item counts specified in the blueprint. Although OSDE may not be able to increase the content coverage of the test forms enough to satisfy Webb's criteria, there are still some steps they may consider. They may review their item bank to make sure most or all objectives are covered in the pool and construct new items for any objectives that are not covered. They may also review the objectives that are assessed in each grade level to see if any of them may be better assessed at a local level.

Finally, the range-of-knowledge results improved when the reduced objective list, provided by OSDE, were included in the analysis. OSDE may consider reviewing their testing documentation to make it more explicit which objectives are assessed by the grade-level assessments.

Chapter 4: Results: Mathematics Content Alignment

The content alignment evaluation analyses discussed in this chapter are based on panelists' ratings of the OSTP mathematics items for grades 3-8, and 10. The current chapter reviews reliability results and the Webb alignment statistics for the OSTP mathematics assessments.

Reliability Results

In this section, we report on the comparison of panelists' ratings of content match and depth-of-knowledge (DOK) to the item bank's documentation. In other words, do panelists assign the same objective and DOK to an item as the item writer during item development?

Panelist-Test Developer Analyses

This analysis examined the agreement outcomes between the objective and DOK assigned to an item by panelists, and the objective and DOK assigned to an item as noted in the item bank. Table 4.1 presents the average agreement outcomes between panelists and the item bank on the content and DOK assessed by items. Agreement in content was evaluated at two levels of specificity: (1) an exact match of the objective and (2) a higher-level match in the strand assigned. Similarly, DOK was also evaluated at two levels: (1) an exact match in the DOK, and (2) a matching or adjacent DOK, which means the panelist assigned a DOK that was either matching or one level above or below the DOK in the item bank. Please note, Table 4.1 only summarizes unique ratings and thus it will not equal total by form or grade reported later as some items appear on multiple forms.

Table 4.1. Mean Agreement between Panelists and Item Bank on Content and DOK

		Content		DOK	
Grade	Total Number of Items Rated by a Panelist	Exact Match	Strand Match	Exact Match	Matching or Adjacent
3	137	76.1%	95.5%	63.6%	98.7%
4	141	77.0%	93.8%	56.9%	97.3%
5	140	80.9%	96.3%	55.3%	96.7%
6	138	63.3%	94.5%	43.9%	95.9%
7	137	63.4%	84.9%	47.6%	96.8%
8	137	52.6%	96.4%	45.3%	96.6%
10	154	70.3%	84.0%	58.0%	98.9%

Note. The above results include ratings for items identified as replacement items in the testmap. These items are removed from all further analyses as they do not contribute to student scores.

As Table 4.1 indicates, panelists were moderately consistent with the item bank in identifying the content codes of items. Panelists identified an exact match for 53-81% of the items and a content match at the strand level for 84-96% of the items. Overall these findings suggest that the majority of mathematics items do measure the intended content.

The panelists' ratings of DOK were also fairly consistent with those cataloged in the item bank. On average, panelists assigned 44-64% of the items DOK levels that matched those in the item bank. The DOKs that did not match were generally found to be one level above or below those documented in the item bank. The Webb alignment methodology accounts for any difference in interpretation of DOK by the panelists because panelists provide DOK ratings for both items and

performance expectations. Thus comparison of the two sets of DOKs takes into account any subjectivity that may have been introduced into the ratings.

Webb Alignment Results

In this section, we review the general outcomes of item analyses for mathematics on the four Webb (1997) alignment indicators. The alignment indicators are all generally calculated in a similar manner. First, mean ratings for a particular indicator are calculated for each panelist based on item ratings. Next, the panelists' mean ratings for the indicator are averaged to provide the final measure of the indicator, a measure which represents the mean alignment indicator across panelists. For mathematics, the results are presented at the strand level. In this way the results evaluate the alignment of the OSTP mathematics assessment by strand assessed.

Categorical Concurrence

Categorical concurrence describes the extent to which the OSTP items, regardless of item type and point value, cover the Oklahoma Academic Standards. Webb (1997, 1999, 2005) recommends a minimum of six test questions to adequately assess each grade level strand. This criterion serves as a guideline for reasonable content coverage based on earlier research on the reliability of tests based on the number of items included (Subkoviak, 1988). Table 4.2 summarizes the OSTP alignment results for categorical concurrence for each grade level at the strand level. Results that do not meet the criterion are presented in bold and highlighted in light blue.

Table 4.2. Summary of Categorical Concurrence Results for OSTP Mathematics

		Mean Number of Items per Strand					
Grade	Form	Number and Operations	Algebraic Reasoning and Algebra	Data and Probability	Geometry and Measurement[a]	Functions[b]	Strands with at Least Six Items
3	A	23.10	6.00	6.80	14.10	--	4 of 4
	B	22.40	6.60	7.00	13.60	--	4 of 4
	C	22.60	7.30	6.30	13.60	--	4 of 4
4	A	22.00	8.40	6.00	13.40	--	4 of 4
	B	20.70	9.70	6.00	13.60	--	4 of 4
	C	22.20	8.00	6.40	13.40	--	4 of 4
5	A	22.40	9.30	**5.70**	12.40	--	**3 of 4**
	B	22.60	9.40	6.00	12.00	--	4 of 4
	C	23.60	8.70	6.00	11.70	--	4 of 4
6	A	20.20	10.40	7.00	12.40	--	4 of 4
	B	19.80	11.60	7.00	11.60	--	4 of 4
	C	19.60	11.20	7.20	12.00	--	4 of 4
7	A	9.00	15.20	10.00	15.60	--	4 of 4
	B	10.40	13.60	10.20	15.60	--	4 of 4
	C	8.70	16.10	9.60	15.40	--	4 of 4

(continued)

Table 4.2. Summary of Categorical Concurrence Results for OSTP Mathematics (continued)

		Mean Number of Items per Strand					
Grade	Form	Number and Operations	Algebraic Reasoning and Algebra	Data and Probability	Geometry and Measurement[a]	Functions[b]	Strands with at Least Six Items
8	A	8.80	21.80	8.20	11.00	--	4 of 4
	B	8.60	22.00	8.00	11.40	--	4 of 4
	C	8.80	22.20	7.80	11.20	--	4 of 4
10	A	**5.75**	20.75	6.00	6.75	18.75	**4 of 5**
	B	**4.50**	25.25	6.00	6.25	15.25	**4 of 5**
	C	**5.25**	22.25	6.00	8.50	14.50	**4 of 5**
						Strands with at Least Six Items	83 of 87

[a]In grade 10 this strand only includes Geometry. [b]The Functions strand is only assessed in grade 10.

As Table 4.2 indicates, the mathematics assessments met the categorical concurrence criterion for nearly all test forms. Across the grades, only one grade 5 form and three grade 10 forms did not meet the criterion for one of the strands assessed. In each instance, the number of items fell just below 6 items with an average of 4.5 to 5.8 items aligned to each. In grade 10, this occurred on the same strand for each form, the Number and Operations strand. Overall, these results indicate that the OSTP mathematics test adequately covers the mathematics strands that students are expected to know at grades 3-8, and 10.

In addition to identifying the content assessed by each item, we asked panelists to indicate how well the item assessed the content. Panelists subjectively rated the quality of content match on a 3-point scale ranging from 'no match' to 'fully matched'. Table 4.3 presents the mean percent of items (across panelists) at each level of alignment.

Table 4.3. Panelist Overall Item Alignment Ratings on Mathematics

Grade	Test Form	No Match	Partially Matched	Fully Matched
3	A	0.00%	2.80%	97.20%
	B	0.00%	3.60%	96.40%
	C	0.00%	2.40%	97.60%
4	A	0.00%	8.40%	91.60%
	B	0.00%	2.80%	97.20%
	C	0.00%	3.20%	96.80%
5	A	0.00%	4.40%	95.60%
	B	0.00%	4.40%	95.60%
	C	0.00%	5.60%	94.40%
6	A	0.00%	4.00%	96.00%
	B	0.00%	2.40%	97.60%
	C	0.00%	4.00%	96.00%

(continued)

Table 4.3. Panelist Overall Item Alignment Ratings on Mathematics (continued)

Grade	Test Form	No Match	Partially Matched	Fully Matched
7	A	0.00%	0.80%	99.20%
	B	0.00%	0.40%	99.60%
	C	0.00%	1.20%	98.80%
8	A	0.00%	0.00%	100.00%
	B	0.00%	1.20%	98.80%
	C	0.00%	0.80%	99.20%
10	A	0.42%	7.92%	91.67%
	B	0.00%	3.75%	96.25%
	C	0.00%	3.79%	96.21%

In general, panelists found the items to be well aligned to the objectives they had assigned. Across the grades and forms, 92-100% of the items were rated by panelists as 'Fully Matched' to the aligned objective. The remaining items were generally found to be 'Partially Matched'. Across all of the grades and forms, no specific items were identified by the majority of panelists as not matched.

Depth-of-Knowledge Consistency

The *depth-of-knowledge* (DOK) *consistency* indicator evaluates the type of cognitive processing required of students to correctly answer an item compared to the processing required to master an objective. In general, it is expected that the DOK requirements implied by the objectives are matched by the assessment items. Webb's (1997) suggested criterion for this alignment indicator is that at least 50% of the items should have complexity ratings at or above the level of the corresponding objective.

To evaluate the DOK consistency between items and objectives, panelists were asked to assign DOKs to the mathematics objectives and the items separately. Panelists used a rating scale (adapted from Webb, 2005) with four levels of cognitive complexity to make their ratings.

- Level 1 Recognition – simple recall of information (i.e., facts, terms); sequencing; more automatic.
- Level 2 Skills/Concepts – beyond habitual response; applying concepts; problem-solving.
- Level 3 Strategic Thinking – requires basic reasoning, planning, or use of evidence; generating hypotheses.
- Level 4 Extended Thinking – complex reasoning; evaluation of multiple sources or independent pieces of evidence; often over an extended period of time.

Table 4.4 presents the percentage of items with complexity ratings at or above the corresponding objective based on panelists' ratings. Because panelists evaluated the DOK at the most specific level of the standards document (objectives), the table refers to consistency in DOK between the items and the objectives to which they were matched. Results are summarized at the strand level for ease of presentation. Results for strands that did not reach the 50% criterion are bolded and highlighted in light blue.

Table 4.4. Summary of Depth-of-Knowledge Results for OSTP Mathematics

		Percentage of Items per Strand					
Grade	Form	Number and Operations	Algebraic Reasoning and Algebra	Data and Probability	Geometry and Measurement[a]	Functions[b]	Number of Strands Assessed Adequately
3	A	87.09%	50.48%	92.50%	87.19%	--	4 of 4
	B	82.15%	57.14%	82.99%	82.20%	--	4 of 4
	C	89.46%	58.63%	93.59%	84.00%	--	4 of 4
4	A	73.68%	72.68%	80.00%	85.23%	--	4 of 4
	B	73.26%	71.00%	66.67%	80.84%	--	4 of 4
	C	65.01%	77.40%	70.83%	71.59%	--	4 of 4
5	A	63.84%	71.57%	85.38%	**37.44%**	--	**3 of 4**
	B	63.46%	70.67%	100.00%	**35.00%**	--	**3 of 4**
	C	73.63%	65.44%	96.67%	**45.47%**	--	**3 of 4**
6	A	52.70%	62.19%	82.86%	79.05%	--	4 of 4
	B	**48.46%**	61.35%	65.71%	58.48%	--	**3 of 4**
	C	60.91%	60.15%	80.36%	68.33%	--	4 of 4
7	A	100.00%	69.73%	**35.76%**	71.41%	--	**3 of 4**
	B	100.00%	67.05%	**43.27%**	72.58%	--	**3 of 4**
	C	100.00%	71.91%	**41.78%**	76.58%	--	**3 of 4**
8	A	76.94%	81.33%	82.29%	**41.82%**	--	**3 of 4**
	B	65.00%	74.80%	77.29%	53.64%	--	4 of 4
	C	68.06%	76.72%	73.85%	61.97%	--	4 of 4
10	A	82.50%	54.43%	62.26%	**19.58%**	62.23%	**4 of 5**
	B	75.00%	50.63%	**29.17%**	**36.19%**	60.72%	**3 of 5**
	C	83.33%	**43.97%**	**16.67%**	**0.00%**	**44.64%**	**1 of 5**
						Strands Assessed Adequately	72 of 87

[a]In grade 10 this strand only includes Geometry. [b]The Functions strand is only assessed in grade 10.

As displayed in Table 4.4, nearly all of the grade 3, 4, 6, and 8 forms met Webb's (1997) criterion for assessing appropriate levels of cognitive complexity for each strand. The grade 5 and 7 forms generally met the criterion for all except one strand. Across these forms, the one strand that did not meet the criterion fell just below the 50% criterion with 35-45% of items at DOKs at a similar or higher level as the objective. Finally, the grade 10 forms had the largest number of strands that did not meet this criterion, with one, two, and four strands, respectively, failing to meet this criterion across forms.

In order to further understand why the grade 10 forms did not meet the DOK criterion for particular strands, we decided to examine the cognitive complexity levels of the grade level objectives. Since the objectives are the base point of comparison for the DOK consistency indicator, examination of their DOK distribution will help identify the necessary DOK level of items in order to meet this criterion. For example, if the DOK levels of objectives within a strand are all level 3, then the majority of items would need to be at a level 3 or 4 for Webb's cognitive complexity criterion to be met. Thus the distribution of item DOKs may need to be different by strand in order to satisfy Webb's criterion. Table 4.5 presents the distribution of the DOK ratings that panelists

assigned to the objectives, presented by corresponding strand. The DOK distribution for grade level strands that did not meet the cognitive complexity criterion (for at least one form) are bolded and highlighted in light blue. Results for grades 3-8 are presented as a point of comparison.

Table 4.5. Summary of Depth-of-Knowledge Ratings for Mathematics Objectives

Grade	DOK Level	Number and Operations	Algebraic Reasoning and Algebra	Data and Probability	Geometry and Measurement[a]	Functions[b]
3	DOK 1	61.1%	20.0%	0.0%	61.5%	--
	DOK 2	38.9%	80.0%	100.0%	30.8%	--
	DOK 3	0.0%	0.0%	0.0%	7.7%	--
	DOK 4	0.0%	0.0%	0.0%	0.0%	--
	Total Objective N	*18*	*5*	*2*	*13*	--
4	DOK 1	43.8%	20.0%	0.0%	50.0%	--
	DOK 2	50.0%	80.0%	100.0%	50.0%	--
	DOK 3	6.3%	0.0%	0.0%	0.0%	--
	DOK 4	0.0%	0.0%	0.0%	0.0%	--
	Total Objective N	*16*	*5*	*3*	*10*	--
5	DOK 1	41.7%	40.0%	50.0%	**30.0%**	--
	DOK 2	50.0%	60.0%	0.0%	**60.0%**	--
	DOK 3	8.3%	0.0%	50.0%	**10.0%**	--
	DOK 4	0.0%	0.0%	0.0%	**0.0%**	--
	Total Objective N	*12*	*5*	*2*	*10*	--
6	DOK 1	**29.4%**	66.7%	33.3%	45.5%	--
	DOK 2	**64.7%**	33.3%	33.3%	54.5%	--
	DOK 3	**5.9%**	0.0%	33.3%	0.0%	--
	DOK 4	**0.0%**	0.0%	0.0%	0.0%	--
	Total Objective N	*17*	*6*	*6*	*11*	--
7	DOK 1	88.9%	36.4%	**40.0%**	44.4%	--
	DOK 2	11.1%	63.6%	**0.0%**	55.6%	--
	DOK 3	0.0%	0.0%	**40.0%**	0.0%	--
	DOK 4	0.0%	0.0%	**20.0%**	0.0%	--
	Total Objective N	*9*	*11*	*5*	*9*	--
8	DOK 1	40.0%	46.2%	50.0%	**50.0%**	--
	DOK 2	60.0%	46.2%	33.3%	**16.7%**	--
	DOK 3	0.0%	7.7%	16.7%	**33.3%**	--
	DOK 4	0.0%	0.0%	0.0%	**0.0%**	--
	Total Objective N	*5*	*13*	*6*	*6*	--
10	DOK 1	0.0%	**6.3%**	**14.3%**	**0.0%**	**11.1%**
	DOK 2	100.0%	**50.0%**	**28.6%**	**22.2%**	**44.4%**
	DOK 3	0.0%	**43.8%**	**57.1%**	**77.8%**	**44.4%**
	DOK 4	0.0%	**0.0%**	**0.0%**	**0.0%**	**0.0%**
	Total Objective N	*2*	*16*	*7*	*9*	*9*

[a]In grade 10 this strand only includes Geometry. [b]The Functions strand is only assessed in grade 10.

As displayed in Table 4.5, the cognitive complexity levels of the grade 10 objectives were generally higher than the grade 3-8 objectives. In particular, there are a larger number of grade 10 objectives that target a DOK level 3 (44-78%) within the Algebraic Reasoning and Algebra, Data and Probability, Geometry, and Functions strands. This overall trend of higher DOKs in higher grades is expected to some degree as students' cognitive abilities improve with age. In comparing these results to those presented in Table 4.4 above, it appears that additional grade 10 items targeting a DOK of 2 and 3 are needed, particularly for items aligned to the Data and Probability and Geometry and Measurement strands.

Range-of-knowledge Correspondence

The *range-of-knowledge correspondence* measure examines in greater detail the breadth of knowledge covered by the assessment. In addition to evaluating which strands are assessed, we must look at how many of the objectives within a strand are represented by items. Each objective should be linked with at least one item. Webb's (1997) minimum level of acceptability for range-of-knowledge correspondence is that at least 50% of objectives per strand should link with items. Table 4.6 summarizes the range-of-knowledge results for each grade level OSTP mathematics test form. The strands that did not meet Webb's indicator criterion are in bold and highlighted in light blue.

Table 4.6. Summary of Range-of-Knowledge Results for OSTP Mathematics

		Percentage of Objectives per Strand					
Grade	Form	Number and Operations	Algebraic Reasoning and Algebra	Data and Probability	Geometry and Measurement[a]	Functions[b]	Number of Strands Assessed Adequately
3	A	66.67%	60.00%	100.00%	53.85%	--	4 of 4
	B	55.56%	80.00%	100.00%	53.85%	--	4 of 4
	C	61.11%	80.00%	100.00%	53.85%	--	4 of 4
4	A	56.25%	60.00%	100.00%	50.00%	--	4 of 4
	B	50.00%	80.00%	100.00%	60.00%	--	4 of 4
	C	62.50%	80.00%	100.00%	70.00%	--	4 of 4
5	A	75.00%	60.00%	50.00%	60.00%	--	4 of 4
	B	66.67%	60.00%	50.00%	60.00%	--	4 of 4
	C	83.33%	60.00%	50.00%	60.00%	--	4 of 4
6	A	52.94%	83.33%	50.00%	63.64%	--	4 of 4
	B	70.59%	83.33%	66.67%	54.55%	--	4 of 4
	C	52.94%	66.67%	66.67%	63.64%	--	4 of 4
7	A	**44.44%**	63.64%	80.00%	77.78%	--	**3 of 4**
	B	55.56%	**45.45%**	80.00%	88.89%	--	**3 of 4**
	C	55.56%	54.55%	80.00%	88.89%	--	4 of 4
8	A	100.00%	69.23%	66.67%	66.67%	--	4 of 4
	B	80.00%	61.54%	83.33%	66.67%	--	4 of 4
	C	100.00%	76.92%	66.67%	66.67%	--	4 of 4
10	A	100.00%	50.00%	57.14%	**44.44%**	88.89%	**4 of 5**
	B	100.00%	56.25%	57.14%	**22.22%**	88.89%	**4 of 5**
	C	50.00%	56.25%	57.14%	**33.33%**	55.56%	**4 of 5**
						Strands Assessed Adequately	82 of 87

[a]In grade 10 this strand only includes Geometry. [b]The Functions strand is only assessed in grade 10.

Across the grade levels, the majority of forms met the range-of-knowledge criterion for each strand. In grade 7, two forms fell just below the criterion for one of the four strands assessed. Additionally, in grade 10, three forms fell below the criterion on the Geometry strand. According to the test blueprint for grade 10, 6 items should target the 9 objectives within the Geometry strand. Thus while it is possible to meet Webb's range-of-knowledge criterion for this particular strand, it may be difficult because 5 of the 6 items would need to assess different objectives. Overall, the range-of-knowledge results suggest that the mathematics forms generally cover the breadth of knowledge represented in the objectives; but the grade 10 forms could be further improved through greater coverage of objectives in the Geometry strand.

Balance of knowledge Representation

The fourth measure of alignment included in the Webb (1997) method is *balance of knowledge representation*. This measure describes the distribution of items linked to each objective within each strand. The number of items should be distributed rather evenly between the objectives to achieve good balance.

The content balance is determined by calculating an index, or score, for each strand[3]. According to Webb (1997), the minimum acceptable index for a single content strand is 70 (on a scale of 0 to 100, with 100 representing perfect balance). An index of 70 or higher suggests that items broadly assess the objectives for a strand instead of clustering around one or two objectives.

Two cautions should be noted regarding the balance index when interpreting the results. First, only those objectives actually matched to items by the panelists are included in calculations of the balance index. A given strand may include more objectives than they are actually linked to items by panelists. For example, if a particular strand includes eight objectives in the state content standards document but panelists found items matching to just three objectives, only these three objectives are evaluated for item distribution. Recognizing this feature of the balance index is important in cases when the range measure and balance measure produce seemingly contrasting results. And second, when states choose to emphasize particular content objectives over others, the balance statistic becomes uninterpretable.

Table 4.7 summarizes the results on balance-of-content representation per grade for the OSTP mathematics tests. The strands that did not meet Webb's (1997) indicator criterion are in bold and highlighted in light blue. Nearly all of the grades assessed surpassed the minimum level of acceptability (index of 70) for demonstrating good content balance among those objectives. Only one form in grade 3 and one in grade 6 did not meet the criterion for one of the four strands assessed. Overall, these results suggest the OSTP mathematics assessment has good balance of knowledge among the assessed objectives.

[3]The exact formula for calculating the balance index is explained in detail in Webb's (2005) alignment training manual: http://www.wcer.wisc.edu/WAT/index.aspx

Table 4.7. Summary of Balance of knowledge Representation Results OSTP Mathematics

		Balance Index per Strand					
Grade	Form	Number and Operations	Algebraic Reasoning and Algebra	Data and Probability	Geometry and Measurement[a]	Functions[b]	Number of Strands Assessed Adequately
3	A	89.79	85.19	73.53	92.23	--	4 of 4
	B	88.78	89.39	74.29	85.71	--	4 of 4
	C	91.56	80.14	**65.87**	89.00	--	**3 of 4**
4	A	78.67	90.48	81.61	87.35	--	4 of 4
	B	84.32	86.49	76.67	78.22	--	4 of 4
	C	84.48	83.33	85.79	84.92	--	4 of 4
5	A	82.42	89.14	100.00	84.86	--	4 of 4
	B	78.59	89.25	100.00	88.00	--	4 of 4
	C	77.69	78.71	100.00	86.96	--	4 of 4
6	A	70.00	80.00	83.33	91.84	--	4 of 4
	B	83.86	**69.31**	81.43	87.21	--	**3 of 4**
	C	78.51	82.00	77.78	80.95	--	4 of 4
7	A	83.33	80.54	86.17	81.52	--	4 of 4
	B	84.00	87.27	90.00	84.29	--	4 of 4
	C	86.99	82.25	81.25	81.00	--	4 of 4
8	A	76.36	81.45	83.33	90.00	--	4 of 4
	B	75.00	83.65	77.50	85.20	--	4 of 4
	C	76.36	84.62	77.78	84.62	--	4 of 4
10	A	84.78	80.80	89.13	90.00	87.50	5 of 5
	B	77.78	85.75	88.64	92.86	81.30	5 of 5
	C	100.00	74.89	83.33	96.45	86.53	5 of 5
Strands Assessed Adequately							85 of 87

[a]In grade 10 this strand only includes Geometry. [b]The Functions strand is only assessed in grade 10.

Summary and Discussion on Webb Alignment Indicators

The overall alignment results provide generally positive support for the content validity of the OSTP mathematics tests. Summary alignment judgments are based on Webb (2005). These summary judgments focus on the percentage of content strands represented well by the assessment. Webb outlined a scale with a range of potential alignment outcomes applied to each of the four indicators:

- Fully aligned – assessments align to all strands (91%–100%),
- Highly aligned – assessments align to the majority of strands (70%–90%),
- Partially aligned – assessments align well to some strands (50%–69%),
- Weakly aligned – assessments align to less than half the strands (below 50%).

Webb's (1997) alignment method does not allow for a *single* judgment of overall alignment across the four alignment indicators. However, one can get a sense of overall alignment between the assessments and strands by looking at all of the alignment indicators together.

Table 4.8 presents the summary alignment outcomes for the OSTP mathematics tests based on the above scale. The table includes a summary judgment for each Webb (1997) alignment indicator per grade level based on the percentage of strands that met the minimum alignment criteria. Thus, these summary judgments reflect a final evaluation of each grade assessment per Webb indicator criteria *across* the strands.

Table 4.8. Summary Alignment Outcomes on Each Webb Criterion by Grade for OSTP Mathematics

	Percentage of Strands that Met Webb Criteria			
Grade	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence	Balance of knowledge Representation
3	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (91.7%)
4	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (100.0%)	Fully aligned (100%)
5	Fully aligned (91.7%)	Highly aligned (75.0%)	Fully aligned (100.0%)	Fully aligned (100%)
6	Fully aligned (100.0%)	Fully aligned (91.7%)	Fully aligned (100.0%)	Fully aligned (91.7%)
7	Fully aligned (100.0%)	Highly aligned (75.0%)	Highly aligned (83.3%)	Fully aligned (100%)
8	Fully aligned (100.0%)	Fully aligned (91.7%)	Fully aligned (100.0%)	Fully aligned (100%)
10	Highly aligned (80.0%)	Partially aligned (53.3%)	Highly aligned (80.0%)	Fully aligned (100%)

Note. Fully Aligned and Highly Aligned indicators are in green as both indicate strong alignment.

As shown in Table 3.9, nearly all grade level math assessments were highly to fully aligned on each of the four Webb alignment criteria. Only the grade 10 forms did not meet the DOK consistency criterion for more than 30% of the strands. Examination of the cognitive complexity levels of the corresponding objectives suggest that additional items targeting a DOK level of 2 and 3 are needed in grade 10, particularly for items aligned to the Data and Probability and Geometry strands. In addition, although the range-knowledge correspondence indicator was considered highly aligned for the grade 10 results, none of the forms met the Webb criterion of having 50% of the objectives assessed for the Geometry strand. Thus the alignment could be further improved through greater coverage of the objectives in the Geometry strand.

In summary, the alignment results suggest the OSTP math assessments generally capture breadth, depth, and cognitive complexity of the math strands.

Chapter 5: Results: Science Content Alignment

The content alignment evaluation analyses discussed in this chapter are based on panelists' ratings of the OSTP science items for grades 5, 8, and 10. The current chapter reviews reliability results, the Webb alignment statistics, and cluster-level alignment results for the OSTP science assessments. The cluster-level analysis is specific to the structure and design of the science assessment.

Reliability Results

In this section, we report on the comparison of panelists' ratings of content match and depth-of-knowledge (DOK) to the item bank's documentation. In other words, do panelists assign the same performance expectation and DOK to an item as the item writer during item development?

Panelist-Test Developer Analyses

This analysis examined the agreement outcomes between the performance expectation and DOK assigned to an item by panelists, and the performance expectation and DOK assigned to an item as noted in the item bank. Table 5.1 presents the agreement outcomes between panelists and the item bank on the content and DOK assessed by items. Agreement in content was evaluated at two levels of specificity: (1) an exact match of the performance expectation and (2) a higher-level match in the reporting category assigned. Similarly, DOK was also evaluated at two levels: (1) an exact match in the DOK, and (2) a matching or adjacent DOK, which means the panelist assigned a DOK that was either matching or one level above or below the DOK in the item bank. Please note, Table 5.1 only summarizes unique ratings and thus it will not equal total by form or grade reported later as some items appear on multiple forms.

Table 5.1. Mean Agreement between Panelists and Item Bank on Content and DOK

		Content		DOK	
Grade	Total Number of Items Rated by a Panelist	Exact Match	Reporting Category Match	Exact Match	Matching or Adjacent
5	66	86.4%	100.0%	52.4%	94.8%
8	66	68.9%	95.1%	34.1%	92.0%
10	66	57.9%	91.1%	48.1%	97.4%

As Table 5.1 indicates, panelists were moderately consistent with the item bank in identifying the content of items. Panelists identified an exact match for 58-86% of the items and a content match at the reporting category level for 91-100% of the items. These results suggest that while panelists may have identified a different performance expectation for a particular item than the item bank, they still generally aligned the items within the same overall reporting category.

Panelists were a little less consistent with the item bank in identifying the DOK. On average, panelists assigned 34-52% of the items DOK levels that matched those in the item bank. The DOKs that did not match were generally found to be one level above or below those documented in the item bank. The Webb alignment methodology accounts for any difference in interpretation of DOK by the panelists because panelists provide DOK ratings for both items and performance expectations. Thus comparison of the two sets of DOKs takes into account any subjectivity that may have been introduced into the ratings.

Webb Alignment Results

In this section, we review the general outcomes of item analyses for science on the four Webb (1997) alignment indicators. The alignment indicators are all generally calculated in a similar manner. First, mean ratings for a particular indicator are calculated for each panelist based on item ratings. Next, the panelists' mean ratings for the indicator are averaged to provide the final measure of the indicator, a measure which represents the mean alignment indicator across panelists. For science, the results are presented at the reporting category level. In this way the results evaluate the alignment of the OSTP science assessment by reporting category assessed.

Categorical Concurrence

Categorical concurrence describes the extent to which the OSTP items, regardless of item type and point value, cover the Oklahoma Academic Standards. Webb (1997, 1999, 2005) recommends a minimum of six test questions to adequately assess each grade level reporting category. This criterion serves as a guideline for reasonable content coverage based on earlier research on the reliability of tests based on the number of items included (Subkoviak, 1988). Table 5.2 summarizes the OSTP alignment results for categorical concurrence for each grade level at the reporting category level.

Table 5.2. Summary of Categorical Concurrence Results for OSTP Science

		Mean Number of Items per Reporting Category						
Grade	Form	Earth and Space Sciences	Life Sciences	Physical Sciences	Ecosystem Dynamics	Heredity, Variation, & Diversity	Structure & Function	Categories with at Least Six Items
5	A	18.00	15.00	12.00	--	--	--	3 of 3
	Breach	18.00	12.00	15.00	--	--	--	3 of 3
8	A	20.75	9.25	15.00	--	--	--	3 of 3
	Breach	22.25	7.75	15.00	--	--	--	3 of 3
10	A	--	--	--	13.62	16.74	14.63	3 of 3
	Breach	--	--	--	12.62	19.24	13.13	3 of 3
Reporting Categories with at Least Six Items								18 of 18

Note. The first three reporting categories presented are only assessed in grade 5 and 8 while the latter three are only assessed in grade 10.

As Table 5.2 indicates, all of the grade 5, 8 and 10 forms met the categorical concurrence criterion for each reporting category. These results indicate that the OSTP science test sufficiently covers the science reporting categories that students are expected to know.

Depth-of-Knowledge Consistency

The *depth-of-knowledge* (DOK) *consistency* indicator evaluates the type of cognitive processing required of students to correctly answer an item compared to the processing required to master a performance expectation. In general, it is expected that the DOK requirements implied by the performance expectations are matched by the assessment items. Webb's (1997) suggested criterion for this alignment indicator is that at least 50% of the items should have complexity ratings at or above the level of the corresponding performance expectation.

To evaluate the DOK consistency between items and performance expectations, panelists were asked to assign DOKs to the science performance expectations and the items separately. Panelists used a rating scale (adapted from Webb, 2005) with four levels of cognitive complexity to make their ratings.

- Level 1 Recognition – simple recall of information (i.e., facts, terms); sequencing; more automatic.
- Level 2 Skills/Concepts – beyond habitual response; applying concepts; problem-solving.
- Level 3 Strategic Thinking – requires basic reasoning, planning, or use of evidence; generating hypotheses.
- Level 4 Extended Thinking – complex reasoning; evaluation of multiple sources or independent pieces of evidence; often over an extended period of time.

Table 5.3 presents the percentage of items with complexity ratings at or above the corresponding performance expectation based on panelists' ratings. Because panelists evaluated the DOK at the most specific level of the standards document (performance expectations), the table refers to consistency between the items and the performance expectations to which they were matched. Results are summarized at the reporting category level for ease of presentation. Results for reporting categories that did not reach the 50% criterion are bolded and highlighted in light blue.

Table 5.3. Summary of Depth-of-Knowledge Results for OSTP Science

		Percentage of Items per Reporting Category						
Grade	Form	Earth and Space Sciences	Life Sciences	Physical Sciences	Ecosystem Dynamics	Heredity, Variation, & Diversity	Structure & Function	Number of Categories Assessed Adequately
5	A	**46.67%**	86.67%	70.00%	--	--	--	**2 of 3**
	Breach	**38.89%**	78.33%	69.33%	--	--	--	**2 of 3**
8	A	**29.14%**	**27.08%**	53.33%	--	--	--	**1 of 3**
	Breach	**31.21%**	**23.61%**	63.33%	--	--	--	**1 of 3**
10	A	--	--	--	57.71%	**45.95%**	58.86%	**2 of 3**
	Breach	--	--	--	**48.94%**	**40.10%**	75.31%	**1 of 3**
Reporting Categories Assessed Adequately								9 of 18

Note. The first three reporting categories presented are only assessed in grade 5 and 8 while the latter three are only assessed in grade 10.

As displayed in Table 5.3, one to two of the three reporting categories assessed did not meet Webb's criterion across each grade level form. In grade 5, 39-47% of items assessed a cognitive complexity on par with or higher than that of the corresponding performance expectation within the Earth and Space Sciences category. To meet Webb's criterion, an additional 11-3% of these items (i.e., 50%-39%=11%) would need to target higher cognitive complexity levels more in line with the corresponding performance expectation. In grade 8, both forms did not meet the criterion for the same two categories (Earth and Space Sciences and Life Sciences) and fell even further below the criterion than grade 5, with only 24-31% of items in these categories assessing comparable or higher DOKs as the aligned performance expectations. The grade 10 reporting categories that did not meet the criterion on a form (i.e., Ecosystem Dynamics and Heredity, Variation, & Diversity) were generally much closer to the criterion than in the previous two grades,

with 40-49% of the items targeting similar or higher DOKs as the corresponding performance expectations.

In order to further understand why some reporting categories did not meet the DOK criterion for particular categories, we examined the cognitive complexity levels of the grade level performance expectations. Since the performance expectations are the base point of comparison for this statistic, examination of their DOK distribution will help identify the necessary DOK level of items in order to meet this criterion. For example, if the DOK levels of performance expectations within a reporting category are all level 3, then the majority of items would need to be at a level 3 or 4 for Webb's cognitive complexity criterion to be met. Thus the distribution of item DOKs may need to be different by reporting category in order to satisfy Webb's criterion. Table 5.4 presents the distribution of the DOK ratings that panelists assigned to the performance expectations, presented by corresponding reporting category. The DOK distribution for grade level reporting categories that did not meet the cognitive complexity criterion (for at least one form) are bolded and highlighted in light blue.

Table 5.4. Summary of Depth-of-Knowledge Ratings for Science Performance Expectations

Grade	DOK Level[a]	Earth and Space Sciences	Life Sciences	Physical Sciences	Ecosystem Dynamics	Heredity, Variation, & Diversity	Structure & Function
5	DOK 1	**0.0%**	0.0%	0.0%	--	--	--
	DOK 2	**20.0%**	75.0%	50.0%	--	--	--
	DOK 3	**60.0%**	25.0%	50.0%	--	--	--
	DOK 4	**20.0%**	0.0%	0.0%	--	--	--
	Total PE N	*5*	*4*	*4*	--	--	--
8	DOK 1	**0.0%**	**0.0%**	12.5%	--	--	--
	DOK 2	**42.9%**	**33.3%**	37.5%	--	--	--
	DOK 3	**42.9%**	**66.7%**	50.0%	--	--	--
	DOK 4	**14.3%**	**0.0%**	0.0%	--	--	--
	Total PE N	*7*	*3*	*8*	--	--	--
10	DOK 1	--	--	--	**0.0%**	**0.0%**	42.9%
	DOK 2	--	--	--	**28.6%**	**37.5%**	14.3%
	DOK 3	--	--	--	**57.1%**	**37.5%**	42.9%
	DOK 4	--	--	--	**14.3%**	**25.0%**	0.0%
	Total PE N	--	--	--	*7*	*8*	*7*

Note. The first three reporting categories presented are only assessed in grade 5 and 8 while the latter three are only assessed in grade 10.
[a]PE represents performance expectations.

As displayed in Table 5.4, the reporting categories that did not meet the cognitive complexity criterion were generally composed of performance expectations of higher cognitive complexity. Across the grades, over 50% of the performance objectives in these categories targeted a DOK of 3 or 4. In comparison, only 25-50% of the performance objectives in the other categories, that met the criterion, targeted a DOK level 3 and none targeted a DOK level 4. As mentioned previously in the ELA results, it can be difficult to write multiple-choice items that require a DOK level 4 and such items may not be appropriate for younger students. Although it may not be possible or advisable to completely satisfy Webb's cognitive complexity criterion for each reporting category

across the test forms, OSDE may consider the following to improve the alignment in cognitive complexity: (1) review the language of the performance expectations to determine if it is sufficiently specific to allow educators to determine the cognitive complexity at which the content is intended to be taught and learned; (2) review the performance expectations across the grades to determine if any would be better assessed at a local level, particularly those that are of higher cognitive complexity; (3) review the item bank for coverage of higher DOK levels among the reporting categories flagged and add/revise items if additional items are needed; and (4) add DOK targets to the test blueprint so that cognitive complexity is taken into consideration during form construction.

Range-of-knowledge Correspondence

The *range-of-knowledge correspondence* measure examines in greater detail the breadth of knowledge covered by the assessment. In addition to evaluating which reporting categories are assessed, we must look at how many of the performance expectations within a reporting category are represented by items. Each performance expectations should be linked with at least one item. Webb's (1997) minimum level of acceptability for range-of-knowledge correspondence is that at least 50% of performance expectations per reporting category should link with items. Table 5.5 summarizes the range-of-knowledge results for each grade level OSTP science test form per reporting category.

Table 5.5. Summary of Range-of-Knowledge Results for OSTP Science

		Percentage of Performance Expectations per Reporting Category						
Grade	Form	Earth and Space Sciences	Life Sciences	Physical Sciences	Ecosystem Dynamics	Heredity, Variation, & Diversity	Structure & Function	Number of Categories Assessed Adequately
5	A	100.00%	100.00%	100.00%	--	--	--	3 of 3
	Breach	100.00%	100.00%	100.00%	--	--	--	3 of 3
8	A	85.71%	100.00%	83.33%	--	--	--	3 of 3
	Breach	85.71%	100.00%	100.00%	--	--	--	3 of 3
10	A	--	--	--	71.43%	75.00%	71.43%	3 of 3
	Breach	--	--	--	57.14%	75.00%	57.14%	3 of 3
Reporting Categories Assessed Adequately								18 of 18

Note. The first three reporting categories presented are only assessed in grade 5 and 8 while the latter three are only assessed in grade 10.

As displayed in Table 5.5, all of the OSTP science test forms met the minimum range-of-knowledge criterion for all of the reporting categories. This indicates that the science assessments cover the range of content represented within the performance expectations.

Balance of knowledge Representation

The fourth measure of alignment included in the Webb (1997) method is *balance of knowledge representation*. This measure describes the distribution of items linked to each performance expectation within each reporting category. The number of items should be distributed rather evenly between the performance expectations to achieve good balance.

The content balance is determined by calculating an index, or score, for each reporting category[4]. According to Webb (1997), the minimum acceptable index for a single reporting category is 70 (on a scale of 0 to 100 with 100 representing perfect balance). An index of 70 or higher suggests that items broadly assess the performance expectations for a reporting category instead of clustering around one or two performance expectations.

Two cautions should be noted regarding the balance index when interpreting the results. First, only those performance expectations actually matched to items by the panelists are included in calculations of the balance index. A given reporting category may include more performance expectations than are actually linked to items by panelists. For example, if a particular reporting category includes eight performance expectations in the state content standards document but panelists found items matching to just three performance expectations, only these three performance expectations are evaluated for item distribution. Recognizing this feature of the balance index is important in cases when the range measure and balance measure produce seemingly contrasting results. And second, when states choose to emphasize particular performance expectations over others, the balance statistic becomes uninterpretable.

Tables 5.6 summarizes the results on balance-of-content representation per grade for the OSTP science tests. All of the grade level forms surpassed the minimum level of acceptability (index of 70) for demonstrating good content balance among those performance expectations matched to items for each reporting category. These results suggest the science assessments capture a balanced representation of the content within each reporting category.

Table 5.6. Summary of Balance of knowledge Representation Results OSTP Science

		Balance Index per Reporting Category						
Grade	Form	Earth and Space Sciences	Life Sciences	Physical Sciences	Ecosystem Dynamics	Heredity, Variation, & Diversity	Structure & Function	Number of Categories Assessed Adequately
5	A	86.67	74.33	89.17	--	--	--	3 of 3
	Breach	86.67	80.83	88.00	--	--	--	3 of 3
8	A	83.33	77.93	94.72	--	--	--	3 of 3
	Breach	78.68	94.62	87.72	--	--	--	3 of 3
10	A	--	--	--	89.36	77.25	91.90	3 of 3
	Breach	--	--	--	88.24	86.01	90.38	3 of 3
Reporting Categories Assessed Adequately								18 of 18

Note. The first three reporting categories presented are only assessed in grade 5 and 8 while the latter three are only assessed in grade 10.

Cluster Level Alignment and DOK

The OSTP Science Assessments were constructed to include item clusters that intentionally target the same performance expectation across all items in the cluster. Across the grade levels, each Science cluster was designed to include 3 items each. The current section of the Science results examines the content assessed and cognitive complexity of items at the cluster level. While these analyses are not part of Webb's alignment method, they can help to provide information about the assessments' alignment at the cluster level.

[4]The exact formula for calculating the balance index is explained in detail in Webb's (2005) alignment training manual: http://www.wcer.wisc.edu/WAT/index.aspx.

Content Assessed

During the alignment workshop, panelists were asked to match each item with a performance expectation that captured the content assessed by the item. In order to evaluate the content alignment at the cluster level, we compared the performance expectation assigned to the cluster in the item bank to that assigned to the items by panelists. Specifically, we identified the number of items each panelist aligned to the cluster's performance expectation (in the item bank) and then computed the mean number of items aligned across panelists. We also examined content alignment at the higher level of the reporting category. Thus we identified the mean number of items that panelists aligned to the same reporting category as the cluster's performance expectation. Finally, in instances where panelists identified another performance expectation for an item, outside of that specified in the item bank for the cluster, we made note of the alternative performance expectations by cluster. These content alignment results are summarized for each grade level in Tables 5.7 – 5.9. Any clusters where panelists matched less than 2 items to the intended performance expectation are in bold and highlighted in light blue.

Table 5.7. Science Cluster-Level Agreement in Item Bank Content, Grade 5

		Items Matched by Panelists to the Item Bank		
Cluster	Intended Performance Expectation	Performance Expectation	Reporting Category	Other Performance Expectations Matched by Panelists
184348A	5.PS1.2	2.4	3.0	5.PS1.3, 5.PS1.4
184520A	5.ESS1.2	3.0	3.0	
186421A	5.PS1.2	2.8	2.9	5.PS1.3
186466A	5.PS1.4	2.5	2.9	5.PS1.3
186480A	5.PS1.4	2.8	3.0	5.PS1.3
186494A	5.PS1.1	2.5	2.9	5.PS1.3
187280A	5.ESS1.1	3.0	3.0	
187484A	5.ESS2.1	3.0	3.0	
187498A	**5.PS3.1**	**0.8**	**2.5**	**5.LS2.1**
188293A	5.LS2.1	2.6	2.7	5.PS3.1
188325A	**5.PS1.1**	**1.9**	**2.8**	**5.PS1.2, 5.PS1.4**
188371A	5.ESS1.1	3.0	3.0	
188382A	5.PS1.4	2.7	2.9	5.PS1.1
188430A	5.PS1.3	3.0	3.0	
188447A	5.ESS2.2	3.0	3.0	
188715A	5.PS2.1	3.0	3.0	
188724A	5.PS2.1	3.0	3.0	
188902A	5.LS1.1	3.0	3.0	
189233A	5.ESS1.2	3.0	3.0	
189338A	5.LS2.2	2.1	2.9	5.LS2.1
189346A	**5.PS3.1**	**0.3**	**2.7**	**5.LS2.1**
189354A	5.LS1.1	3.0	3.0	
Number of Clusters with 2 or More Items Aligned				19 of 22

Table 5.8. Science Cluster-Level Agreement in Item Bank Content, Grade 8

		Items Matched by Panelists to the Item Bank		
Cluster	Intended Performance Expectation	Performance Expectation	Reporting Category	Other Performance Expectations Matched by Panelists
185781A	MS.PS2.2	2.3	3.0	MS.PS2.1
185895A	**MS.ESS3.1**	**1.8**	**3.0**	**MS.ESS2.2, MS.ESS2.3**
186152A	**MS.LS4.1**	**1.5**	**1.5**	**MS.ESS1.4, MS.ESS3.2**
186932A	MS.PS4.1	3.0	3.0	
187028A	**MS.ESS2.2**	**1.8**	**3.0**	**MS.ESS2.1, MS.ESS2.3**
187667A	MS.ESS3.2	2.3	3.0	MS.ESS2.3
188147A	MS.ESS2.3	3.0	3.0	
188155A	MS.PS1.6	2.5	3.0	MS.PS1.5
188247A	MS.ESS2.3	3.0	3.0	
188297A	**MS.LS4.1**	**1.5**	**1.5**	**MS.ESS1.4, MS.ESS2.3**
188321A	MS.ESS1.4	2.3	3.0	MS.ESS2.3
188836A	**MS.PS2.2**	**1.1**	**2.6**	**MS.PS2.1**
188844A	MS.PS4.2	3.0	3.0	
188861A	MS.LS1.7	3.0	3.0	
189041A	MS.PS4.1	2.5	3.0	MS.PS4.2, MS.PS4.3
189085A	MS.PS1.5	2.3	3.0	MS.PS1.X
189093A	**MS.ESS3.2**	**0.0**	**3.0**	**MS.ESS2.1, MS.ESS2.3, MS.ESS3.2**
189436A	MS.LS4.2	2.3	3.0	MS.LS4.1
300067A	MS.ESS3.4	2.5	2.8	MS.LS4.1, MS.ESS3.1
300075A	**MS.LS4.2**	**1.1**	**1.9**	**MS.LS4.1**
300091A	**MS.ESS2.1**	**0.8**	**3.0**	**MS.ESS1.4, MS.ESS2.2, MS.ESS2.3**
300107A	MS.ESS3.1	2.3	3.0	MS.ESS2.1
Number of Clusters with 2 or More Items Aligned				14 of 22

Table 5.9. Science Cluster-Level Agreement in Item Bank Content, Grade 10

		Items Matched by Panelists to the Item Bank		
Cluster	Intended Performance Expectation	Performance Expectation	Reporting Category	Other Performance Expectations Matched by Panelists
186815A	HS.LS2.4	2.9	2.9	
186922A	HS.LS1.7	3.0	3.0	
187521A	**HS.LS1.3**	**1.9**	**1.9**	**HS.LS4.1, HS.LS4.5**
187931A	HS.LS1.3	2.3	2.3	HS.LS2.3
187969A	**HS.LS4.2**	**0.5**	**2.1**	**HS.LS4.1, HS.LS4.3, HS.LS4.4, HS.LS4.5**
187988A	**HS.LS1.5**	**1.8**	**1.8**	**HS.LS2.5**
188063A	HS.LS1.4	3.0	3.0	
188461A	HS.LS1.2	3.0	3.0	
188479A	HS.LS2.3	2.1	2.1	HS.LS1.7
188541A	**HS.LS4.4**	**0.6**	**2.3**	**HS.LS3.2, HS.LS4.3, HS.LS4.5**
188644A	**HS.LS4.5**	**0.3**	**2.5**	**HS.LS3.2, HS.LS4.2**
188655A	**HS.LS2.2**	**0.3**	**1.3**	**HS.LS4.2, HS.LS4.5, HS.LS2.1, HS.LS2.6**
188828A	**HS.LS3.3**	**0.5**	**2.4**	**HS.LS2.2, HS.LS3.2, HS.LS4.2, HS.LS4.3, HS.LS4.5**
188961A	HS.LS2.1	2.0	3.0	HS.LS2.6
189101A	**HS.LS4.2**	**0.4**	**1.9**	**HS.LS2.1, HS.LS2.6, HS.LS3.2, HS.LS4.3, HS.LS4.4**
189217A	HS.LS4.1	2.1	2.5	HS.LS3.2, HS.LS4.2
189381A	HS.LS2.5	2.9	2.9	
189390A	**HS.LS2.6**	**1.1**	**2.2**	**HS.LS2.2**
189401A	**HS.LS4.4**	**1.3**	**2.5**	**HS.LS4.2, HS.LS4.3, HS.LS4.5**
189410A	**HS.LS4.5**	**0.0**	**1.7**	**HS.LS2.2, HS.LS2.6, HS.LS4.4, HS.LS4.5**
189418A	**HS.LS3.1**	**1.4**	**2.6**	**HS.LS3.2, HS.LS3.3**
189579A	HS.LS1.1	2.9	2.9	
Number of Clusters with 2 or More Items Aligned				10 of 22

As displayed above, panelists in grades 8 and 10 aligned a number of items to performance expectations outside of that associated with the cluster in the item bank. In grade 8, panelists found more than one item, on average, to be aligned with a different performance expectation for 8 of the 22 clusters reviewed. In grade 10, 12 of the 22 clusters were flagged using the same criteria. In contrast, only 3 of the 22 clusters in grade 5 were flagged using that criteria. Additionally, there were a handful of occurrences across the grades where panelists identified less than an item, on average, that aligned with the intended cluster-level performance expectation. OSDE may want to review the particular clusters and items flagged above to determine whether some clusters may align to multiple performance expectations.

Depth-of-Knowledge

Panelists provided DOK ratings for items as well as performance objectives. In order to examine the consistency in DOK at the cluster level, we identified the mean DOK assigned by panelists to items that they matched with the cluster level performance expectation (from the item bank). We then computed the average DOK of the matched items across panelists. We only used items that were matched to the intended cluster level performance expectation in order to provide an estimate of the cognitive complexity of the items that assess the content targeted at the cluster level. This allows us to compare the mean DOK of the aligned items to the DOK of the corresponding cluster objective.

Note that these analyses are systematically different from the Webb DOK consistency analysis. The Webb analysis reports the percentage of items that target a similar or higher DOK than the corresponding performance expectation. Since there were only three items within each cluster and panelists did not always believe all three items aligned to the cluster-level performance expectation (see Tables 5.7-5.9), there were a relatively small number of items to consider in this evaluation. In addition, since all items at the cluster level that are included in the current analysis were aligned to the same performance expectation, a simple comparison of the mean item DOK and the DOK of the performance expectation provides more information. The results for this analysis are presented for each grade level in Tables 5.10-5.12. Any clusters that did not reach the 50% criterion are bolded and highlighted in light blue.

Table 5.10. Science Cluster-Level DOK Summary, Grade 5

			DOK of Items Matched to the PE in the Item Bank		
Cluster	Panelists who Matched an Item to the Intended DOK	DOK of Performance Expectation (PE)	Mean	SD	Mean Panelist DOK is Greater than or Equal to PE DOK?
184348A	4	3	**2.4**	0.42	**No**
184520A	5	4	**2.3**	0.28	**No**
186421A	5	3	**2.3**	0.24	**No**
186466A	5	3	**2.6**	0.43	**No**
186480A	5	3	**2.5**	0.29	**No**
186494A	5	2	2.5	0.38	Yes
187280A	5	3	3.2	0.38	Yes
187484A	5	3	**1.7**	0.28	**No**
187498A	4	2	**1.9**	0.25	**No**
188293A	5	2	2.2	0.33	Yes
188325A	4	2	2.3	0.32	Yes
188371A	5	3	**2.9**	0.49	**No**
188382A	5	3	**2.6**	0.25	**No**
188430A	5	2	2.2	0.51	Yes
188447A	5	2	**1.7**	0.24	**No**
188715A	5	3	**2.3**	0.28	**No**
188724A	5	3	**2.1**	0.38	**No**
188902A	5	3	**2.6**	0.28	**No**
189233A	5	4	**2.5**	0.30	**No**
189338A	4	2	2.3	0.27	Yes
189346A	1	2	2.0	--	Yes
189354A	5	3	3.1	0.37	Yes
Number of Clusters with a Higher or Equivalent Panelist DOK					8 of 22

Table 5.11. Science Cluster-Level DOK Summary, Grade 8

			DOK of Items Matched to the PE in the Item Bank		
Cluster	Panelists who Matched an Item to the Intended DOK	DOK of Performance Expectation (PE)	Mean	SD	Mean Panelist DOK is Greater than or Equal to PE DOK?
185781A	3	3	**1.9**	0.38	**No**
185895A	3	3	**1.8**	0.38	**No**
186152A	2	3	**1.8**	0.71	**No**
186932A	4	1	1.8	0.32	Yes
187028A	3	2	2.4	0.51	Yes
187667A	3	4	**1.2**	0.19	**No**
188147A	4	3	**1.4**	0.32	**No**
188155A	4	3	**1.9**	0.63	**No**
188247A	4	3	**2.2**	0.43	**No**
188297A	2	3	**1.7**	0.47	**No**
188321A	3	2	**1.4**	0.51	**No**
188836A	2	3	**2.0**	0.00	**No**
188844A	4	2	**1.7**	0.54	**No**
188861A	4	3	**2.1**	0.32	**No**
189041A	4	1	1.8	0.57	Yes
189085A	3	2	**1.7**	0.33	**No**
189093A	0	2	--	--	--
189436A	3	2	**1.4**	0.38	**No**
300067A	4	3	**2.3**	0.72	**No**
300075A	3	2	2.1	0.51	Yes
300091A	1	2	2.0	--	Yes
300107A	3	3	**2.1**	0.38	**No**
Number of Clusters with a Higher or Equivalent Panelist DOK					5 of 22

Table 5.12. Science Cluster-Level DOK Summary, Grade 10

			DOK of Items Matched to the PE in the Item Bank		
Cluster	Panelists who Matched an Item to the Intended DOK	DOK of Performance Expectation (PE)	Mean	SD	Mean Panelist DOK is Greater than or Equal to PE DOK?
186815A	4	2	2.0	0.27	Yes
186922A	4	1	2.1	0.17	Yes
187521A	4	3	**2.3**	0.47	**No**
187931A	3	3	**2.2**	0.38	**No**
187969A	2	4	**2.5**	0.71	**No**
187988A	3	1	1.8	0.69	Yes
188063A	4	1	2.0	0.54	Yes
188461A	4	2	**1.4**	0.17	**No**
188479A	1	1	2.0	--	Yes
188479A	3	3	**2.7**	0.58	**No**
188541A	2	2	2.5	0.71	Yes
188644A	1	4	**2.0**	--	**No**
188655A	1	3	**2.5**	--	**No**
188828A	2	2	2.0	0.00	Yes
188961A	4	2	2.0	0.00	Yes
189101A	1	4	**2.0**	--	**No**
189217A	4	3	**2.6**	0.28	**No**
189381A	4	3	**2.5**	0.43	**No**
189390A	2	4	**2.3**	0.00	**No**
189401A	2	2	2.8	0.35	Yes
189410A	0	3	--	--	--
189418A	3	2	3.1	0.84	Yes
Number of Clusters with a Higher or Equivalent Panelist DOK					10 of 22

As displayed above, the majority of clusters across the grade levels were aligned with items that targeted a lower cognitive complexity level. These results are generally in line with the Webb DOK consistency indicator results reviewed earlier. While the current analysis examines the mean DOK in comparison to the DOK of the cluster level performance expectation, as opposed to the proportion of items at a similar or higher DOK than the corresponding performance objective (as is done for the Webb analysis), the results still highlight the lower level of cognitive complexity targeted by several sets of items in comparison to their aligned performance expectation. However, these results do highlight the range in cognitive complexity across the items. This range in cognitive complexity is important for allowing access to the reporting categories among students at varying ability levels.

Summary and Discussion on Webb Alignment Indicators

The overall alignment results provide generally positive support for the content validity of the OSTP science tests. Summary alignment judgments are based on Webb (2005). These summary

judgments focus on the percentage of reporting categories represented well by the assessment. Webb outlined a scale with a range of potential alignment outcomes applied to each of the four indicators:

- Fully aligned – assessments align to all reporting categories (91%–100%),
- Highly aligned – assessments align to the majority of reporting categories (70%–90%),
- Partially aligned – assessments align well to some reporting categories (50%–69%),
- Weakly aligned – assessments align to less than half the reporting categories (below 50%).

Webb's (1997) alignment method does not allow for a *single* judgment of overall alignment across the four alignment indicators. However, one can get a sense of overall alignment between the assessments and reporting categories by looking at all of the alignment indicators together.

Table 5.13 presents the summary alignment outcomes for the OSTP science tests based on the above scale. The table includes a summary judgment for each Webb (1997) alignment indicator per grade level based on the percentage of reporting categories that met the minimum alignment criteria. Thus, these summary judgments reflect a final evaluation of each grade assessment per Webb indicator criteria *across* the reporting categories.

Table 5.13. Summary Alignment Outcomes on Each Webb Criterion by Grade for OSTP Science

	Percentage of Reporting Categories that Met Webb Criteria			
Grade	Categorical Concurrence	Depth-of-Knowledge Consistency	Range-of-Knowledge Correspondence	Balance of knowledge Representation
5	Fully aligned (100.0%)	Partially aligned (66.7%)	Fully aligned (100.0%)	Fully aligned (100.0%)
8	Fully aligned (100.0%)	Weakly aligned (33.3%)	Fully aligned (100.0%)	Fully aligned (100.0%)
10	Fully aligned (100.0%)	Partially aligned (50.0%)	Fully aligned (100.0%)	Fully aligned (100.0%)

As shown in Table 5.13, all of the grade level science assessments were fully aligned on the categorical concurrence, range-of-knowledge, and balance of knowledge representation criteria. These results suggest that the science assessments capture the breadth and depth in the reporting categories and have sufficient counts to accurately report scores at that level.

All of the grade levels exhibited partial to weak alignment on the DOK consistency criterion. In general, many of the science performance expectations targeted higher cognitive complexity levels than the items used to assess them on a number of reporting categories. An examination of the grade level performance expectations found that this tended to occur in instances where the majority of objectives for a reporting category targeted the higher cognitive complexity levels of 3 and 4.

Although it may not be possible or advisable to completely satisfy Webb's cognitive complexity criterion for each reporting category across the assessments, there are a few things OSDE may consider to improve the alignment. First, OSDE might review the language of the performance expectation to determine if it is sufficiently specific to allow educators to determine the cognitive complexity at which the content is intended to be taught and learned. Vague or broad

performance categories may lead educators (and panelists) to assume a higher cognitive complexity level than intended. Second, OSDE could review the performance expectations across the grades to determine if any would be better assessed at a local level, particularly those that are of higher cognitive complexity. Teachers are better equipped to assess such performance expectations through use of projects, reports, or other extended assessment events. Third, OSDE may consider reviewing their item bank to evaluate whether there are items that assess higher cognitive complexity levels within the performance expectations flagged above. If there are not many items at these levels, OSDE may consider creating new items or revising old items to target those complexity levels. Finally, OSDE may consider adding DOK targets to the test blueprint to take cognitive complexity into consideration during form construction.

Chapter 6: Summary and Recommendations

HumRRO conducted a review of the OSTP ELA, mathematics and science tests to examine the content alignment to the Oklahoma Academic Standards. Alignment of assessments and achievement standards to the state academic content standards is a requirement of the No Child Left Behind Act (2002).

The cumulative results provide validity evidence to support that the content of OSTP ELA, mathematics, and science test items match the intended content as specified in the standards. Expert panelists from each content areas tended to agree that items were measuring the intended objectives or performance expectations. They also tended to rate items as fully aligned to the Oklahoma Academic Standards.

Across the subjects, there were some issues identified in the cognitive complexity of the test forms. Across the ELA and Science assessments many of the objectives or performance expectations were found to target higher cognitive complexity levels than the items used to assess them. Examination of the grade level assessment standards (or reporting categories for science) found this tended to occur in instances where the majority of objectives or performance expectations for a standard or reporting category targeted the higher cognitive complexity levels of 3 and 4. This occurred across grade levels. While it makes sense that students are assessed at higher cognitive complexity levels as they get older, it may not make sense at younger grade levels. Thus it may not be possible to completely satisfy Webb's cognitive complexity criterion for these assessments. The grade 10 math assessment also did not meet Webb's criterion for cognitive complexity. In this instance, it appeared the criterion could be met by adding some additional items that target cognitive complexity levels of 2 and 3.

In addition, the ELA assessments did not capture the full breadth of the content standards (range-of-knowledge correspondence). The majority of the standards on a test form generally were assessed by items that covered less than half the content in a standard. Examination of the test blueprint and the number of objectives suggested that there may be too many objectives to capture the breadth of particular standards. For example, in a number of instances there were more objectives than items to assess them. The range-of-knowledge results improved when the reduced objective list, provided by OSDE, were included in the analysis (see Range of knowledge Correspondence, page 14).

As with most reviews of state assessment systems, these findings point to areas where the alignment between assessments and content standards could be strengthened. For this reason, HumRRO makes the following recommendation to Oklahoma on ways in which alignment might be improved:

- ***Review ELA, Math, and Science items' depth-of-knowledge.*** The DOK consistency review showed that the items did not adequately reflect the cognitive complexity of the standards for all the grade level ELA and Science assessments and for the Math grade 10 assessment. There were items of varying DOKs, but a substantial percentage were lower than their associated objective or performance expectation. OSDE may consider reviewing the item pool and determining whether additional items that target a higher DOK are needed. Additionally, if OSDE has particular targets they would like to meet in regard to the distribution of items by cognitive complexity, they may consider adding the targets to their test blueprint.

- ***Review ELA and Science standards' language.*** Across the grade levels, a number of the ELA and Science objectives or performance expectations were evaluated by panelists as requiring higher levels of cognitive complexity. OSDE might review the language of the objectives or performance expectations to determine if it is sufficiently specific to allow educators to determine the cognitive complexity at which the content is intended to be taught and learned. Vague or broad objectives or performance expectations may lead educators (and panelists) to assume a higher cognitive complexity level than intended.
- ***Review ELA, Math, and Science standards' depth-of-knowledge.*** A number of the assessed objectives or performance expectations were identified as having higher levels of cognitive complexities than the corresponding items. In addition, the ELA assessments did not assess the breadth of knowledge represented in the content standards. One potential way to reduce both of these issues is to review the content standards and determine whether any may be better assessed locally. In particular, OSDE may focus on reviewing some of the objectives or performance expectations that target higher complexity levels to determine whether local assessments may be better equipped to assess the content than a multiple-choice exam. Reducing the number of objectives or performance expectations that target high DOK levels would improve the alignment in cognitive complexity and could also improve the breadth of content coverage as fewer standards (strands or reporting categories) would be assessed at the state level.
- ***Review ELA content coverage.*** The ELA assessments did not meet the range-of-knowledge criterion which specifies 50% of the objectives within each standard should be assessed by a test form. Although OSDE may not be able to increase the content coverage of the test forms enough to satisfy Webb's criteria due to blueprint constraints, they may review their item bank to make sure most or all objectives are covered in the item pool. Any objectives that are not covered sufficiently may be flagged for future item development efforts.

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Appendix A.

Content Alignment Results: ELA

The following tables include complete statistical results on the Webb (1997) alignment indicators, including means and standard deviations per standard for each OSTP ELA test.

Categorical Concurrence

The categorical concurrence results for the OSTP ELA test forms are presented below. Each table includes: the mean number of items matched by panelists; the standard deviation among panelists' ratings; and, the final alignment conclusion (Yes or No). The bottom row indicates the percentage of standards that met the minimum alignment indicator criterion.

Table A-1. Categorical Concurrence for ELA, Grade 3: Mean Number of Items per Standard

Standard	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Reading and Writing Process	17.3	1.48	Yes	15.5	0.50	Yes	15.3	0.45	Yes
Critical Reading and Writing	8.5	1.66	Yes	9.6	1.14	Yes	10.1	0.89	Yes
Vocabulary	11.5	0.71	Yes	11.8	0.45	Yes	11.4	0.89	Yes
Language	6.0	0.00	Yes	6.0	0.00	Yes	6.0	0.00	Yes
Research	5.1	0.74	No	5.3	0.45	No	6.0	0.71	Yes
% of Standards with at least 6 items:			80%			80%			100%

Table A-2. Categorical Concurrence for ELA, Grade 4: Mean Number of Items per Standard

Standard	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Reading and Writing Process	17.3	0.57	Yes	14.9	0.65	Yes	18.3	1.52	Yes
Critical Reading and Writing	8.9	0.65	Yes	11.1	0.65	Yes	8.9	1.08	Yes
Vocabulary	12.0	0.00	Yes	12.2	0.45	Yes	12.0	0.00	Yes
Language	5.8	0.45	No	6.0	0.00	Yes	4.8	0.45	No
Research	6.0	0.00	Yes	5.8	0.45	No	6.0	0.00	Yes
% of Standards with at least 6 items:			80%			80%			80%

Table A-3. Categorical Concurrence for ELA, Grade 5: Mean Number of Items per Standard

Standard	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Reading and Writing Process	16.7	0.76	Yes	16.6	0.96	Yes	15.8	0.91	Yes
Critical Reading and Writing	11.2	1.25	Yes	11.4	0.96	Yes	13.2	0.91	Yes
Vocabulary	10.2	0.45	Yes	10.4	0.55	Yes	10.0	0.00	Yes
Language	5.9	0.22	No	5.6	0.55	No	6.0	0.00	Yes
Research	3.6	0.89	No	3.2	1.30	No	4.2	1.30	No
% of Standards with at least 6 items:			60%			60%			80%

Table A-4. Categorical Concurrence for ELA, Grade 6: Mean Number of Items per Standard

Standard	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Reading and Writing Process	15.8	0.96	Yes	16.3	1.50	Yes	16.5	1.73	Yes
Critical Reading and Writing	11.5	1.29	Yes	11.0	1.63	Yes	10.8	1.71	Yes
Vocabulary	10.8	0.96	Yes	10.5	0.58	Yes	11.1	0.85	Yes
Language	6.0	0.00	Yes	6.0	0.00	Yes	6.0	0.00	Yes
Research	5.6	0.75	No	5.8	1.26	No	5.0	1.63	No
% of Standards with at least 6 items:			80%			80%			80%

Table A-5. Categorical Concurrence for ELA, Grade 7: Mean Number of Items per Standard

Standard	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Reading and Writing Process	15.0	1.41	Yes	16.3	0.96	Yes	14.3	2.22	Yes
Critical Reading and Writing	13.5	1.00	Yes	12.3	0.96	Yes	14.3	2.22	Yes
Vocabulary	7.5	0.58	Yes	7.5	0.58	Yes	7.5	0.58	Yes
Language	6.o	0.00	Yes	6.0	0.00	Yes	6.0	0.00	Yes
Research	7.6	0.75	Yes	7.6	0.75	Yes	7.6	0.75	Yes
% of Standards with at least 6 items:			100%			100%			100%

Table A-6. Categorical Concurrence for ELA, Grade 8: Mean Number of Items per Standard

Standard	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Reading and Writing Process	11.3	1.26	Yes	13.3	2.63	Yes	12.0	1.63	Yes
Critical Reading and Writing	16.0	2.12	Yes	15.1	2.25	Yes	14.3	1.89	Yes
Vocabulary	7.0	0.00	Yes	7.5	1.29	Yes	8.8	2.06	Yes
Language	7.0	0.00	Yes	7.0	0.00	Yes	7.3	0.50	Yes
Research	7.1	1.18	Yes	6.1	1.18	Yes	6.8	0.50	Yes
% of Standards with at least 6 items:			100%			100%			100%

Table A-7. Categorical Concurrence for ELA, Grade 10: Mean Number of Items per Standard

Standard	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Reading and Writing Process	19.2	4.60	Yes	16.4	5.98	Yes	18.8	8.07	Yes
Critical Reading and Writing	19.1	3.57	Yes	19.3	3.07	Yes	18.3	3.55	Yes
Vocabulary	9.0	1.83	Yes	7.5	1.00	Yes	8.5	0.58	Yes
Language	7.7	3.23	Yes	9.8	1.27	Yes	7.9	2.95	Yes
Research	4.0	0.00	No	4.8	1.89	No	5.4	2.63	No
% of Standards with at least 6 items:			80%			80%			80%

Depth-of-Knowledge Consistency

The Depth-of-Knowledge (DOK) consistency results for the OSTP ELA test forms are presented below. The tables present the results from the comparison between the depth-of-knowledge expected in the matched objective and the depth-of-knowledge assessed by items. The tables include the mean percentage of items rated as below, at the same level, or above the DOK level of the objective along with the corresponding standard deviations. Standards with at least 50% of items at the same (or above) DOK level of the matched objective met the minimum indicator criterion.

Table A-8. DOK Consistency for ELA, Grade 3: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Standard	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Reading and Writing Process	17.3	10.4	8.0	87.3	7.8	2.2	5.0	Yes
	Critical Reading and Writing	8.5	50.4	19.2	44.5	25.2	5.1	7.2	No
	Vocabulary	11.5	20.7	13.9	68.7	17.3	10.6	7.5	Yes
	Language	6.0	53.3	21.7	46.7	21.7	0.0	0.0	No
	Research	5.1	77.7	15.4	18.3	11.9	4.0	8.9	No
	% of Standards Met Criterion								40%
B	Reading and Writing Process	7.8	7.4	85.6	14.6	6.6	8.2	7.8	No
	Critical Reading and Writing	65.3	17.6	30.4	22.0	4.2	5.8	65.3	No
	Vocabulary	12.6	23.7	73.9	23.4	13.5	7.3	12.6	No
	Language	53.3	13.9	46.7	13.9	0.0	0.0	53.3	No
	Research	64.2	15.6	32.5	13.4	3.3	7.5	64.2	No
	% of Standards Met Criterion								0%
C	Reading and Writing Process	5.2	5.4	93.5	7.9	1.3	2.9	5.2	No
	Critical Reading and Writing	50.1	12.7	45.8	14.9	4.0	5.6	50.1	No
	Vocabulary	19.7	27.0	75.4	29.7	4.9	7.1	19.7	No
	Language	16.7	0.0	83.3	0.0	0.0	0.0	16.7	No
	Research	77.6	14.2	19.5	14.1	2.9	6.4	77.6	No
	% of Standards Met Criterion								0%

Table A-9. DOK Consistency for ELA, Grade 4: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Standard	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Reading and Writing Process	17.3	12.6	5.9	85.1	6.2	2.3	3.1	Yes
	Critical Reading and Writing	8.9	53.8	10.6	28.0	5.6	18.2	6.9	No
	Vocabulary	12.0	30.0	21.7	68.3	24.6	1.7	3.7	Yes
	Language	5.8	27.3	14.4	52.0	12.6	20.7	21.7	Yes
	Research	6.0	50.0	0.0	50.0	0.0	0.0	0.0	Yes
	% of Standards Met Criterion								80%
B	Reading and Writing Process	14.9	18.9	5.8	75.6	8.3	5.5	7.6	Yes
	Critical Reading and Writing	11.1	47.3	13.2	34.8	10.4	18.0	6.1	Yes
	Vocabulary	12.2	21.0	18.4	74.0	22.6	5.0	7.5	Yes
	Language	6.0	33.3	16.7	56.7	14.9	10.0	9.1	Yes
	Research	5.8	48.7	15.2	44.7	18.3	6.7	9.1	Yes
	% of Standards Met Criterion								100%
C	Reading and Writing Process	18.3	16.3	3.0	74.8	2.8	8.9	5.1	Yes
	Critical Reading and Writing	8.9	44.9	9.5	26.6	13.5	28.5	8.0	Yes
	Vocabulary	12.0	28.3	25.4	70.0	28.6	1.7	3.7	Yes
	Language	4.8	25.0	16.6	55.0	20.6	20.0	14.1	Yes
	Research	6.0	73.3	9.1	26.7	9.1	0.0	0.0	No
	% of Standards Met Criterion								80%

Table A-10. DOK Consistency for ELA, Grade 5: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Standard	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Reading and Writing Process	16.70	27.5	5.0	72.5	5.0	0.0	0.0	Yes
	Critical Reading and Writing	11.20	29.0	8.4	44.4	10.1	26.7	8.3	Yes
	Vocabulary	10.20	39.6	28.6	60.4	28.6	0.0	0.0	Yes
	Language	5.90	23.3	14.9	76.7	14.9	0.0	0.0	Yes
	Research	3.60	0.0	0.0	70.0	27.4	30.0	27.4	Yes
	% of Standards Met Criterion								100%
B	Reading and Writing Process	16.60	16.7	8.6	75.0	7.0	8.4	6.5	Yes
	Critical Reading and Writing	11.40	31.6	3.9	29.6	6.4	38.8	5.9	Yes
	Vocabulary	10.40	24.5	18.7	75.5	18.7	0.0	0.0	Yes
	Language	5.60	3.3	7.5	42.0	17.6	54.7	20.8	Yes
	Research	3.20	6.7	14.9	66.7	35.8	26.7	30.8	Yes
	% of Standards Met Criterion								100%
C	Reading and Writing Process	15.80	11.4	5.2	86.1	2.8	2.6	3.5	Yes
	Critical Reading and Writing	13.20	36.9	11.8	26.7	10.7	36.4	5.9	Yes
	Vocabulary	10.00	40.0	22.4	58.0	19.2	2.0	4.5	Yes
	Language	6.00	10.0	14.9	60.0	19.0	30.0	21.7	Yes
	Research	4.20	27.0	13.0	51.0	20.7	22.0	22.8	Yes
	% of Standards Met Criterion								100%

Table A-11. DOK Consistency for ELA, Grade 6: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Standard	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Reading and Writing Process	15.75	7.8	2.6	76.2	9.2	15.9	10.8	Yes
	Critical Reading and Writing	11.50	46.5	29.9	53.5	29.9	0.0	0.0	Yes
	Vocabulary	10.75	5.0	10.0	83.6	9.7	11.4	3.5	Yes
	Language	6.00	4.2	8.3	54.2	25.0	41.7	28.9	Yes
	Research	5.63	86.1	16.7	13.9	16.7	0.0	0.0	No
	% of Standards Met Criterion								80%
B	Reading and Writing Process	16.25	12.7	8.0	72.3	13.9	15.0	9.8	Yes
	Critical Reading and Writing	11.00	66.3	23.6	33.7	23.6	0.0	0.0	No
	Vocabulary	10.50	7.5	9.6	85.5	12.7	7.0	8.8	Yes
	Language	6.00	12.5	8.3	75.0	9.6	12.5	16.0	Yes
	Research	5.75	75.6	29.1	16.1	13.7	8.3	16.7	No
	% of Standards Met Criterion								60%
C	Reading and Writing Process	16.50	14.8	12.9	73.4	19.7	11.8	7.4	Yes
	Critical Reading and Writing	10.75	55.0	34.6	45.0	34.6	0.0	0.0	No
	Vocabulary	11.13	2.5	5.0	88.8	4.2	8.7	7.1	Yes
	Language	6.00	16.7	13.6	79.2	8.3	4.2	8.3	Yes
	Research	5.00	87.9	14.5	12.1	14.5	0.0	0.0	No
	% of Standards Met Criterion								60%

Table A-12. DOK Consistency for ELA, Grade 7: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Standard	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Reading and Writing Process	15.0	3.8	7.7	77.9	17.8	18.3	19.1	Yes
	Critical Reading and Writing	13.5	61.7	18.7	38.3	18.7	0.0	0.0	No
	Vocabulary	7.5	0.0	0.0	84.4	18.8	15.6	18.8	Yes
	Language	6.0	4.2	8.3	45.8	28.5	50.0	36.0	Yes
	Research	7.6	96.9	6.3	3.1	6.3	0.0	0.0	No
	% of Standards Met Criterion								60%
B	Reading and Writing Process	16.3	11.5	19.2	79.6	14.9	8.9	7.5	Yes
	Critical Reading and Writing	12.3	83.4	10.1	16.6	10.1	0.0	0.0	No
	Vocabulary	7.5	0.0	0.0	93.8	12.5	6.3	12.5	Yes
	Language	6.0	0.0	0.0	29.2	37.0	70.8	37.0	Yes
	Research	7.6	86.8	10.3	13.2	10.3	0.0	0.0	No
	% of Standards Met Criterion								60%
C	Reading and Writing Process	14.25	17.8	22.3	76.8	20.5	5.4	6.6	Yes
	Critical Reading and Writing	14.25	71.5	14.1	28.5	14.1	0.0	0.0	No
	Vocabulary	7.50	0.0	0.0	83.9	23.6	16.1	23.6	Yes
	Language	6.00	0.0	0.0	37.5	21.0	62.5	21.0	Yes
	Research	7.63	96.9	6.3	3.1	6.3	0.0	0.0	No
	% of Standards Met Criterion								60%

Table A-13. DOK Consistency for ELA, Grade 8: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Standard	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Reading and Writing Process	11.25	38.5	10.6	57.0	16.7	4.5	9.1	Yes
	Critical Reading and Writing	16.00	82.1	17.6	17.9	17.6	0.0	0.0	No
	Vocabulary	7.00	0.0	0.0	92.9	8.2	7.1	8.2	Yes
	Language	7.00	3.6	7.1	67.9	24.4	28.6	20.2	Yes
	Research	7.13	95.5	9.1	4.5	9.1	0.0	0.0	No
	% of Standards Met Criterion								60%
B	Reading and Writing Process	13.25	30.0	12.3	60.1	24.0	10.0	14.5	Yes
	Critical Reading and Writing	15.13	89.7	8.9	10.3	8.9	0.0	0.0	No
	Vocabulary	7.50	0.0	0.0	85.8	21.0	14.2	21.0	Yes
	Language	7.00	0.0	0.0	50.0	14.3	50.0	14.3	Yes
	Research	6.13	96.4	7.1	3.6	7.1	0.0	0.0	No
	% of Standards Met Criterion								60%
C	Reading and Writing Process	12.00	43.3	16.4	52.9	14.9	3.9	4.5	Yes
	Critical Reading and Writing	14.25	86.7	11.6	13.3	11.6	0.0	0.0	No
	Vocabulary	8.75	0.0	0.0	72.3	26.2	27.7	26.2	Yes
	Language	7.25	7.1	14.3	62.1	6.7	30.8	12.5	Yes
	Research	6.75	92.9	14.3	7.1	14.3	0.0	0.0	No
	% of Standards Met Criterion								60%

Table A-14. DOK Consistency for ELA, Grade 10: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Standard	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Reading and Writing Process	19.21	67.8	13.3	31.2	11.6	1.0	1.9	No
	Critical Reading and Writing	18.88	73.4	7.9	25.0	7.3	1.6	3.1	No
	Vocabulary	9.00	20.6	21.1	63.8	9.8	15.6	12.4	Yes
	Language	7.66	36.6	33.1	36.6	30.1	26.8	25.9	Yes
	Research	4.00	100.0	0.0	0.0	0.0	0.0	0.0	No
	% of Standards Met Criterion								40%
B	Reading and Writing Process	16.38	67.9	11.4	32.1	11.4	0.0	0.0	No
	Critical Reading and Writing	19.00	84.3	10.5	15.7	10.5	0.0	0.0	No
	Vocabulary	7.50	16.3	12.3	64.7	17.8	19.0	15.1	Yes
	Language	9.63	13.3	12.4	34.4	35.6	52.3	33.5	Yes
	Research	4.50	83.3	23.6	16.7	23.6	0.0	0.0	No
	% of Standards Met Criterion								40%
C	Reading and Writing Process	18.75	64.1	22.4	33.0	17.5	2.9	5.7	No
	Critical Reading and Writing	18.04	81.6	15.1	18.4	15.1	0.0	0.0	No
	Vocabulary	8.50	20.5	23.8	67.7	23.8	11.8	0.8	Yes
	Language	7.88	11.1	22.2	41.9	37.2	46.9	40.3	Yes
	Research	5.25	66.7	47.1	33.3	47.1	0.0	0.0	No
	% of Standards Met Criterion								40%

Range-of-Knowledge Correspondence

The results for Range-of-Knowledge correspondence for the OSTP ELA test forms are presented below. The tables include the number of assessed objectives, the number of objectives that were not aligned by panelists to at least one item (on average), the specific objectives that were not assessed by at least one item, and the proportion of objectives that were aligned. For acceptable range-of-knowledge correspondence, a minimum of 50% of objectives within each standard should be matched to at least one item.

Table A-15. Range-of-Knowledge for OSTP ELA, Grade 3: Mean Percent of Objectives per Standard Linked with Items

Form	Standard	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Reading and Writing Process	13	10	3.2.F.1, 3.2.F.2, 3.2.PC, 3.2.PWS.1, 3.2.PWS.2, 3.2.PWS.3, 3.2.W.1, 3.2.W.2, 3.2.W.3, 3.2.W.4	23.1	No
	Critical Reading and Writing	10	5	3.3.R.1, 3.3.R.6, 3.3.W.1, 3.3.W.2, 3.3.W.3	50.0	Yes
	Vocabulary	7	3	3.4.R.1, 3.4.W.1, 3.4.W.2	57.1	Yes
	Language	9	5	3.5.R.2, 3.5.R.3, 3.5.R.4, 3.5.R.5, 3.5.W.2	44.4	No
	Research	7	6	3.6.R.1, 3.6.R.3, 3.6.R.4, 3.6.W.1, 3.6.W.2, 3.6.W.3	14.3	No
					% of Standards Met Criterion	40%
B	Reading and Writing Process	13	10	3.2.F.1, 3.2.F.2, 3.2.PC, 3.2.PWS.1, 3.2.PWS.2, 3.2.PWS.3, 3.2.W.1, 3.2.W.2, 3.2.W.3, 3.2.W.4	23.1	No
	Critical Reading and Writing	10	5	3.3.R.2, 3.3.R.6, 3.3.W.1, 3.3.W.2, 3.3.W.3	50.0	Yes
	Vocabulary	7	5	3.4.R.1, 3.4.R.2, 3.4.R.4, 3.4.W.1, 3.4.W.2	28.6	No
	Language	9	5	3.5.R.1, 3.5.R.2, 3.5.R.5, 3.5.W.1, 3.5.W.2	44.4	No
	Research	7	5	3.6.R.1, 3.6.R.4, 3.6.W.1, 3.6.W.2, 3.6.W.3	28.6	No
					% of Standards Met Criterion	20%
C	Reading and Writing Process	13	10	3.2.F.1, 3.2.F.2, 3.2.PC, 3.2.PWS.1, 3.2.PWS.2, 3.2.PWS.3, 3.2.W.1, 3.2.W.2, 3.2.W.3, 3.2.W.4	23.1	No
	Critical Reading and Writing	10	6	3.3.R.1, 3.3.R.2, 3.3.R.6, 3.3.W.1, 3.3.W.2, 3.3.W.3	40.0	No
	Vocabulary	7	4	3.4.R.1, 3.4.R.2, 3.4.W.1, 3.4.W.2	42.9	No
	Language	9	4	3.5.R.1, 3.5.W.1, 3.5.W.2, 3.5.W.4	55.6	Yes
	Research	7	4	3.6.R.4, 3.6.W.1, 3.6.W.2, 3.6.W.3	42.9	No
					% of Standards Met Criterion	20%

Table A-16. Range-of-Knowledge for OSTP ELA, Grade 4: Mean Percent of Objectives per Standard Linked with Items

Form	Standard	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Reading and Writing Process	12	8	4.2.F.1, 4.2.F.2, 4.2.PC, 4.2.PWS.1, 4.2.W.1, 4.2.W.2, 4.2.W.3, 4.2.W.4	33.3	No
	Critical Reading and Writing	10	5	4.3.R.2, 4.3.R.6, 4.3.W.1, 4.3.W.2, 4.3.W.3	50.0	Yes
	Vocabulary	7	3	4.4.R.1, 4.4.W.1, 4.4.W.2	57.1	Yes
	Language	9	7	4.5.R.1, 4.5.R.2, 4.5.R.5, 4.5.W.1, 4.5.W.2, 4.5.W.3, 4.5.W.4	22.2	No
	Research	6	3	4.6.W.1, 4.6.W.2, 4.6.W.3	50.0	Yes
				% of Standards Met Criterion		60%
B	Reading and Writing Process	12	8	4.2.F.1, 4.2.F.2, 4.2.PC, 4.2.PWS.1, 4.2.W.1, 4.2.W.2, 4.2.W.3, 4.2.W.4	33.3	No
	Critical Reading and Writing	10	5	4.3.R.2, 4.3.R.6, 4.3.W.1, 4.3.W.2, 4.3.W.3	50.0	Yes
	Vocabulary	7	3	4.4.R.1, 4.4.W.1, 4.4.W.2	57.1	Yes
	Language	9	6	4.5.R.1, 4.5.R.3, 4.5.R.4, 4.5.R.5, 4.5.W.3, 4.5.W.4	33.3	No
	Research	6	3	4.6.W.1, 4.6.W.2, 4.6.W.3	50.0	Yes
				% of Standards Met Criterion		60%
C	Reading and Writing Process	12	7	4.2.F.1, 4.2.F.2, 4.2.PC, 4.2.PWS.1, 4.2.W.1, 4.2.W.3, 4.2.W.4	41.7	No
	Critical Reading and Writing	10	5	4.3.R.2, 4.3.R.6, 4.3.W.1, 4.3.W.2, 4.3.W.3	50.0	Yes
	Vocabulary	7	3	4.4.R.1, 4.4.W.1, 4.4.W.2	57.1	Yes
	Language	9	7	4.5.R.1, 4.5.R.3, 4.5.R.4, 4.5.R.5, 4.5.W.1, 4.5.W.2, 4.5.W.3	22.2	No
	Research	6	2	4.6.W.2, 4.6.W.3	66.7	Yes
				% of Standards Met Criterion		60%

Table A-17. Range-of-Knowledge for OSTP ELA, Grade 5: Mean Percent of Objectives per Standard Linked with Items

Form	Standard	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Reading and Writing Process	8	5	5.2.W.1, 5.2.W.2, 5.2.W.3, 5.2.W.4, 5.2.W.5	37.5	No
	Critical Reading and Writing	11	6	5.3.R.2, 5.3.R.7, 5.3.W.1, 5.3.W.2, 5.3.W.3, 5.3.W.4	45.5	No
	Vocabulary	7	4	5.4.R.1, 5.4.R.5, 5.4.W.1, 5.4.W.2	42.9	No
	Language	8	4	5.5.W.2, 5.5.W.3, 5.5.W.4, 5.5.W.5	50.0	Yes
	Research	7	6	5.6.R.1, 5.6.R.2, 5.6.W.1, 5.6.W.2, 5.6.W.3, 5.6.W.4	14.3	No
				% of Standards Met Criterion		20%
B	Reading and Writing Process	8	5	5.2.W.1, 5.2.W.2, 5.2.W.3, 5.2.W.4, 5.2.W.5	37.5	No
	Critical Reading and Writing	11	6	5.3.R.1, 5.3.R.7, 5.3.W.1, 5.3.W.2, 5.3.W.3, 5.3.W.4	45.5	No
	Vocabulary	7	5	5.4.R.1, 5.4.R.4, 5.4.R.5, 5.4.W.1, 5.4.W.2	28.6	No
	Language	8	4	5.5.R.1, 5.5.W.1, 5.5.W.2, 5.5.W.3	50.0	Yes
	Research	7	6	5.6.R.1, 5.6.R.2, 5.6.W.1, 5.6.W.2, 5.6.W.3, 5.6.W.4	14.3	No
				% of Standards Met Criterion		20%
C	Reading and Writing Process	8	5	5.2.W.1, 5.2.W.2, 5.2.W.3, 5.2.W.4, 5.2.W.5	37.5	No
	Critical Reading and Writing	11	5	5.3.R.2, 5.3.W.1, 5.3.W.2, 5.3.W.3, 5.3.W.4	54.5	Yes
	Vocabulary	7	4	5.4.R.1, 5.4.R.5, 5.4.W.1, 5.4.W.2	42.9	No
	Language	8	4	5.5.R.2, 5.5.R.3, 5.5.W.2, 5.5.W.3	50.0	Yes
	Research	7	5	5.6.R.2, 5.6.W.1, 5.6.W.2, 5.6.W.3, 5.6.W.4	28.6	No
				% of Standards Met Criterion		40%

Table A-18. Range-of-Knowledge for OSTP ELA, Grade 6: Mean Percent of Objectives per Standard Linked with Items

Form	Standard	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Reading and Writing Process	8	5	6.2.W.1, 6.2.W.2, 6.2.W.3, 6.2.W.4, 6.2.W.5	37.5	No
	Critical Reading and Writing	11	7	6.3.R.1, 6.3.R.2, 6.3.R.5, 6.3.W.1, 6.3.W.2, 6.3.W.3, 6.3.W.4	36.4	No
	Vocabulary	7	5	6.4.R.1, 6.4.R.4, 6.4.R.5, 6.4.W.1, 6.4.W.2	28.6	No
	Language	8	5	6.5.R.1, 6.5.R.3, 6.5.W.3, 6.5.W.4, 6.5.W.5	37.5	No
	Research	7	5	6.6.R.2, 6.6.W.1, 6.6.W.2, 6.6.W.3, 6.6.W.4	28.6	No
				% of Standards Met Criterion		0%
B	Reading and Writing Process	8	5	6.2.W.1, 6.2.W.2, 6.2.W.3, 6.2.W.4, 6.2.W.5	37.5	No
	Critical Reading and Writing	11	7	6.3.R.1, 6.3.R.2, 6.3.R.5, 6.3.W.1, 6.3.W.2, 6.3.W.3, 6.3.W.4	36.4	No
	Vocabulary	7	5	6.4.R.1, 6.4.R.4, 6.4.R.5, 6.4.W.1, 6.4.W.2	28.6	No
	Language	8	3	6.5.R.1, 6.5.W.3, 6.5.W.4	62.5	Yes
	Research	7	5	6.6.R.1, 6.6.W.1, 6.6.W.2, 6.6.W.3, 6.6.W.4	28.6	No
				% of Standards Met Criterion		20%
C	Reading and Writing Process	8	5	6.2.W.1, 6.2.W.2, 6.2.W.3, 6.2.W.4, 6.2.W.5	37.5	No
	Critical Reading and Writing	11	7	6.3.R.1, 6.3.R.2, 6.3.R.5, 6.3.W.1, 6.3.W.2, 6.3.W.3, 6.3.W.4	36.4	No
	Vocabulary	7	4	6.4.R.1, 6.4.R.4, 6.4.W.1, 6.4.W.2	42.9	No
	Language	8	3	6.5.R.1, 6.5.W.3, 6.5.W.5	62.5	Yes
	Research	7	6	6.6.R.1, 6.6.R.2, 6.6.W.1, 6.6.W.2, 6.6.W.3, 6.6.W.4	14.3	No
				% of Standards Met Criterion		20%

Table A-19. Range-of-Knowledge for OSTP ELA, Grade 7: Mean Percent of Objectives per Standard Linked with Items

Form	Standard	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Reading and Writing Process	8	5	7.2.W.1, 7.2.W.2, 7.2.W.3, 7.2.W.4, 7.2.W.5	37.5	No
	Critical Reading and Writing	11	4	7.3.W.1, 7.3.W.2, 7.3.W.3, 7.3.W.4	63.6	Yes
	Vocabulary	7	3	7.4.R.1, 7.4.W.1, 7.4.W.2	57.1	Yes
	Language	7	2	7.5.R.2, 7.5.W.2	71.4	Yes
	Research	7	6	7.6.R.1, 7.6.R.2, 7.6.W.1, 7.6.W.2, 7.6.W.3, 7.6.W.4	14.3	No
				% of Standards Met Criterion		60%
B	Reading and Writing Process	8	4	7.2.W.1, 7.2.W.3, 7.2.W.4, 7.2.W.5	50.0	Yes
	Critical Reading and Writing	11	7	7.3.R.1, 7.3.R.5, 7.3.R.7, 7.3.W.1, 7.3.W.2, 7.3.W.3, 7.3.W.4	36.4	No
	Vocabulary	7	4	7.4.R.1, 7.4.R.5, 7.4.W.1, 7.4.W.2	42.9	No
	Language	7	4	7.5.R.1, 7.5.R.3, 7.5.W.2, 7.5.W.3	42.9	No
	Research	7	5	7.6.R.1, 7.6.R.2, 7.6.W.1, 7.6.W.2, 7.6.W.4	28.6	No
				% of Standards Met Criterion		20%
C	Reading and Writing Process	8	5	7.2.W.1, 7.2.W.2, 7.2.W.3, 7.2.W.4, 7.2.W.5	37.5	No
	Critical Reading and Writing	11	5	7.3.R.7, 7.3.W.1, 7.3.W.2, 7.3.W.3, 7.3.W.4	54.5	Yes
	Vocabulary	7	4	7.4.R.1, 7.4.R.5, 7.4.W.1, 7.4.W.2	42.9	No
	Language	7	3	7.5.R.3, 7.5.W.2, 7.5.W.3	57.1	Yes
	Research	7	5	7.6.R.1, 7.6.R.2, 7.6.W.1, 7.6.W.2, 7.6.W.4	28.6	No
				% of Standards Met Criterion		40%

Table A-20. Range-of-Knowledge for OSTP ELA, Grade 8: Mean Percent of Objectives per Standard Linked with Items

Form	Standard	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Reading and Writing Process	8	5	8.2.W.1, 8.2.W.2, 8.2.W.3, 8.2.W.4, 8.2.W.5	37.5	No
	Critical Reading and Writing	11	4	8.3.W.1, 8.3.W.2, 8.3.W.3, 8.3.W.4	63.6	Yes
	Vocabulary	7	5	8.4.R.1, 8.4.R.2, 8.4.R.5, 8.4.W.1, 8.4.W.2	28.6	No
	Language	9	3	8.5.R.4, 8.5.W.3, 8.5.W.4	66.7	Yes
	Research	7	5	8.6.R.2, 8.6.W.1, 8.6.W.2, 8.6.W.3, 8.6.W.4	28.6	No
				% of Standards Met Criterion		40%
B	Reading and Writing Process	8	5	8.2.W.1, 8.2.W.2, 8.2.W.3, 8.2.W.4, 8.2.W.5	37.5	No
	Critical Reading and Writing	11	5	8.3.R.7, 8.3.W.1, 8.3.W.2, 8.3.W.3, 8.3.W.4	54.5	Yes
	Vocabulary	7	5	8.4.R.1, 8.4.R.2, 8.4.R.5, 8.4.W.1, 8.4.W.2	28.6	No
	Language	9	5	8.5.R.4, 8.5.W.1, 8.5.W.3, 8.5.W.4, 8.5.W.5	44.4	No
	Research	7	5	8.6.R.2, 8.6.W.1, 8.6.W.2, 8.6.W.3, 8.6.W.4	28.6	No
				% of Standards Met Criterion		20%
C	Reading and Writing Process	8	5	8.2.W.1, 8.2.W.2, 8.2.W.3, 8.2.W.4, 8.2.W.5	37.5	No
	Critical Reading and Writing	11	4	8.3.W.1, 8.3.W.2, 8.3.W.3, 8.3.W.4	63.6	Yes
	Vocabulary	7	4	8.4.R.2, 8.4.R.5, 8.4.W.1, 8.4.W.2	42.9	No
	Language	9	6	8.5.R.2, 8.5.R.4, 8.5.W.1, 8.5.W.3, 8.5.W.4, 8.5.W.5	33.3	No
	Research	7	5	8.6.R.1, 8.6.R.2, 8.6.W.1, 8.6.W.2, 8.6.W.4	28.6	No
				% of Standards Met Criterion		20%

Table A-21. Range-of-Knowledge for OSTP ELA, Grade 10: Mean Percent of Objectives per Standard Linked with Items

Form	Standard	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Reading and Writing Process	7	4	10.2.W.1, 10.2.W.2, 10.2.W.3, 10.2.W.5	42.9	No
	Critical Reading and Writing	13	7	10.3.R.1, 10.3.W.1, 10.3.W.2, 10.3.W.3, 10.3.W.4, 10.3.W.5, 10.3.W.6	46.2	No
	Vocabulary	7	5	10.4.R.1, 10.4.R.2, 10.4.R.5, 10.4.W.1, 10.4.W.2	28.6	No
	Language	4	1	10.5.W.2	75.0	Yes
	Research	7	6	10.6.R.1, 10.6.R.2, 10.6.R.3, 10.6.W.1, 10.6.W.2, 10.6.W.4	14.3	No
				% of Standards Met Criterion		20%
B	Reading and Writing Process	7	4	10.2.W.1, 10.2.W.2, 10.2.W.3, 10.2.W.5	42.9	No
	Critical Reading and Writing	13	7	10.3.R.1, 10.3.W.1, 10.3.W.2, 10.3.W.3, 10.3.W.4, 10.3.W.5, 10.3.W.6	46.2	No
	Vocabulary	7	5	10.4.R.1, 10.4.R.4, 10.4.R.5, 10.4.W.1, 10.4.W.2	28.6	No
	Language	4	1	10.5.W.2	75.0	Yes
	Research	7	6	10.6.R.1, 10.6.R.2, 10.6.R.3, 10.6.W.1, 10.6.W.2, 10.6.W.4	14.3	No
				% of Standards Met Criterion		20%
C	Reading and Writing Process	7	4	10.2.W.1, 10.2.W.2, 10.2.W.3, 10.2.W.5	42.9	No
	Critical Reading and Writing	13	7	10.3.R.1, 10.3.W.1, 10.3.W.2, 10.3.W.3, 10.3.W.4, 10.3.W.5, 10.3.W.6	46.2	No
	Vocabulary	7	4	10.4.R.1, 10.4.R.2, 10.4.W.1, 10.4.W.2	42.9	No
	Language	4	2	10.5.R, 10.5.W.2	50.0	Yes
	Research	7	5	10.6.R.2, 10.6.R.3, 10.6.W.1, 10.6.W.2, 10.6.W.4	28.6	No
				% of Standards Met Criterion		20%

Balance of knowledge Representation

The results for Balance of knowledge representation for the OSTP ELA test forms are presented below. The tables include the minimum, maximum and mean number of items that were aligned, on average, to each objective (out of the objectives that were aligned to items) within a standard. In addition, they include the number of objectives that were aligned to items, the mean number of items aligned to the standard and the balance index. The minimum acceptable balance index is 70 out of 100.

Table A-22. Balance of knowledge Representation for ELA, Grade 3: Mean Balance Index per Standard

Form	Standard	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Standard	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Reading and Writing Process	3.3	7.2	5.4	3	16.1	87.2	Yes
	Critical Reading and Writing	1.0	3.9	1.7	5	8.3	73.0	Yes
	Vocabulary	1.4	4.6	2.9	4	11.5	81.3	Yes
	Language	1.0	3.0	1.5	4	6.0	75.0	Yes
	Research	3.7	3.7	3.7	1	3.7	100.0	Yes
						% of Standards Met Criterion		100%
B	Reading and Writing Process	4.0	6.0	4.9	3	14.7	92.5	Yes
	Critical Reading and Writing	1.0	4.2	1.9	5	9.6	75.4	Yes
	Vocabulary	3.1	7.6	5.4	2	10.7	79.0	Yes
	Language	1.0	2.8	1.5	4	5.8	76.7	Yes
	Research	1.0	3.3	2.2	2	4.3	73.3	Yes
						% of Standards Met Criterion		100%
C	Reading and Writing Process	3.9	6.9	4.9	3	14.7	86.4	Yes
	Critical Reading and Writing	1.0	4.1	2.3	4	9.2	71.7	Yes
	Vocabulary	2.6	5.9	3.7	3	11.2	80.7	Yes
	Language	1.0	1.6	1.2	5	6.0	90.0	Yes
	Research	1.6	2.4	1.9	3	5.8	92.0	Yes
						% of Standards Met Criterion		100%

Table A-23. Balance of knowledge Representation for ELA, Grade 4: Mean Balance Index per Standard

Form	Standard	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Standard	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Reading and Writing Process	1.8	8.8	4.3	4	17.3	74.1	Yes
	Critical Reading and Writing	1.0	3.4	1.6	5	8.0	77.5	Yes
	Vocabulary	1.1	5.2	3.0	4	12.0	74.2	Yes
	Language	1.0	1.8	1.4	2	2.8	85.7	Yes
	Research	1.0	2.4	1.8	3	5.4	85.2	Yes
						% of Standards Met Criterion		100%
B	Reading and Writing Process	2.2	7.0	3.7	4	14.9	78.0	Yes
	Critical Reading and Writing	1.2	3.8	2.2	5	10.8	84.8	Yes
	Vocabulary	1.1	4.7	3.1	4	12.2	76.2	Yes
	Language	1.4	2.4	1.9	3	5.8	90.8	Yes
	Research	1.6	2.0	1.8	3	5.4	96.3	Yes
						% of Standards Met Criterion		100%
C	Reading and Writing Process	1.2	7.4	3.7	5	18.3	72.2	Yes
	Critical Reading and Writing	1.0	2.8	1.7	5	8.6	77.2	Yes
	Vocabulary	1.1	5.1	3.0	4	11.8	81.4	Yes
	Language	1.0	1.4	1.2	2	2.4	91.7	Yes
	Research	1.0	2.4	1.5	4	6.0	83.3	Yes
						% of Standards Met Criterion		100%

Table A-24. Balance of knowledge Representation for ELA, Grade 5: Mean Balance Index per Standard

Form	Standard	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Standard	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Reading and Writing Process	4.6	6.4	5.5	3	16.6	94.4	Yes
	Critical Reading and Writing	1.0	3.4	2.0	5	10.2	77.3	Yes
	Vocabulary	2.8	4.4	3.4	3	10.2	90.2	Yes
	Language	1.0	1.2	1.1	4	4.2	96.4	Yes
	Research	3.6	3.6	3.6	1	3.6	100.0	Yes
						% of Standards Met Criterion		100%
B	Reading and Writing Process	4.6	6.4	5.5	3	16.6	94.4	Yes
	Critical Reading and Writing	1.0	4.6	2.1	5	10.4	75.8	Yes
	Vocabulary	3.7	4.6	4.2	2	8.3	94.6	Yes
	Language	1.0	1.2	1.1	4	4.2	96.4	Yes
	Research	3.0	3.0	3.0	1	3.0	100.0	Yes
						% of Standards Met Criterion		100%
C	Reading and Writing Process	3.0	7.4	5.3	3	15.8	85.7	Yes
	Critical Reading and Writing	1.0	5.0	2.2	6	13.2	78.8	Yes
	Vocabulary	2.4	3.7	3.2	3	9.7	91.4	Yes
	Language	1.0	1.2	1.1	4	4.4	95.5	Yes
	Research	1.0	3.2	2.1	2	4.2	73.8	Yes
						% of Standards Met Criterion		100%

Table A-25. Balance of knowledge Representation for ELA, Grade 6: Mean Balance Index per Standard

Form	Standard	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Standard	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Reading and Writing Process	2.8	6.8	5.3	3	15.8	84.1	Yes
	Critical Reading and Writing	2.0	3.3	2.6	4	10.5	90.5	Yes
	Vocabulary	4.3	6.5	5.4	2	10.8	89.5	Yes
	Language	1.0	2.0	1.4	3	4.3	86.3	Yes
	Research	1.0	3.9	2.4	2	4.9	70.5	Yes
						% of Standards Met Criterion		100%
B	Reading and Writing Process	3.0	8.0	5.4	3	16.3	84.1	Yes
	Critical Reading and Writing	1.5	4.3	2.7	4	10.8	82.6	Yes
	Vocabulary	2.3	8.0	5.1	2	10.3	72.0	Yes
	Language	1.0	1.3	1.1	5	5.3	96.2	Yes
	Research	1.5	4.0	2.8	2	5.5	77.3	Yes
						% of Standards Met Criterion		100%
C	Reading and Writing Process	3.5	8.8	5.5	3	16.5	80.3	Yes
	Critical Reading and Writing	1.5	3.3	2.7	4	10.8	89.0	Yes
	Vocabulary	1.0	8.0	3.4	3	10.3	55.3	No
	Language	1.0	1.3	1.1	5	5.3	96.2	Yes
	Research	4.0	4.0	4.0	1	4.0	100.0	Yes
						% of Standards Met Criterion		80%

Table A-26. Balance of knowledge Representation for ELA, Grade 7: Mean Balance Index per Standard

Form	Standard	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Standard	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Reading and Writing Process	3.0	7.0	5.0	3	15.0	86.7	Yes
	Critical Reading and Writing	1.0	3.5	1.8	7	12.8	82.6	Yes
	Vocabulary	1.0	3.5	1.9	4	7.5	76.7	Yes
	Language	1.0	1.0	1.0	5	5.0	100.0	Yes
	Research	7.1	7.1	7.1	1	7.1	100.0	Yes
						% of Standards Met Criterion		100%
B	Reading and Writing Process	2.0	6.8	4.1	4	16.3	82.3	Yes
	Critical Reading and Writing	2.5	3.0	2.9	4	11.5	96.7	Yes
	Vocabulary	1.0	4.0	2.5	3	7.5	80.0	Yes
	Language	1.3	2.3	1.8	3	5.3	90.5	Yes
	Research	1.0	6.6	3.8	2	7.6	63.1	No
						% of Standards Met Criterion		80%
C	Reading and Writing Process	3.0	6.5	4.8	3	14.3	87.7	Yes
	Critical Reading and Writing	1.3	3.0	2.2	6	13.0	87.2	Yes
	Vocabulary	2.0	3.0	2.5	3	7.5	93.3	Yes
	Language	1.0	1.8	1.3	4	5.3	88.1	Yes
	Research	1.3	5.4	3.3	2	6.6	68.9	No
						% of Standards Met Criterion		80%

Table A-27. Balance of knowledge Representation for ELA, Grade 8: Mean Balance Index per Standard

Form	Standard	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Standard	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Reading and Writing Process	2.5	4.5	3.7	3	11.0	89.4	Yes
	Critical Reading and Writing	1.0	3.8	2.3	7	16.0	78.8	Yes
	Vocabulary	1.3	5.5	3.4	2	6.8	68.5	No
	Language	1.0	1.5	1.1	6	6.5	93.6	Yes
	Research	1.5	5.1	3.3	2	6.6	72.6	Yes
						% of Standards Met Criterion		80%
B	Reading and Writing Process	3.8	5.0	4.4	3	13.3	95.0	Yes
	Critical Reading and Writing	1.0	4.0	2.4	6	14.6	81.6	Yes
	Vocabulary	2.3	4.5	3.4	2	6.8	83.3	Yes
	Language	1.0	2.0	1.5	4	6.0	83.3	Yes
	Research	1.5	3.6	2.6	2	5.1	79.3	Yes
						% of Standards Met Criterion		100%
C	Reading and Writing Process	2.5	5.0	4.0	3	12.0	87.5	Yes
	Critical Reading and Writing	1.0	3.0	2.0	7	14.0	82.1	Yes
	Vocabulary	1.8	3.8	2.9	3	8.8	86.7	Yes
	Language	1.0	2.0	1.5	3	4.5	88.9	Yes
	Research	2.0	3.8	2.9	2	5.8	84.8	Yes
						% of Standards Met Criterion		100%

Table A-28. Balance of knowledge Representation for ELA, Grade 10: Mean Balance Index per Standard

Form	Standard	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Standard	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Reading and Writing Process	1.8	9.9	6.4	3	19.2	76.2	Yes
	Critical Reading and Writing	1.3	6.8	3.1	6	18.6	74.9	Yes
	Vocabulary	1.3	5.6	3.4	2	6.9	68.2	No
	Language	1.9	3.3	2.6	3	7.7	90.4	Yes
	Research	3.8	3.8	3.8	1	3.8	100.0	Yes
						% of Standards Met Criterion		80%
B	Reading and Writing Process	1.0	7.8	5.5	3	16.4	72.8	Yes
	Critical Reading and Writing	1.3	6.1	3.1	6	18.6	76.8	Yes
	Vocabulary	1.5	4.5	3.0	2	6.0	75.0	Yes
	Language	2.7	3.9	3.2	3	9.5	92.4	Yes
	Research	2.0	2.0	2.0	1	2.0	100.0	Yes
						% of Standards Met Criterion		100%
C	Reading and Writing Process	1.9	9.5	6.3	3	18.8	76.7	Yes
	Critical Reading and Writing	1.1	5.3	2.9	6	17.7	77.6	Yes
	Vocabulary	1.0	5.1	2.6	3	7.8	67.2	No
	Language	2.8	3.9	3.3	2	6.6	91.5	Yes
	Research	1.3	2.8	2.0	2	4.0	81.3	Yes
						% of Standards Met Criterion		80%

Objectives Matched to Items by Panelists

The average number of items matched by panelists, on average, to each objective are presented below. One note of caution when reading these tables: the same items may not be represented by the mean number of items. For example, objective '1.1.a' in the first row shows that panelists matched a mean number of 7.14 items to this objective. This does not mean/assume that the items matched to the objective by the panelists were the same items across panelists.

Table A-29. Objectives Matched to Items for ELA, Grade 3: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
3.2.F.1	0.0	--	0.0	--	0.0	--
3.2.F.2	0.0	--	0.0	--	0.0	--
3.2.PC	0.0	--	0.0	--	0.0	--
3.2.PWS.1	0.0	--	0.0	--	0.0	--
3.2.PWS.2	0.6	.89	0.2	.45	0.0	--
3.2.PWS.3	0.2	.45	0.2	.45	0.2	.45
3.2.R.1	5.6	.42	4.7	.45	3.9	.74
3.2.R.2	3.3	.45	4.0	.00	3.9	1.10
3.2.R.3	7.2	.76	6.0	.00	6.9	.22
3.2.W.1	0.0	--	0.0	--	0.0	--
3.2.W.2	0.0	--	0.0	--	0.0	--
3.2.W.3	0.0	--	0.0	--	0.0	--
3.2.W.4	0.4	.55	0.4	.55	0.4	.55
3.3.R.1	0.0	--	1.0	.00	0.0	--
3.3.R.2	1.0	.00	0.0	--	0.2	.45
3.3.R.3	1.4	1.10	1.4	1.50	3.1	.55
3.3.R.4	1.0	.00	2.0	.00	1.0	.00
3.3.R.5	1.0	.00	1.0	.00	1.0	.00
3.3.R.6	0.2	.45	0.0	--	0.7	.84
3.3.R.7	3.9	1.30	4.2	1.30	4.1	.74
3.3.W.1	0.0	--	0.0	--	0.0	--
3.3.W.2	0.0	--	0.0	--	0.0	--
3.3.W.3	0.0	--	0.0	--	0.0	--
3.4.R.1	0.0	--	0.0	--	0.0	--
3.4.R.2	1.4	.89	0.7	.45	0.2	.45
3.4.R.3	4.6	.55	7.6	.65	5.9	1.00
3.4.R.4	2.2	.27	0.4	.65	2.7	.67
3.4.R.5	3.3	.67	3.1	.55	2.6	.55
3.4.W.1	0.0	--	0.0	--	0.0	--
3.4.W.2	0.0	--	0.0	--	0.0	--
3.5.R.1	1.0	.00	0.0	--	0.0	--
3.5.R.2	0.0	--	0.0	--	1.6	.55
3.5.R.3	0.0	--	1.0	.00	1.0	.00
3.5.R.4	0.0	--	1.0	.00	1.0	.00
3.5.R.5	0.0	--	0.0	--	1.4	.55
3.5.W.1	1.0	.00	0.0	--	0.0	--
3.5.W.2	0.0	--	0.2	.45	0.0	--
3.5.W.3	3.0	.00	1.0	.71	1.0	.00
3.5.W.4	1.0	.00	2.8	.45	0.0	--
3.6.R.1	0.9	.89	0.8	.45	1.6	.55
3.6.R.2	3.7	.84	3.3	.45	2.4	.55
3.6.R.3	0.3	.45	1.0	.00	1.8	.45
3.6.R.4	0.2	.45	0.0	--	0.0	--
3.6.W.1	0.0	--	0.2	.45	0.2	.45
3.6.W.2	0.0	--	0.0	--	0.0	--
3.6.W.3	0.0	--	0.0	--	0.0	--

Table A-30. Objectives Matched to Items for ELA, Grade 4: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
4.2.F.1	0.0	--	0.0	--	0.0	--
4.2.F.2	0.0	--	0.0	--	0.0	--
4.2.PC	0.0	--	0.0	--	0.0	--
4.2.PWS.1	0.0	--	0.0	--	0.0	--
4.2.R.1	1.8	.45	2.8	1.10	2.0	.00
4.2.R.2	8.8	.45	7.0	.71	7.4	.89
4.2.R.3	3.5	.35	2.9	.65	2.7	.27
4.2.R.4	3.2	.45	2.2	1.10	5.0	.00
4.2.W.1	0.0	--	0.0	--	0.0	--
4.2.W.2	0.0	--	0.0	--	1.2	.45
4.2.W.3	0.0	--	0.0	--	0.0	--
4.2.W.4	0.0	--	0.0	--	0.0	--
4.3.R.1	1.0	.00	1.8	.45	1.0	.00
4.3.R.2	0.4	.55	0.0	--	0.0	--
4.3.R.3	1.6	.55	2.0	.71	2.6	.55
4.3.R.4	1.0	.00	1.2	.45	1.2	.45
4.3.R.5	1.0	.00	2.0	.00	1.0	.00
4.3.R.6	0.3	.27	0.3	.27	0.3	.27
4.3.R.7	3.4	.55	3.8	.84	2.8	.45
4.3.W.1	0.0	--	0.0	--	0.0	--
4.3.W.2	0.2	.45	0.0	--	0.0	--
4.3.W.3	0.0	--	0.0	--	0.0	--
4.4.R.1	0.0	--	0.0	--	0.0	--
4.4.R.2	1.8	.45	2.1	.55	2.6	.55
4.4.R.3	5.2	.45	4.7	.67	5.1	.55
4.4.R.4	3.9	.22	4.3	.67	3.0	.00
4.4.R.5	1.1	.22	1.1	.22	1.1	.22
4.4.W.1	0.0	--	0.0	--	0.0	--
4.4.W.2	0.0	--	0.0	--	0.2	.45
4.5.R.1	0.8	.45	0.0	--	0.8	.45
4.5.R.2	0.0	--	1.4	.55	1.4	.55
4.5.R.3	1.0	.00	0.0	--	0.6	.55
4.5.R.4	1.8	.84	0.0	--	0.0	--
4.5.R.5	0.2	.45	0.2	.45	0.2	.45
4.5.W.1	0.0	--	2.0	.00	0.0	--
4.5.W.2	0.8	.45	2.4	.55	0.2	.45
4.5.W.3	0.4	.55	0.0	--	0.6	.55
4.5.W.4	0.8	.45	0.0	--	1.0	.00
4.6.R.1	2.4	1.30	1.6	.89	1.6	2.20
4.6.R.2	1.0	.00	1.8	.45	1.0	.00
4.6.R.3	2.0	.00	2.0	.00	1.0	.00
4.6.W.1	0.6	1.30	0.4	.89	2.4	2.20
4.6.W.2	0.0	--	0.0	--	0.0	--
4.6.W.3	0.0	--	0.0	--	0.0	--

Table A-31. Objectives Matched to Items for ELA, Grade 5: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
5.2.R.1	5.6	.89	4.6	.89	3.0	.79
5.2.R.2	6.4	.82	6.4	.82	7.4	.82
5.2.R.3	4.6	.89	5.6	1.10	5.4	1.10
5.2.W.1	0.0	--	0.0	--	0.0	--
5.2.W.2	0.0	--	0.0	--	0.0	--
5.2.W.3	0.0	--	0.0	--	0.0	--
5.2.W.4	0.1	.22	0.0	--	0.0	--
5.2.W.5	0.0	--	0.0	--	0.0	--
5.3.R.1	1.8	.45	0.4	.55	2.2	.45
5.3.R.2	0.4	.55	1.8	.45	0.0	--
5.3.R.3	3.0	1.20	4.6	.65	5.0	.79
5.3.R.4	3.4	.55	2.0	.00	2.0	.00
5.3.R.5	1.0	.00	1.0	.00	1.0	.00
5.3.R.6	1.0	.00	1.0	.00	1.6	.55
5.3.R.7	0.6	.89	0.6	.89	1.4	.82
5.3.W.1	0.0	--	0.0	--	0.0	--
5.3.W.2	0.0	--	0.0	--	0.0	--
5.3.W.3	0.0	--	0.0	--	0.0	--
5.3.W.4	0.0	--	0.0	--	0.0	--
5.4.R.1	0.0	--	0.0	--	0.0	--
5.4.R.2	4.4	1.10	3.7	.45	3.6	.65
5.4.R.3	3.0	1.50	4.6	.65	2.4	1.20
5.4.R.4	2.8	.45	0.9	.22	3.7	.67
5.4.R.5	0.0	--	0.8	.45	0.3	.45
5.4.W.1	0.0	--	0.0	--	0.0	--
5.4.W.2	0.0	--	0.4	.55	0.0	--
5.5.R.1	1.0	.00	0.0	--	1.0	.00
5.5.R.2	1.0	.71	1.2	.45	0.0	--
5.5.R.3	1.0	.00	1.0	.00	0.0	--
5.5.W.1	1.2	.45	0.0	--	1.2	.45
5.5.W.2	0.7	.45	0.6	.55	0.8	.45
5.5.W.3	0.8	.45	0.8	.45	0.8	.45
5.5.W.4	0.0	--	1.0	.00	1.0	.00
5.5.W.5	0.2	.45	1.0	.00	1.2	.45
5.6.R.1	0.0	--	0.2	.45	1.0	.00
5.6.R.2	0.0	--	0.0	--	0.0	--
5.6.R.3	3.6	.89	3.0	1.40	3.2	1.30
5.6.W.1	0.0	--	0.0	--	0.0	--
5.6.W.2	0.0	--	0.0	--	0.0	--
5.6.W.3	0.0	--	0.0	--	0.0	--
5.6.W.4	0.0	--	0.0	--	0.0	--

Table A-32. Objectives Matched to Items for ELA, Grade 6: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
6.2.R.1	6.3	1.50	5.3	1.70	4.3	3.00
6.2.R.2	6.8	.50	8.0	.82	8.8	.50
6.2.R.3	2.8	2.10	3.0	1.40	3.5	1.70
6.2.W.1	0.0	--	0.0	--	0.0	--
6.2.W.2	0.0	--	0.0	--	0.0	--
6.2.W.3	0.0	--	0.0	--	0.0	--
6.2.W.4	0.0	--	0.0	--	0.0	--
6.2.W.5	0.0	--	0.0	--	0.0	--
6.3.R.1	0.0	--	0.0	--	0.0	--
6.3.R.2	0.3	.50	0.3	.50	0.0	--
6.3.R.3	3.0	.00	4.3	.50	1.5	.58
6.3.R.4	2.0	.00	2.0	.00	2.8	.50
6.3.R.5	0.8	.50	0.0	--	0.0	--
6.3.R.6	3.3	1.30	3.0	.82	3.3	1.30
6.3.R.7	2.3	1.90	1.5	.58	3.3	.50
6.3.W.1	0.0	--	0.0	--	0.0	--
6.3.W.2	0.0	--	0.0	--	0.0	--
6.3.W.3	0.0	--	0.0	--	0.0	--
6.3.W.4	0.0	--	0.0	--	0.0	--
6.4.R.1	0.0	--	0.0	--	0.0	--
6.4.R.2	4.3	.50	2.3	.50	1.3	.50
6.4.R.3	6.5	1.30	8.0	.82	8.0	.82
6.4.R.4	0.0	--	0.3	.50	0.9	1.00
6.4.R.5	0.0	--	0.0	--	1.0	.82
6.4.W.1	0.0	--	0.0	--	0.0	--
6.4.W.2	0.0	--	0.0	--	0.0	--
6.5.R.1	0.8	.50	0.8	.50	0.0	--
6.5.R.2	1.0	.00	1.0	.00	1.0	.00
6.5.R.3	0.0	--	1.0	.00	1.0	.00
6.5.W.1	2.0	.00	1.0	.00	1.0	.00
6.5.W.2	1.3	.50	1.3	.50	1.0	.00
6.5.W.3	0.3	.50	0.0	--	0.0	--
6.5.W.4	0.0	--	0.0	--	1.3	.50
6.5.W.5	0.8	.50	1.0	.00	0.8	.50
6.6.R.1	1.0	.82	0.3	.50	0.3	.50
6.6.R.2	0.5	1.00	1.5	1.70	0.8	.96
6.6.R.3	3.9	1.40	4.0	2.20	4.0	.82
6.6.W.1	0.0	--	0.0	--	0.0	--
6.6.W.2	0.3	0.50	0.0	--	0.0	--
6.6.W.3	0.0	--	0.0	--	0.0	--
6.6.W.4	0.0	--	0.0	--	0.0	--

Table A-33. Objectives Matched to Items for ELA, Grade 7: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
7.2.R.1	5.0	3.70	4.3	1.90	3.0	2.20
7.2.R.2	3.0	.00	6.8	.50	6.5	1.00
7.2.R.3	7.0	3.40	3.3	2.10	4.8	3.30
7.2.W.1	0.0	--	0.0	--	0.0	--
7.2.W.2	0.0	--	2.0	.00	0.0	--
7.2.W.3	0.0	--	0.0	--	0.0	--
7.2.W.4	0.0	--	0.0	--	0.0	--
7.2.W.5	0.0	--	0.0	--	0.0	--
7.3.R.1	1.0	.82	0.3	.50	1.3	.50
7.3.R.2	2.0	.00	3.0	.00	2.0	.00
7.3.R.3	2.0	.00	3.0	.00	3.0	.82
7.3.R.4	3.5	.58	2.5	.58	1.8	.50
7.3.R.5	1.0	.00	0.0	--	2.0	.00
7.3.R.6	1.3	.50	3.0	.82	3.0	2.00
7.3.R.7	2.0	.82	0.5	1.00	0.8	.96
7.3.W.1	0.0	--	0.0	--	0.0	--
7.3.W.2	0.0	--	0.0	--	0.0	--
7.3.W.3	0.0	--	0.0	--	0.0	--
7.3.W.4	0.8	.50	0.0	--	0.5	.58
7.4.R.1	0.0	--	0.0	--	0.0	--
7.4.R.2	1.0	.00	1.0	.00	3.0	.00
7.4.R.3	2.0	.00	4.0	.00	2.0	.00
7.4.R.4	3.5	.58	2.5	.58	2.5	.58
7.4.R.5	1.0	.00	0.0	--	0.0	--
7.4.W.1	0.0	--	0.0	--	0.0	--
7.4.W.2	0.0	--	0.0	--	0.0	--
7.5.R.1	1.0	.82	0.5	.58	1.5	1.00
7.5.R.2	0.8	.50	2.3	.50	1.8	.50
7.5.R.3	1.0	.00	0.0	--	0.0	--
7.5.R.4	1.0	.00	1.8	.50	1.0	.00
7.5.W.1	1.0	.00	1.3	.50	1.0	.00
7.5.W.2	0.3	.50	0.0	--	0.3	.50
7.5.W.3	1.0	.82	0.3	.50	0.5	1.00
7.6.R.1	0.0	--	0.0	--	0.5	.58
7.6.R.2	0.5	.58	0.0	--	0.5	1.00
7.6.R.3	7.1	.63	6.6	.75	5.4	1.40
7.6.W.1	0.0	--	0.0	--	0.0	--
7.6.W.2	0.0	--	0.0	--	0.0	--
7.6.W.3	0.0	--	1.0	.00	1.3	.50
7.6.W.4	0.0	--	0.0	--	0.0	--

Table A-34. Objectives Matched to Items for ELA, Grade 8: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
8.2.R.1	2.5	1.70	5.0	.82	2.5	1.00
8.2.R.2	4.0	1.40	3.8	1.30	5.0	1.40
8.2.R.3	4.5	3.30	4.5	4.40	4.5	2.40
8.2.W.1	0.0	--	0.0	--	0.0	--
8.2.W.2	0.0	--	0.0	--	0.0	--
8.2.W.3	0.3	.50	0.0	--	0.0	--
8.2.W.4	0.0	--	0.0	--	0.0	--
8.2.W.5	0.0	--	0.0	--	0.0	--
8.3.R.1	1.5	.58	1.0	.00	1.0	.00
8.3.R.2	1.0	.00	1.8	.50	3.0	.00
8.3.R.3	3.8	.50	3.5	1.30	1.8	.96
8.3.R.4	2.3	.96	2.5	0.58	3.0	.82
8.3.R.5	3.3	1.00	1.9	0.25	1.8	.50
8.3.R.6	3.3	1.90	4.0	1.40	2.5	1.70
8.3.R.7	1.0	1.20	0.3	.50	1.0	.00
8.3.W.1	0.0	--	0.0	--	0.0	--
8.3.W.2	0.0	--	0.0	--	0.0	--
8.3.W.3	0.0	--	0.3	.50	0.3	.50
8.3.W.4	0.0	--	0.0	--	0.0	--
8.4.R.1	0.0	--	0.8	.96	1.8	2.10
8.4.R.2	0.3	.50	0.0	--	0.0	--
8.4.R.3	5.5	1.00	4.5	.58	3.8	.50
8.4.R.4	1.3	.50	2.3	.50	3.3	.50
8.4.R.5	0.0	--	0.0	--	0.0	--
8.4.W.1	0.0	--	0.0	--	0.0	--
8.4.W.2	0.0	--	0.0	--	0.0	--
8.5.R.1	1.0	.00	1.0	.00	2.0	.82
8.5.R.2	1.0	.82	2.0	.82	0.5	.58
8.5.R.3	1.5	1.00	2.0	.82	1.5	1.00
8.5.R.4	0.3	.50	0.0	--	0.8	.50
8.5.W.1	1.0	.00	0.0	--	0.0	--
8.5.W.2	1.0	.00	1.0	.00	1.0	.00
8.5.W.3	0.0	--	0.0	--	0.3	.50
8.5.W.4	0.3	.50	0.3	.50	0.5	.58
8.5.W.5	1.0	.00	0.8	.50	0.8	.50
8.6.R.1	1.5	.58	1.5	.58	0.8	.50
8.6.R.2	0.0	--	0.0	--	0.0	--
8.6.R.3	5.1	1.20	3.6	.75	3.8	.50
8.6.W.1	0.0	--	0.0	--	0.0	--
8.6.W.2	0.5	.58	0.3	.50	0.3	.50
8.6.W.3	0.0	--	0.8	.50	2.0	.00
8.6.W.4	0.0	--	0.0	--	0.0	--

Table A-35. Objectives Matched to Items for ELA, Grade 10: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
10.2.R.1	7.5	1.00	7.8	1.30	7.4	2.20
10.2.R.2	9.9	3.70	7.6	4.50	9.5	2.80
10.2.W.1	0.0	--	0.0	--	0.0	--
10.2.W.2	0.0	--	0.0	--	0.0	--
10.2.W.3	0.0	--	0.0	--	0.0	--
10.2.W.4	1.8	2.20	1.0	2.00	1.9	3.80
10.2.W.5	0.0	--	0.0	--	0.0	--
10.3.R.1	0.0	--	0.4	.48	0.4	.75
10.3.R.2	1.5	1.00	1.6	.95	3.9	2.80
10.3.R.3	2.5	.41	3.9	1.70	2.0	1.10
10.3.R.4	6.8	1.30	6.1	1.00	5.3	1.70
10.3.R.5	1.3	1.30	1.3	1.00	1.1	1.30
10.3.R.6	2.5	1.00	2.1	.48	1.8	.50
10.3.R.7	4.1	1.00	3.6	.85	3.6	.99
10.3.R.X	0.3	.50	0.3	.50	0.3	.50
10.3.W.1	0.0	--	0.0	--	0.0	--
10.3.W.2	0.0	--	0.0	--	0.0	--
10.3.W.3	0.3	.50	0.0	--	0.0	--
10.3.W.4	0.0	--	0.0	--	0.0	--
10.3.W.5	0.0	--	0.0	--	0.0	--
10.3.W.6	0.0	--	0.0	--	0.0	--
10.4.R.1	0.3	.50	0.0	--	0.0	--
10.4.R.2	0.6	.48	1.5	.58	0.3	.50
10.4.R.3	5.6	1.50	4.5	1.30	5.1	1.80
10.4.R.4	1.3	1.30	0.4	.48	1.6	1.60
10.4.R.5	0.8	.96	0.6	.48	1.0	.00
10.4.W.1	0.0	--	0.0	--	0.0	--
10.4.W.2	0.5	1.00	0.5	1.00	0.5	1.00
10.5.R	1.9	2.20	2.7	2.60	0.8	1.50
10.5.W.1	2.5	3.10	2.9	2.50	2.8	3.80
10.5.W.2	0.0	--	0.3	.47	0.5	1.00
10.5.W.3	3.3	3.40	3.9	3.00	3.9	3.60
10.6.R.1	0.0	--	0.5	.58	1.3	.96
10.6.R.2	0.0	--	0.4	.48	0.3	.50
10.6.R.3	0.3	.50	0.4	.75	0.6	.75
10.6.W.1	0.0	--	0.0	--	0.0	--
10.6.W.2	0.0	--	0.5	1.00	0.5	1.00
10.6.W.3	3.8	.50	2.0	2.30	2.8	1.90
10.6.W.4	0.0	--	0.8	1.50	0.0	--
10.6.W.X	0.0	--	0.3	.50	0.0	--

Appendix B.

Content Alignment Results: Mathematics

The following tables include complete statistical results on the Webb (1997) alignment indicators, including means and standard deviations per standard for each OSTP Mathematics.

Categorical Concurrence

The categorical concurrence results for the OSTP Mathematics test forms are presented below. Each table includes: the mean number of items matched by panelists; the standard deviation among panelists' ratings; and, the final alignment conclusion (Yes or No). The bottom row indicates the percentage of standards that met the minimum alignment indicator criterion.

Table B-1. Categorical Concurrence for Mathematics, Grade 3: Mean Number of Items per Standard

Strand	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Algebraic Reasoning and Algebra	6.0	1.73	Yes	6.6	.55	Yes	7.3	.67	Yes
Data and Probability	6.8	1.10	Yes	7.0	.79	Yes	6.3	.45	Yes
Geometry and Measurement	14.1	.55	Yes	13.6	.55	Yes	13.6	1.14	Yes
Number and Operations	23.1	1.43	Yes	22.4	.96	Yes	22.6	1.82	Yes
% of Standards with at least 6 items:			100%			100%			100%

Table B-2. Categorical Concurrence for Mathematics, Grade 4: Mean Number of Items per Standard

Strand	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Algebraic Reasoning and Algebra	8.4	2.30	Yes	9.7	.97	Yes	8.0	2.55	Yes
Data and Probability	6.0	.00	Yes	6.0	.00	Yes	6.4	.89	Yes
Geometry and Measurement	13.4	.89	Yes	13.6	.89	Yes	13.4	.89	Yes
Number and Operations	22.0	2.00	Yes	20.7	1.48	Yes	22.2	1.64	Yes
% of Standards with at least 6 items:			100%			100%			100%

Table B-3. Categorical Concurrence for Mathematics, Grade 5: Mean Number of Items per Standard

Strand	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Algebraic Reasoning and Algebra	9.3	.67	Yes	9.4	.65	Yes	8.7	.45	Yes
Data and Probability	5.7	.97	No	6.0	.00	Yes	6.0	.00	Yes
Geometry and Measurement	12.4	.55	Yes	12.0	.00	Yes	11.7	.45	Yes
Number and Operations	22.4	.65	Yes	22.6	.65	Yes	23.6	.42	Yes
% of Standards with at least 6 items:			75%			100%			100%

Table B-4. Categorical Concurrence for Mathematics, Grade 6: Mean Number of Items per Standard

Strand	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Algebraic Reasoning and Algebra	10.4	2.19	Yes	11.6	1.14	Yes	11.2	.84	Yes
Data and Probability	7.0	.00	Yes	7.0	.00	Yes	7.2	.45	Yes
Geometry and Measurement	12.4	.89	Yes	11.6	.55	Yes	12.0	.00	Yes
Number and Operations	20.2	3.03	Yes	19.8	1.30	Yes	19.6	1.14	Yes
% of Standards with at least 6 items:			100%			100%			100%

Table B-5. Categorical Concurrence for Mathematics, Grade 7: Mean Number of Items per Standard

Strand	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Algebraic Reasoning and Algebra	15.2	2.05	Yes	13.6	2.07	Yes	16.1	.74	Yes
Data and Probability	10.0	.71	Yes	10.2	.45	Yes	9.6	.55	Yes
Geometry and Measurement	15.6	.89	Yes	15.6	.89	Yes	15.4	.55	Yes
Number and Operations	9.0	2.35	Yes	10.4	1.14	Yes	8.7	.97	Yes
% of Standards with at least 6 items:			100%			100%			100%

Table B-6. Categorical Concurrence for Mathematics, Grade 8: Mean Number of Items per Standard

Strand	Form A	Form B	Form C

	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Algebraic Reasoning and Algebra	21.8	1.48	Yes	22.0	1.58	Yes	22.2	.84	Yes
Data and Probability	8.2	1.10	Yes	8.0	1.22	Yes	7.8	.84	Yes
Geometry and Measurement	11.0	.00	Yes	11.4	.55	Yes	11.2	.45	Yes
Number and Operations	8.8	.45	Yes	8.6	.55	Yes	8.8	.45	Yes
% of Standards with at least 6 items:			100%			100%			100%

Table B-7. Categorical Concurrence for Mathematics, Grade 10: Mean Number of Items per Standard

	Form A			Form B			Form C		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
Strand	Mean	*SD*		Mean	*SD*		Mean	*SD*	
Algebraic Reasoning and Algebra	20.8	2.22	Yes	25.3	2.06	Yes	22.3	1.71	Yes
Data and Probability	6.0	.82	Yes	6.0	.00	Yes	6.0	.00	Yes
Functions	18.8	1.71	Yes	15.3	1.71	Yes	14.5	1.00	Yes
Geometry	6.8	1.32	Yes	6.3	.96	Yes	8.5	1.29	Yes
Number and Operations	5.8	.50	No	4.5	1.00	No	5.3	1.50	No
% of Standards with at least 6 items:			80%			80%			80%

Depth-of-Knowledge Consistency

The Depth-of-Knowledge (DOK) consistency results for the OSTP mathematics test forms are presented below. The tables present the results from the comparison between the depth-of-knowledge expected in the matched objective and the depth-of-knowledge assessed by items. The tables include the mean percentage of items rated as below, at the same level, or above the DOK level of the objective along with the corresponding standard deviations. Standards with at least 50% of items at the same (or above) DOK level of the matched objective met the minimum indicator criterion.

Table B-8. DOK Consistency for Mathematics, Grade 3: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Strand	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Algebraic Reasoning and Algebra	6.0	49.5	16.7	44.8	12.0	5.7	7.8	Yes
	Data and Probability	6.8	7.5	11.2	69.2	18.5	23.3	13.7	Yes
	Geometry and Measurement	13.7	13.0	9.2	70.1	3.7	16.9	6.4	Yes
	Number and Operations	22.9	13.0	4.6	70.9	7.6	16.1	9.1	Yes
	% of Standards Met Criterion								100%
B	Algebraic Reasoning and Algebra	6.6	42.9	14.7	48.6	13.2	8.6	7.8	Yes
	Data and Probability	7.0	17.0	18.1	60.7	17.8	22.3	9.1	Yes
	Geometry and Measurement	13.2	18.3	4.5	72.6	14.1	9.1	10.1	Yes
	Number and Operations	22.4	17.8	4.4	66.3	10.1	15.8	8.5	Yes
	% of Standards Met Criterion								100%
C	Algebraic Reasoning and Algebra	7.3	41.4	10.8	50.8	5.3	7.9	7.2	Yes
	Data and Probability	6.3	6.4	8.8	69.1	16.6	24.5	18.3	Yes
	Geometry and Measurement	13.2	16.8	8.8	69.7	13.3	13.5	14.3	Yes
	Number and Operations	22.6	10.5	4.9	68.2	9.0	21.3	10.0	Yes
	% of Standards Met Criterion								100%

Table B-9. DOK Consistency for Mathematics, Grade 4: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Strand	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Algebraic Reasoning and Algebra	8.0	30.7	22.6	43.2	23.7	26.2	13.8	Yes
	Data and Probability	5.8	20.7	18.2	69.3	21.3	10.0	14.9	Yes
	Geometry and Measurement	13.4	14.8	4.4	79.5	11.0	5.7	7.9	Yes
	Number and Operations	22.0	26.3	15.6	62.7	15.7	11.0	2.9	Yes
	% of Standards Met Criterion								100%
B	Algebraic Reasoning and Algebra	9.3	31.5	24.8	45.6	9.6	22.9	24.7	Yes
	Data and Probability	6.0	33.3	31.2	66.7	31.2	0.0	0.0	Yes
	Geometry and Measurement	13.6	19.2	4.2	73.7	9.4	7.2	7.2	Yes
	Number and Operations	20.7	26.7	18.4	65.7	17.6	7.6	3.7	Yes
	% of Standards Met Criterion								100%
C	Algebraic Reasoning and Algebra	7.6	25.1	21.9	57.0	15.7	17.9	20.8	Yes
	Data and Probability	6.2	29.8	22.8	70.2	22.8	0.0	0.0	Yes
	Geometry and Measurement	13.4	28.4	11.4	64.5	13.0	7.1	8.2	Yes
	Number and Operations	22.0	35.6	18.5	58.1	14.4	6.3	5.3	Yes
	% of Standards Met Criterion								100%

Table B-10. DOK Consistency for Mathematics, Grade 5: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Strand	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Algebraic Reasoning and Algebra	9.1	30.0	26.2	50.9	21.3	19.1	12.0	Yes
	Data and Probability	5.7	14.6	8.6	26.2	27.8	59.2	32.8	Yes
	Geometry and Measurement	12.4	62.6	13.0	27.6	7.6	9.9	7.0	No
	Number and Operations	22.4	36.2	11.4	33.6	9.5	30.2	17.0	Yes
	% of Standards Met Criterion								75%
B	Algebraic Reasoning and Algebra	9.4	29.3	19.7	46.3	22.1	24.4	14.4	Yes
	Data and Probability	6.0	0.0	0.0	40.0	43.5	60.0	43.5	Yes
	Geometry and Measurement	11.6	67.4	10.5	22.4	4.7	10.2	6.9	No
	Number and Operations	22.6	36.5	9.0	24.6	14.6	38.9	21.6	Yes
	% of Standards Met Criterion								75%
C	Algebraic Reasoning and Algebra	8.7	34.6	20.9	45.5	25.5	19.9	10.9	Yes
	Data and Probability	6.0	3.3	7.5	43.3	41.8	53.3	43.1	Yes
	Geometry and Measurement	11.7	54.5	11.9	28.1	8.2	17.3	9.2	No
	Number and Operations	23.6	26.4	11.6	31.8	18.2	41.8	16.3	Yes
	% of Standards Met Criterion								75%

Table B-11. DOK Consistency for Mathematics, Grade 6: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Strand	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Algebraic Reasoning and Algebra	10.0	38.9	17.5	56.5	11.9	4.6	10.3	Yes
	Data and Probability	7.0	17.1	6.4	80.0	7.8	2.9	6.4	Yes
	Geometry and Measurement	12.2	21.3	7.3	72.2	7.1	6.5	6.9	Yes
	Number and Operations	20.2	47.3	19.1	48.2	14.1	4.5	6.4	Yes
	% of Standards Met Criterion								100%
B	Algebraic Reasoning and Algebra	11.6	38.7	14.3	54.9	9.6	6.4	6.5	Yes
	Data and Probability	7.0	34.3	12.8	65.7	12.8	0.0	0.0	Yes
	Geometry and Measurement	11.6	41.5	11.6	58.5	11.6	0.0	0.0	Yes
	Number and Operations	19.8	51.5	4.5	40.3	4.3	8.2	4.8	No
	% of Standards Met Criterion								75%
C	Algebraic Reasoning and Algebra	11.2	39.8	10.4	44.5	7.5	15.6	9.3	Yes
	Data and Probability	7.2	19.6	8.2	80.4	8.2	0.0	0.0	Yes
	Geometry and Measurement	12.0	31.7	10.9	65.0	14.9	3.3	4.6	Yes
	Number and Operations	19.6	39.1	7.8	42.7	3.6	18.2	7.2	Yes
	% of Standards Met Criterion								100%

Table B-12. DOK Consistency for Mathematics, Grade 7: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Strand	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Algebraic Reasoning and Algebra	15.2	30.3	15.6	57.7	12.0	12.0	14.3	Yes
	Data and Probability	10.0	64.2	6.8	16.4	11.6	19.3	15.2	No
	Geometry and Measurement	15.6	28.6	15.6	35.8	4.5	35.6	13.2	Yes
	Number and Operations	9.0	0.0	0.0	69.2	20.5	30.8	20.5	Yes
	% of Standards Met Criterion								75%
B	Algebraic Reasoning and Algebra	13.6	33.0	20.4	45.7	19.1	21.3	10.7	Yes
	Data and Probability	10.2	56.7	6.3	27.8	11.3	15.5	10.6	No
	Geometry and Measurement	15.6	27.4	19.6	44.7	5.4	27.9	14.8	Yes
	Number and Operations	10.4	0.0	0.0	74.8	23.6	25.2	23.6	Yes
	% of Standards Met Criterion								75%
C	Algebraic Reasoning and Algebra	16.1	28.1	20.3	58.2	19.8	13.7	13.4	Yes
	Data and Probability	9.6	58.2	2.4	27.8	18.7	14.0	16.7	No
	Geometry and Measurement	15.4	23.4	15.8	45.6	11.0	31.0	19.1	Yes
	Number and Operations	8.7	0.0	0.0	77.4	26.2	22.6	26.2	Yes
	% of Standards Met Criterion								75%

Table B-13. DOK Consistency for Mathematics, Grade 8: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Strand	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Algebraic Reasoning and Algebra	21.8	18.7	14.9	63.9	22.8	17.4	27.2	Yes
	Data and Probability	8.2	17.7	8.4	43.6	10.8	38.7	7.7	Yes
	Geometry and Measurement	11.0	58.2	29.9	16.4	11.9	25.5	31.8	No
	Number and Operations	8.8	23.1	9.4	59.2	9.4	17.8	14.9	Yes
	% of Standards Met Criterion								75%
B	Algebraic Reasoning and Algebra	21.6	25.6	13.5	59.8	13.1	14.6	20.1	Yes
	Data and Probability	8.0	22.7	13.6	45.0	8.5	32.3	8.5	Yes
	Geometry and Measurement	11.4	46.4	26.4	19.5	14.7	34.1	33.3	Yes
	Number and Operations	8.0	37.5	0.0	45.0	11.2	17.5	11.2	Yes
	% of Standards Met Criterion								100%
C	Algebraic Reasoning and Algebra	21.8	23.8	12.9	62.1	12.2	14.1	17.8	Yes
	Data and Probability	7.8	26.2	15.8	38.2	10.8	35.7	8.6	Yes
	Geometry and Measurement	11.2	38.0	21.0	21.8	13.8	40.2	30.9	Yes
	Number and Operations	8.8	31.9	9.7	51.9	8.1	16.1	10.5	Yes
	% of Standards Met Criterion								100%

Table B-14. DOK Consistency for Mathematics, Grade 10: Mean Percent of Items with DOK Below, At, and Above DOK Level of Objectives

Form	Strand	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Algebraic Reasoning and Algebra	20.8	45.6	11.0	50.5	7.6	3.9	5.3	Yes
	Data and Probability	6.0	37.7	24.8	57.3	21.9	5.0	10.0	Yes
	Functions	18.8	37.8	8.4	55.6	8.1	6.6	5.3	Yes
	Geometry	6.8	80.4	14.2	19.6	14.2	0.0	0.0	No
	Number and Operations	5.8	17.5	23.6	65.0	14.0	17.5	13.7	Yes
	% of Standards Met Criterion								80%
B	Algebraic Reasoning and Algebra	25.3	49.4	4.0	40.9	5.0	9.7	3.0	Yes
	Data and Probability	6.0	70.8	25.0	25.0	21.5	4.2	8.3	No
	Functions	15.3	39.3	1.6	48.9	3.2	11.8	4.1	Yes
	Geometry	6.3	63.8	6.5	29.0	10.9	7.1	14.3	No
	Number and Operations	4.5	25.0	37.9	70.0	38.3	5.0	10.0	Yes
	% of Standards Met Criterion								60%
C	Algebraic Reasoning and Algebra	22.0	56.6	4.8	35.6	6.9	7.8	3.9	No
	Data and Probability	6.0	83.3	13.6	16.7	13.6	0.0	0.0	No
	Functions	14.5	55.4	6.8	34.4	4.0	10.3	3.7	No
	Geometry	8.5	100.0	0.0	0.0	0.0	0.0	0.0	No
	Number and Operations	5.3	16.7	33.3	75.0	31.9	8.3	16.7	Yes
	% of Standards Met Criterion								20%

Range-of-Knowledge Correspondence

The results for Range-of-Knowledge correspondence for the OSTP mathematics test forms are presented below. The tables include the number of assessed objectives, the number of objectives that were not aligned by panelists to at least one item (on average), the specific objectives that were not assessed by at least one item, and the proportion of objectives that were aligned. For acceptable range-of-knowledge correspondence, a minimum of 50% of objectives within each standard should be matched to at least one item.

Table B-15. Range-of-Knowledge for OSTP Mathematics, Grade 3: Mean Percent of Objectives per Strand Linked with Items

Form	Strand	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Algebraic Reasoning and Algebra	5	2	3.A.1.3, 3.A.2.1	60.0	Yes
	Data and Probability	2	0		100.0	Yes
	Geometry and Measurement	13	6	3.GM.1.2, 3.GM.2.2, 3.GM.2.3, 3.GM.2.5, 3.GM.2.7, 3.GM.2.8	53.8	Yes
	Number and Operations	18	6	3.N.1.3, 3.N.2.3, 3.N.2.6, 3.N.2.7, 3.N.2.8, 3.N.3.2	66.7	Yes
				% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	5	1	3.A.1.3	80.0	Yes
	Data and Probability	2	0		100.0	Yes
	Geometry and Measurement	13	6	3.GM.1.2, 3.GM.2.3, 3.GM.2.4, 3.GM.2.5, 3.GM.2.7, 3.GM.2.8	53.8	Yes
	Number and Operations	18	8	3.N.1.3, 3.N.2.3, 3.N.2.6, 3.N.2.7, 3.N.2.8, 3.N.3.2, 3.N.3.3, 3.N.4.2	55.6	Yes
				% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	5	1	3.A.1.3	80.0	Yes
	Data and Probability	2	0		100.0	Yes
	Geometry and Measurement	13	6	3.GM.1.2, 3.GM.2.3, 3.GM.2.4, 3.GM.2.5, 3.GM.2.7, 3.GM.2.8	53.8	Yes
	Number and Operations	18	7	3.N.1.3, 3.N.2.3, 3.N.2.6, 3.N.2.7, 3.N.2.8, 3.N.3.2, 3.N.4.1	61.1	Yes
				% of Standards Met Criterion		100%

Table B-16. Range-of-Knowledge for OSTP Mathematics, Grade 4: Mean Percent of Objectives per Strand Linked with Items

Form	Strand	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Algebraic Reasoning and Algebra	5	2	4.A.1.1, 4.A.1.3	60.0	Yes
	Data and Probability	3	0		100.0	Yes
	Geometry and Measurement	10	5	4.GM.1.3, 4.GM.2.2, 4.GM.2.3, 4.GM.2.4, 4.GM.3.2	50.0	Yes
	Number and Operations	16	7	4.N.1.2, 4.N.1.3, 4.N.1.5, 4.N.2.1, 4.N.2.3, 4.N.2.5, 4.N.2.8	56.3	Yes
				% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	5	1	4.A.1.1	80.0	Yes
	Data and Probability	3	0		100.0	Yes
	Geometry and Measurement	10	4	4.GM.1.3, 4.GM.2.1, 4.GM.2.5, 4.GM.3.2	60.0	Yes
	Number and Operations	16	8	4.N.1.2, 4.N.1.3, 4.N.1.5, 4.N.1.6, 4.N.1.7, 4.N.2.1, 4.N.2.3, 4.N.2.5	50.0	Yes
				% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	5	1	4.A.1.1	80.0	Yes
	Data and Probability	3	0		100.0	Yes
	Geometry and Measurement	10	3	4.GM.2.1, 4.GM.2.5, 4.GM.3.2	70.0	Yes
	Number and Operations	16	6	4.N.1.2, 4.N.1.3, 4.N.1.5, 4.N.2.1, 4.N.2.3, 4.N.2.5	62.5	Yes
				% of Standards Met Criterion		100%

Table B-17. Range-of-Knowledge for OSTP Mathematics, Grade 5: Mean Percent of Objectives per Strand Linked with Items

Form	Strand	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Algebraic Reasoning and Algebra	5	2	5.A.1.2, 5.A.2.2	60.0	Yes
	Data and Probability	2	1	5.D.1.2	50.0	Yes
	Geometry and Measurement	10	4	5.GM.1.3, 5.GM.2.1, 5.GM.3.1, 5.GM.3.2	60.0	Yes
	Number and Operations	12	3	5.N.1.2, 5.N.3.2, 5.N.3.4	75.0	Yes
				% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	5	2	5.A.1.2, 5.A.2.2	60.0	Yes
	Data and Probability	2	1	5.D.1.2	50.0	Yes
	Geometry and Measurement	10	4	5.GM.1.3, 5.GM.2.1, 5.GM.3.1, 5.GM.3.2	60.0	Yes
	Number and Operations	12	4	5.N.2.2, 5.N.3.1, 5.N.3.2, 5.N.3.4	66.7	Yes
				% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	5	2	5.A.1.2, 5.A.2.2	60.0	Yes
	Data and Probability	2	1	5.D.1.2	50.0	Yes
	Geometry and Measurement	10	4	5.GM.2.1, 5.GM.3.2, 5.GM.3.3, 5.GM.3.4	60.0	Yes
	Number and Operations	12	2	5.N.3.2, 5.N.3.4	83.3	Yes
				% of Standards Met Criterion		100%

Table B-18. Range-of-Knowledge for OSTP Mathematics, Grade 6: Mean Percent of Objectives per Strand Linked with Items

Form	Strand	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Algebraic Reasoning and Algebra	6	1	6.A.1.2	83.3	Yes
	Data and Probability	6	3	6.D.1.2, 6.D.2.2, 6.D.2.3	50.0	Yes
	Geometry and Measurement	11	4	6.GM.1.2, 6.GM.1.3, 6.GM.2.2, 6.GM.4.3	63.6	Yes
	Number and Operations	17	8	6.N.1.1, 6.N.1.3, 6.N.1.5, 6.N.1.6, 6.N.2.1, 6.N.3.4, 6.N.4.2, 6.N.4.3	52.9	Yes
				% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	6	1	6.A.1.2	83.3	Yes
	Data and Probability	6	2	6.D.1.2, 6.D.2.3	66.7	Yes
	Geometry and Measurement	11	5	6.GM.1.2, 6.GM.1.3, 6.GM.2.2, 6.GM.3.1, 6.GM.4.3	54.5	Yes
	Number and Operations	17	5	6.N.1.3, 6.N.1.5, 6.N.1.6, 6.N.2.2, 6.N.3.4	70.6	Yes
				% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	6	2	6.A.1.2, 6.A.3.2	66.7	Yes
	Data and Probability	6	2	6.D.1.2, 6.D.2.3	66.7	Yes
	Geometry and Measurement	11	4	6.GM.1.2, 6.GM.1.3, 6.GM.2.2, 6.GM.4.3	63.6	Yes
	Number and Operations	17	8	6.N.1.3, 6.N.1.5, 6.N.1.6, 6.N.2.1, 6.N.2.2, 6.N.3.1, 6.N.3.4, 6.N.4.2	52.9	Yes
				% of Standards Met Criterion		100%

Table B-19. Range-of-Knowledge for OSTP Mathematics, Grade 7: Mean Percent of Objectives per Strand Linked with Items

Form	Strand	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Algebraic Reasoning and Algebra	11	4	7.A.1.1, 7.A.2.4, 7.A.3.3, 7.A.4.1	63.6	Yes
	Data and Probability	5	1	7.D.2.3	80.0	Yes
	Geometry and Measurement	9	2	7.GM.2.1, 7.GM.3.1	77.8	Yes
	Number and Operations	9	5	7.N.1.1, 7.N.2.1, 7.N.2.2, 7.N.2.4, 7.N.2.6	44.4	No
				% of Standards Met Criterion		75%
B	Algebraic Reasoning and Algebra	11	6	7.A.1.1, 7.A.1.2, 7.A.2.2, 7.A.2.4, 7.A.3.2, 7.A.3.3	45.5	No
	Data and Probability	5	1	7.D.2.3	80.0	Yes
	Geometry and Measurement	9	1	7.GM.2.1	88.9	Yes
	Number and Operations	9	4	7.N.1.1, 7.N.2.1, 7.N.2.2, 7.N.2.4	55.6	Yes
				% of Standards Met Criterion		75%
C	Algebraic Reasoning and Algebra	11	5	7.A.1.1, 7.A.1.2, 7.A.2.4, 7.A.3.3, 7.A.4.1	54.5	Yes
	Data and Probability	5	1	7.D.2.3	80.0	Yes
	Geometry and Measurement	9	1	7.GM.2.1	88.9	Yes
	Number and Operations	9	4	7.N.1.1, 7.N.2.1, 7.N.2.2, 7.N.2.4	55.6	Yes
				% of Standards Met Criterion		100%

Table B-20. Range-of-Knowledge for OSTP Mathematics, Grade 8: Mean Percent of Objectives per Strand Linked with Items

Form	Strand	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Algebraic Reasoning and Algebra	13	4	PA.A.2.1, PA.A.2.2, PA.A.2.5, PA.A.3.2	69.2	Yes
	Data and Probability	6	2	PA.D.1.2, PA.D.2.3	66.7	Yes
	Geometry and Measurement	6	2	PA.GM.1.2, PA.GM.2.2	66.7	Yes
	Number and Operations	5	0		100.0	Yes
				% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	13	5	PA.A.1.2, PA.A.2.1, PA.A.2.2, PA.A.2.3, PA.A.2.5	61.5	Yes
	Data and Probability	6	1	PA.D.1.2	83.3	Yes
	Geometry and Measurement	6	2	PA.GM.1.2, PA.GM.2.2	66.7	Yes
	Number and Operations	5	1	PA.N.1.3	80.0	Yes
				% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	13	3	PA.A.1.2, PA.A.2.2, PA.A.2.5	76.9	Yes
	Data and Probability	6	2	PA.D.1.2, PA.D.2.3	66.7	Yes
	Geometry and Measurement	6	2	PA.GM.1.2, PA.GM.2.4	66.7	Yes
	Number and Operations	5	0		100.0	Yes
				% of Standards Met Criterion		100%

Table B-21. Range-of-Knowledge for OSTP Mathematics, Grade 10: Mean Percent of Objectives per Strand Linked with Items

Form	Strand	Assessed Objectives	Objectives Not Matched with at least 1 Item by Panelists		% of Total Objectives Aligned	Range-of-Knowledge Target Met
			Count	Objectives		
A	Algebraic Reasoning and Algebra	16	8	A1.A.1.2, A1.A.2.2, A1.A.3.4, A1.A.3.5, A1.A.3.6, A1.A.4.1, A1.A.4.2, A1.A.4.4	50.0	Yes
	Data and Probability	7	3	A1.D.1.3, A1.D.2.1, A1.D.2.2	57.1	Yes
	Functions	9	1	A1.F.1.4	88.9	Yes
	Geometry	9	5	G.2D.1.1, G.2D.1.2, G.2D.1.7, G.2D.1.8, G.2D.1.9	44.4	No
	Number and Operations	2	0		100.0	Yes
				% of Standards Met Criterion		80%
B	Algebraic Reasoning and Algebra	16	7	A1.A.1.2, A1.A.2.2, A1.A.3.1, A1.A.3.3, A1.A.3.5, A1.A.4.2, A1.A.4.4	56.3	Yes
	Data and Probability	7	3	A1.D.1.3, A1.D.2.1, A1.D.2.4	57.1	Yes
	Functions	9	1	A1.F.3.2	88.9	Yes
	Geometry	9	7	G.2D.1.1, G.2D.1.2, G.2D.1.3, G.2D.1.4, G.2D.1.5, G.2D.1.6, G.2D.1.8	22.2	No
	Number and Operations	2	0		100.0	Yes
				% of Standards Met Criterion		80%
C	Algebraic Reasoning and Algebra	16	7	A1.A.1.2, A1.A.2.2, A1.A.3.1, A1.A.3.3, A1.A.3.4, A1.A.3.6, A1.A.4.4	56.3	Yes
	Data and Probability	7	3	A1.D.1.3, A1.D.2.1, A1.D.2.4	57.1	Yes
	Functions	9	4	A1.F.1.3, A1.F.1.4, A1.F.3.1, A1.F.3.2	55.6	Yes
	Geometry	9	6	G.2D.1.3, G.2D.1.4, G.2D.1.5, G.2D.1.7, G.2D.1.8, G.2D.1.9	33.3	No
	Number and Operations	2	1	A1.N.1.1	50.0	Yes
				% of Standards Met Criterion		80%

Balance of knowledge Representation

The results for Balance of knowledge representation for the OSTP mathematics test forms are presented below. The tables also include minimum, maximum and mean number of items that were aligned, on average, to each objective (out of the objectives that were aligned to items) within a strand. In addition, they include the number of objectives that were aligned to items, the

mean number of items aligned to the strand and the balance index. The minimum acceptable balance index is 70 out of 100.

Table B-22. Balance of knowledge Representation for Mathematics, Grade 3: Mean Balance Index per Strand

Form	Strand	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Strand	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Algebraic Reasoning and Algebra	1.0	2.4	1.8	3	5.4	85.2	Yes
	Data and Probability	1.6	5.2	3.4	2	6.8	73.5	Yes
	Geometry and Measurement	1.0	2.2	1.8	7	12.5	92.2	Yes
	Number and Operations	1.0	2.8	1.8	12	21.3	89.8	Yes
						% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	1.0	2.0	1.7	4	6.6	89.4	Yes
	Data and Probability	1.7	5.3	3.5	2	7.0	74.3	Yes
	Geometry and Measurement	1.0	2.8	1.6	7	11.2	85.7	Yes
	Number and Operations	1.0	2.8	2.0	10	19.6	88.8	Yes
						% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	1.0	3.1	1.8	4	7.3	80.1	Yes
	Data and Probability	1.0	5.3	3.2	2	6.3	65.9	No
	Geometry and Measurement	1.0	2.2	1.6	7	11.3	89.0	Yes
	Number and Operations	1.2	2.4	1.8	11	19.7	91.6	Yes
						% of Standards Met Criterion		75%

Table B-23. Balance of knowledge Representation for Mathematics, Grade 4: Mean Balance Index per Strand

Form	Strand	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Strand	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Algebraic Reasoning and Algebra	2.0	3.0	2.3	3	7.0	90.5	Yes
	Data and Probability	1.2	3.0	1.9	3	5.8	81.6	Yes
	Geometry and Measurement	1.2	3.0	2.3	5	11.7	87.4	Yes
	Number and Operations	1.0	3.7	2.1	9	18.6	78.7	Yes
						% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	1.0	2.8	2.2	4	8.7	86.5	Yes
	Data and Probability	1.0	3.4	2.0	3	6.0	76.7	Yes

	Geometry and Measurement	1.0	4.0	2.1	6	12.7	78.2	Yes
	Number and Operations	1.0	3.4	2.2	8	17.3	84.3	Yes
						% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	1.2	2.6	1.8	4	7.2	83.3	Yes
	Data and Probability	1.4	2.9	2.0	3	6.1	85.8	Yes
	Geometry and Measurement	1.0	2.7	1.8	7	12.6	84.9	Yes
	Number and Operations	1.0	3.3	2.0	10	20.3	84.5	Yes
						% of Standards Met Criterion		100%

Table B-24. Balance of knowledge Representation for Mathematics, Grade 5: Mean Balance Index per Strand

Form	Strand	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Strand	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Algebraic Reasoning and Algebra	2.0	3.9	3.0	3	8.9	89.1	Yes
	Data and Probability	4.8	4.8	4.8	1	4.8	100.0	Yes
	Geometry and Measurement	1.2	2.9	1.8	6	10.9	84.9	Yes
	Number and Operations	1.1	6.0	2.4	9	21.8	82.4	Yes
						% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	2.1	3.7	3.1	3	9.3	89.2	Yes
	Data and Probability	6.0	6.0	6.0	1	6.0	100.0	Yes
	Geometry and Measurement	1.0	2.4	1.7	6	10.0	88.0	Yes
	Number and Operations	1.2	6.9	2.6	8	20.9	78.6	Yes
						% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	1.0	3.7	2.8	3	8.3	78.7	Yes
	Data and Probability	5.8	5.8	5.8	1	5.8	100.0	Yes
	Geometry and Measurement	1.0	2.0	1.5	6	9.2	87.0	Yes
	Number and Operations	1.2	6.5	2.3	10	23.4	77.7	Yes
						% of Standards Met Criterion		100%

Table B-25. Balance of knowledge Representation for Mathematics, Grade 6: Mean Balance Index per Strand

Form	Strand	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Strand	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Algebraic Reasoning and Algebra	1.0	3.4	2.0	5	10.0	80.0	Yes
	Data and Probability	1.0	3.0	2.0	3	6.0	83.3	Yes
	Geometry and Measurement	1.0	2.0	1.4	7	9.8	91.8	Yes
	Number and Operations	1.0	5.8	2.0	9	18.0	70.0	Yes
						% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	1.0	4.6	2.3	5	11.6	69.3	No
	Data and Probability	1.0	3.0	1.8	4	7.0	81.4	Yes
	Geometry and Measurement	1.0	1.8	1.4	6	8.6	87.2	Yes
	Number and Operations	1.0	2.8	1.6	12	19.0	83.9	Yes
						% of Standards Met Criterion		75%
C	Algebraic Reasoning and Algebra	1.2	4.2	2.5	4	10.0	82.0	Yes
	Data and Probability	1.0	3.2	1.8	4	7.2	77.8	Yes
	Geometry and Measurement	1.0	2.3	1.5	7	10.5	81.0	Yes
	Number and Operations	1.0	4.6	2.0	9	18.2	78.5	Yes
						% of Standards Met Criterion		100%

Table B-26. Balance of knowledge Representation for Mathematics, Grade 7: Mean Balance Index per Strand

Form	Strand	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Strand	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Algebraic Reasoning and Algebra	1.2	3.8	2.0	7	13.8	80.5	Yes
	Data and Probability	1.2	3.6	2.4	4	9.4	86.2	Yes
	Geometry and Measurement	1.0	4.8	2.1	7	15.0	81.5	Yes
	Number and Operations	1.0	2.8	2.1	4	8.4	83.3	Yes
						% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	1.2	2.8	2.2	5	11.0	87.3	Yes
	Data and Probability	1.8	3.2	2.5	4	10.0	90.0	Yes
	Geometry and Measurement	1.0	3.8	2.0	8	15.6	84.3	Yes
	Number and Operations	1.0	3.0	2.0	5	10.0	84.0	Yes
						% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	1.0	4.1	2.3	6	13.9	82.3	Yes
	Data and Probability	1.4	4.2	2.4	4	9.6	81.3	Yes
	Geometry and Measurement	1.0	4.0	1.9	8	15.0	81.0	Yes
	Number and Operations	1.0	2.5	1.7	5	8.3	87.0	Yes
						% of Standards Met Criterion		100%

Table B-27. Balance of knowledge Representation for Mathematics, Grade 8: Mean Balance Index per Strand

Form	Strand	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Strand	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Algebraic Reasoning and Algebra	1.2	5.0	2.3	9	20.6	81.4	Yes
	Data and Probability	1.0	3.0	2.0	4	7.8	83.3	Yes
	Geometry and Measurement	1.6	3.4	2.5	4	10.0	90.0	Yes
	Number and Operations	1.0	3.6	1.8	5	8.8	76.4	Yes
						% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	1.4	3.6	2.3	8	18.2	83.7	Yes
	Data and Probability	1.0	3.0	1.6	5	8.0	77.5	Yes
	Geometry and Measurement	1.0	3.4	2.5	4	9.8	85.2	Yes
	Number and Operations	1.0	3.6	1.8	4	7.2	75.0	Yes
						% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	1.0	3.0	2.1	10	20.8	84.6	Yes
	Data and Probability	1.0	3.0	1.8	4	7.2	77.8	Yes
	Geometry and Measurement	1.0	3.6	2.6	4	10.4	84.6	Yes
	Number and Operations	1.0	3.8	1.8	5	8.8	76.4	Yes
						% of Standards Met Criterion		100%

Table B-28. Balance of knowledge Representation for Mathematics, Grade 10: Mean Balance Index per Strand

Form	Strand	Mean Items Matched with Each Objective			Objectives Aligned to Items	Mean Items Aligned to the Strand	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Algebraic Reasoning and Algebra	1.0	3.8	2.4	8	19.1	80.8	Yes
	Data and Probability	1.0	1.8	1.4	4	5.8	89.1	Yes
	Functions	1.1	3.6	2.3	8	18.8	87.5	Yes
	Geometry	1.0	1.8	1.3	4	5.0	90.0	
	Number and Operations	2.0	3.8	2.9	2	5.8	84.8	Yes
						% of Standards Met Criterion		100%
B	Algebraic Reasoning and Algebra	1.3	4.0	2.6	9	23.0	85.7	Yes
	Data and Probability	1.0	2.0	1.4	4	5.5	88.6	Yes
	Functions	1.0	2.8	1.8	8	14.4	81.3	
	Geometry	1.5	2.0	1.8	2	3.5	92.9	Yes
	Number and Operations	1.3	3.3	2.3	2	4.5	77.8	Yes
						% of Standards Met Criterion		100%
C	Algebraic Reasoning and Algebra	1.0	4.8	2.1	9	19.3	74.9	Yes
	Data and Probability	1.0	2.3	1.5	4	6.0	83.3	Yes
	Functions	1.4	4.0	2.5	5	12.6	86.5	Yes
	Geometry	1.8	2.1	2.0	3	5.9	96.5	
	Number and Operations	5.0	5.0	5.0	1	5.0	100.0	Yes
						% of Standards Met Criterion		100%

Objectives Matched to Items by Panelists

The average number of items matched by panelists, on average, to each objective are presented below. One note of caution when reading these tables: the same items may not be represented by the mean number of items. For example, objective '1.1.a' in the first row shows that panelists matched a mean number of 7.14 items to this objective. This does not mean/assume that the items matched to the objective by the panelists were the same items across panelists.

Table B-29. Objectives Matched to Items for Mathematics, Grade 3: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
3.A.1.1	2.4	1.30	1.6	.55	3.1	1.20
3.A.1.2	1.0	.00	2.0	.00	1.0	1.00
3.A.1.3	0.0	--	0.0	--	0.0	--
3.A.2.1	0.6	.55	1.0	.00	1.2	.45
3.A.2.2	2.0	.00	2.0	.00	2.0	.00
3.D.1.1	1.6	1.30	1.7	1.40	1.0	1.00
3.D.1.2	5.2	1.50	5.3	1.40	5.3	.97
3.GM.1.1	1.6	.89	1.4	.89	1.4	.89
3.GM.1.2	0.0	--	0.2	.45	0.2	.45
3.GM.1.3	2.2	.45	1.6	.55	2.2	.45
3.GM.1.X	0.4	.89	0.4	.89	0.4	.89
3.GM.2.1	2.0	.00	2.8	.45	1.8	.45
3.GM.2.2	0.6	.55	1.4	.89	1.9	1.20
3.GM.2.3	0.0	--	0.0	--	0.0	--
3.GM.2.4	1.8	.45	0.8	.45	0.8	.45
3.GM.2.5	0.2	.45	0.2	.45	0.2	.45
3.GM.2.6	1.9	.22	1.0	.00	1.0	.00
3.GM.2.7	0.2	.45	0.4	.89	0.4	.89
3.GM.2.8	0.2	.45	0.4	.89	0.3	.45
3.GM.3.1	1.0	.00	2.0	.00	1.2	.45
3.GM.3.2	2.0	.00	1.0	.00	1.8	.45
3.N.1.1	1.0	1.00	1.8	.45	1.6	.55
3.N.1.2	2.8	.84	1.8	.45	2.0	1.20
3.N.1.3	0.0	--	0.0	--	0.0	--
3.N.1.4	2.0	.00	2.0	.00	1.8	.45
3.N.2.1	1.6	.55	1.0	.71	1.2	1.10
3.N.2.2	1.6	.89	1.2	.91	2.4	1.70
3.N.2.3	0.6	.55	0.4	.55	0.6	.89
3.N.2.4	2.0	.00	1.8	.45	1.3	.45
3.N.2.5	1.5	.87	2.4	.55	1.8	.45
3.N.2.6	0.3	.45	0.3	.45	0.3	.45
3.N.2.7	0.7	.45	0.7	.45	0.7	.45
3.N.2.8	0.0	--	0.0	--	0.1	.22
3.N.3.1	1.8	.84	2.4	.55	2.4	.55
3.N.3.2	0.0	--	0.6	.55	0.4	.55
3.N.3.3	1.8	1.30	0.2	.45	1.4	.55
3.N.3.4	2.2	.84	2.8	.45	1.8	.45
3.N.4.1	2.0	.00	2.4	.89	0.8	.45
3.N.4.2	1.0	.00	0.6	.89	2.0	.00

Table B-30. Objectives Matched to Items for Mathematics, Grade 4: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
4.A.1.1	0.2	.45	0.6	.89	0.4	.55
4.A.1.2	2.0	.71	2.8	1.10	2.6	.89
4.A.1.3	0.8	.45	1.0	.71	1.2	.45
4.A.1.X	0.2	.45	0.2	.45	0.2	.45
4.A.2.1	3.0	1.60	2.7	1.30	2.2	1.10
4.A.2.2	2.0	.71	2.2	.45	1.2	1.10
4.D.1.1	1.6	.89	1.0	.71	1.4	1.50
4.D.1.2	3.0	1.40	3.4	.89	2.9	1.90
4.D.1.3	1.2	1.60	1.6	.89	1.8	1.60
4.D.1.X	0.2	.45	0.0	--	0.2	.45
4.GM.1.1	3.0	.00	4.0	.00	2.0	.00
4.GM.1.2	2.5	.50	1.7	.45	2.7	.45
4.GM.1.3	0.5	.50	0.3	.45	1.3	.45
4.GM.2.1	2.0	.00	0.0	--	0.0	--
4.GM.2.2	0.8	.45	1.6	.89	1.6	.89
4.GM.2.3	0.2	.45	1.4	.89	1.4	.89
4.GM.2.4	0.2	.45	1.0	.00	1.0	.00
4.GM.2.5	1.2	1.10	0.6	.89	0.4	.89
4.GM.3.1	3.0	.00	3.0	.00	2.6	.55
4.GM.3.2	0.0	--	0.0	--	0.4	.55
4.N.1.1	2.7	1.40	2.1	1.10	2.4	.89
4.N.1.2	0.0	--	0.0	--	0.0	--
4.N.1.3	0.8	.84	0.8	.84	0.6	.55
4.N.1.4	2.7	.57	3.2	.45	1.8	.57
4.N.1.5	0.9	1.70	0.4	.89	0.6	1.30
4.N.1.6	1.3	.27	0.8	.45	3.3	.45
4.N.1.7	1.0	.71	0.8	.45	1.0	1.00
4.N.1.X	0.0	--	0.0	--	0.1	.22
4.N.2.1	0.8	1.10	0.6	.89	0.4	.55
4.N.2.2	2.4	.89	1.4	1.10	2.4	1.30
4.N.2.3	0.0	--	0.0	--	0.0	--
4.N.2.4	1.0	.00	1.0	.00	1.0	.00
4.N.2.5	0.1	.22	0.0	--	0.0	--
4.N.2.6	1.0	.00	3.4	.55	1.8	.45
4.N.2.7	3.7	.67	1.6	.89	2.6	.55
4.N.2.8	0.8	.45	2.0	1.00	1.4	1.50
4.N.2.X	0.0	--	0.0	--	0.2	.45
4.N.3.1	2.8	.45	2.6	0.89	2.6	.89

Table B-31. Objectives Matched to Items for Mathematics, Grade 5: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
5.A.1.1	3.9	.89	3.7	.84	3.7	.45
5.A.1.2	0.0	--	0.0	--	0.2	.45
5.A.1.X	0.2	.45	0.0	--	0.0	--
5.A.2.1	3.0	.00	3.5	1.10	3.6	.89
5.A.2.2	0.2	.45	0.1	.22	0.2	.45
5.A.2.3	2.0	.00	2.1	.22	1.0	.00
5.D.1.1	4.8	.45	6.0	.00	5.8	.45
5.D.1.2	0.9	.55	0.0	--	0.2	.45
5.GM.1.1	1.4	.55	2.4	.55	1.8	1.10
5.GM.1.2	2.9	.22	1.6	.55	2.0	.00
5.GM.1.3	0.1	.22	0.2	.45	1.2	.45
5.GM.1.X	0.0	--	0.2	.45	0.0	--
5.GM.2.1	0.8	.45	0.8	.45	0.8	.45
5.GM.2.2	1.2	.45	1.2	.45	2.0	.71
5.GM.2.3	2.0	.00	2.0	.00	1.0	.00
5.GM.3.1	0.6	.55	0.6	.55	1.2	1.10
5.GM.3.2	0.0	--	0.0	--	0.0	--
5.GM.3.3	1.2	.45	1.0	.00	0.8	.45
5.GM.3.4	2.2	.45	1.8	.45	0.9	.22
5.GM.3.X	0.0	--	0.2	.45	0.0	--
5.N.1.1	2.2	1.10	1.8	.84	1.2	.45
5.N.1.2	0.4	.55	1.4	.55	1.7	1.90
5.N.1.3	1.4	.89	1.2	.84	1.6	1.10
5.N.1.4	2.6	.89	2.2	1.10	3.4	1.10
5.N.1.X	0.0	--	0.1	.22	0.0	--
5.N.2.1	2.4	.55	2.4	.89	2.3	1.10
5.N.2.2	1.1	.89	0.4	.55	2.3	.45
5.N.2.3	2.5	1.00	2.2	.45	1.4	.55
5.N.2.4	2.4	.89	2.8	.84	1.6	.55
5.N.3.1	1.2	.45	0.8	.45	1.4	.89
5.N.3.2	0.2	.45	0.4	.42	0.2	.45
5.N.3.3	6.0	.94	6.9	.82	6.5	1.30
5.N.3.4	0.0	--	0.0	--	0.0	--

Table B-32. Objectives Matched to Items for Mathematics, Grade 6: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
6.A.1.1	1.0	.00	1.0	.00	2.0	.00
6.A.1.2	0.0	--	0.0	--	0.4	.89
6.A.1.3	1.4	.89	1.0	1.00	1.2	1.10
6.A.2.1	3.4	.89	4.6	1.50	4.2	1.60
6.A.3.1	2.6	.89	3.6	.89	2.6	.55
6.A.3.2	1.6	1.50	1.4	1.10	0.8	.84
6.D.1.1	3.0	.00	3.0	.00	3.2	.45
6.D.1.2	0.0	--	0.0	--	0.0	--
6.D.1.3	1.0	.00	1.0	.00	1.0	.00
6.D.2.1	2.0	.00	1.2	.45	2.0	.00
6.D.2.2	0.6	.55	1.8	.45	1.0	.00
6.D.2.3	0.4	.55	0.0	--	0.0	--
6.GM.1.1	1.6	.89	1.8	.45	2.3	.27
6.GM.1.2	0.8	.45	0.8	.84	0.4	.42
6.GM.1.3	0.8	.84	0.6	.55	0.5	.50
6.GM.2.1	2.0	.00	1.8	.45	2.2	.45
6.GM.2.2	0.8	.45	0.8	.45	0.6	.55
6.GM.3.1	1.0	.00	0.8	.45	1.0	.00
6.GM.3.2	1.4	.89	1.0	.00	1.0	.00
6.GM.4.1	1.4	.89	1.8	.84	2.0	.00
6.GM.4.2	1.4	.89	1.2	.84	1.0	.00
6.GM.4.3	0.0	--	0.0	--	0.0	--
6.GM.4.4	1.0	.00	1.0	.00	1.0	.00
6.GM.4.X	0.2	.45	0.0	--	0.0	--
6.N.1.1	0.4	.89	1.4	.55	2.2	1.80
6.N.1.2	1.4	.55	1.0	.71	1.0	.71
6.N.1.3	0.2	.45	0.4	.89	0.2	.45
6.N.1.4	1.4	1.10	1.2	1.30	1.2	1.30
6.N.1.5	0.0	--	0.2	.45	0.0	--
6.N.1.6	0.0	--	0.2	.27	0.0	--
6.N.2.1	0.0	--	1.2	.45	0.2	.45
6.N.2.2	1.2	1.10	0.0	--	0.2	.45
6.N.2.3	1.6	1.00	1.0	.71	2.0	1.20
6.N.3.1	1.0	.00	2.4	.89	0.8	.45
6.N.3.2	1.0	.71	1.4	.89	2.8	1.50
6.N.3.3	3.6	.89	1.4	.89	1.0	.71
6.N.3.4	0.8	.45	0.0	--	0.0	--
6.N.4.1	1.0	1.20	1.6	.82	1.0	1.20
6.N.4.2	0.0	--	1.0	.71	0.0	--
6.N.4.3	0.8	.76	2.6	.55	2.4	2.30
6.N.4.4	5.8	1.90	2.8	1.60	4.6	1.80

Table B-33. Objectives Matched to Items for Mathematics, Grade 7: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
7.A.1.1	0.4	.55	0.8	.45	0.8	.45
7.A.1.2	1.2	.84	0.8	.45	0.8	.84
7.A.2.1	2.0	1.20	2.8	1.60	3.0	.00
7.A.2.2	1.2	.84	0.0	--	2.2	.45
7.A.2.3	1.2	.45	2.4	.89	1.0	.71
7.A.2.4	0.0	--	0.2	.45	0.2	.45
7.A.3.1	2.8	.84	2.8	1.30	2.0	.71
7.A.3.2	1.6	.55	0.2	.45	1.6	.89
7.A.3.3	0.2	.45	0.6	1.30	0.2	.45
7.A.4.1	0.8	.84	1.2	.45	0.2	.45
7.A.4.2	3.8	2.40	1.8	.84	4.1	1.20
7.D.1.1	3.6	.89	3.2	.45	4.2	.45
7.D.1.2	2.2	.45	2.8	.45	1.4	.89
7.D.2.1	1.2	.84	1.8	1.60	2.0	1.40
7.D.2.2	2.4	1.10	2.2	1.60	2.0	1.40
7.D.2.3	0.6	.55	0.2	.45	0.0	--
7.GM.1.1	1.0	.00	1.0	.00	1.2	.45
7.GM.1.2	1.0	.00	1.0	.00	1.0	.00
7.GM.2.1	0.0	--	0.0	--	0.4	.55
7.GM.2.2	2.2	.45	2.0	.00	1.6	.55
7.GM.3.1	0.6	.89	1.4	2.60	1.4	2.60
7.GM.3.2	4.8	.45	3.8	2.20	4.0	1.70
7.GM.4.1	2.2	1.10	2.4	.89	2.6	1.10
7.GM.4.2	1.8	.45	2.0	.71	1.4	.55
7.GM.4.3	2.0	.00	2.0	.00	1.8	.45
7.N.1.1	0.0	--	0.2	.45	0.2	.45
7.N.1.2	2.8	1.10	2.6	.55	2.5	.50
7.N.1.3	1.8	.84	1.8	.45	1.9	.55
7.N.2.1	0.0	--	0.0	--	0.0	--
7.N.2.2	0.0	--	0.0	--	0.0	--
7.N.2.3	1.0	.71	3.0	.00	1.3	.45
7.N.2.4	0.6	.55	0.2	.45	0.2	.45
7.N.2.5	2.8	1.90	1.6	.89	1.6	.89
7.N.2.6	0.0	--	1.0	.00	1.0	.00

Table B-34. Objectives Matched to Items for Mathematics, Grade 8: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
PA.A.1.1	2.2	.45	2.0	.71	3.0	.71
PA.A.1.2	2.0	1.00	0.8	.84	0.6	.89
PA.A.1.3	1.6	.55	1.6	.55	1.0	.00
PA.A.2.1	0.0	--	0.8	.45	2.6	1.30
PA.A.2.2	0.2	.45	0.8	.84	0.2	.45
PA.A.2.3	1.4	.89	0.6	.55	2.0	1.00
PA.A.2.4	5.0	2.30	3.4	1.30	2.4	.89
PA.A.2.5	0.2	.45	0.4	.89	0.2	.45
PA.A.3.1	1.8	.45	1.6	.89	1.4	.89
PA.A.3.2	0.8	.45	1.4	.55	1.0	.00
PA.A.4.1	1.2	1.10	2.8	1.80	1.8	.45
PA.A.4.2	3.4	.89	1.8	.84	3.0	.71
PA.A.4.3	2.0	1.20	3.6	2.50	2.6	.89
PA.A.4.X	0.0	--	0.4	.55	0.4	.55
PA.D.1.1	3.0	.00	3.0	.00	3.0	.00
PA.D.1.2	0.0	--	0.0	--	0.0	--
PA.D.1.3	1.0	.00	1.0	.00	1.0	.00
PA.D.2.1	1.6	.55	2.0	1.00	2.2	.45
PA.D.2.2	2.2	.84	1.0	.00	1.0	.00
PA.D.2.3	0.4	.89	1.0	.71	0.6	.55
PA.GM.1.1	3.4	1.30	3.4	1.90	3.2	1.80
PA.GM.1.2	0.4	.89	0.8	1.80	0.8	1.80
PA.GM.2.1	1.6	1.30	2.6	1.30	3.6	1.30
PA.GM.2.2	0.6	1.30	0.8	.84	1.0	.00
PA.GM.2.3	2.6	.89	2.8	1.10	2.6	.89
PA.GM.2.4	2.4	1.30	1.0	1.00	0.0	--
PA.N.1.1	1.2	.45	1.6	.89	1.8	.45
PA.N.1.2	1.0	.71	1.0	.00	1.0	.71
PA.N.1.3	2.0	.71	0.8	1.30	1.2	1.10
PA.N.1.4	1.0	.00	1.0	.00	1.0	.00
PA.N.1.5	3.6	.55	3.6	.55	3.8	.45
PA.N.1.X	0.0	--	0.6	.55	0.0	--

Table B-35. Objectives Matched to Items for Mathematics, Grade 10: Mean Items

Objective	Form A		Form B		Form C	
	Mean	*SD*	Mean	*SD*	Mean	*SD*
A1.A.1.1	3.8	2.80	1.3	1.90	1.3	1.90
A1.A.1.2	0.8	.96	0.3	.50	0.3	.50
A1.A.1.3	1.0	.00	4.0	.82	2.8	.50
A1.A.2.1	3.0	.82	3.0	1.60	4.8	1.30
A1.A.2.2	0.0	--	0.0	--	0.0	--
A1.A.2.3	2.5	.58	2.5	1.30	1.0	.82
A1.A.2.X	0.0	--	0.0	--	0.3	.50
A1.A.3.1	1.5	.58	0.5	.58	0.5	.58
A1.A.3.2	1.0	.00	2.3	1.30	1.8	.96
A1.A.3.3	2.8	.50	0.8	.50	0.8	.50
A1.A.3.4	0.0	--	1.8	.50	0.0	--
A1.A.3.5	0.0	--	0.0	--	1.0	.00
A1.A.3.6	0.5	.58	1.8	.96	0.5	.58
A1.A.4.1	0.4	.48	3.0	1.20	2.0	.00
A1.A.4.2	0.0	--	0.8	.50	1.0	.00
A1.A.4.3	3.6	1.10	3.5	1.30	3.8	.96
A1.A.4.4	0.0	--	0.0	--	0.8	.50
A1.D.1.1	1.8	.50	1.3	.50	1.0	.00
A1.D.1.2	1.3	.50	2.0	.00	2.3	.50
A1.D.1.3	0.0	--	00	--	0.0	--
A1.D.2.1	0.3	.50	0.5	.58	0.0	--
A1.D.2.2	0.0	--	1.0	.00	1.8	.50
A1.D.2.3	1.0	.00	1.3	.50	1.0	.00
A1.D.2.4	1.8	.50	0.0	--	0.0	--
A1.F.1.1	2.3	1.30	2.8	.50	2.0	.82
A1.F.1.2	3.0	.82	2.3	.50	4.0	.82
A1.F.1.3	1.8	.96	1.5	1.00	0.5	.58
A1.F.1.4	0.0	--	1.0	.00	0.0	--
A1.F.2.1	2.0	1.40	1.0	1.20	2.5	.58
A1.F.2.2	2.3	.96	2.8	.50	2.8	.50
A1.F.3.1	2.8	1.70	1.0	.82	0.8	.96
A1.F.3.2	1.1	.25	0.9	.25	0.6	.48
A1.F.3.3	3.6	.48	2.1	.85	1.4	.48
A1.N.1.1	2.0	.00	1.3	.50	0.3	.50
A1.N.1.2	3.8	.50	3.3	.96	5.0	1.40
G.2D.1.1	0.5	.58	0.5	.58	1.8	.65
G.2D.1.2	0.5	.58	0.5	.58	2.1	.48
G.2D.1.3	1.0	.00	0.0	--	0.1	.25
G.2D.1.4	1.75	.87	0.3	.50	0.8	.96
G.2D.1.5	1.25	.50	0.3	.50	0.3	.50
G.2D.1.6	1	.00	0.5	.00	2.0	.00
G.2D.1.7	0	--	1.5	.00	0.8	.50
G.2D.1.8	0.75	.50	0.8	.50	0.8	.50
G.2D.1.9	0	--	2.0	.00	0.0	--

Appendix C.

Content Alignment Results: Science

The following tables include complete statistical results on the Webb (1997) alignment indicators, including means and standard deviations per standard for each OSTP Science.

Categorical Concurrence

The categorical concurrence results for the OSTP Science test forms are presented below. Each table includes: the mean number of items matched by panelists; the standard deviation among panelists' ratings; and, the final alignment conclusion (Yes or No). The bottom row indicates the percentage of reporting categories (RCs) that met the minimum alignment indicator criterion.

Table C-1. Categorical Concurrence for Science, Grade 5: Mean Number of Items per Performance Expectation

Reporting Category	Form A			Form Breach		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*	
Earth and Space Sciences	18.0	.00	Yes	18.0	.00	Yes
Life Sciences	15.0	.00	Yes	12.0	.00	Yes
Physical Sciences	12.0	.00	Yes	15.0	.00	Yes
% of RCs with at least 6 items:			100%			100%

Table C-2. Categorical Concurrence for Science, Grade 8: Mean Number of Items per Performance Expectation

Reporting Category	Form A			Form Breach		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*	
Earth and Space Sciences	20.8	2.06	Yes	22.3	1.50	Yes
Life Sciences	9.3	2.06	Yes	7.8	1.50	Yes
Physical Sciences	15.0	.00	Yes	15.0	.00	Yes
% of RCs with at least 6 items:			100%			100%

Table C-3. Categorical Concurrence for Science, Grade 10: Mean Number of Items per Performance Expectation

Reporting Category	Form A			Form Breach		
	Items Matched		At Least 6 Items	Items Matched		At Least 6 Items
	Mean	*SD*		Mean	*SD*	
Ecosystem Dynamics	13.6	2.50	Yes	12.6	2.87	Yes
Heredity, Variation, & Diversity	16.7	2.89	Yes	19.2	3.79	Yes
Structure and Function	14.6	1.65	Yes	13.1	1.65	Yes
% of RCs with at least 6 items:			100%			100%

Depth-of-Knowledge Consistency

The Depth-of-Knowledge (DOK) consistency results for the OSTP science test forms are presented below. The tables present the results from the comparison between the depth-of-knowledge expected in the matched performance expectation and the depth-of-knowledge assessed by items. The tables include the mean percentage of items rated as below, at the same level, or above the DOK level of the performance expectation along with the corresponding standard deviations. Standards with at least 50% of items at the same (or above) DOK level of the matched performance expectation met the minimum indicator criterion.

Table C-4. DOK Consistency for Science, Grade 5: Mean Percent of Items with DOK Below, At, and Above DOK Level of Performance Expectations

Form	Reporting Category	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Earth and Space Sciences	18.0	53.3	7.5	38.9	11.1	7.8	9.3	No
	Life Sciences	15.0	13.3	12.5	68.0	8.7	18.7	7.3	Yes
	Physical Sciences	12.0	30.0	12.6	53.3	7.5	16.7	10.2	Yes
	% of Reporting Categories Met Criterion								66.7%
B	Earth and Space Sciences	18.0	61.1	5.6	34.4	8.2	4.4	4.6	No
	Life Sciences	12.0	21.7	15.1	60.0	13.7	18.3	9.1	Yes
	Physical Sciences	15.0	30.7	3.7	48.0	15.9	21.3	15.2	Yes
	% of Reporting Categories Met Criterion								66.7%

Table C-5. DOK Consistency for Science, Grade 8: Mean Percent of Items with DOK Below, At, and Above DOK Level of Performance Expectations

Form	Reporting Category	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Earth and Space Sciences	20.8	70.9	8.3	24.3	8.2	4.9	0.5	No
	Life Sciences	9.3	72.9	20.6	19.4	14.0	7.6	10.5	No
	Physical Sciences	14.3	49.6	8.0	33.8	12.5	16.7	13.9	Yes
	% of Reporting Categories Met Criterion								33.3%
B	Earth and Space Sciences	22.3	68.8	8.6	28.9	7.1	2.3	2.6	No
	Life Sciences	7.8	76.4	20.5	23.6	20.5	0.0	0.0	No
	Physical Sciences	14.3	38.8	8.5	37.9	12.0	23.3	8.6	Yes
	% of Reporting Categories Met Criterion								33.3%

Table C-6. DOK Consistency for Science, Grade 10: Mean Percent of Items with DOK Below, At, and Above DOK Level of Performance Expectations

Form	Reporting Category	Mean Items Aligned	Depth-of-Knowledge Consistency						DOK Consistency Target Met
			% Items Below		% Items Same Level		%Items Above		
			M	*SD*	*M*	*SD*	*M*	*SD*	
A	Ecosystem Dynamics	13.6	42.3	9.8	49.6	15.0	8.2	6.3	Yes
	Heredity, Variation, & Diversity	16.7	54.0	10.6	25.7	8.0	20.3	7.1	No
	Structure and Function	14.6	41.1	11.6	22.0	13.8	36.9	7.4	Yes
	% of Reporting Categories Met Criterion								66.7%
B	Ecosystem Dynamics	12.6	51.1	5.1	44.4	7.7	4.5	3.4	No
	Heredity, Variation, & Diversity	19.2	59.9	13.6	23.1	8.8	17.0	5.7	No
	Structure and Function	13.1	24.7	13.1	22.6	16.7	52.7	12.6	Yes
	% of Reporting Categories Met Criterion								33.3%

Range-of-Knowledge Correspondence

The results for Range-of-Knowledge correspondence for the OSTP science test forms are presented below. The tables include the number of assessed performance expectations, the number of performance expectations that were not aligned by panelists to at least one item (on average), the specific performance expectations that were not assessed by at least one item, and the proportion of performance expectations that were aligned. For acceptable range-of-knowledge correspondence, a minimum of 50% of performance expectations within each reporting category should be matched to at least one item.

Table C-7. Range-of-Knowledge for OSTP Science, Grade 5: Mean Percent of Performance Expectations per Reporting Category Linked with Items

Form	Reporting Category	Assessed PEs	PEs Not Matched with at least 1 Item by Panelists		% of Total PEs Aligned	Range-of-Knowledge Target Met
			Count	PEs		
A	Earth and Space Sciences	5	0		100.0	Yes
	Life Sciences	4	0		100.0	Yes
	Physical Sciences	4	0		100.0	Yes
	% of Reporting Categories Met Criterion					100%
Breach	Earth and Space Sciences	5	0		100.0	Yes
	Life Sciences	4	0		100.0	Yes
	Physical Sciences	4	0		100.0	Yes
	% of Reporting Categories Met Criterion					100%

Table C-8. Range-of-Knowledge for OSTP Science, Grade 8: Mean Percent of Performance Expectations per Reporting Category Linked with Items

Form	Reporting Category	Assessed PEs	PEs Not Matched with at least 1 Item by Panelists		% of Total PEs Aligned	Range-of-Knowledge Target Met
			Count	PEs		
A	Earth and Space Sciences	7	1	MS-ESS2-1	85.7	Yes
	Life Sciences	3	0		100.0	Yes
	Physical Sciences	8	3	MS-PS1-3, MS-PS2-1, MS-PS4-3	62.5	Yes
	% of Reporting Categories Met Criterion					100%
Breach	Earth and Space Sciences	7	1	MS-ESS2-2	85.7	Yes
	Life Sciences	3	0		100.0	Yes
	Physical Sciences	8	2	MS-PS1-3, MS-PS4-3	75.0	Yes
	% of Reporting Categories Met Criterion					100%

Table C-9. Range-of-Knowledge for OSTP Science, Grade 10: Mean Percent of Performance Expectations per Reporting Category Linked with Items

Form	Reporting Category	Assessed PEs	PEs Not Matched with at least 1 Item by Panelists		% of Total PEs Aligned	Range-of-Knowledge Target Met
			Count	PEs		
A	Ecosystem Dynamics	7	2	HS-LS2-5, HS-LS2-8	71.4	Yes
	Heredity, Variation, & Diversity	8	2	HS-LS4-1, HS-LS4-3	75.0	Yes
	Structure and Function	7	2	HS-LS1-4, HS-LS1-6	71.4	Yes
	% of Reporting Categories Met Criterion					100%
Breach	Ecosystem Dynamics	7	3	HS-LS2-3, HS-LS2-4, HS-LS2-8	57.1	Yes
	Heredity, Variation, & Diversity	8	2	HS-LS3-1, HS-LS3-3	75.0	Yes
	Structure and Function	7	3	HS-LS1-1, HS-LS1-2, HS-LS1-6	57.1	Yes
	% of Reporting Categories Met Criterion					100%

Balance of knowledge Representation

The results for Balance of knowledge representation for the OSTP science test forms are presented below. The tables include the minimum, maximum and mean number of items that were aligned, on average, to each performance expectation (out of the performance expectations that were aligned to items) within a reporting category. In addition, they include the number of performance expectations that were aligned to items, the mean number of items aligned to the reporting category and the balance index. The minimum acceptable balance index is 70 out of 100.

Table C-10. Balance of knowledge Representation for Science, Grade 5: Mean Balance Index per Performance Expectation

Form	Reporting Category (RC)	Mean Items Matched with Each Performance Expectation (PE)			PEs Aligned to Items	Mean Items Aligned to the RC	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Earth and Space Sciences	3.0	6.0	3.6	5	18.0	86.7	Yes
	Life Sciences	1.8	7.6	3.8	4	15.0	74.3	Yes
	Physical Sciences	1.9	4.1	3.0	4	12.0	89.2	Yes
	% of Reporting Categories Met Criterion							100%
Breach	Earth and Space Sciences	3.0	6.0	3.6	5	18.0	86.7	Yes
	Life Sciences	1.3	5.2	3.0	4	12.0	80.8	Yes
	Physical Sciences	2.7	5.5	3.8	4	15.0	88.0	Yes
	% of Reporting Categories Met Criterion							100%

Table C-11. Balance of knowledge Representation for Science, Grade 8: Mean Balance Index per Performance Expectation

Form	Reporting Category (RC)	Mean Items Matched with Each Performance Expectation (PE)			PEs Aligned to Items	Mean Items Aligned to the RC	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Earth and Space Sciences	2.0	6.3	3.3	6	20.0	83.3	Yes
	Life Sciences	1.1	5.1	3.1	3	9.3	77.9	Yes
	Physical Sciences	2.3	3.3	2.7	5	13.3	94.7	Yes
	% of Reporting Categories Met Criterion							100%
Breach	Earth and Space Sciences	1.8	8.0	3.6	6	21.5	78.7	Yes
	Life Sciences	2.3	3.0	2.6	3	7.8	94.6	Yes
	Physical Sciences	1.1	3.0	2.4	6	14.3	87.7	Yes
	% of Reporting Categories Met Criterion							100%

Table C-12. Balance of knowledge Representation for Science, Grade 10: Mean Balance Index per Performance Expectation

Form	Reporting Category (RC)	Mean Items Matched with Each Performance Expectation (PE)			PEs Aligned to Items	Mean Items Aligned to the RC	Balance Index	Balance Index Target Met
		Min	*Max*	*Mean*				
A	Ecosystem Dynamics	1.8	3.7	2.6	5	13.0	89.4	Yes
	Heredity, Variation, & Diversity	1.4	5.5	2.7	6	16.1	77.3	Yes
	Structure and Function	2.3	3.8	2.9	5	14.5	91.9	Yes
	% of Reporting Categories Met Criterion							100%
Breach	Ecosystem Dynamics	1.8	3.8	3.0	4	11.9	88.2	Yes
	Heredity, Variation, & Diversity	1.6	4.2	3.1	6	18.7	86.0	Yes
	Structure and Function	2.5	4.5	3.3	4	13.0	90.4	Yes
	% of Reporting Categories Met Criterion							100%

Performance Expectations Matched to Items by Panelists

The average number of items matched by panelists, on average, to each performance expectation are presented below. One note of caution when reading these tables: the same items may not be represented by the mean number of items. For example, performance expectation '5-ESS1-1' in the first row shows that panelists matched a mean number of 6 items to this performance expectation on form A. This does not mean/assume that the items matched to the performance expectation by the panelists were the same items across panelists.

Table C-13. Performance Expectations Matched to Items for Science, Grade 5: Mean Items

Performance Expectations	Form A		Form Breach	
	Mean	*SD*	Mean	*SD*
5-ESS1-1	6.0	.00	3.0	.00
5-ESS1-2	3.0	.00	3.0	.00
5-ESS2-1	3.0	.00	3.0	.00
5-ESS2-2	3.0	.00	3.0	.00
5-LS1-1	3.1	.22	3.1	.22
5-LS2-1	7.6	3.00	5.2	2.10
5-LS2-2	2.5	1.80	2.4	1.60
5-PS1-1	1.9	1.50	2.7	.97
5-PS1-2	3.2	1.80	3.0	.00
5-PS1-3	4.1	2.50	3.8	1.10
5-PS1-4	2.8	.45	5.5	1.10
5-PS2-1	3.0	.00	6.0	.00
5-PS3-1	1.8	1.00	1.3	.45

Table C-14. Performance Expectations Matched to Items for Science, Grade 8: Mean Items

Performance Expectations	Form A		Form Breach	
	Mean	*SD*	Mean	*SD*
MS-ESS1-4	3.8	1.50	3.8	2.90
MS-ESS2-1	0.8	1.50	1.8	1.50
MS-ESS2-2	2.5	1.00	0.8	1.50
MS-ESS2-3	6.3	2.90	8.0	2.80
MS-ESS3-1	2.0	1.40	2.5	1.70
MS-ESS3-2	3.0	.00	3.0	2.40
MS-ESS3-4	2.5	1.00	2.5	1.00
MS-LS1-7	3.0	.00	3.0	.00
MS-LS4-1	5.1	1.60	2.5	1.70
MS-LS4-2	1.1	.75	2.3	1.50
MS-PS1-3	0.0	--	0.0	--
MS-PS1-5	2.8	.50	2.8	.50
MS-PS1-6	2.5	1.00	2.5	1.00
MS-PS2-1	0.8	1.50	1.9	1.40
MS-PS2-2	2.3	1.50	1.1	1.40
MS-PS4-1	2.5	1.00	3.0	.00
MS-PS4-2	3.3	.50	3.0	.00
MS-PS4-3	0.0	--	0.0	--

Table C-15. Performance Expectations Matched to Items for Science, Grade 10: Mean Items

Performance Expectations	Form A		Form Breach	
	Mean	*SD*	Mean	*SD*
HS-LS1-1	3.0	.00	0.1	.25
HS-LS1-2	3.1	.25	0.0	--
HS-LS1-3	2.3	.65	4.5	1.50
HS-LS1-4	0.0	--	3.0	.00
HS-LS1-5	2.4	.75	2.5	.58
HS-LS1-6	0.1	.25	0.0	--
HS-LS1-7	3.8	.87	3.0	.00
HS-LS2-1	2.5	.71	2.8	1.20
HS-LS2-2	1.8	1.80	1.8	1.80
HS-LS2-3	2.1	1.00	0.8	1.50
HS-LS2-4	2.9	.25	0.0	--
HS-LS2-5	0.6	.75	3.5	.58
HS-LS2-6	3.7	.95	3.8	1.00
HS-LS2-8	0.0	--	0.0	--
HS-LS3-1	1.5	1.30	0.0	--
HS-LS3-2	3.6	1.80	1.6	2.40
HS-LS3-3	2.0	1.60	0.5	.58
HS-LS4-1	0.3	.29	2.6	.48
HS-LS4-2	2.2	2.60	3.8	3.90
HS-LS4-3	0.4	.75	2.5	1.80
HS-LS4-4	1.4	1.10	4.2	1.20
HS-LS4-5	5.5	3.10	4.0	2.70

Appendix D.

Panelist Data

Appendix D contains the Depth-of-Knowledge (DOK) panel group consensus ratings by subject and grade for the content objectives or performance expectations and includes all individual panelist ratings for the item rating task beginning on page D13.

Depth-of-Knowledge Standard Consensus Ratings

Panelists provided group consensus ratings for each standard using Webb's DOK levels (refer to page 10 for more information): Level 1 – Recognition, Level 2 – Skills/Concepts, Level 3 – Strategic Thinking, and Level 4 – Extended Thinking.

ELA Grade 3			
Standard Code	DOK	Standard Code	DOK
3.1.R.1	2	3. 4.R.2	2
3.1.R.2	3	3. 4.R.3	2
3.1.R.3	3	3. 4.R.4	2
3.1.W.1	2	3. 4.R.5	1
3.1.W.2	2	3.4.W.1	2
3.2.PC	1	3.4.W.2	3
3.2.PWS.1	2	3.5.R.1	1
3.2.PWS.2	2	3.5.R.2	1
3.2.PWS.3	2	3.5.R.3	1
3.2.F.1	2	3.5.R.4	1
3.2.F.2	2	3.5.R.5	1
3.2.R.1	2	3.5.W.1	1
3.2.R.2	2	3.5.W.2	1
3.2.R.3	2	3.5.W.3	2
3.2.W.1	3	3.5.W.4	2
3.2.W.2	3	3.6.R.1	4
3.2.W.3	1	3.6.R.2	2
3.2.W.4	2	3.6.R.3	2
3.3.R.1	3	3.6.R.4	2
3.3.R.2	2	3.6.W.1	1
3.3.R.3	2	3.6.W.2	2
3.3.R.4	2	3.6.W.3	2
3.3.R.5	2	3.7.R.1	2
3.3.R.6	2	3.7.R.2	2
3.3.R.7	3	3.7.W.1	4
3.3.W.1	3	3.7.W.2	4
3.3.W.2	3	3.8.R	2
3.3.W.3	3	3.8.W	3
3. 4.R.1	2		

ELA Grade 4			
Standard Code	DOK	Standard Code	DOK
4.1.R.1	NA*	4. 4.R.2	2
4.1.R.2	NA*	4. 4.R.3	2
4.1.R.3	NA*	4. 4.R.4	2
4.1.W.1	NA*	4. 4.R.5	1
4.1.W.2	NA*	4.4.W.1	2
4.2.PC	1	4.4.W.2	3
4.2.PWS.1	2	4.5.R.1	1
4.2.F.1	2	4.5.R.2	1
4.2.F.2	2	4.5.R.3	1
4.2.R.1	3	4.5.R.4	1
4.2.R.2	2	4.5.R.5	1
4.2.R.3	2	4.5.W.1	1
4.2.R.4	2	4.5.W.2	2
4.2.W.1	3	4.5.W.3	2
4.2.W.2	3	4.5.W.4	2
4.2.W.3	1	4.6.R.1	4
4.2.W.4	2	4.6.R.2	2
4.3.R.1	3	4.6.R.3	2
4.3.R.2	2	4.6.W.1	4
4.3.R.3	1	4.6.W.2	3
4.3.R.4	1	4.6.W.3	2
4.3.R.5	2	4.7.R.1	4
4.3.R.6	2	4.7.R.2	3
4.3.R.7	3	4.7.W.1	4
4.3.W.1	3	4.7.W.2	4
4.3.W.2	3	4.8.R	2
4.3.W.3	3	4.8.W	3
4. 4.R.1	2		

* Not Assessed

ELA Grade 5			
Standard Code	DOK	Standard Code	DOK
5.1.R.1	NA	5.4.R.3	2
5.1.R.2	NA	5.4.R.4	2
5.1.R.3	NA	5.4.R.5	1
5.1.W.1	NA	5.4.W.1	2
5.1.W.2	NA	5.4.W.2	2
5.2.R.1	3	5.5.R.1	1
5.2.R.2	2	5.5.R.2	1
5.2.R.3	2	5.5.R.3	1
5.2.W.1	2	5.5.W.1	2
5.2.W.2	2	5.5.W.2	2
5.2.W.3	3	5.5.W.3	1
5.2.W.4	3	5.5.W.4	1
5.2.W.5	2	5.5.W.5	1
5.3.R.1	3	5.6.R.1	4
5.3.R.2	3	5.6.R.2	2
5.3.R.3	1	5.6.R.3	2
5.3.R.4	2	5.6.W.1	4
5.3.R.5	2	5.6.W.2	4
5.3.R.6	3	5.6.W.3	3
5.3.R.7	3	5.6.W.4	2
5.3.W.1	3	5.7.R.1	4
5.3.W.2	3	5.7.R.2	3
5.3.W.3	3	5.7.W.1	4
5.3.W.4	4	5.7.W.2	4
5.4.R.1	2	5.8.R	2
5.4.R.2	2	5.8.W	3

* Not Assessed

ELA Grade 6			
Standard Code	DOK	Standard Code	DOK
6.1.R.1	2	6.4.R.3	2
6.1.R.2	2	6.4.R.4	2
6.1.R.3	3	6.4.R.5	1
6.1.W.1	3	6.4.W.1	1
6.1.W.2	1	6.4.W.2	2
6.2.R.1	2	6.5.R.1	2
6.2.R.2	2	6.5.R.2	1
6.2.R.3	2	6.5.R.3	1
6.2.W.1	3	6.5.W.1	1
6.2.W.2	2	6.5.W.2	2
6.2.W.3	3	6.5.W.3	2
6.2.W.4	3	6.5.W.4	2
6.2.W.5	1	6.5.W.5	2
6.3.R.1	3	6.6.R.1	4
6.3.R.2	4	6.6.R.2	2
6.3.R.3	3	6.6.R.3	4
6.3.R.4	3	6.6.W.1	4
6.3.R.5	3	6.6.W.2	3
6.3.R.6	3	6.6.W.3	2
6.3.R.7	3	6.6.W.4	2
6.3.W.1	3	6.7.R.1	3
6.3.W.2	3	6.7.R.2	3
6.3.W.3	3	6.7.W.1	4
6.3.W.4	3	6.7.W.2	4
6.4.R.1	1	6.8.R	2
6.4.R.2	1	6.8.W	4

ELA Grade 7			
Standard Code	DOK	Standard Code	DOK
7.1.R.1	2	7.4.R.3	2
7.1.R.2	2	7.4.R.4	2
7.1.R.3	3	7.4.R.5	1
7.1.W.1	3	7.4.W.1	1
7.1.W.2	1	7.4.W.2	2
7.2.R.1	2	7.5.R.1	1
7.2.R.2	2	7.5.R.2	1
7.2.R.3	2	7.5.R.3	1
7.2.W.1	3	7.5.R.4	1
7.2.W.2	2	7.5.W.1	1
7.2.W.3	3	7.5.W.2	2
7.2.W.4	3	7.5.W.3	2
7.2.W.5	1	7.6.R.1	4
7.3.R.1	3	7.6.R.2	3
7.3.R.2	4	7.6.R.3	3
7.3.R.3	3	7.6.W.1	4
7.3.R.4	3	7.6.W.2	4
7.3.R.5	2	7.6.W.3	3
7.3.R.6	3	7.6.W.4	2
7.3.R.7	3	7.7.R.1	3
7.3.W.1	3	7.7.R.2	3
7.3.W.2	3	7.7.W.1	4
7.3.W.3	3	7.7.W.2	2
7.3.W.4	3	7.8.R	2
7.4.R.1	1	7.8.W	4
7.4.R.2	1		

ELA Grade 8			
Standard Code	DOK	Standard Code	DOK
8.1.R.1	2	8.4.R.4	2
8.1.R.2	2	8.4.R.5	1
8.1.R.3	3	8.4.W.1	1
8.1.W.1	3	8.4.W.2	2
8.1.W.2	1	8.5.R.1	1
8.2.R.1	2	8.5.R.2	1
8.2.R.2	3	8.5.R.3	2
8.2.R.3	2	8.5.R.4	2
8.2.W.1	3	8.5.W.1	1
8.2.W.2	2	8.5.W.2	2
8.2.W.3	3	8.5.W.3	2
8.2.W.4	3	8.5.W.4	2
8.2.W.5	1	8.5.W.5	2
8.3.R.1	3	8.6.R.1	4
8.3.R.2	4	8.6.R.2	3
8.3.R.3	3	8.6.R.3	3
8.3.R.4	3	8.6.W.1	4
8.3.R.5	3	8.6.W.2	4
8.3.R.6	3	8.6.W.3	3
8.3.R.7	4	8.6.W.4	2
8.3.W.1	3	8.7.R.1	4
8.3.W.2	3	8.7.R.2	3
8.3.W.3	4	8.7.W.1	4
8.3.W.4	3	8.7.W.2	2
8.4.R.1	1	8.8.R	2
8.4.R.2	1	8.8.W	4
8.4.R.3	2		

ELA Grade 10			
Standard Code	DOK	Standard Code	DOK
10.1.R.1	1	10.4.R.1	2
10.1.R.2	3	10.4.R.2	1
10.1.R.3	3	10.4.R.3	2
10.1.W.1	3	10.4.R.4	3
10.1.W.2	2	10.4.R.5	1
10.2.R.1	3	10.4.W.1	2
10.2.R.2	3	10.4.W.2	3
10.2.W.1	2	10.5.R	3
10.2.W.2	3	10.5.W.1	1
10.2.W.3	4	10.5.W.2	2
10.2.W.4	3	10.5.W.3	1
10.2.W.5	1	10.6.R.1	3
10.3.R.1	4	10.6.R.2	4
10.3.R.2	4	10.6.R.3	3
10.3.R.3	3	10.6.W.1	4
10.3.R.4	3	10.6.W.2	4
10.3.R.5	4	10.6.W.3	3
10.3.R.6	4	10.6.W.4	4
10.3.R.7	4	10.7.R.1	4
10.3.W.1	2	10.7.R.2	3
10.3.W.2	3	10.7.W.1	3
10.3.W.3	3	10.7.W.2	4
10.3.W.4	3	10.8.R	2
10.3.W.5	4	10.8.W	4
10.3.W.6	4		

Math Grade 3			
Standard Code	DOK	Standard Code	DOK
3.N.1.1	1	3.A.1.2	2
3.N.1.2	1	3.A.1.3	2
3.N.1.3	1	3.A.2.1	1
3.N.1.4	2	3.A.2.2	2
3.N.2.1	1	3.GM.1.1	1
3.N.2.2	1	3.GM.1.2	2
3.N.2.3	2	3.GM.1.3	1
3.N.2.4	2	3.GM.2.1	2
3.N.2.5	2	3.GM.2.2	3
3.N.2.6	1	3.GM.2.3	1
3.N.2.7	1	3.GM.2.4	1
3.N.2.8	1	3.GM.2.5	2
3.N.3.1	1	3.GM.2.6	1
3.N.3.2	2	3.GM.2.7	1
3.N.3.3	1	3.GM.2.8	1
3.N.3.4	1	3.GM.3.1	1
3.N.4.1	2	3.GM.3.2	2
3.N.4.2	2	3.D.1.1	2
3.A.1.1	2	3.D.1.2	2

Math Grade 4			
Standard Code	DOK	Standard Code	DOK
4.N.1.1	1	4. A.1.2	2
4.N.1.2	1	4. A.1.3	2
4.N.1.3	2	4. A.2.1	2
4.N.1.4	2	4. A.2.2	1
4.N.1.5	3	4.GM.1.1	1
4.N.1.6	2	4.GM.1.2	2
4.N.1.7	2	4.GM.1.3	1
4.N.2.1	1	4.GM.2.1	1
4.N.2.2	2	4.GM.2.2	2
4.N.2.3	1	4.GM.2.3	2
4.N.2.4	1	4.GM.2.4	1
4.N.2.5	1	4.GM.2.5	1
4.N.2.6	1	4.GM.3.1	2
4.N.2.7	2	4.GM.3.2	2
4.N.2.8	2	4.D.1.1	2
4.N.3.1	2	4.D.1.2	2
4.A.1.1	2	4.D.1.3	2

Math Grade 5			
Standard Code	DOK	Standard Code	DOK
5.N.1.1	2	5.A.2.2	1
5.N.1.2	1	5.A.2.3	1
5.N.1.3	3	5.GM.1.1	2
5.N.1.4	1	5.GM.1.2	2
5.N.2.1	2	5.GM.1.3	2
5.N.2.2	1	5.GM.2.1	1
5.N.2.3	2	5.GM.2.2	1
5.N.2.4	2	5.GM.2.3	3
5.N.3.1	2	5.GM.3.1	2
5.N.3.2	2	5.GM.3.2	1
5.N.3.3	1	5.GM.3.3	2
5.N.3.4	1	5.GM.3.4	2
5.A.1.1	2	5.D.1.1	1
5.A.1.2	2	5.D.1.2	3
5.A.2.1	2		

Math Grade 6			
Standard Code	DOK	Standard Code	DOK
6.N.1.1	1	6.A.2.1	2
6.N.1.2	2	6.A.3.1	1
6.N.1.3	2	6.A.3.2	2
6.N.1.4	2	6.GM.1.1	2
6.N.1.5	2	6.GM.1.2	2
6.N.1.6	2	6.GM.1.3	2
6.N.2.1	2	6.GM.2.1	1
6.N.2.2	1	6.GM.2.2	2
6.N.2.3	1	6.GM.3.1	1
6.N.3.1	2	6.GM.3.2	2
6.N.3.2	1	6.GM.4.1	2
6.N.3.3	2	6.GM.4.2	1
6.N.3.4	2	6.GM.4.3	1
6.N.4.1	2	6.GM.4.4	1
6.N.4.2	2	6.D.1.1	1
6.N.4.3	1	6.D.1.2	3
6.N.4.4	3	6.D.1.3	3
6.A.1.1	1	6.D.2.1	1
6.A.1.2	1	6.D.2.2	2
6.A.1.3	1	6.D.2.3	2

Math Grade 7			
Standard Code	DOK	Standard Code	DOK
7.N.1.1	1	7.A.3.3	1
7.N.1.2	1	7.A.4.1	2
7.N.1.3	1	7.A.4.2	1
7.N.2.1	2	7.GM.1.1	1
7.N.2.2	1	7.GM.1.2	1
7.N.2.3	1	7.GM.2.1	2
7.N.2.4	1	7.GM.2.2	2
7.N.2.5	1	7.GM.3.1	1
7.N.2.6	1	7.GM.3.2	1
7.A.1.1	1	7.GM.4.1	2
7.A.1.2	1	7.GM.4.2	2
7.A.2.1	2	7.GM.4.3	2
7.A.2.2	2	7.D.1.1	4
7.A.2.3	2	7.D.1.2	3
7.A.2.4	2	7.D.2.1	1
7.A.3.1	2	7.D.2.2	1
7.A.3.2	2	7.D.2.3	3

Math Grade 8			
Standard Code	DOK	Standard Code	DOK
PA.N.1.1	2	PA.A.4.1	2
PA.N.1.2	1	PA.A.4.2	2
PA.N.1.3	2	PA.A.4.3	1
PA.N.1.4	2	PA.GM.1.1	2
PA.N.1.5	1	PA.GM.1.2	1
PA.A.1.1	1	PA.GM.2.1	1
PA.A.1.2	1	PA.GM.2.2	1
PA.A.1.3	1	PA.GM.2.3	3
PA.A.2.1	2	PA.GM.2.4	3
PA.A.2.2	2	PA.D.1.1	1
PA.A.2.3	1	PA.D.1.2	1
PA.A.2.4	2	PA.D.1.3	3
PA.A.2.5	2	PA.D.2.1	2
PA.A.3.1	1	PA.D.2.2	1
PA.A.3.2	3	PA.D.2.3	2

Math Grade 10			
Standard Code	DOK	Standard Code	DOK
A1.N.1.1	2	G.2D.1.9	2
A1.N.1.2	2	G.3D.1.1	2
A1.A.1.1	3	G.3D.1.2	2
A1.A.1.2	3	G.C.1.1	2
A1.A.1.3	3	G.C.1.2	2
A1.A.2.1	3	G.C.1.3	2
A1.A.2.2	2	G.C.1.4	2
A1.A.2.3	3	G.RT.1.1	2
A1.A.3.1	2	G.RT.1.2	3
A1.A.3.2	1	G.RT.1.3	2
A1.A.3.3	2	G.RT.1.4	2
A1.A.3.4	3	A2.N.1.1	2
A1.A.3.5	2	A2.N.1.2	1
A1.A.3.6	3	A2.N.1.3	2
A1.A.4.1	2	A2.N.1.4	3
A1.A.4.2	2	A2.A.1.1	3
A1.A.4.3	2	A2.A.1.2	3
A1.A.4.4	2	A2.A.1.3	3
A1.F.1.1	1	A2.A.1.4	2
A1.F.1.2	3	A2.A.1.5	2
A1.F.1.3	3	A2.A.1.6	2
A1.F.1.4	3	A2.A.1.7	3
A1.F.2.1	2	A2.A.1.8	3
A1.F.2.2	2	A2.A.1.9	2
A1.F.3.1	2	A2.A.2.1	3
A1.F.3.2	3	A2.A.2.2	2
A1.F.3.3	2	A2.A.2.3	2
A1.D.1.1	3	A2.A.2.4	2
A1.D.1.2	3	A2.F.1.1	2
A1.D.1.3	1	A2.F.1.2	3
A1.D.2.1	2	A2.F.1.3	2
A1.D.2.2	3	A2.F.1.4	2
A1.D.2.3	3	A2.F.1.5	3
A1.D.2.4	2	A2.F.1.6	2
G.RL.1.1	1	A2.F.1.7	2
G.RL.1.2	2	A2.F.1.8	3
G.RL.1.3	3	A2.F.2.1	2
G.2D.1.1	3	A2.F.2.2	2
G.2D.1.2	3	A2.F.2.3	3
G.2D.1.3	3	A2.F.2.4	2
G.2D.1.4	3	A2.D.1.1	2
G.2D.1.5	2	A2.D.1.2	3
G.2D.1.6	3	A2.D.1.3	2
G.2D.1.7	3	A2.D.2.1	4
G.2D.1.8	3	A2.D.2.2	4

Science Grade 5			
Standard Code	DOK	Standard Code	DOK
5-PS1-1	2	5-LS2-1	2
5-PS1-2	3	5-LS2-2	2
5-PS1-3	2	5-ESS1-1	3
5-PS1-4	3	5-ESS1-2	4
5-PS2-1	3	5-ESS2-1	3
5-PS3-1	2	5-ESS2-2	2
5-LS1-1	3	5-ESS3-1	3

Science Grade 8			
Standard Code	DOK	Standard Code	DOK
MS-PS1-3	3	MS-LS4-1	3
MS-PS1-5	2	MS-LS4-2	2
MS-PS1-6	3	MS-ESS1-4	2
MS-PS2-1	2	MS-ESS2-1	2
MS-PS2-2	3	MS-ESS2-2	2
MS-PS4-1	1	MS-ESS2-3	3
MS-PS4-2	2	MS-ESS3-1	3
MS-PS4-3	3	MS-ESS3-2	4
MS-LS1-7	3	MS-ESS3-4	3

Science Grade 10			
Standard Code	DOK	Standard Code	DOK
HS-LS1-1	3	HS-LS2-5	3
HS-LS1-2	2	HS-LS2-6	4
HS-LS1-3	3	HS-LS2-8	3
HS-LS1-4	1	HS-LS3-1	2
HS-LS1-5	1	HS-LS3-2	3
HS-LS1-6	3	HS-LS3-3	2
HS-LS1-7	1	HS-LS4-1	3
HS-LS2-1	2	HS-LS4-2	4
HS-LS2-2	3	HS-LS4-3	3
HS-LS2-3	3	HS-LS4-4	2
HS-LS2-4	2	HS-LS4-5	4

Individual Panelist Ratings

This section of Appendix D contains the data from all individual panelist item rating forms. Panelists provided ratings for each item on the following dimensions in the tables:

- DOK (depth-of-knowledge) Levels: 1 – Recognition, 2 – Skills/Concepts, 3 – Strategic Thinking, and 4 – Extended Thinking.
- Alignment Rating is the quality of match for the primary objective or performance expectation (PE) selected by the panelists. The codes are: 0 – No Match, 1 – Partial Match, 2 – Fully Matched.
- Objective or Performance Expectation (PE) contains the objective or PE identification number panelists selected. Panelists could provide additional objectives or PEs if the content measured by the item was not part of the primary objective or PE selected.

ELA Panelist Data

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	146971A	1	2	2	3.3.R.7		
3	A	146971A	2	3	2	3.3.R.3		
3	A	146971A	3	3	2	3.3.R.3		
3	A	146971A	4	3	2	3.3.R.7		
3	A	146971A	5	2	2	3.3.R.7		
3	A	146972A	1	2	2	3.2.R.2		
3	A	146972A	2	2	2	3.2.R.2		
3	A	146972A	3	2	2	3.2.R.2		
3	A	146972A	4	2	2	3.2.R.2		
3	A	146972A	5	2	1	3.2.R.2		
3	A	146994A	1	2	2	3.3.R.5		
3	A	146994A	2	1	2	3.3.R.5		
3	A	146994A	3	1	2	3.3.R.5		
3	A	146994A	4	2	2	3.3.R.5		
3	A	146994A	5	2	2	3.3.R.5		
3	A	147007A	1	2	2	3.3.R.3		
3	A	147007A	2	2	2	3.4.R.3		
3	A	147007A	3	2	2	3.4.R.3		
3	A	147007A	4	2	2	3.4.R.3		
3	A	147007A	5	2	2	3.4.R.3		
3	A	147008A	1	1	2	3.4.R.5		
3	A	147008A	2	1	2	3.2.W.4		
3	A	147008A	3	2	2	3.4.R.5		
3	A	147008A	4	1	2	3.2.W.4		
3	A	147008A	5	1	2	3.4.R.5		
3	A	147010A	1	1	1	3.3.R.4		
3	A	147010A	2	1	1	3.3.R.4		
3	A	147010A	3	1	1	3.3.R.4		
3	A	147010A	4	1	1	3.3.R.4		
3	A	147010A	5	2	1	3.3.R.4		
3	A	147012A	1	3	2	3.7.R.2		
3	A	147012A	2	3	2	3.7.R.2		
3	A	147012A	3	2	2	3.7.R.2		
3	A	147012A	4	3	2	3.7.R.2		
3	A	147012A	5	2	2	3.7.R.2		
3	A	147351A	1	2	2	3.4.R.2		
3	A	147351A	2	1	2	3.4.R.2		
3	A	147351A	3	1	2	3.2.PWS.2		
3	A	147351A	4	1	2	3.4.R.2		
3	A	147351A	5	2	2	3.4.R.2		
3	A	147358A	1	2	2	3.4.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	147358A	2	1	2	3.4.R.4		
3	A	147358A	3	2	2	3.4.R.4		
3	A	147358A	4	2	2	3.4.R.4		
3	A	147358A	5	1	2	3.4.R.4		
3	A	147359A	1	2	2	3.3.R.3		
3	A	147359A	2	2	2	3.3.R.6		
3	A	147359A	3	2	2	3.2.R.3		
3	A	147359A	4	2	2	3.3.R.3		
3	A	147359A	5	1	1	3.7.R.1		
3	A	147433A	1	2	2	3.2.R.3		
3	A	147433A	2	2	2	3.2.R.3		
3	A	147433A	3	2	2	3.2.R.3		
3	A	147433A	4	2	2	3.2.R.3		
3	A	147433A	5	2	2	3.2.R.3		
3	A	147436A	1	2	2	3.4.R.3		
3	A	147436A	2	2	2	3.4.R.3		
3	A	147436A	3	2	2	3.4.R.3		
3	A	147436A	4	2	2	3.4.R.3		
3	A	147436A	5	1	2	3.4.R.3		
3	A	147456A	1	2	2	3.2.R.2		
3	A	147456A	2	2	2	3.2.R.2		
3	A	147456A	3	2	2	3.2.R.2		
3	A	147456A	4	2	2	3.2.R.2		
3	A	147456A	5	2	1	3.2.R.2		
3	A	148631A	1	2	2	3.4.R.3		
3	A	148631A	2	2	2	3.4.R.3		
3	A	148631A	3	2	2	3.4.R.3		
3	A	148631A	4	2	2	3.4.R.3		
3	A	148631A	5	1	2	3.4.R.3		
3	A	148632A	1	2	2	3.4.R.3		
3	A	148632A	2	2	2	3.4.R.3		
3	A	148632A	3	2	2	3.4.R.3		
3	A	148632A	4	2	2	3.4.R.3		
3	A	148632A	5	1	2	3.4.R.3		
3	A	148636A	1	2	2	3.3.R.3		
3	A	148636A	2	2	2	3.3.R.3		
3	A	148636A	3	1	2	3.7.R.1		
3	A	148636A	4	1	2	3.3.R.7		
3	A	148636A	5	1	2	3.7.R.1		
3	A	155253A	1	2	2	3.3.R.7		
3	A	155253A	2	2	2	3.3.R.7		
3	A	155253A	3	2	2	3.3.R.7		
3	A	155253A	4	2	2	3.3.R.7		
3	A	155253A	5	2	2	3.3.R.7		
3	A	155254A	1	2	2	3.3.R.7		
3	A	155254A	2	2	2	3.3.R.7		
3	A	155254A	3	2	2	3.3.R.7		
3	A	155254A	4	2	2	3.3.R.7		
3	A	155254A	5	2	2	3.3.R.7		
3	A	155255A	1	2	2	3.2.R.3		
3	A	155255A	2	2	2	3.2.R.3		
3	A	155255A	3	2	2	3.2.R.3		
3	A	155255A	4	2	2	3.2.R.3		
3	A	155255A	5	2	2	3.2.R.3		
3	A	155274A	1	2	2	3.2.R.1		
3	A	155274A	2	2	2	3.2.R.1		
3	A	155274A	3	2	2	3.2.R.1		
3	A	155274A	4	1	2	3.2.R.1		
3	A	155274A	5	2	2	3.2.R.1		
3	A	155277A	1	2	2	3.4.R.3		
3	A	155277A	2	2	2	3.4.R.3		
3	A	155277A	3	2	2	3.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	155277A	4	2	2	3.4.R.3		
3	A	155277A	5	1	2	3.2.PWS.3		
3	A	155278A	1	1	2	3.4.R.5		
3	A	155278A	2	1	2	3.4.R.5		
3	A	155278A	3	2	2	3.4.R.5		
3	A	155278A	4	1	2	3.4.R.5		
3	A	155278A	5	2	2	3.4.R.5		
3	A	155279A	1	1	2	3.6.R.2		
3	A	155279A	2	1	2	3.6.R.2		
3	A	155279A	3	1	2	3.6.R.2		
3	A	155279A	4	1	2	3.6.R.2		
3	A	155279A	5	1	2	3.6.R.2		
3	A	155282A	1	1	2	3.6.R.2		
3	A	155282A	2	1	2	3.6.R.2		
3	A	155282A	3	1	2	3.6.R.2		
3	A	155282A	4	1	2	3.6.R.2		
3	A	155282A	5	1	2	3.6.R.2		
3	A	155283A	1	2	2	3.2.R.1		
3	A	155283A	2	2	2	3.2.R.1		
3	A	155283A	3	2	1	3.2.R.1	3.2.R.3	
3	A	155283A	4	1	2	3.6.R.2		
3	A	155283A	5	2	2	3.2.R.1		
3	A	155295A	1	2	2	3.2.R.3		
3	A	155295A	2	2	2	3.2.R.3		
3	A	155295A	3	2	2	3.2.R.3		
3	A	155295A	4	2	2	3.2.R.3		
3	A	155295A	5	2	2	3.2.R.3		
3	A	156120A	1	2	2	3.3.R.5		
3	A	156120A	2	2	2	3.3.R.5		
3	A	156120A	3	1	2	3.3.R.5		
3	A	156120A	4	2	2	3.3.R.5		
3	A	156120A	5	2	2	3.3.R.5		
3	A	156121A	1	2	2	3.2.R.1		
3	A	156121A	2	2	2	3.3.R.7		
3	A	156121A	3	2	2	3.2.R.1		
3	A	156121A	4	1	2	3.2.R.1		
3	A	156121A	5	2	2	3.2.R.1		
3	A	156123A	1	2	2	3.2.R.3		
3	A	156123A	2	2	2	3.2.R.3		
3	A	156123A	3	2	2	3.2.R.3		
3	A	156123A	4	2	2	3.2.R.1	3.2.R.3	
3	A	156123A	5	3	2	3.2.R.3		
3	A	156124A	1	1	2	3.4.R.2		
3	A	156124A	2	1	2	3.2.PWS.2		
3	A	156124A	3	1	2	3.2.PWS.2		
3	A	156124A	4	1	2	3.4.R.2		
3	A	156124A	5	1	2	3.4.R.2		
3	A	156125A	1	1	1	3.4.R.5		
3	A	156125A	2	2	2	3.4.R.5		
3	A	156125A	3	2	1	3.6.R.3	3.4.R.4	
3	A	156125A	4	1	1	3.4.R.5	3.4.R.4	
3	A	156125A	5	1	2	3.4.R.5		
3	A	156126A	1	2	2	3.6.R.3		
3	A	156126A	2	1	2	3.6.R.2		
3	A	156126A	3	1	2	3.6.R.2		
3	A	156126A	4	1	2	3.6.R.2		
3	A	156126A	5	1	2	3.6.R.2		
3	A	156336A	1	2	2	3.4.R.4		
3	A	156336A	2	1	2	3.4.R.4		
3	A	156336A	3	1	2	3.4.R.4		
3	A	156336A	4	2	2	3.4.R.4		
3	A	156336A	5	2	2	3.4.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	184195A	1	2	2	3.4.R.5		
3	A	184195A	2	1	2	3.4.R.5		
3	A	184195A	3	1	2	3.4.R.5		
3	A	184195A	4	1	2	3.4.R.5		
3	A	184195A	5	2	2	3.4.R.5		
3	A	184197A	1	2	2	3.6.R.2		
3	A	184197A	2	2	2	3.6.R.2		
3	A	184197A	3	2	1	3.2.R.2	3.6.R.2	
3	A	184197A	4	2	2	3.6.R.2		
3	A	184197A	5	2	2	3.2.R.2		
3	A	184198A	1	2	2	3.2.R.3		
3	A	184198A	2	2	2	3.2.R.3		
3	A	184198A	3	2	2	3.2.R.3		
3	A	184198A	4	2	2	3.2.R.3		
3	A	184198A	5	2	2	3.2.R.3		
3	A	481996	1	1	2	3.5.W.3		
3	A	481996	2	1	2	3.5.W.3		
3	A	481996	3	1	2	3.5.W.3		
3	A	481996	4	1	2	3.5.W.3		
3	A	481996	5	2	2	3.5.W.3		
3	A	482165	1	1	2	3.5.W.3		
3	A	482165	2	1	2	3.5.W.3		
3	A	482165	3	1	2	3.5.W.3		
3	A	482165	4	1	2	3.5.W.3		
3	A	482165	5	2	2	3.5.W.3		
3	A	482183	1	1	2	3.5.W.3		
3	A	482183	2	1	2	3.5.W.3		
3	A	482183	3	1	2	3.5.W.3		
3	A	482183	4	1	2	3.5.W.3		
3	A	482183	5	2	2	3.5.W.3		
3	A	482314	1	1	2	3.5.W.4		
3	A	482314	2	1	2	3.5.W.4		
3	A	482314	3	1	2	3.5.W.4		
3	A	482314	4	2	2	3.5.W.4		
3	A	482314	5	1	2	3.5.W.4		
3	A	482322	1	1	2	3.5.R.1		
3	A	482322	2	1	2	3.5.R.1		
3	A	482322	3	1	2	3.5.R.1		
3	A	482322	4	1	2	3.5.R.1		
3	A	482322	5	1	2	3.5.R.1		
3	A	482911	1	1	2	3.5.W.1		
3	A	482911	2	1	2	3.5.W.1		
3	A	482911	3	1	2	3.5.W.1		
3	A	482911	4	1	2	3.5.W.1		
3	A	482911	5	1	2	3.5.W.1		
3	A	484462	1	1	2	3.3.R.3		
3	A	484462	2	2	2	3.3.R.7		
3	A	484462	3	1	2	3.7.R.1		
3	A	484462	4	1	2	3.3.R.7		
3	A	484462	5	2	2	3.7.R.1		
3	A	484464	1	2	2	3.3.R.7		
3	A	484464	2	2	2	3.3.R.7		
3	A	484464	3	2	2	3.2.R.2		
3	A	484464	4	2	2	3.2.R.2		
3	A	484464	5	2	2	3.2.R.2		
3	A	484466	1	3	2	3.3.R.1		
3	A	484466	2	3	2	3.3.R.1		
3	A	484466	3	2	2	3.3.R.1		
3	A	484466	4	3	2	3.3.R.1		
3	A	484466	5	2	2	3.3.R.1		
3	A	484468	1	2	2	3.3.R.2		
3	A	484468	2	2	2	3.3.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	484468	3	1	2	3.3.R.2		
3	A	484468	4	2	2	3.3.R.2		
3	A	484468	5	2	2	3.3.R.2		
3	A	484565	1	2	2	3.2.R.1		
3	A	484565	2	2	2	3.2.R.1		
3	A	484565	3	2	2	3.2.R.1		
3	A	484565	4	2	2	3.2.R.1		
3	A	484565	5	2	2	3.2.R.1		
3	A	484567	1	2	2	3.2.R.3		
3	A	484567	2	2	2	3.2.R.3		
3	A	484567	3	2	2	3.2.R.3		
3	A	484567	4	2	2	3.2.R.3		
3	A	484567	5	2	2	3.2.R.3		
3	A	484569	1	2	2	3.2.R.1		
3	A	484569	2	2	2	3.2.R.1		
3	A	484569	3	2	1	3.2.R.1		
3	A	484569	4	2	2	3.2.R.1		
3	A	484569	5	3	2	3.2.R.1		
3	A	484571	1	2	2	3.2.R.2		
3	A	484571	2	1	2	3.2.R.2		
3	A	484571	3	2	2	3.2.R.2		
3	A	484571	4	2	2	3.2.R.2		
3	A	484571	5	2	1	3.2.R.2		
3	A	484575	1	2	2	3.2.R.3		
3	A	484575	2	2	2	3.2.R.3		
3	A	484575	3	2	2	3.2.R.3		
3	A	484575	4	2	2	3.2.R.3		
3	A	484575	5	2	2	3.2.R.3		
3	A	484577	1	3	2	3.3.R.1		
3	A	484577	2	2	2	3.3.R.1		
3	A	484577	3	2	2	3.3.R.1		
3	A	484577	4	3	2	3.3.R.1		
3	A	484577	5	2	2	3.3.R.1		
3	A	484579	1	2	2	3.3.R.2		
3	A	484579	2	2	2	3.3.R.2		
3	A	484579	3	1	2	3.3.R.2		
3	A	484579	4	2	2	3.3.R.2		
3	A	484579	5	2	2	3.3.R.2		
3	A	484581	1	3	2	3.6.R.1		
3	A	484581	2	3	2	3.6.R.4		
3	A	484581	3	3	1	3.6.R.1	3.3.R.7	
3	A	484581	4	3	2	3.3.R.7		
3	A	484581	5	3	2	3.3.R.7		
3	A	484584	1	2	2	3.2.R.1		
3	A	484584	2	2	2	3.2.R.1		
3	A	484584	3	2	2	3.2.R.1		
3	A	484584	4	2	2	3.2.R.1		
3	A	484584	5	2	2	3.2.R.1		
3	A	484590	1	3	2	3.6.R.1		
3	A	484590	2	3	2	3.3.R.7		
3	A	484590	3	3	2	3.6.R.1		
3	A	484590	4	3	2	3.3.R.7		
3	A	484590	5	3	2	3.6.R.1		
3	B	146833A	1	2	2	3.4.R.5		
3	B	146833A	2	2	2	3.4.R.5		
3	B	146833A	3	2	1	3.4.R.3	3.4.R.5	
3	B	146833A	4	2	2	3.4.R.5		
3	B	146833A	5	2	2	3.4.R.3		
3	B	147411A	1	2	2	3.3.R.4		
3	B	147411A	2	1	2	3.3.R.4		
3	B	147411A	3	1	1	3.3.R.4		
3	B	147411A	4	1	2	3.3.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	B	147411A	5	2	2	3.3.R.4		
3	B	147416A	1	2	2	3.6.R.3		
3	B	147416A	2	2	2	3.6.R.3		
3	B	147416A	3	1	2	3.6.R.3		
3	B	147416A	4	2	2	3.6.R.3		
3	B	147416A	5	2	2	3.6.R.3		
3	B	147861A	1	2	2	3.3.R.3		
3	B	147861A	2	2	2	3.3.R.7		
3	B	147861A	3	2	2	3.3.R.7		
3	B	147861A	4	2	2	3.3.R.7		
3	B	147861A	5	1	2	3.7.R.1		
3	B	147864A	1	2	2	3.4.R.3		
3	B	147864A	2	2	2	3.4.R.3		
3	B	147864A	3	2	2	3.4.R.3		
3	B	147864A	4	2	2	3.4.R.3		
3	B	147864A	5	1	2	3.4.R.3		
3	B	147866A	1	2	2	3.3.R.4		
3	B	147866A	2	1	2	3.3.R.4		
3	B	147866A	3	1	1	3.3.R.4		
3	B	147866A	4	1	2	3.3.R.4		
3	B	147866A	5	2	1	3.3.R.4		
3	B	147870A	1	2	2	3.4.R.2		
3	B	147870A	2	2	1	3.4.R.2	3.4.R.3	
3	B	147870A	3	1	2	3.2.PWS.2		
3	B	147870A	4	2	2	3.4.R.2		
3	B	147870A	5	1	2	3.3.R.3		
3	B	155272A	1	2	2	3.6.R.2		
3	B	155272A	2	2	2	3.6.R.2		
3	B	155272A	3	1	2	3.6.R.2		
3	B	155272A	4	2	2	3.6.R.2		
3	B	155272A	5	2	2	3.6.R.2		
3	B	155348A	1	2	2	3.4.R.3		
3	B	155348A	2	2	2	3.4.R.3		
3	B	155348A	3	2	2	3.4.R.2		
3	B	155348A	4	2	2	3.4.R.3		
3	B	155348A	5	1	2	3.4.R.3		
3	B	155349A	1	2	2	3.4.R.3		
3	B	155349A	2	2	2	3.4.R.3		
3	B	155349A	3	2	2	3.4.R.3		
3	B	155349A	4	2	2	3.4.R.4		
3	B	155349A	5	1	2	3.4.R.3		
3	B	155350A	1	2	2	3.3.R.3		
3	B	155350A	2	2	2	3.3.R.7		
3	B	155350A	3	2	2	3.3.R.7		
3	B	155350A	4	2	2	3.3.R.7		
3	B	155350A	5	2	2	3.7.R.1		
3	B	155352A	1	2	2	3.2.R.1		
3	B	155352A	2	2	2	3.2.R.1		
3	B	155352A	3	2	1	3.2.R.1		
3	B	155352A	4	2	2	3.2.R.1		
3	B	155352A	5	2	2	3.2.R.1		
3	B	155353A	1	2	2	3.2.R.3		
3	B	155353A	2	2	2	3.2.R.3		
3	B	155353A	3	2	2	3.2.R.3		
3	B	155353A	4	3	2	3.2.R.3		
3	B	155353A	5	2	2	3.2.R.3		
3	B	155427A	1	3	2	3.2.R.1		
3	B	155427A	2	3	2	3.2.R.1		
3	B	155427A	3	2	2	3.2.R.1		
3	B	155427A	4	3	2	3.2.R.1		
3	B	155427A	5	2	2	3.2.R.1		
3	B	155965A	1	2	2	3.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	B	155965A	2	2	2	3.4.R.3		
3	B	155965A	3	1	2	3.4.R.3		
3	B	155965A	4	2	2	3.4.R.3		
3	B	155965A	5	1	2	3.4.R.3		
3	B	155966A	1	1	2	3.4.R.5		
3	B	155966A	2	2	2	3.4.R.5		
3	B	155966A	3	2	1	3.4.R.5	3.4.R.4	
3	B	155966A	4	1	1	3.4.R.5	3.4.R.4	
3	B	155966A	5	1	2	3.4.R.5		
3	B	155968A	1	2	2	3.3.R.3		
3	B	155968A	2	2	2	3.3.R.7		
3	B	155968A	3	2	2	3.7.R.1		
3	B	155968A	4	2	2	3.3.R.7		
3	B	155968A	5	1	2	3.7.R.1		
3	B	184852A	1	2	2	3.4.R.3		
3	B	184852A	2	2	2	3.4.R.3		
3	B	184852A	3	2	2	3.4.R.3		
3	B	184852A	4	2	2	3.4.R.3		
3	B	184852A	5	1	2	3.4.R.3		
3	B	482190	1	1	2	3.5.W.4		
3	B	482190	2	1	2	3.5.W.4		
3	B	482190	3	1	2	3.5.W.4		
3	B	482190	4	1	2	3.5.W.4		
3	B	482190	5	1	2	3.5.W.4		
3	B	482316	1	1	2	3.5.W.4		
3	B	482316	2	1	2	3.5.W.4		
3	B	482316	3	1	2	3.5.W.4		
3	B	482316	4	1	2	3.5.W.4		
3	B	482316	5	1	2	3.5.W.4		
3	B	482320	1	2	2	3.5.W.3		
3	B	482320	2	2	2	3.5.W.4		
3	B	482320	3	1	2	3.5.W.4		
3	B	482320	4	2	2	3.5.W.4		
3	B	482320	5	1	2	3.5.W.4		
3	B	482324	1	1	2	3.5.W.3		
3	B	482324	2	1	2	3.5.W.2		
3	B	482324	3	1	2	3.5.W.3		
3	B	482324	4	1	2	3.5.W.3		
3	B	482324	5	1	2	3.5.W.3		
3	B	482851	1	1	2	3.5.R.3		
3	B	482851	2	1	2	3.5.R.3		
3	B	482851	3	1	2	3.5.R.3		
3	B	482851	4	1	2	3.5.R.3		
3	B	482851	5	1	2	3.5.R.3		
3	B	482867	1	1	2	3.5.R.4		
3	B	482867	2	1	2	3.5.R.4		
3	B	482867	3	1	2	3.5.R.4		
3	B	482867	4	1	2	3.5.R.4		
3	B	482867	5	1	2	3.5.R.4		
3	B	484486	1	2	2	3.2.R.3		
3	B	484486	2	2	2	3.2.R.3		
3	B	484486	3	2	2	3.2.R.3		
3	B	484486	4	2	2	3.2.R.3		
3	B	484486	5	2	2	3.2.R.3		
3	B	484488	1	3	2	3.3.R.1		
3	B	484488	2	3	2	3.3.R.1		
3	B	484488	3	2	2	3.3.R.1		
3	B	484488	4	3	2	3.3.R.1		
3	B	484488	5	2	2	3.3.R.1		
3	B	484490	1	2	2	3.3.R.5		
3	B	484490	2	2	2	3.3.R.5		
3	B	484490	3	2	2	3.3.R.5		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	B	484490	4	2	2	3.3.R.5		
3	B	484490	5	2	2	3.3.R.5		
3	B	484492	1	2	2	3.3.R.6		
3	B	484492	2	2	2	3.3.R.6		
3	B	484492	3	3	2	3.3.R.6		
3	B	484492	4	2	2	3.3.R.6		
3	B	484492	5	2	2	3.3.R.6		
3	B	484494	1	3	2	3.6.R.1		
3	B	484494	2	2	2	3.6.R.1		
3	B	484494	3	3	2	3.6.R.1		
3	B	484494	4	2	2	3.6.W.1		
3	B	484494	5	3	2	3.6.R.1		
3	B	484547	1	2	2	3.2.R.1		
3	B	484547	2	2	2	3.2.R.1		
3	B	484547	3	2	2	3.2.R.1		
3	B	484547	4	2	2	3.2.R.1		
3	B	484547	5	2	2	3.2.R.1		
3	B	484549	1	2	2	3.2.R.2		
3	B	484549	2	2	2	3.2.R.2		
3	B	484549	3	2	2	3.2.R.2		
3	B	484549	4	2	2	3.2.R.2		
3	B	484549	5	2	2	3.2.R.2		
3	B	484551	1	2	2	3.2.R.3		
3	B	484551	2	2	2	3.2.R.3		
3	B	484551	3	2	2	3.2.R.3		
3	B	484551	4	2	2	3.2.R.3		
3	B	484551	5	2	2	3.2.R.3		
3	B	484553	1	3	2	3.3.R.1		
3	B	484553	2	2	2	3.3.R.1		
3	B	484553	3	2	2	3.3.R.1		
3	B	484553	4	3	2	3.3.R.1		
3	B	484553	5	2	2	3.3.R.1		
3	B	484559	1	2	2	3.2.R.3		
3	B	484559	2	2	2	3.2.R.3		
3	B	484559	3	2	2	3.2.R.3		
3	B	484559	4	2	2	3.2.R.3		
3	B	484559	5	2	2	3.2.R.3		
3	B	484563	1	2	2	3.6.R.1		
3	B	484563	2	3	2	3.6.R.1		
3	B	484563	3	3	1	3.6.R.1		
3	B	484563	4	3	2	3.6.R.1		
3	B	484563	5	3	2	3.6.R.1		
3	B	484592	1	2	2	3.2.R.1		
3	B	484592	2	2	2	3.2.R.1		
3	B	484592	3	2	2	3.2.R.1		
3	B	484592	4	1	2	3.2.R.1		
3	B	484592	5	2	2	3.2.R.1		
3	B	484594	1	2	2	3.2.R.2		
3	B	484594	2	2	2	3.2.R.2		
3	B	484594	3	2	2	3.2.R.2		
3	B	484594	4	3	2	3.2.R.2		
3	B	484594	5	2	2	3.2.R.2		
3	B	484596	1	2	2	3.2.R.3		
3	B	484596	2	2	2	3.2.R.3		
3	B	484596	3	2	1	3.2.R.3	3.6.R.2	
3	B	484596	4	2	2	3.2.R.3		
3	B	484596	5	2	2	3.2.R.3		
3	C	147016A	1	2	2	3.3.R.7		
3	C	147016A	2	2	2	3.3.R.7		
3	C	147016A	3	2	2	3.3.R.7		
3	C	147016A	4	2	2	3.3.R.7		
3	C	147016A	5	2	2	3.3.R.7		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	C	147017A	1	2	2	3.3.R.3		
3	C	147017A	2	3	2	3.3.R.3		
3	C	147017A	3	2	2	3.3.R.3		
3	C	147017A	4	2	2	3.3.R.3		
3	C	147017A	5	2	2	3.3.R.3		
3	C	147018A	1	2	2	3.3.R.3		
3	C	147018A	2	2	2	3.3.R.3		
3	C	147018A	3	2	2	3.3.R.7		
3	C	147018A	4	2	2	3.3.R.3	3.3.R.7	
3	C	147018A	5	2	2	3.3.R.7		
3	C	147341A	1	2	2	3.4.R.4		
3	C	147341A	2	1	2	3.4.R.4		
3	C	147341A	3	1	2	3.7.R.1		
3	C	147341A	4	2	1	3.4.R.3	3.4.R.4	
3	C	147341A	5	1	2	3.4.R.4		
3	C	147348A	1	2	2	3.2.R.1		
3	C	147348A	2	2	2	3.2.R.1		
3	C	147348A	3	1	2	3.4.R.4		
3	C	147348A	4	2	2	3.2.R.1		
3	C	147348A	5	2	2	3.2.R.1		
3	C	147768A	1	2	2	3.4.R.3		
3	C	147768A	2	2	2	3.4.R.3		
3	C	147768A	3	2	2	3.4.R.2		
3	C	147768A	4	2	2	3.4.R.3		
3	C	147768A	5	1	2	3.4.R.3		
3	C	147808A	1	1	2	3.4.R.5		
3	C	147808A	2	1	2	3.4.R.5		
3	C	147808A	3	1	2	3.4.R.5		
3	C	147808A	4	1	1	3.4.R.5	3.4.R.4	
3	C	147808A	5	2	2	3.4.R.5		
3	C	147845A	1	2	2	3.3.R.5		
3	C	147845A	2	2	2	3.3.R.5		
3	C	147845A	3	1	2	3.3.R.5		
3	C	147845A	4	2	2	3.3.R.5		
3	C	147845A	5	2	2	3.3.R.5		
3	C	156102A	1	2	2	3.6.R.2		
3	C	156102A	2	2	2	3.6.R.3		
3	C	156102A	3	1	2	3.6.R.3		
3	C	156102A	4	2	2	3.6.R.3		
3	C	156102A	5	1	2	3.6.R.3		
3	C	156355A	1	2	2	3.4.R.3		
3	C	156355A	2	2	2	3.4.R.3		
3	C	156355A	3	2	2	3.4.R.3		
3	C	156355A	4	2	2	3.4.R.3		
3	C	156355A	5	1	2	3.4.R.3		
3	C	156356A	1	2	2	3.4.R.4		
3	C	156356A	2	1	2	3.4.R.4		
3	C	156356A	3	2	2	3.4.R.4		
3	C	156356A	4	2	1	3.4.R.3	3.4.R.4	
3	C	156356A	5	1	2	3.4.R.4		
3	C	156357A	1	1	2	3.4.R.5		
3	C	156357A	2	1	2	3.4.R.5		
3	C	156357A	3	1	2	3.4.R.5		
3	C	156357A	4	1	2	3.4.R.5		
3	C	156357A	5	1	2	3.4.R.5		
3	C	156360A	1	2	2	3.3.R.3		
3	C	156360A	2	2	2	3.3.R.3		
3	C	156360A	3	2	2	3.3.R.3		
3	C	156360A	4	2	2	3.3.R.3		
3	C	156360A	5	2	2	3.3.R.3		
3	C	156362A	1	2	2	3.2.R.3		
3	C	156362A	2	2	2	3.2.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	C	156362A	3	2	2	3.2.R.3		
3	C	156362A	4	2	2	3.2.R.3		
3	C	156362A	5	2	2	3.2.R.3		
3	C	184210A	1	2	2	3.6.R.3		
3	C	184210A	2	2	2	3.6.R.3		
3	C	184210A	3	2	2	3.4.R.3		
3	C	184210A	4	1	2	3.6.R.3		
3	C	184210A	5	2	2	3.6.R.3		
3	C	184212A	1	2	2	3.4.R.3		
3	C	184212A	2	2	2	3.4.R.3		
3	C	184212A	3	2	2	3.4.R.4		
3	C	184212A	4	2	2	3.4.R.3		
3	C	184212A	5	1	2	3.4.R.3		
3	C	184214A	1	2	2	3.4.R.4		
3	C	184214A	2	1	2	3.4.R.4		
3	C	184214A	3	2	2	3.2.R.3		
3	C	184214A	4	2	1	3.4.R.3	3.4.R.4	
3	C	184214A	5	1	2	3.4.R.4		
3	C	184225A	1	2	2	3.2.R.3		
3	C	184225A	2	2	2	3.2.R.3		
3	C	184225A	3	1	2	3.6.R.3		
3	C	184225A	4	2	2	3.2.R.3		
3	C	184225A	5	2	2	3.2.R.3		
3	C	482170	1	1	2	3.5.W.3		
3	C	482170	2	1	2	3.5.W.3		
3	C	482170	3	2	2	3.4.R.3		
3	C	482170	4	1	2	3.5.W.3		
3	C	482170	5	1	2	3.5.W.3		
3	C	482326	1	1	2	3.5.R.2		
3	C	482326	2	1	2	3.5.R.2		
3	C	482326	3	1	2	3.5.R.2		
3	C	482326	4	1	2	3.5.R.2		
3	C	482326	5	1	2	3.5.R.2		
3	C	482328	1	1	2	3.5.R.5		
3	C	482328	2	1	2	3.5.R.2		
3	C	482328	3	1	2	3.5.W.3		
3	C	482328	4	1	2	3.5.R.2		
3	C	482328	5	1	2	3.5.R.2		
3	C	482502	1	1	2	3.5.R.3		
3	C	482502	2	1	2	3.5.R.3		
3	C	482502	3	1	2	3.5.R.3		
3	C	482502	4	1	2	3.5.R.3		
3	C	482502	5	1	2	3.5.R.3		
3	C	482860	1	1	2	3.5.R.4		
3	C	482860	2	1	2	3.5.R.4		
3	C	482860	3	1	2	3.5.R.4		
3	C	482860	4	1	2	3.5.R.4		
3	C	482860	5	1	2	3.5.R.4		
3	C	482898	1	1	2	3.5.R.5		
3	C	482898	2	1	2	3.5.R.5		
3	C	482898	3	1	2	3.5.R.5		
3	C	482898	4	1	2	3.5.R.5		
3	C	482898	5	1	2	3.5.R.5		
3	C	484472	1	2	2	3.3.R.2		
3	C	484472	2	2	2	3.3.R.2		
3	C	484472	3	1	2	3.3.R.2		
3	C	484472	4	2	2	3.3.R.2		
3	C	484472	5	2	2	3.3.R.2		
3	C	484474	1	2	2	3.3.R.3		
3	C	484474	2	2	2	3.2.R.1		
3	C	484474	3	2	2	3.3.R.3		
3	C	484474	4	2	2	3.3.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	C	484474	5	2	2	3.3.R.3		
3	C	484476	1	2	2	3.3.R.6		
3	C	484476	2	2	2	3.3.R.6		
3	C	484476	3	2	2	3.2.R.2		
3	C	484476	4	2	1	3.3.R.6	3.2.R.2	
3	C	484476	5	1	2	3.3.R.3		
3	C	484478	1	2	2	3.2.R.3		
3	C	484478	2	2	2	3.2.R.3		
3	C	484478	3	2	2	3.2.R.2		
3	C	484478	4	2	2	3.2.R.3		
3	C	484478	5	2	2	3.2.R.3		
3	C	484480	1	2	2	3.2.R.1		
3	C	484480	2	3	2	3.3.R.1		
3	C	484480	3	2	2	3.3.R.1		
3	C	484480	4	3	2	3.3.R.1		
3	C	484480	5	2	2	3.3.R.1		
3	C	484541	1	2	2	3.2.R.2		
3	C	484541	2	2	2	3.3.R.6		
3	C	484541	3	2	2	3.2.R.3		
3	C	484541	4	2	2	3.2.R.2		
3	C	484541	5	2	2	3.2.R.2		
3	C	484543	1	2	2	3.2.R.3		
3	C	484543	2	2	2	3.2.R.3		
3	C	484543	3	3	2	3.6.R.1		
3	C	484543	4	2	2	3.2.R.3		
3	C	484543	5	2	2	3.2.R.3		
3	C	484545	1	2	2	3.6.R.1		
3	C	484545	2	2	2	3.6.R.1		
3	C	484545	3	1	2	3.5.R.5		
3	C	484545	4	2	2	3.6.W.1		
3	C	484545	5	3	2	3.6.R.1		
3	C	484598	1	2	2	3.2.R.2		
3	C	484598	2	2	2	3.3.R.2		
3	C	484598	3	2	2	3.2.R.2		
3	C	484598	4	3	2	3.2.R.2		
3	C	484598	5	2	2	3.2.R.2		
3	C	484600	1	2	2	3.2.R.3		
3	C	484600	2	2	2	3.2.R.3		
3	C	484600	3	2	2	3.2.R.3		
3	C	484600	4	2	2	3.2.R.3		
3	C	484600	5	2	2	3.2.R.3		
3	C	484602	1	2	2	3.2.R.1		
3	C	484602	2	2	2	3.2.R.1		
3	C	484602	3	2	2	3.2.R.1		
3	C	484602	4	2	2	3.2.R.1		
3	C	484602	5	2	2	3.2.R.1		
3	C	484607	1	2	2	3.2.R.2		
3	C	484607	2	2	2	3.2.R.2		
3	C	484607	3	1	2	3.2.R.1		
3	C	484607	4	2	2	3.2.R.2		
3	C	484607	5	1	1	3.2.R.2		
3	C	484615	1	2	2	3.3.R.1		
3	C	484615	2	3	2	3.3.R.1		
3	C	484615	3	2	2	3.3.R.1		
3	C	484615	4	3	2	3.3.R.1		
3	C	484615	5	2	2	3.3.R.1		
3	C	484617	1	2	2	3.6.R.1		
3	C	484617	2	2	2	3.6.R.1		
3	C	484617	3	2	2	3.2.R.1		
3	C	484617	4	3	2	3.6.R.1		
3	C	484617	5	3	2	3.6.R.1		
4	A	146887A	1	2	2	4.2.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	146887A	2	2	2	4.2.R.4		
4	A	146887A	3	2	2	4.2.R.4		
4	A	146887A	4	2	2	4.2.R.4		
4	A	146887A	5	2	2	4.2.R.4		
4	A	148685A	1	2	2	4.4.R.3		
4	A	148685A	2	2	2	4.4.R.3		
4	A	148685A	3	2	2	4.4.R.3		
4	A	148685A	4	2	2	4.4.R.3		
4	A	148685A	5	2	2	4.4.R.3		
4	A	148686A	1	2	1	4.3.R.6	4.2.R.3	
4	A	148686A	2	2	2	4.3.R.6	4.2.R.3	
4	A	148686A	3	2	2	4.2.R.3		
4	A	148686A	4	2	2	4.3.R.6	4.2.R.3	
4	A	148686A	5	2	2	4.2.R.3		
4	A	148719A	1	1	2	4.4.R.5		
4	A	148719A	2	1	2	4.4.R.5		
4	A	148719A	3	1	2	4.4.R.5		
4	A	148719A	4	1	2	4.4.R.5		
4	A	148719A	5	2	2	4.4.R.5		
4	A	148754A	1	2	2	4.3.R.7		
4	A	148754A	2	2	2	4.3.R.7		
4	A	148754A	3	2	2	4.3.R.7		
4	A	148754A	4	2	2	4.3.R.3		
4	A	148754A	5	2	2	4.3.R.7		
4	A	148938A	1	2	2	4.4.R.2		
4	A	148938A	2	1	2	4.4.R.2		
4	A	148938A	3	1	2	4.4.R.2		
4	A	148938A	4	2	1	4.4.R.3	4.4.R.2	
4	A	148938A	5	2	2	4.4.R.2		
4	A	149114A	1	2	2	4.4.R.3		
4	A	149114A	2	2	2	4.4.R.3		
4	A	149114A	3	2	2	4.4.R.3		
4	A	149114A	4	2	2	4.4.R.3		
4	A	149114A	5	1	2	4.4.R.3		
4	A	149115A	1	1	2	4.3.R.4		
4	A	149115A	2	1	2	4.3.R.4		
4	A	149115A	3	1	2	4.3.R.4		
4	A	149115A	4	1	2	4.3.R.4		
4	A	149115A	5	2	2	4.3.R.4		
4	A	149116A	1	2	2	4.3.R.3		
4	A	149116A	2	2	2	4.3.R.7		
4	A	149116A	3	2	2	4.3.R.7		
4	A	149116A	4	2	2	4.3.R.7		
4	A	149116A	5	2	2	4.3.R.3		
4	A	149136A	1	2	2	4.6.R.3		
4	A	149136A	2	2	2	4.6.R.3		
4	A	149136A	3	2	2	4.6.R.3		
4	A	149136A	4	2	2	4.6.R.3		
4	A	149136A	5	2	2	4.6.R.3		
4	A	155473A	1	2	2	4.3.R.7		
4	A	155473A	2	2	2	4.3.R.7		
4	A	155473A	3	2	2	4.3.R.7		
4	A	155473A	4	2	2	4.3.R.7		
4	A	155473A	5	2	2	4.3.R.7		
4	A	155490A	1	2	2	4.6.R.2		
4	A	155490A	2	2	2	4.6.R.2		
4	A	155490A	3	2	2	4.6.R.2		
4	A	155490A	4	2	2	4.6.R.2		
4	A	155490A	5	2	2	4.6.R.2		
4	A	155569A	1	2	2	4.4.R.3		
4	A	155569A	2	2	2	4.4.R.3		
4	A	155569A	3	2	2	4.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	155569A	4	2	2	4.4.R.3		
4	A	155569A	5	1	2	4.4.R.3		
4	A	155571A	1	1	2	4.4.R.2		
4	A	155571A	2	1	2	4.4.R.2		
4	A	155571A	3	1	2	4.4.R.2		
4	A	155571A	4	2	2	4.4.R.2	4.4.R.3	
4	A	155571A	5	1	2	4.4.R.2		
4	A	155572A	1	2	2	4.4.R.4		
4	A	155572A	2	1	2	4.4.R.4		
4	A	155572A	3	1	2	4.4.R.4		
4	A	155572A	4	2	2	4.4.R.4	4.4.R.3	
4	A	155572A	5	1	2	4.4.R.4		
4	A	155580A	1	2	2	4.2.R.2		
4	A	155580A	2	2	2	4.2.R.2		
4	A	155580A	3	2	2	4.2.R.2		
4	A	155580A	4	2	2	4.2.R.2		
4	A	155580A	5	2	2	4.2.R.2		
4	A	158587A	1	2	2	4.4.R.3		
4	A	158587A	2	2	2	4.4.R.3		
4	A	158587A	3	2	2	4.4.R.3		
4	A	158587A	4	2	2	4.4.R.3		
4	A	158587A	5	1	2	4.4.R.3		
4	A	158589A	1	2	2	4.2.R.2		
4	A	158589A	2	2	2	4.2.R.2		
4	A	158589A	3	2	2	4.2.R.2		
4	A	158589A	4	2	2	4.2.R.2		
4	A	158589A	5	1	2	4.2.R.2		
4	A	158602A	1	2	2	4.4.R.3		
4	A	158602A	2	2	2	4.4.R.3		
4	A	158602A	3	2	2	4.4.R.3		
4	A	158602A	4	2	1	4.4.R.3	4.4.R.5	
4	A	158602A	5	1	2	4.4.R.3		
4	A	158603A	1	2	2	4.4.R.4		
4	A	158603A	2	2	2	4.4.R.4		
4	A	158603A	3	1	2	4.4.R.4		
4	A	158603A	4	2	2	4.4.R.4		
4	A	158603A	5	1	2	4.4.R.4		
4	A	158604A	1	2	2	4.3.R.3		
4	A	158604A	2	2	2	4.3.R.3		
4	A	158604A	3	2	2	4.3.R.3		
4	A	158604A	4	2	2	4.3.R.3		
4	A	158604A	5	1	2	4.3.R.3		
4	A	158611A	1	2	2	4.2.R.4		
4	A	158611A	2	2	2	4.2.R.4		
4	A	158611A	3	2	2	4.2.R.4		
4	A	158611A	4	2	2	4.2.R.4		
4	A	158611A	5	2	2	4.2.R.1		
4	A	158691A	1	2	2	4.2.R.2		
4	A	158691A	2	2	2	4.2.R.2		
4	A	158691A	3	2	2	4.2.R.2		
4	A	158691A	4	2	2	4.2.R.2		
4	A	158691A	5	2	2	4.2.R.2		
4	A	158692A	1	1	2	4.3.R.5		
4	A	158692A	2	1	2	4.3.R.5		
4	A	158692A	3	1	2	4.3.R.5		
4	A	158692A	4	2	2	4.3.R.5		
4	A	158692A	5	2	2	4.3.R.5		
4	A	184821A	1	2	2	4.2.R.1		
4	A	184821A	2	2	2	4.2.R.1		
4	A	184821A	3	2	2	4.2.R.1		
4	A	184821A	4	2	2	4.2.R.1		
4	A	184821A	5	2	2	4.2.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	184822A	1	2	2	4.2.R.2		
4	A	184822A	2	2	2	4.2.R.2		
4	A	184822A	3	2	2	4.2.R.2		
4	A	184822A	4	2	2	4.2.R.2		
4	A	184822A	5	2	1	4.2.R.2		
4	A	184823A	1	3	2	4.3.R.1		
4	A	184823A	2	2	2	4.3.R.1		
4	A	184823A	3	2	2	4.3.R.1		
4	A	184823A	4	3	2	4.3.R.1		
4	A	184823A	5	2	2	4.3.R.1		
4	A	184824A	1	2	2	4.4.R.4		
4	A	184824A	2	1	2	4.4.R.4		
4	A	184824A	3	2	2	4.4.R.4		
4	A	184824A	4	2	2	4.4.R.4		
4	A	184824A	5	2	2	4.4.R.4		
4	A	184827A	1	3	2	4.2.R.2		
4	A	184827A	2	2	2	4.2.R.2		
4	A	184827A	3	2	2	4.2.R.2		
4	A	184827A	4	2	2	4.2.R.2		
4	A	184827A	5	2	2	4.2.R.2		
4	A	185806A	1	2	2	4.2.R.2		
4	A	185806A	2	2	2	4.2.R.2		
4	A	185806A	3	2	2	4.2.R.2		
4	A	185806A	4	3	2	4.2.R.2		
4	A	185806A	5	2	2	4.2.R.2		
4	A	186016A	1	2	1	4.4.R.4		
4	A	186016A	2	2	2	4.4.R.4		
4	A	186016A	3	1	1	4.4.R.4		
4	A	186016A	4	1	2	4.4.R.4		
4	A	186016A	5	2	1	4.4.R.4		
4	A	186018A	1	2	2	4.6.R.3		
4	A	186018A	2	2	2	4.6.R.3		
4	A	186018A	3	2	2	4.6.R.3		
4	A	186018A	4	2	2	4.6.R.3		
4	A	186018A	5	2	2	4.6.R.3		
4	A	186065A	1	2	2	4.3.R.7		
4	A	186065A	2	2	2	4.3.R.7		
4	A	186065A	3	2	2	4.3.R.7		
4	A	186065A	4	2	2	4.3.R.7		
4	A	186065A	5	2	2	4.3.R.7		
4	A	483076	1	1	2	4.5.W.2		
4	A	483076	2	1	2	4.5.W.2		
4	A	483076	3	1	2	4.5.W.2		
4	A	483076	4	1	2	4.3.W.2		
4	A	483076	5	1	2	4.5.W.2		
4	A	483084	1	1	2	4.5.W.3		
4	A	483084	2	2	2	4.5.R.4		
4	A	483084	3	2	2	4.5.W.3		
4	A	483084	4	2	2	4.5.R.4		
4	A	483084	5	2	2	4.5.R.4		
4	A	483092	1	1	2	4.5.W.4		
4	A	483092	2	2	2	4.5.R.4		
4	A	483092	3	1	2	4.5.W.4		
4	A	483092	4	1	2	4.5.W.4		
4	A	483092	5	2	2	4.5.W.4		
4	A	483100	1	1	2	4.5.R.5		
4	A	483100	2	1	2	4.5.R.1		
4	A	483100	3	1	2	4.5.R.1		
4	A	483100	4	1	2	4.5.R.1		
4	A	483100	5	1	2	4.5.R.1		
4	A	483108	1	1	2	4.5.R.3		
4	A	483108	2	1	2	4.5.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	483108	3	1	2	4.5.R.3		
4	A	483108	4	1	2	4.5.R.3		
4	A	483108	5	1	2	4.5.R.3		
4	A	483113	1	1	2	4.5.R.4		
4	A	483113	2	2	2	4.5.R.4		
4	A	483113	3	1	2	4.5.R.4		
4	A	483113	4	1	2	4.5.R.4		
4	A	483113	5	2	2	4.5.R.4		
4	A	484623	1	2	2	4.3.R.3		
4	A	484623	2	2	2	4.3.R.3		
4	A	484623	3	2	2	4.3.R.3		
4	A	484623	4	2	2	4.3.R.3		
4	A	484623	5	2	2	4.3.R.3		
4	A	484626	1	2	2	4.2.R.3		
4	A	484626	2	2	2	4.2.R.3		
4	A	484626	3	2	2	4.2.R.3		
4	A	484626	4	2	2	4.2.R.3		
4	A	484626	5	2	2	4.2.R.3		
4	A	484628	1	2	2	4.6.R.1		
4	A	484628	2	2	2	4.6.R.1		
4	A	484628	3	3	2	4.6.R.1		
4	A	484628	4	3	2	4.6.W.1		
4	A	484628	5	2	2	4.6.R.1		
4	A	484632	1	2	2	4.2.R.1		
4	A	484632	2	2	2	4.2.R.4		
4	A	484632	3	2	2	4.2.R.1		
4	A	484632	4	2	2	4.2.R.1		
4	A	484632	5	2	2	4.2.R.4		
4	A	484636	1	2	2	4.2.R.2		
4	A	484636	2	2	2	4.2.R.2		
4	A	484636	3	2	2	4.2.R.2		
4	A	484636	4	2	2	4.2.R.2		
4	A	484636	5	1	2	4.2.R.2		
4	A	484638	1	2	2	4.6.R.1		
4	A	484638	2	2	2	4.6.R.1		
4	A	484638	3	3	2	4.6.R.1		
4	A	484638	4	3	2	4.6.W.1		
4	A	484638	5	2	2	4.6.R.1		
4	A	484640	1	2	2	4.3.R.2		
4	A	484640	2	2	2	4.3.R.2		
4	A	484640	3	1	2	4.3.R.2		
4	A	484640	4	2	2	4.3.R.2		
4	A	484640	5	2	2	4.3.R.2		
4	A	484646	1	2	2	4.2.R.2		
4	A	484646	2	2	2	4.2.R.2		
4	A	484646	3	2	2	4.3.R.2		
4	A	484646	4	2	2	4.2.R.2		
4	A	484646	5	2	1	4.2.R.2		
4	A	484648	1	2	2	4.2.R.3		
4	A	484648	2	2	2	4.2.R.3		
4	A	484648	3	2	2	4.2.R.2		
4	A	484648	4	2	2	4.2.R.3		
4	A	484648	5	2	2	4.2.R.3		
4	A	484650	1	2	2	4.3.R.7		
4	A	484650	2	2	2	4.3.R.7		
4	A	484650	3	2	2	4.3.R.7		
4	A	484650	4	2	2	4.3.R.7		
4	A	484650	5	2	2	4.3.R.7		
4	A	484652	1	2	2	4.2.R.2		
4	A	484652	2	2	2	4.3.R.2		
4	A	484652	3	2	2	4.2.R.2		
4	A	484652	4	2	2	4.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	484652	5	2	2	4.2.R.2		
4	A	484654	1	2	2	4.2.R.3		
4	A	484654	2	2	2	4.2.R.3		
4	A	484654	3	2	2	4.2.R.3		
4	A	484654	4	2	2	4.2.R.3		
4	A	484654	5	2	2	4.2.R.3		
4	A	484658	1	2	2	4.6.R.1		
4	A	484658	2	2	2	4.6.R.1		
4	A	484658	3	3	2	4.6.R.1		
4	A	484658	4	3	2	4.6.W.1		
4	A	484658	5	2	2	4.6.R.1		
4	A	484722	1	2	2	4.2.R.3		
4	A	484722	2	2	2	4.2.R.3		
4	A	484722	3	2	2	4.2.R.3		
4	A	484722	4	2	2	4.2.R.3		
4	A	484722	5	2	2	4.2.R.3		
4	A	485159	1	3	2	4.2.W.2		
4	A	485159	2	2	2	4.2.W.2		
4	A	485159	3	2	2	4.2.W.2		
4	A	485159	4	2	2	4.2.W.2		
4	A	485159	5	2	2	4.2.W.2		
4	A	485165	1	2	2	4.2.R.4		
4	A	485165	2	2	2	4.2.R.4		
4	A	485165	3	2	2	4.2.R.4		
4	A	485165	4	2	2	4.2.R.4		
4	A	485165	5	2	2	4.2.R.1		
4	A	485172	1	1	2	4.3.R.2		
4	A	485172	2	2	2	4.3.R.2		
4	A	485172	3	2	2	4.3.R.2		
4	A	485172	4	2	2	4.3.R.2		
4	A	485172	5	2	2	4.3.R.2		
4	B	146826A	1	1	2	4.3.R.4		
4	B	146826A	2	1	2	4.3.R.4		
4	B	146826A	3	1	2	4.3.R.4		
4	B	146826A	4	1	2	4.3.R.4		
4	B	146826A	5	1	2	4.3.R.4		
4	B	146863A	1	2	2	4.4.R.4		
4	B	146863A	2	1	2	4.4.R.4		
4	B	146863A	3	1	2	4.4.R.4		
4	B	146863A	4	2	2	4.4.R.3	4.4.R.4	
4	B	146863A	5	1	2	4.4.R.4		
4	B	146864A	1	2	2	4.2.R.2		
4	B	146864A	2	2	2	4.2.R.2		
4	B	146864A	3	2	2	4.2.R.2		
4	B	146864A	4	2	2	4.2.R.2		
4	B	146864A	5	2	2	4.2.R.2		
4	B	146866A	1	2	2	4.3.R.7		
4	B	146866A	2	2	2	4.3.R.7		
4	B	146866A	3	2	2	4.3.R.7		
4	B	146866A	4	2	2	4.3.R.7		
4	B	146866A	5	2	2	4.3.R.7		
4	B	146867A	1	2	2	4.3.R.5		
4	B	146867A	2	2	2	4.3.R.5		
4	B	146867A	3	1	2	4.3.R.5		
4	B	146867A	4	2	2	4.3.R.5		
4	B	146867A	5	2	2	4.3.R.5		
4	B	146878A	1	2	2	4.3.R.7		
4	B	146878A	2	2	2	4.3.R.7		
4	B	146878A	3	2	2	4.3.R.3		
4	B	146878A	4	2	2	4.3.R.3		
4	B	146878A	5	2	2	4.3.R.7		
4	B	146880A	1	2	2	4.4.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	B	146880A	2	2	2	4.4.R.2		
4	B	146880A	3	1	2	4.4.R.2		
4	B	146880A	4	2	2	4.4.R.2	4.4.R.3	
4	B	146880A	5	2	2	4.4.R.2		
4	B	146893A	1	3	2	4.3.R.1		
4	B	146893A	2	3	2	4.3.R.1		
4	B	146893A	3	3	2	4.3.R.1		
4	B	146893A	4	3	2	4.3.R.1		
4	B	146893A	5	1	2	4.3.R.7		
4	B	146896A	1	2	2	4.4.R.3		
4	B	146896A	2	2	2	4.4.R.3		
4	B	146896A	3	2	2	4.4.R.3		
4	B	146896A	4	2	2	4.4.R.3		
4	B	146896A	5	2	2	4.4.R.3		
4	B	148877A	1	2	2	4.6.R.2		
4	B	148877A	2	2	2	4.6.R.2		
4	B	148877A	3	2	2	4.6.R.2		
4	B	148877A	4	1	2	4.6.R.2		
4	B	148877A	5	1	2	4.6.R.2		
4	B	149122A	1	2	2	4.3.R.7		
4	B	149122A	2	2	2	4.3.R.7		
4	B	149122A	3	2	2	4.3.R.7		
4	B	149122A	4	2	2	4.3.R.7		
4	B	149122A	5	2	2	4.3.R.7		
4	B	185497A	1	2	2	4.3.R.4		
4	B	185497A	2	2	2	4.3.R.3		
4	B	185497A	3	2	2	4.2.R.1		
4	B	185497A	4	2	2	4.3.R.3		
4	B	185497A	5	2	2	4.3.R.3		
4	B	185498A	1	1	2	4.3.R.4		
4	B	185498A	2	1	2	4.3.R.4		
4	B	185498A	3	1	2	4.3.R.4		
4	B	185498A	4	1	2	4.3.R.4		
4	B	185498A	5	1	2	4.3.R.4		
4	B	185500A	1	2	2	4.6.R.2		
4	B	185500A	2	2	2	4.6.R.2		
4	B	185500A	3	1	2	4.6.R.2		
4	B	185500A	4	1	2	4.6.R.2		
4	B	185500A	5	2	2	4.2.R.2		
4	B	185508A	1	2	2	4.4.R.2		
4	B	185508A	2	2	2	4.4.R.2		
4	B	185508A	3	1	2	4.4.R.2		
4	B	185508A	4	2	2	4.4.R.2		
4	B	185508A	5	1	2	4.4.R.2		
4	B	185545A	1	2	2	4.3.R.6		
4	B	185545A	2	2	2	4.3.R.6		
4	B	185545A	3	2	2	4.3.R.6		
4	B	185545A	4	2	2	4.3.R.6		
4	B	185545A	5	2	2	4.2.R.3		
4	B	185616A	1	2	2	4.4.R.3		
4	B	185616A	2	2	2	4.4.R.3		
4	B	185616A	3	2	2	4.4.R.3		
4	B	185616A	4	2	2	4.4.R.3		
4	B	185616A	5	1	2	4.4.R.3		
4	B	185625A	1	2	2	4.4.R.4		
4	B	185625A	2	2	2	4.4.R.4		
4	B	185625A	3	2	2	4.4.R.3		
4	B	185625A	4	3	2	4.4.R.3		
4	B	185625A	5	3	2	4.4.R.3		
4	B	483078	1	1	2	4.5.W.2		
4	B	483078	2	1	2	4.5.W.2		
4	B	483078	3	1	2	4.5.W.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	B	483078	4	2	2	4.5.W.2		
4	B	483078	5	2	2	4.5.W.2		
4	B	483102	1	1	2	4.5.W.2		
4	B	483102	2	1	2	4.5.W.2		
4	B	483102	3	1	2	4.5.W.2		
4	B	483102	4	1	2	4.5.W.2		
4	B	483102	5	1	2	4.5.W.2		
4	B	483106	1	1	2	4.5.R.2		
4	B	483106	2	1	2	4.5.W.2		
4	B	483106	3	1	2	4.5.W.2		
4	B	483106	4	2	2	4.5.R.2		
4	B	483106	5	1	2	4.5.R.2		
4	B	483119	1	1	2	4.5.R.2		
4	B	483119	2	2	2	4.5.R.2		
4	B	483119	3	1	2	4.5.R.2		
4	B	483119	4	1	2	4.5.R.5		
4	B	483119	5	2	2	4.5.R.2		
4	B	483121	1	1	2	4.5.W.1		
4	B	483121	2	1	2	4.5.W.1		
4	B	483121	3	1	2	4.5.W.1		
4	B	483121	4	1	2	4.5.W.1		
4	B	483121	5	1	2	4.5.W.1		
4	B	483123	1	1	2	4.5.W.1		
4	B	483123	2	1	2	4.5.W.1		
4	B	483123	3	1	2	4.5.W.1		
4	B	483123	4	1	2	4.5.W.1		
4	B	483123	5	1	2	4.5.W.1		
4	B	484668	1	2	2	4.2.R.1		
4	B	484668	2	2	2	4.2.R.1		
4	B	484668	3	2	2	4.2.R.1		
4	B	484668	4	2	2	4.2.R.1		
4	B	484668	5	2	2	4.2.R.4		
4	B	484672	1	2	2	4.6.R.1		
4	B	484672	2	2	2	4.6.R.1		
4	B	484672	3	3	2	4.6.R.1		
4	B	484672	4	3	2	4.6.W.1		
4	B	484672	5	3	2	4.6.R.1		
4	B	484674	1	3	2	4.6.R.3		
4	B	484674	2	2	2	4.6.R.3		
4	B	484674	3	2	2	4.6.R.3		
4	B	484674	4	3	2	4.6.R.3		
4	B	484674	5	2	2	4.6.R.3		
4	B	484690	1	2	2	4.2.R.3		
4	B	484690	2	2	2	4.2.R.3		
4	B	484690	3	2	2	4.2.R.3		
4	B	484690	4	2	2	4.2.R.3		
4	B	484690	5	1	2	4.2.R.3		
4	B	484701	1	2	2	4.6.R.1		
4	B	484701	2	2	2	4.6.R.1		
4	B	484701	3	3	2	4.6.R.1		
4	B	484701	4	3	2	4.6.W.1		
4	B	484701	5	1	2	4.6.R.1		
4	B	485331	1	2	2	4.2.R.2		
4	B	485331	2	2	2	4.2.R.2		
4	B	485331	3	2	2	4.2.R.2		
4	B	485331	4	2	2	4.2.R.2		
4	B	485331	5	2	2	4.2.R.2		
4	B	485333	1	3	2	4.2.R.3		
4	B	485333	2	2	2	4.2.R.3		
4	B	485333	3	2	2	4.2.R.3		
4	B	485333	4	3	2	4.2.R.3		
4	B	485333	5	2	2	4.2.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	B	485335	1	2	2	4.2.R.4		
4	B	485335	2	2	2	4.2.R.4		
4	B	485335	3	2	2	4.2.R.3		
4	B	485335	4	2	2	4.2.R.4		
4	B	485335	5	2	2	4.2.R.4		
4	B	485346	1	2	2	4.3.R.2		
4	B	485346	2	2	2	4.3.R.2		
4	B	485346	3	2	2	4.2.R.4		
4	B	485346	4	2	2	4.3.R.2		
4	B	485346	5	2	2	4.3.R.2		
4	B	485348	1	2	2	4.2.R.3		
4	B	485348	2	2	2	4.2.R.3		
4	B	485348	3	2	2	4.2.R.3		
4	B	485348	4	2	2	4.2.R.4		
4	B	485348	5	2	2	4.2.R.3		
4	B	485350	1	2	2	4.2.R.4		
4	B	485350	2	2	2	4.2.R.4		
4	B	485350	3	2	2	4.2.R.4		
4	B	485350	4	2	2	4.2.R.4		
4	B	485350	5	2	2	4.2.R.4		
4	B	485352	1	2	2	4.2.R.4		
4	B	485352	2	2	2	4.2.R.4		
4	B	485352	3	2	2	4.2.R.4		
4	B	485352	4	2	2	4.2.R.4		
4	B	485352	5	2	2	4.2.R.1		
4	B	485354	1	2	2	4.2.R.1		
4	B	485354	2	2	2	4.2.R.1		
4	B	485354	3	2	2	4.2.R.1		
4	B	485354	4	3	2	4.2.R.1		
4	B	485354	5	2	2	4.2.R.4		
4	B	485357	1	2	2	4.2.R.2		
4	B	485357	2	2	2	4.2.R.2		
4	B	485357	3	2	2	4.4.R.2		
4	B	485357	4	2	2	4.2.R.2		
4	B	485357	5	2	1	4.2.R.2		
4	C	146846A	1	2	2	4.2.R.2		
4	C	146846A	2	2	2	4.2.R.2		
4	C	146846A	3	2	2	4.2.R.2		
4	C	146846A	4	2	2	4.2.R.2		
4	C	146846A	5	2	2	4.2.R.2		
4	C	146904A	1	2	2	4.4.R.2		
4	C	146904A	2	2	2	4.4.R.2		
4	C	146904A	3	1	2	4.4.R.2		
4	C	146904A	4	2	2	4.4.R.2	4.4.R.3	
4	C	146904A	5	1	2	4.4.R.2		
4	C	148588A	1	1	2	4.4.R.2		
4	C	148588A	2	2	2	4.4.R.2		
4	C	148588A	3	1	2	4.4.R.2		
4	C	148588A	4	2	2	4.4.R.2	4.4.R.3	
4	C	148588A	5	1	2	4.4.R.2		
4	C	148597A	1	2	2	4.4.R.3		
4	C	148597A	2	2	2	4.4.R.3		
4	C	148597A	3	2	2	4.4.R.3		
4	C	148597A	4	2	2	4.4.R.3		
4	C	148597A	5	1	2	4.4.R.3		
4	C	148613A	1	2	2	4.3.R.7		
4	C	148613A	2	2	2	4.3.R.7		
4	C	148613A	3	2	2	4.3.R.7		
4	C	148613A	4	2	2	4.3.R.7		
4	C	148613A	5	2	2	4.2.R.2		
4	C	155556A	1	2	2	4.6.R.2		
4	C	155556A	2	2	2	4.6.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	C	155556A	3	1	2	4.6.R.2		
4	C	155556A	4	1	2	4.6.R.2		
4	C	155556A	5	2	2	4.6.R.2		
4	C	155636A	1	2	2	4.2.R.3		
4	C	155636A	2	2	2	4.2.R.3		
4	C	155636A	3	2	2	4.2.R.3		
4	C	155636A	4	2	2	4.2.R.3		
4	C	155636A	5	2	2	4.2.R.3		
4	C	155638A	1	2	2	4.3.R.7		
4	C	155638A	2	2	2	4.3.R.7		
4	C	155638A	3	2	2	4.3.R.7		
4	C	155638A	4	2	2	4.3.R.7		
4	C	155638A	5	2	2	4.3.R.7		
4	C	158547A	1	2	2	4.4.R.3		
4	C	158547A	2	2	2	4.4.R.3		
4	C	158547A	3	2	2	4.4.R.3		
4	C	158547A	4	2	2	4.4.W.2		
4	C	158547A	5	1	2	4.4.R.3		
4	C	158548A	1	2	2	4.4.R.2		
4	C	158548A	2	2	2	4.4.R.2		
4	C	158548A	3	1	2	4.4.R.2		
4	C	158548A	4	2	2	4.4.R.2		
4	C	158548A	5	1	2	4.4.R.3		
4	C	158553A	1	2	2	4.2.R.4		
4	C	158553A	2	2	2	4.2.R.1		
4	C	158553A	3	3	2	4.2.R.4		
4	C	158553A	4	2	2	4.2.R.4		
4	C	158553A	5	2	2	4.2.R.1		
4	C	158554A	1	2	2	4.2.R.1		
4	C	158554A	2	2	2	4.2.R.4		
4	C	158554A	3	3	2	4.2.R.1		
4	C	158554A	4	2	2	4.2.R.1		
4	C	158554A	5	2	2	4.2.R.4		
4	C	158557A	1	2	2	4.3.R.3		
4	C	158557A	2	2	2	4.3.R.4		
4	C	158557A	3	3	2	4.3.R.3		
4	C	158557A	4	2	2	4.3.R.3		
4	C	158557A	5	2	2	4.3.R.3		
4	C	158559A	1	1	2	4.3.R.4		
4	C	158559A	2	1	2	4.3.R.4		
4	C	158559A	3	1	2	4.3.R.4		
4	C	158559A	4	1	2	4.3.R.4		
4	C	158559A	5	1	2	4.3.R.4		
4	C	158564A	1	2	2	4.2.R.2		
4	C	158564A	2	2	2	4.2.R.2		
4	C	158564A	3	2	2	4.2.R.2		
4	C	158564A	4	2	2	4.2.R.2		
4	C	158564A	5	2	2	4.2.R.2		
4	C	158566A	1	2	2	4.3.R.3		
4	C	158566A	2	2	2	4.3.R.3		
4	C	158566A	3	2	2	4.3.R.3		
4	C	158566A	4	2	2	4.3.R.3		
4	C	158566A	5	2	2	4.2.R.2		
4	C	184829A	1	2	2	4.4.R.3		
4	C	184829A	2	2	2	4.4.R.3		
4	C	184829A	3	2	2	4.4.R.3		
4	C	184829A	4	2	2	4.4.R.3		
4	C	184829A	5	1	2	4.4.R.3		
4	C	185590A	1	2	2	4.2.R.2		
4	C	185590A	2	2	2	4.2.R.2		
4	C	185590A	3	2	2	4.2.R.2		
4	C	185590A	4	2	2	4.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	C	185590A	5	2	2	4.2.R.2		
4	C	483086	1	2	2	4.2.W.2		
4	C	483086	2	2	2	4.2.W.2		
4	C	483086	3	2	2	4.2.W.2		
4	C	483086	4	2	2	4.2.W.2		
4	C	483086	5	2	2	4.2.W.2		
4	C	483088	1	1	2	4.5.W.3		
4	C	483088	2	2	2	4.5.W.2		
4	C	483088	3	1	2	4.5.W.3		
4	C	483088	4	1	2	4.5.W.3		
4	C	483088	5	2	2	4.2.W.2		
4	C	483096	1	1	2	4.5.W.4		
4	C	483096	2	2	2	4.5.W.4		
4	C	483096	3	1	2	4.5.W.4		
4	C	483096	4	2	2	4.5.W.4		
4	C	483096	5	1	2	4.5.W.4		
4	C	483104	1	1	2	4.5.R.2		
4	C	483104	2	1	2	4.5.R.2		
4	C	483104	3	1	2	4.5.R.2		
4	C	483104	4	2	2	4.5.R.2		
4	C	483104	5	1	2	4.5.R.2		
4	C	483111	1	2	2	4.5.R.3		
4	C	483111	2	2	2	4.5.R.2		
4	C	483111	3	2	2	4.5.R.3		
4	C	483111	4	2	2	4.5.R.3		
4	C	483111	5	1	2	4.5.R.2		
4	C	484660	1	2	2	4.6.W.1		
4	C	484660	2	2	2	4.6.W.1		
4	C	484660	3	3	2	4.6.R.1		
4	C	484660	4	2	2	4.6.W.1		
4	C	484660	5	2	2	4.6.R.1		
4	C	484662	1	2	2	4.2.R.1		
4	C	484662	2	2	2	4.2.R.1		
4	C	484662	3	2	2	4.2.R.1		
4	C	484662	4	2	2	4.2.R.1		
4	C	484662	5	2	2	4.2.R.4		
4	C	484666	1	2	2	4.2.R.1		
4	C	484666	2	2	2	4.2.R.1		
4	C	484666	3	3	2	4.2.R.2		
4	C	484666	4	2	2	4.2.R.4		
4	C	484666	5	2	2	4.2.R.1		
4	C	484676	1	2	2	4.2.R.4		
4	C	484676	2	2	2	4.2.R.4		
4	C	484676	3	2	2	4.2.R.4		
4	C	484676	4	2	2	4.2.R.4		
4	C	484676	5	2	2	4.2.R.4		
4	C	484678	1	3	2	4.2.R.4		
4	C	484678	2	3	2	4.2.R.4		
4	C	484678	3	3	2	4.2.R.4		
4	C	484678	4	2	2	4.2.R.4		
4	C	484678	5	3	2	4.2.R.4		
4	C	484682	1	2	2	4.6.W.1		
4	C	484682	2	2	2	4.6.W.1		
4	C	484682	3	3	2	4.6.R.1		
4	C	484682	4	3	2	4.6.W.1		
4	C	484682	5	3	2	4.6.R.1		
4	C	484684	1	2	2	4.2.R.3		
4	C	484684	2	2	2	4.2.R.3		
4	C	484684	3	2	2	4.2.R.3		
4	C	484684	4	2	2	4.2.R.3		
4	C	484684	5	2	2	4.2.R.3		
4	C	484686	1	2	2	4.2.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	C	484686	2	2	2	4.2.R.4		
4	C	484686	3	3	2	4.2.R.4		
4	C	484686	4	2	2	4.2.R.4		
4	C	484686	5	2	2	4.2.R.4		
4	C	484688	1	2	2	4.6.W.1		
4	C	484688	2	2	2	4.6.W.1		
4	C	484688	3	3	2	4.6.R.1		
4	C	484688	4	2	2	4.6.W.1		
4	C	484688	5	3	2	4.6.R.1		
4	C	485359	1	2	2	4.2.R.1		
4	C	485359	2	2	2	4.2.R.1		
4	C	485359	3	2	2	4.2.R.1		
4	C	485359	4	2	2	4.2.R.1		
4	C	485359	5	2	2	4.2.R.4		
4	C	485364	1	2	2	4.3.R.6		
4	C	485364	2	2	2	4.3.R.6		
4	C	485364	3	2	2	4.3.R.6		
4	C	485364	4	2	2	4.3.R.6		
4	C	485364	5	2	2	4.3.R.6		
4	C	485366	1	2	2	4.3.R.6		
4	C	485366	2	2	2	4.3.R.5		
4	C	485366	3	2	2	4.3.R.5		
4	C	485366	4	2	2	4.3.R.5		
4	C	485366	5	2	2	4.3.R.5		
4	C	485368	1	2	2	4.3.R.1		
4	C	485368	2	2	2	4.3.R.1		
4	C	485368	3	2	2	4.3.R.1		
4	C	485368	4	3	2	4.3.R.1		
4	C	485368	5	2	2	4.3.R.1		
4	C	487992	1	2	2	4.6.W.1		
4	C	487992	2	2	2	4.6.W.1		
4	C	487992	3	3	2	4.6.R.1		
4	C	487992	4	3	2	4.6.W.1		
4	C	487992	5	2	2	4.6.R.1		
5	A	147920A	1	2	2	5.3.R.3		
5	A	147920A	2	2	2	5.3.R.3		
5	A	147920A	3	2	2	5.3.R.3		
5	A	147920A	4	2	2	5.3.R.3		
5	A	147920A	5	2	2	5.3.R.3		
5	A	147921A	1	2	2	5.2.R.3		
5	A	147921A	2	2	2	5.2.R.3		
5	A	147921A	3	2	2	5.2.R.3		
5	A	147921A	4	2	2	5.2.R.3		
5	A	147921A	5	2	2	5.2.R.1		
5	A	147923A	1	2	2	5.4.R.2		
5	A	147923A	2	1	2	5.4.R.2	5.4.R.3	
5	A	147923A	3	2	2	5.4.R.2		
5	A	147923A	4	2	2	5.4.R.2	5.4.R.3	
5	A	147923A	5	2	2	5.4.R.2		
5	A	147924A	1	2	2	5.2.R.2		
5	A	147924A	2	2	2	5.2.R.2		
5	A	147924A	3	2	2	5.2.R.2		
5	A	147924A	4	2	2	5.2.R.2		
5	A	147924A	5	2	2	5.2.R.2		
5	A	147926A	1	2	2	5.2.R.2	5.3.R.3	
5	A	147926A	2	2	2	5.2.R.2		
5	A	147926A	3	2	1	5.2.R.2	5.3.R.3	
5	A	147926A	4	3	2	5.3.R.1		
5	A	147926A	5	2	1	5.2.R.2		
5	A	147969A	1	2	2	5.2.R.2		
5	A	147969A	2	2	2	5.2.R.2		
5	A	147969A	3	2	2	5.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	147969A	4	2	2	5.3.R.7		
5	A	147969A	5	2	2	5.2.R.2		
5	A	148003A	1	2	2	5.3.R.6		
5	A	148003A	2	2	2	5.3.R.6		
5	A	148003A	3	2	2	5.3.R.6		
5	A	148003A	4	2	2	5.3.R.6		
5	A	148003A	5	1	2	5.3.R.6		
5	A	148005A	1	2	2	5.4.R.4		
5	A	148005A	2	1	2	5.4.R.4		
5	A	148005A	3	2	2	5.4.R.4		
5	A	148005A	4	2	2	5.4.R.4		
5	A	148005A	5	1	2	5.4.R.4		
5	A	148007A	1	2	2	5.2.R.2		
5	A	148007A	2	2	2	5.2.R.2		
5	A	148007A	3	2	2	5.2.R.2		
5	A	148007A	4	2	2	5.2.R.2		
5	A	148007A	5	2	2	5.2.R.2		
5	A	148008A	1	2	2	5.2.R.1		
5	A	148008A	2	2	2	5.2.R.1		
5	A	148008A	3	2	2	5.2.R.1		
5	A	148008A	4	2	2	5.2.R.3		
5	A	148008A	5	2	2	5.2.R.1		
5	A	148019A	1	2	2	5.4.R.2		
5	A	148019A	2	1	2	5.4.R.2		
5	A	148019A	3	2	2	5.4.R.2		
5	A	148019A	4	2	2	5.4.R.2	5.4.R.3	
5	A	148019A	5	2	2	5.4.R.2		
5	A	148026A	1	2	2	5.2.R.3		
5	A	148026A	2	2	2	5.2.R.3		
5	A	148026A	3	2	2	5.2.R.3		
5	A	148026A	4	3	2	5.2.R.1		
5	A	148026A	5	2	2	5.2.R.3		
5	A	148834A	1	2	2	5.4.R.4		
5	A	148834A	2	1	2	5.4.R.4		
5	A	148834A	3	2	2	5.4.R.4		
5	A	148834A	4	2	2	5.4.R.4	5.4.R.3	
5	A	148834A	5	1	2	5.4.R.4		
5	A	148839A	1	2	2	5.2.R.2		
5	A	148839A	2	2	2	5.2.R.2		
5	A	148839A	3	2	2	5.2.R.2		
5	A	148839A	4	2	2	5.2.R.2		
5	A	148839A	5	2	2	5.2.R.2		
5	A	148841A	1	3	2	5.6.R.3		
5	A	148841A	2	2	2	5.6.R.3		
5	A	148841A	3	3	2	5.6.R.3		
5	A	148841A	4	3	2	5.6.R.3		
5	A	148841A	5	2	2	5.6.R.3		
5	A	149152A	1	3	2	5.2.R.1		
5	A	149152A	2	2	2	5.2.R.1		
5	A	149152A	3	3	2	5.2.R.1		
5	A	149152A	4	3	2	5.2.R.1		
5	A	149152A	5	3	2	5.2.R.1		
5	A	149158A	1	3	2	5.6.R.3		
5	A	149158A	2	2	2	5.6.R.3		
5	A	149158A	3	3	2	5.6.R.3		
5	A	149158A	4	3	2	5.6.R.3		
5	A	149158A	5	2	2	5.6.R.3		
5	A	149196A	1	3	2	5.3.R.1		
5	A	149196A	2	2	2	5.3.R.1		
5	A	149196A	3	3	2	5.3.R.2		
5	A	149196A	4	3	2	5.3.R.2		
5	A	149196A	5	2	2	5.3.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	149318A	1	2	2	5.2.R.2		
5	A	149318A	2	2	2	5.2.R.2		
5	A	149318A	3	2	2	5.2.R.2		
5	A	149318A	4	2	2	5.2.R.2		
5	A	149318A	5	2	2	5.2.R.2		
5	A	149321A	1	2	2	5.6.R.3		
5	A	149321A	2	2	2	5.6.R.3		
5	A	149321A	3	2	2	5.6.R.3		
5	A	149321A	4	2	2	5.6.R.3		
5	A	149321A	5	2	2	5.8.R		
5	A	149330A	1	2	2	5.2.R.2		
5	A	149330A	2	2	2	5.2.R.2		
5	A	149330A	3	2	2	5.2.R.2		
5	A	149330A	4	2	2	5.2.R.2		
5	A	149330A	5	2	2	5.2.R.2		
5	A	149334A	1	2	2	5.7.R.1		
5	A	149334A	2	2	2	5.7.R.1		
5	A	149334A	3	2	2	5.7.R.1		
5	A	149334A	4	2	2	5.7.R.1		
5	A	149334A	5	2	2	5.8.R		
5	A	149338A	1	2	2	5.6.R.3		
5	A	149338A	2	2	2	5.6.R.3		
5	A	149338A	3	2	2	5.6.R.3		
5	A	149338A	4	2	2	5.6.R.3		
5	A	149338A	5	2	2	5.8.R		
5	A	149339A	1	2	2	5.2.R.1		
5	A	149339A	2	2	2	5.2.R.1		
5	A	149339A	3	2	2	5.2.R.1		
5	A	149339A	4	2	2	5.2.R.1		
5	A	149339A	5	2	2	5.2.R.1		
5	A	158903A	1	2	2	5.2.R.3		
5	A	158903A	2	2	2	5.2.R.3		
5	A	158903A	3	2	2	5.2.R.3		
5	A	158903A	4	2	2	5.2.R.3		
5	A	158903A	5	2	2	5.2.R.3		
5	A	159544A	1	2	2	5.3.R.4		
5	A	159544A	2	1	2	5.3.R.4		
5	A	159544A	3	2	2	5.3.R.4		
5	A	159544A	4	3	2	5.3.R.4		
5	A	159544A	5	2	2	5.3.R.4		
5	A	159546A	1	2	2	5.8.R		
5	A	159546A	2	2	2	5.8.R		
5	A	159546A	3	2	2	5.8.R		
5	A	159546A	4	2	2	5.8.R		
5	A	159546A	5	3	2	5.8.R		
5	A	159592A	1	2	2	5.2.R.3		
5	A	159592A	2	2	2	5.2.R.3		
5	A	159592A	3	2	2	5.2.R.3		
5	A	159592A	4	2	2	5.2.R.3		
5	A	159592A	5	2	2	5.2.R.1		
5	A	159600A	1	2	2	5.4.R.3		
5	A	159600A	2	2	2	5.4.R.3		
5	A	159600A	3	2	2	5.4.R.3		
5	A	159600A	4	2	2	5.4.R.3		
5	A	159600A	5	1	2	5.4.R.3		
5	A	160718A	1	1	2	5.4.R.2		
5	A	160718A	2	1	2	5.4.R.2		
5	A	160718A	3	1	2	5.4.R.2		
5	A	160718A	4	1	2	5.4.R.2		
5	A	160718A	5	1	2	5.4.R.2		
5	A	186097A	1	2	2	5.3.R.4		
5	A	186097A	2	2	2	5.3.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	186097A	3	2	2	5.3.R.4		
5	A	186097A	4	2	2	5.3.R.4		
5	A	186097A	5	2	2	5.3.R.4		
5	A	186107A	1	2	2	5.4.R.2		
5	A	186107A	2	2	2	5.4.R.2		
5	A	186107A	3	2	2	5.4.R.2		
5	A	186107A	4	2	2	5.4.R.2	5.4.R.3	
5	A	186107A	5	1	2	5.4.R.2		
5	A	186115A	1	2	2	5.4.R.4		
5	A	186115A	2	2	2	5.4.R.4		
5	A	186115A	3	1	2	5.4.R.4		
5	A	186115A	4	2	2	5.4.R.4	5.4.R.3	
5	A	186115A	5	1	2	5.4.R.4		
5	A	186121A	1	2	2	5.3.R.3		
5	A	186121A	2	2	2	5.3.R.3		
5	A	186121A	3	2	2	5.3.R.3		
5	A	186121A	4	2	2	5.3.R.7		
5	A	186121A	5	2	2	5.3.R.7		
5	A	186131A	1	1	2	5.3.R.4		
5	A	186131A	2	2	2	5.3.R.4		
5	A	186131A	3	1	2	5.3.R.4		
5	A	186131A	4	2	2	5.3.R.4		
5	A	186131A	5	2	2	5.3.R.4		
5	A	186469A	1	2	2	5.3.R.3		
5	A	186469A	2	2	2	5.3.R.3		
5	A	186469A	3	2	2	5.4.R.3		
5	A	186469A	4	2	2	5.3.R.4		
5	A	186469A	5	2	2	5.3.R.4		
5	A	186471A	1	2	2	5.4.R.3		
5	A	186471A	2	2	2	5.4.R.3		
5	A	186471A	3	2	2	5.4.R.3		
5	A	186471A	4	2	2	5.4.R.3		
5	A	186471A	5	1	2	5.4.R.3		
5	A	186474A	1	1	2	5.4.R.2		
5	A	186474A	2	1	2	5.4.R.2		
5	A	186474A	3	2	2	5.4.R.2		
5	A	186474A	4	1	2	5.4.R.3		
5	A	186474A	5	1	2	5.4.R.2		
5	A	186476A	1	2	2	5.2.R.3		
5	A	186476A	2	2	2	5.2.R.3		
5	A	186476A	3	2	2	5.2.R.1		
5	A	186476A	4	2	2	5.2.R.3		
5	A	186476A	5	2	2	5.2.R.3		
5	A	186488A	1	2	2	5.2.R.2		
5	A	186488A	2	2	2	5.2.R.2		
5	A	186488A	3	2	2	5.2.R.2		
5	A	186488A	4	1	2	5.2.R.2		
5	A	186488A	5	2	2	5.2.R.2		
5	A	186505A	1	3	2	5.3.R.1		
5	A	186505A	2	2	2	5.3.R.1		
5	A	186505A	3	2	2	5.3.R.1		
5	A	186505A	4	3	2	5.3.R.1		
5	A	186505A	5	2	2	5.3.R.1		
5	A	186777A	1	2	2	5.3.R.3		
5	A	186777A	2	2	2	5.3.R.3		
5	A	186777A	3	2	2	5.2.R.3		
5	A	186777A	4	2	2	5.3.R.3		
5	A	186777A	5	2	2	5.3.R.3		
5	A	483126	1	1	2	5.5.W.1		
5	A	483126	2	1	2	5.5.W.1		
5	A	483126	3	1	2	5.5.W.1		
5	A	483126	4	2	2	5.5.W.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	483126	5	1	2	5.5.W.1		
5	A	483134	1	1	2	5.5.W.2		
5	A	483134	2	1	2	5.5.W.2		
5	A	483134	3	1	2	5.5.W.2		
5	A	483134	4	2	2	5.5.W.2	5.2.W.4	
5	A	483134	5	2	2	5.5.W.1		
5	A	483140	1	1	2	5.5.W.3		
5	A	483140	2	1	2	5.5.W.3		
5	A	483140	3	1	2	5.5.W.3		
5	A	483140	4	1	2	5.5.W.3		
5	A	483140	5	1	2	5.5.R.2		
5	A	483160	1	1	2	5.5.R.1		
5	A	483160	2	1	2	5.5.R.1		
5	A	483160	3	1	2	5.5.R.1		
5	A	483160	4	1	2	5.5.R.1		
5	A	483160	5	1	2	5.5.R.1		
5	A	483166	1	1	2	5.5.R.2		
5	A	483166	2	1	2	5.5.R.2		
5	A	483166	3	1	2	5.5.R.2		
5	A	483166	4	1	2	5.5.W.5		
5	A	483166	5	1	2	5.5.R.2		
5	A	483172	1	1	2	5.5.R.3		
5	A	483172	2	1	2	5.5.R.3		
5	A	483172	3	1	2	5.5.R.3		
5	A	483172	4	1	2	5.5.R.3		
5	A	483172	5	1	2	5.5.R.3		
5	A	485384	1	3	2	5.3.R.1		
5	A	485384	2	2	2	5.3.R.1		
5	A	485384	3	3	2	5.3.R.2		
5	A	485384	4	3	2	5.3.R.1		
5	A	485384	5	2	2	5.6.R.3		
5	A	485386	1	2	2	5.2.R.1		
5	A	485386	2	2	2	5.2.R.1		
5	A	485386	3	3	2	5.2.R.1		
5	A	485386	4	2	2	5.2.R.1		
5	A	485386	5	2	2	5.2.R.1		
5	A	485392	1	3	2	5.6.R.3	5.7.R.1	
5	A	485392	2	3	2	5.6.R.3		
5	A	485392	3	3	2	5.6.R.3	5.7.R.1	
5	A	485392	4	3	2	5.6.R.3	5.7.R.1	
5	A	485392	5	2	2	5.6.R.3		
5	A	485394	1	2	2	5.4.R.3		
5	A	485394	2	1	2	5.4.R.3		
5	A	485394	3	2	2	5.4.R.3		
5	A	485394	4	2	2	5.4.R.5	5.4.R.3	
5	A	485394	5	1	2	5.4.R.3		
5	A	485429	1	2	2	5.2.R.1		
5	A	485429	2	2	2	5.2.R.1		
5	A	485429	3	2	2	5.2.R.1		
5	A	485429	4	2	2	5.2.R.1		
5	A	485429	5	2	2	5.2.R.1		
5	A	485431	1	2	2	5.3.R.5		
5	A	485431	2	2	2	5.3.R.5		
5	A	485431	3	2	2	5.3.R.5		
5	A	485431	4	2	2	5.3.R.5		
5	A	485431	5	2	2	5.3.R.5		
5	A	485433	1	3	2	5.6.R.1		
5	A	485433	2	2	2	5.6.R.1		
5	A	485433	3	3	2	5.6.R.1		
5	A	485433	4	3	2	5.6.R.1		
5	A	485433	5	3	2	5.6.R.1		
5	A	485435	1	3	2	5.6.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	485435	2	3	2	5.6.R.3		
5	A	485435	3	3	2	5.6.R.3		
5	A	485435	4	3	2	5.6.R.3		
5	A	485435	5	3	2	5.6.R.3		
5	B	140927A	1	4	2	5.3.W.2	5.2.W.3	
5	B	140927A	2	4	2	5.3.W.2		
5	B	140927A	3	4	1	5.3.W.2	5.2.W.3	
5	B	140927A	4	4	2	5.3.W.2	5.3.R.7	5.4.W.2
5	B	140927A	5	4	2	5.3.W.2		
5	B	147974A	1	1	2	5.4.R.2		
5	B	147974A	2	1	2	5.4.R.2		
5	B	147974A	3	1	2	5.4.R.2		
5	B	147974A	4	1	2	5.4.R.2		
5	B	147974A	5	2	2	5.4.R.2		
5	B	148925A	1	2	2	5.4.R.2		
5	B	148925A	2	1	2	5.4.R.2		
5	B	148925A	3	2	2	5.4.R.2		
5	B	148925A	4	2	2	5.4.R.2		
5	B	148925A	5	2	2	5.4.R.2		
5	B	148927A	1	2	2	5.2.R.3		
5	B	148927A	2	2	2	5.2.R.3		
5	B	148927A	3	2	2	5.2.R.1		
5	B	148927A	4	2	2	5.2.R.3		
5	B	148927A	5	2	2	5.2.R.3		
5	B	148930A	1	2	2	5.4.R.3		
5	B	148930A	2	2	2	5.4.R.3		
5	B	148930A	3	2	2	5.4.R.3		
5	B	148930A	4	2	2	5.4.R.3		
5	B	148930A	5	1	2	5.4.R.3		
5	B	148933A	1	2	2	5.3.R.3		
5	B	148933A	2	2	2	5.3.R.3		
5	B	148933A	3	2	2	5.3.R.3		
5	B	148933A	4	2	2	5.3.R.3		
5	B	148933A	5	2	2	5.3.R.3		
5	B	148961A	1	2	2	5.3.R.6		
5	B	148961A	2	2	2	5.3.R.6		
5	B	148961A	3	2	2	5.3.R.6		
5	B	148961A	4	2	2	5.3.R.6		
5	B	148961A	5	2	2	5.3.R.6		
5	B	148963A	1	2	2	5.2.R.2		
5	B	148963A	2	2	2	5.2.R.2		
5	B	148963A	3	2	2	5.2.R.2		
5	B	148963A	4	2	2	5.2.R.2		
5	B	148963A	5	2	2	5.2.R.2		
5	B	148967A	1	2	2	5.3.R.5		
5	B	148967A	2	2	2	5.3.R.5		
5	B	148967A	3	2	2	5.3.R.5		
5	B	148967A	4	2	2	5.3.R.5		
5	B	148967A	5	2	2	5.3.R.5		
5	B	148971A	1	2	2	5.7.R.1		
5	B	148971A	2	2	2	5.7.R.1		
5	B	148971A	3	3	2	5.7.R.1		
5	B	148971A	4	2	2	5.7.R.1		
5	B	148971A	5	2	2	5.7.R.1		
5	B	158697A	1	2	2	5.4.R.3		
5	B	158697A	2	2	2	5.4.R.3		
5	B	158697A	3	2	2	5.4.R.3		
5	B	158697A	4	2	2	5.4.R.3		
5	B	158697A	5	1	2	5.4.R.3		
5	B	158749A	1	2	2	5.4.R.3		
5	B	158749A	2	2	2	5.4.R.3		
5	B	158749A	3	2	2	5.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	B	158749A	4	2	2	5.4.R.3		
5	B	158749A	5	2	2	5.4.R.3		
5	B	158887A	1	2	2	5.2.R.3		
5	B	158887A	2	2	2	5.2.R.3		
5	B	158887A	3	2	2	5.2.R.3		
5	B	158887A	4	2	2	5.2.R.3		
5	B	158887A	5	2	2	5.2.R.3		
5	B	158889A	1	2	2	5.2.R.3		
5	B	158889A	2	2	2	5.2.R.3		
5	B	158889A	3	2	2	5.2.R.3		
5	B	158889A	4	2	2	5.2.R.1		
5	B	158889A	5	2	2	5.2.R.3		
5	B	158912A	1	3	2	5.3.R.6		
5	B	158912A	2	3	2	5.3.R.6		
5	B	158912A	3	3	2	5.3.R.6		
5	B	158912A	4	3	2	5.3.R.6		
5	B	158912A	5	2	2	5.3.R.6		
5	B	159151A	1	2	2	5.3.R.3		
5	B	159151A	2	2	2	5.3.R.3		
5	B	159151A	3	2	2	5.3.R.3		
5	B	159151A	4	2	2	5.3.R.3		
5	B	159151A	5	2	2	5.3.R.3		
5	B	159164A	1	3	2	5.2.R.3		
5	B	159164A	2	2	2	5.2.R.3		
5	B	159164A	3	3	2	5.2.R.3		
5	B	159164A	4	3	2	5.2.R.3		
5	B	159164A	5	2	2	5.2.R.3		
5	B	159165A	1	2	2	5.2.R.1		
5	B	159165A	2	3	2	5.2.R.1		
5	B	159165A	3	3	2	5.2.R.2		
5	B	159165A	4	3	2	5.2.R.1		
5	B	159165A	5	2	2	5.2.R.1		
5	B	159368A	1	2	2	5.2.R.2		
5	B	159368A	2	2	2	5.2.R.2		
5	B	159368A	3	2	2	5.2.R.1		
5	B	159368A	4	2	2	5.2.R.2		
5	B	159368A	5	2	2	5.2.R.2		
5	B	159408A	1	2	2	5.3.R.2		
5	B	159408A	2	2	2	5.3.R.1		
5	B	159408A	3	3	2	5.3.R.2		
5	B	159408A	4	3	2	5.3.R.2		
5	B	159408A	5	2	2	5.3.R.2		
5	B	159467A	1	2	2	5.7.R.1		
5	B	159467A	2	2	2	5.7.R.1		
5	B	159467A	3	2	2	5.7.R.1		
5	B	159467A	4	3	2	5.7.R.1		
5	B	159467A	5	2	2	5.7.R.1		
5	B	159475A	1	2	2	5.6.R.3		
5	B	159475A	2	2	2	5.6.R.3		
5	B	159475A	3	3	2	5.6.R.1		
5	B	159475A	4	3	2	5.6.R.3		
5	B	159475A	5	2	2	5.8.R		
5	B	160517A	1	2	2	5.3.R.2		
5	B	160517A	2	2	2	5.3.R.2		
5	B	160517A	3	1	2	5.3.R.2		
5	B	160517A	4	2	2	5.3.R.2		
5	B	160517A	5	2	2	5.3.R.2		
5	B	160563A	1	2	2	5.2.R.2		
5	B	160563A	2	2	2	5.2.R.2		
5	B	160563A	3	2	2	5.2.R.2		
5	B	160563A	4	2	2	5.2.R.2		
5	B	160563A	5	2	2	5.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	B	160565A	1	3	2	5.2.R.3		
5	B	160565A	2	3	2	5.2.R.3		
5	B	160565A	3	3	2	5.2.R.3		
5	B	160565A	4	3	2	5.2.R.1		
5	B	160565A	5	2	2	5.2.R.3		
5	B	160570A	1	2	2	5.3.R.4		
5	B	160570A	2	1	2	5.3.R.4		
5	B	160570A	3	1	2	5.3.R.4		
5	B	160570A	4	2	2	5.3.R.4		
5	B	160570A	5	2	2	5.3.R.4		
5	B	483136	1	2	2	5.5.W.2		
5	B	483136	2	1	2	5.5.W.2		
5	B	483136	3	2	2	5.4.W.2		
5	B	483136	4	2	2	5.5.W.2		
5	B	483136	5	2	2	5.4.W.2		
5	B	483142	1	2	2	5.5.W.5		
5	B	483142	2	2	2	5.5.W.5		
5	B	483142	3	2	2	5.5.W.5		
5	B	483142	4	2	2	5.5.W.5		
5	B	483142	5	1	2	5.5.W.5		
5	B	483146	1	2	2	5.5.W.4		
5	B	483146	2	2	2	5.5.W.4		
5	B	483146	3	2	2	5.5.W.4		
5	B	483146	4	2	2	5.5.W.4		
5	B	483146	5	1	2	5.5.W.4		
5	B	483150	1	2	2	5.5.W.3		
5	B	483150	2	1	2	5.5.W.3		
5	B	483150	3	2	2	5.5.W.3		
5	B	483150	4	1	2	5.5.W.3		
5	B	483150	5	2	2	5.5.R.2		
5	B	483168	1	2	2	5.5.R.2		
5	B	483168	2	1	2	5.5.R.2		
5	B	483168	3	1	2	5.5.R.2		
5	B	483168	4	1	2	5.5.R.2		
5	B	483168	5	2	2	5.5.R.2		
5	B	483179	1	1	2	5.5.R.3		
5	B	483179	2	1	2	5.5.R.3		
5	B	483179	3	2	2	5.5.R.3		
5	B	483179	4	1	2	5.5.R.3		
5	B	483179	5	2	2	5.5.R.3		
5	B	485372	1	2	2	5.6.R.3		
5	B	485372	2	2	2	5.6.R.3		
5	B	485372	3	3	2	5.8.R		
5	B	485372	4	3	2	5.6.R.3		
5	B	485372	5	2	2	5.8.R		
5	B	485377	1	2	2	5.2.R.1		
5	B	485377	2	2	2	5.2.R.1		
5	B	485377	3	2	2	5.2.R.1		
5	B	485377	4	2	2	5.2.R.3		
5	B	485377	5	2	2	5.2.R.1		
5	B	485379	1	1	2	5.4.R.5		
5	B	485379	2	1	2	5.4.R.5		
5	B	485379	3	1	2	5.4.R.5		
5	B	485379	4	1	2	5.4.R.5		
5	B	485379	5	1	2	5.4.R.3		
5	B	485405	1	2	2	5.2.R.1		
5	B	485405	2	2	2	5.2.R.1		
5	B	485405	3	3	2	5.2.R.1		
5	B	485405	4	3	2	5.2.R.1		
5	B	485405	5	2	2	5.2.R.1		
5	B	485407	1	2	2	5.3.R.2		
5	B	485407	2	2	2	5.3.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	B	485407	3	1	2	5.3.R.2		
5	B	485407	4	2	2	5.3.R.2		
5	B	485407	5	2	2	5.3.R.2		
5	B	485411	1	3	2	5.6.R.1		
5	B	485411	2	3	2	5.6.R.1		
5	B	485411	3	3	2	5.6.R.1		
5	B	485411	4	3	2	5.6.R.1		
5	B	485411	5	3	2	5.6.R.1		
5	B	485413	1	2	2	5.2.R.3		
5	B	485413	2	2	2	5.3.R.1		
5	B	485413	3	2	2	5.3.R.1		
5	B	485413	4	3	2	5.3.R.1		
5	B	485413	5	2	2	5.2.R.3		
5	C	148893A	1	1	2	5.4.R.4		
5	C	148893A	2	1	2	5.4.R.4		
5	C	148893A	3	2	2	5.4.R.4		
5	C	148893A	4	2	2	5.4.R.4	5.4.R.3	
5	C	148893A	5	2	2	5.4.R.4		
5	C	148900A	1	1	2	5.3.R.4		
5	C	148900A	2	1	2	5.3.R.4		
5	C	148900A	3	2	2	5.3.R.4		
5	C	148900A	4	2	2	5.3.R.4		
5	C	148900A	5	2	2	5.3.R.4		
5	C	148904A	1	2	2	5.3.R.6		
5	C	148904A	2	2	2	5.3.R.3		
5	C	148904A	3	2	2	5.3.R.6		
5	C	148904A	4	2	2	5.3.R.3		
5	C	148904A	5	2	2	5.3.R.6		
5	C	148906A	1	1	2	5.4.R.2		
5	C	148906A	2	1	2	5.4.R.2		
5	C	148906A	3	1	2	5.4.R.2		
5	C	148906A	4	1	2	5.4.R.2		
5	C	148906A	5	1	2	5.4.R.2		
5	C	158753A	1	2	2	5.4.R.3		
5	C	158753A	2	1	2	5.4.R.5		
5	C	158753A	3	1	2	5.4.R.3		
5	C	158753A	4	2	2	5.4.R.5	5.4.R.3	
5	C	158753A	5	1	2	5.4.R.3		
5	C	158832A	1	1	2	5.4.R.4		
5	C	158832A	2	2	2	5.4.R.4		
5	C	158832A	3	2	2	5.4.R.4		
5	C	158832A	4	2	2	5.4.R.4		
5	C	158832A	5	1	2	5.4.R.4		
5	C	158900A	1	2	2	5.2.R.3		
5	C	158900A	2	2	2	5.2.R.3		
5	C	158900A	3	2	2	5.2.R.3		
5	C	158900A	4	2	2	5.2.R.3		
5	C	158900A	5	2	2	5.2.R.3		
5	C	159157A	1	2	2	5.2.R.3		
5	C	159157A	2	2	2	5.2.R.3		
5	C	159157A	3	2	2	5.2.R.3		
5	C	159157A	4	2	2	5.2.R.3		
5	C	159157A	5	2	2	5.2.R.3		
5	C	159364A	1	2	2	5.3.R.5		
5	C	159364A	2	2	2	5.3.R.5		
5	C	159364A	3	1	2	5.3.R.5		
5	C	159364A	4	2	2	5.3.R.5		
5	C	159364A	5	2	2	5.3.R.5		
5	C	159367A	1	2	2	5.2.R.2		
5	C	159367A	2	2	2	5.2.R.2		
5	C	159367A	3	2	2	5.2.R.2		
5	C	159367A	4	2	2	5.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	C	159367A	5	2	2	5.2.R.2		
5	C	159398A	1	2	2	5.3.R.1		
5	C	159398A	2	2	2	5.3.R.1		
5	C	159398A	3	2	2	5.3.R.1		
5	C	159398A	4	3	2	5.3.R.1		
5	C	159398A	5	2	2	5.3.R.1		
5	C	159474A	1	2	2	5.4.R.5		
5	C	159474A	2	2	2	5.4.R.5		
5	C	159474A	3	2	2	5.4.R.5		
5	C	159474A	4	2	2	5.4.R.5		
5	C	159474A	5	2	2	5.4.R.5		
5	C	159477A	1	2	2	5.6.R.3		
5	C	159477A	2	2	2	5.6.R.3		
5	C	159477A	3	3	2	5.6.R.3		
5	C	159477A	4	2	2	5.6.R.3		
5	C	159477A	5	2	2	5.8.R		
5	C	160270A	1	2	2	5.2.R.1		
5	C	160270A	2	2	2	5.2.R.3		
5	C	160270A	3	2	2	5.2.R.3		
5	C	160270A	4	2	2	5.2.R.1		
5	C	160270A	5	2	2	5.2.R.3		
5	C	160276A	1	3	2	5.3.R.1		
5	C	160276A	2	2	2	5.3.R.1		
5	C	160276A	3	2	2	5.3.R.1		
5	C	160276A	4	3	2	5.3.R.1		
5	C	160276A	5	2	2	5.3.R.1		
5	C	160288A	1	3	2	5.3.R.3		
5	C	160288A	2	2	2	5.3.R.3		
5	C	160288A	3	2	2	5.3.R.3		
5	C	160288A	4	3	2	5.3.R.3		
5	C	160288A	5	2	2	5.3.R.3		
5	C	160514A	1	2	2	5.3.R.6		
5	C	160514A	2	2	2	5.3.R.6		
5	C	160514A	3	2	2	5.3.R.6		
5	C	160514A	4	2	2	5.3.R.6		
5	C	160514A	5	2	2	5.3.R.6		
5	C	160516A	1	1	2	5.3.R.4		
5	C	160516A	2	1	2	5.3.R.4		
5	C	160516A	3	1	2	5.3.R.4		
5	C	160516A	4	1	2	5.3.R.4		
5	C	160516A	5	2	2	5.3.R.4		
5	C	160568A	1	1	2	5.4.R.2		
5	C	160568A	2	1	2	5.4.R.2		
5	C	160568A	3	2	2	5.4.R.2		
5	C	160568A	4	2	2	5.4.R.2	5.4.R.3	
5	C	160568A	5	2	2	5.4.R.2		
5	C	160573A	1	2	2	5.4.R.4		
5	C	160573A	2	1	2	5.4.R.4		
5	C	160573A	3	2	2	5.4.R.4		
5	C	160573A	4	2	2	5.4.R.4	5.4.R.3	
5	C	160573A	5	1	2	5.4.R.4		
5	C	160579A	1	2	2	5.2.R.2		
5	C	160579A	2	2	2	5.2.R.2		
5	C	160579A	3	2	2	5.2.R.2		
5	C	160579A	4	2	2	5.2.R.2		
5	C	160579A	5	2	2	5.2.R.2		
5	C	160681A	1	1	2	5.3.R.4		
5	C	160681A	2	1	2	5.3.R.4		
5	C	160681A	3	2	2	5.3.R.4		
5	C	160681A	4	2	2	5.3.R.4		
5	C	160681A	5	2	2	5.3.R.4		
5	C	160682A	1	2	2	5.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	C	160682A	2	2	2	5.2.R.2		
5	C	160682A	3	2	2	5.2.R.2		
5	C	160682A	4	2	2	5.2.R.2		
5	C	160682A	5	2	2	5.2.R.2		
5	C	483130	1	1	2	5.5.W.1		
5	C	483130	2	1	2	5.5.W.1		
5	C	483130	3	2	2	5.5.W.1		
5	C	483130	4	2	2	5.5.W.1		
5	C	483130	5	2	2	5.5.W.1		
5	C	483138	1	1	2	5.5.W.2		
5	C	483138	2	2	2	5.5.W.2		
5	C	483138	3	2	2	5.5.W.1		
5	C	483138	4	2	2	5.5.W.2		
5	C	483138	5	2	2	5.5.W.2		
5	C	483144	1	1	2	5.5.W.3		
5	C	483144	2	2	2	5.5.W.3		
5	C	483144	3	1	2	5.5.W.3		
5	C	483144	4	2	2	5.5.W.5		
5	C	483144	5	2	2	5.5.W.3		
5	C	483148	1	1	2	5.5.W.4		
5	C	483148	2	2	2	5.5.W.4		
5	C	483148	3	1	2	5.5.W.4		
5	C	483148	4	2	2	5.5.W.4		
5	C	483148	5	1	2	5.5.W.4		
5	C	483154	1	1	2	5.5.W.5		
5	C	483154	2	2	2	5.5.W.5		
5	C	483154	3	2	2	5.5.W.5		
5	C	483154	4	2	2	5.5.W.5		
5	C	483154	5	2	2	5.5.W.5		
5	C	483162	1	1	2	5.5.R.1		
5	C	483162	2	1	2	5.5.R.1		
5	C	483162	3	1	2	5.5.R.1		
5	C	483162	4	1	2	5.5.R.1		
5	C	483162	5	1	2	5.5.R.1		
5	C	485397	1	2	2	5.2.R.1		
5	C	485397	2	2	2	5.2.R.1		
5	C	485397	3	2	2	5.2.R.1		
5	C	485397	4	3	2	5.2.R.1		
5	C	485397	5	2	2	5.2.R.1		
5	C	485399	1	2	2	5.2.R.3		
5	C	485399	2	2	2	5.2.R.3		
5	C	485399	3	3	2	5.2.R.3		
5	C	485399	4	3	2	5.2.R.3		
5	C	485399	5	2	2	5.2.R.3		
5	C	485401	1	2	2	5.6.R.1		
5	C	485401	2	2	2	5.6.R.1		
5	C	485401	3	3	2	5.6.R.1		
5	C	485401	4	3	2	5.6.R.1		
5	C	485401	5	3	2	5.6.R.1		
5	C	485403	1	2	2	5.6.R.3		
5	C	485403	2	2	2	5.6.R.3		
5	C	485403	3	3	2	5.8.R		
5	C	485403	4	3	2	5.6.R.3		
5	C	485403	5	2	2	5.8.R		
5	C	485417	1	2	2	5.3.R.3		
5	C	485417	2	2	2	5.3.R.3		
5	C	485417	3	2	2	5.3.R.3		
5	C	485417	4	3	2	5.3.R.3		
5	C	485417	5	2	2	5.3.R.3		
5	C	485423	1	2	2	5.4.R.3		
5	C	485423	2	1	2	5.4.R.5		
5	C	485423	3	2	2	5.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	C	485423	4	2	2	5.4.R.5	5.3.R.3	
5	C	485423	5	1	2	5.4.R.3		
5	C	485425	1	2	2	5.6.R.1		
5	C	485425	2	2	2	5.6.R.3		
5	C	485425	3	3	2	5.6.R.1		
5	C	485425	4	3	2	5.6.R.1		
5	C	485425	5	3	2	5.6.R.1		
5	C	488027	1	2	2	5.3.R.7		
5	C	488027	2	2	2	5.3.R.7		
5	C	488027	3	3	1	5.2.R.1	5.3.R.7	
5	C	488027	4	3	2	5.3.R.7	5.2.R.1	
5	C	488027	5	2	2	5.3.R.7		
6	A	147283A	1	2	2	6.2.R.1		
6	A	147283A	2	2	2	6.2.R.1		
6	A	147283A	3	2	2	6.2.R.3		
6	A	147283A	4	3	2	6.3.R.3		
6	A	147289A	1	3	2	6.2.R.2		
6	A	147289A	2	2	2	6.2.R.2		
6	A	147289A	3	3	2	6.2.R.2		
6	A	147289A	4	2	2	6.2.R.2		
6	A	147290A	1	2	2	6.6.R.2		
6	A	147290A	2	2	2	6.6.R.3		
6	A	147290A	3	3	2	6.6.R.3		
6	A	147290A	4	2	1	6.6.R.3		
6	A	149396A	1	3	2	6.2.R.2		
6	A	149396A	2	2	2	6.2.R.2		
6	A	149396A	3	3	2	6.2.R.2		
6	A	149396A	4	2	2	6.2.R.2		
6	A	149400A	1	1	2	6.4.R.2		
6	A	149400A	2	1	2	6.4.R.2		
6	A	149400A	3	1	2	6.4.R.2		
6	A	149400A	4	1	2	6.4.R.2		
6	A	149414A	1	3	2	6.3.R.3		
6	A	149414A	2	3	2	6.3.R.3		
6	A	149414A	3	3	2	6.3.R.3		
6	A	149414A	4	3	2	6.3.R.7		
6	A	149458A	1	1	2	6.4.R.3		
6	A	149458A	2	2	2	6.4.R.3		
6	A	149458A	3	2	2	6.4.R.3		
6	A	149458A	4	2	2	6.4.R.3		
6	A	149466A	1	2	2	6.2.R.1		
6	A	149466A	2	2	2	6.2.R.3		
6	A	149466A	3	2	2	6.2.R.3		
6	A	149466A	4	2	2	6.2.R.3		
6	A	149570A	1	1	2	6.4.R.2		
6	A	149570A	2	1	2	6.4.R.2		
6	A	149570A	3	1	2	6.4.R.2		
6	A	149570A	4	2	2	6.4.R.2		
6	A	149571A	1	2	2	6.2.R.1		
6	A	149571A	2	2	2	6.2.R.3		
6	A	149571A	3	2	2	6.2.R.3		
6	A	149571A	4	2	2	6.2.R.3		
6	A	149737A	1	1	2	6.4.R.2		
6	A	149737A	2	2	2	6.4.R.2		
6	A	149737A	3	2	2	6.4.R.2		
6	A	149737A	4	1	2	6.4.R.2		
6	A	154490A	1	2	2	6.4.R.2		
6	A	154490A	2	1	2	6.4.R.2		
6	A	154490A	3	1	2	6.4.R.2		
6	A	154490A	4	1	2	6.4.R.2		
6	A	158700A	1	2	2	6.4.R.3		
6	A	158700A	2	2	2	6.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	158700A	3	2	2	6.4.R.3		
6	A	158700A	4	2	2	6.4.R.3		
6	A	158702A	1	1	2	6.4.R.3		
6	A	158702A	2	2	2	6.4.R.3		
6	A	158702A	3	2	2	6.4.R.3		
6	A	158702A	4	2	2	6.4.R.3		
6	A	158705A	1	1	1	6.4.R.2		
6	A	158705A	2	2	2	6.4.R.3		
6	A	158705A	3	2	2	6.4.R.3		
6	A	158705A	4	2	2	6.4.R.3		
6	A	158723A	1	2	2	6.4.R.2		
6	A	158723A	2	1	2	6.4.R.2		
6	A	158723A	3	1	2	6.4.R.2		
6	A	158723A	4	1	2	6.4.R.2		
6	A	158739A	1	2	2	6.3.R.7		
6	A	158739A	2	2	2	6.2.R.1		
6	A	158739A	3	2	2	6.2.R.1		
6	A	158739A	4	2	2	6.2.R.1		
6	A	158740A	1	2	2	6.2.R.1		
6	A	158740A	2	1	2	6.2.R.1		
6	A	158740A	3	2	2	6.2.R.3		
6	A	158740A	4	2	2	6.2.R.3		
6	A	158747A	1	2	2	6.3.R.6		
6	A	158747A	2	3	2	6.3.R.7		
6	A	158747A	3	3	2	6.3.R.7		
6	A	158747A	4	2	2	6.3.R.6		
6	A	158756A	1	2	2	6.3.R.7		
6	A	158756A	2	3	2	6.3.R.7		
6	A	158756A	3	3	2	6.3.R.7		
6	A	158756A	4	2	2	6.2.R.1		
6	A	158772A	1	2	2	6.2.R.1		
6	A	158772A	2	2	2	6.2.R.1		
6	A	158772A	3	2	2	6.2.R.3		
6	A	158772A	4	2	2	6.2.R.3		
6	A	158774A	1	2	2	6.2.R.1		
6	A	158774A	2	2	2	6.2.R.1		
6	A	158774A	3	2	2	6.2.R.1		
6	A	158774A	4	3	2	6.2.R.1		
6	A	158786A	1	2	2	6.3.R.7		
6	A	158786A	2	2	2	6.2.R.1		
6	A	158786A	3	2	2	6.2.R.1		
6	A	158786A	4	3	2	6.2.R.1		
6	A	158811A	1	2	2	6.3.R.6		
6	A	158811A	2	2	2	6.3.R.6		
6	A	158811A	3	2	2	6.3.R.6		
6	A	158811A	4	3	2	6.3.R.6		
6	A	158830A	1	2	2	6.2.R.2		
6	A	158830A	2	2	2	6.2.R.2		
6	A	158830A	3	2	2	6.2.R.2		
6	A	158830A	4	2	2	6.2.R.2		
6	A	158858A	1	3	2	6.3.R.3		
6	A	158858A	2	3	2	6.3.R.3		
6	A	158858A	3	3	2	6.3.R.3		
6	A	158858A	4	3	2	6.3.R.3		
6	A	158886A	1	2	2	6.3.R.4		
6	A	158886A	2	2	2	6.3.R.4		
6	A	158886A	3	3	2	6.3.R.4		
6	A	158886A	4	2	2	6.3.R.4		
6	A	158893A	1	2	2	6.6.R.3		
6	A	158893A	2	2	2	6.6.R.3		
6	A	158893A	3	3	2	6.6.R.3		
6	A	158893A	4	2	2	6.6.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	158897A	1	2	2	6.6.R.2		
6	A	158897A	2	2	2	6.6.R.3		
6	A	158897A	3	3	2	6.6.R.3		
6	A	158897A	4	2	2	6.6.R.3		
6	A	158935A	1	2	2	6.4.R.3		
6	A	158935A	2	2	2	6.4.R.3		
6	A	158935A	3	2	2	6.4.R.3		
6	A	158935A	4	2	2	6.4.R.3		
6	A	158937A	1	2	2	6.3.R.6		
6	A	158937A	2	2	2	6.3.R.6		
6	A	158937A	3	2	2	6.3.R.6		
6	A	158937A	4	3	2	6.3.R.6		
6	A	158943A	1	2	2	6.2.R.1		
6	A	158943A	2	3	2	6.2.R.1		
6	A	158943A	3	3	2	6.2.R.1		
6	A	158943A	4	3	2	6.3.R.6		
6	A	158947A	1	2	2	6.2.R.1		
6	A	158947A	2	2	2	6.2.R.3		
6	A	158947A	3	3	2	6.4.R.3		
6	A	158947A	4	2	2	6.4.R.3		
6	A	158954A	1	2	2	6.4.R.3		
6	A	158954A	2	2	2	6.4.R.3		
6	A	158954A	3	2	2	6.4.R.3		
6	A	158954A	4	2	2	6.4.R.3		
6	A	158978A	1	3	2	6.6.R.3		
6	A	158978A	2	2	2	6.6.R.3		
6	A	158978A	3	2	2	6.6.R.3		
6	A	158978A	4	2	1	6.6.R.3	6.8.R	
6	A	159058A	1	2	2	6.3.R.7		
6	A	159058A	2	2	2	6.2.R.1		
6	A	159058A	3	2	2	6.4.R.3		
6	A	159058A	4	2	2	6.2.R.1		
6	A	159281A	1	2	2	6.4.R.3		
6	A	159281A	2	2	2	6.4.R.3		
6	A	159281A	3	2	2	6.4.R.3		
6	A	159281A	4	2	2	6.4.R.3		
6	A	159286A	1	2	2	6.2.R.3		
6	A	159286A	2	2	2	6.2.R.1		
6	A	159286A	3	3	2	6.3.R.7		
6	A	159286A	4	2	1	6.2.R.3		
6	A	159297A	1	1	2	6.2.R.2		
6	A	159297A	2	1	2	6.2.R.2		
6	A	159297A	3	1	2	6.2.R.2		
6	A	159297A	4	1	2	6.2.R.2		
6	A	159451A	1	2	2	6.3.R.4		
6	A	159451A	2	3	2	6.3.R.4		
6	A	159451A	3	3	2	6.3.R.4		
6	A	159451A	4	2	2	6.3.R.4		
6	A	159453A	1	2	2	6.6.R.1		
6	A	159453A	2	2	2	6.6.R.3		
6	A	159453A	3	3	2	6.6.R.3		
6	A	159453A	4	2	2	6.7.R.1		
6	A	159454A	1	2	2	6.3.R.7		
6	A	159454A	2	2	2	6.3.R.7		
6	A	159454A	3	3	2	6.2.R.3		
6	A	159454A	4	3	2	6.3.R.6		
6	A	159455A	1	2	2	6.3.R.6		
6	A	159455A	2	2	2	6.3.R.6		
6	A	159455A	3	2	2	6.2.R.1		
6	A	159455A	4	3	2	6.3.R.6		
6	A	159457A	1	2	2	6.2.R.2		
6	A	159457A	2	2	2	6.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	159457A	3	2	2	6.2.R.2		
6	A	159457A	4	2	2	6.2.R.2		
6	A	159458A	1	2	2	6.3.R.3		
6	A	159458A	2	2	2	6.3.R.3		
6	A	159458A	3	3	2	6.3.R.3		
6	A	159458A	4	3	2	6.3.R.3		
6	A	485443	1	3	2	6.6.R.1		
6	A	485443	2	3	2	6.6.R.1		
6	A	485443	3	3	2	6.6.R.1		
6	A	485443	4	3	2	6.6.W.2		
6	A	485688	1	2	2	6.2.R.2		
6	A	485688	2	2	2	6.2.R.2		
6	A	485688	3	2	2	6.3.R.2		
6	A	485688	4	2	2	6.2.R.2		
6	A	485698	1	2	2	6.3.R.6		
6	A	485698	2	3	1	6.3.R.1		
6	A	485698	3	2	1	6.3.R.2	6.3.R.1	
6	A	485698	4	2	2	6.3.R.5		
6	A	485700	1	2	2	6.2.R.1		
6	A	485700	2	3	2	6.3.R.5		
6	A	485700	3	3	2	6.3.R.5		
6	A	485700	4	3	2	6.3.R.5		
6	A	485702	1	2	2	6.2.R.2		
6	A	485702	2	2	2	6.2.R.2		
6	A	485702	3	3	2	6.2.R.2		
6	A	485702	4	2	2	6.2.R.2		
6	A	485986	1	1	2	6.5.R.2		
6	A	485986	2	2	2	6.5.R.2		
6	A	485986	3	2	2	6.5.R.2		
6	A	485986	4	1	2	6.5.R.2		
6	A	486350	1	1	2	6.5.W.1		
6	A	486350	2	2	2	6.5.W.1		
6	A	486350	3	2	2	6.5.W.1		
6	A	486350	4	1	2	6.5.W.1		
6	A	486369	1	2	2	6.5.R.1		
6	A	486369	2	2	2	6.5.W.2		
6	A	486369	3	2	2	6.5.R.1		
6	A	486369	4	1	2	6.5.R.1		
6	A	486371	1	2	2	6.5.W.1		
6	A	486371	2	2	2	6.5.W.1		
6	A	486371	3	2	2	6.5.W.1		
6	A	486371	4	2	2	6.5.W.1		
6	A	486376	1	2	2	6.5.W.5		
6	A	486376	2	2	2	6.5.W.3		
6	A	486376	3	2	2	6.5.W.5		
6	A	486376	4	2	2	6.5.W.5		
6	A	486378	1	2	2	6.5.W.2		
6	A	486378	2	3	2	6.5.W.2		
6	A	486378	3	3	2	6.5.W.2		
6	A	486378	4	2	2	6.5.W.2		
6	B	147159A	1	2	2	6.3.R.4		
6	B	147159A	2	2	2	6.3.R.4		
6	B	147159A	3	3	2	6.3.R.4		
6	B	147159A	4	2	2	6.3.R.4		
6	B	147165A	1	3	2	6.2.R.2		
6	B	147165A	2	3	2	6.3.R.7		
6	B	147165A	3	3	2	6.3.R.7		
6	B	147165A	4	3	2	6.3.R.7		
6	B	147166A	1	2	2	6.3.R.1		
6	B	147166A	2	3	2	6.3.R.1		
6	B	147166A	3	3	2	6.3.R.1		
6	B	147166A	4	3	2	6.3.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	B	147252A	1	2	2	6.3.R.3		
6	B	147252A	2	3	2	6.3.R.3		
6	B	147252A	3	2	2	6.3.R.3		
6	B	147252A	4	2	2	6.3.R.3		
6	B	149494A	1	2	2	6.2.R.1		
6	B	149494A	2	1	2	6.2.R.1		
6	B	149494A	3	2	2	6.2.R.3		
6	B	149494A	4	2	2	6.2.R.3		
6	B	149499A	1	2	2	6.4.R.3		
6	B	149499A	2	1	2	6.4.R.3		
6	B	149499A	3	2	2	6.4.R.3		
6	B	149499A	4	2	2	6.4.R.3		
6	B	158860A	1	2	2	6.3.R.3		
6	B	158860A	2	3	2	6.3.R.3		
6	B	158860A	3	2	2	6.3.R.3		
6	B	158860A	4	2	2	6.3.R.3		
6	B	158996A	1	1	2	6.4.R.2		
6	B	158996A	2	1	2	6.4.R.2		
6	B	158996A	3	1	2	6.4.R.2		
6	B	158996A	4	1	2	6.4.R.2		
6	B	158998A	1	2	2	6.2.R.2		
6	B	158998A	2	1	2	6.2.R.2		
6	B	158998A	3	1	2	6.2.R.2		
6	B	158998A	4	2	2	6.2.R.2		
6	B	159006A	1	2	2	6.3.R.7		
6	B	159006A	2	3	2	6.3.R.7		
6	B	159006A	3	3	2	6.3.R.7		
6	B	159006A	4	2	2	6.3.R.7		
6	B	159011A	1	2	2	6.2.R.1		
6	B	159011A	2	2	2	6.2.R.3		
6	B	159011A	3	2	2	6.2.R.1		
6	B	159011A	4	2	2	6.2.R.3		
6	B	159016A	1	2	2	6.2.R.2		
6	B	159016A	2	2	2	6.2.R.2		
6	B	159016A	3	2	2	6.6.R.2		
6	B	159016A	4	2	2	6.2.R.2		
6	B	159018A	1	3	2	6.6.R.3		
6	B	159018A	2	2	2	6.6.R.3		
6	B	159018A	3	3	2	6.6.R.3		
6	B	159018A	4	2	1	6.6.R.3	6.8.R	
6	B	159031A	1	2	2	6.4.R.3		
6	B	159031A	2	1	2	6.4.R.3		
6	B	159031A	3	2	2	6.4.R.3		
6	B	159031A	4	2	2	6.4.R.3		
6	B	159424A	1	2	2	6.3.R.3		
6	B	159424A	2	2	2	6.3.R.3		
6	B	159424A	3	2	2	6.3.R.3		
6	B	159424A	4	2	2	6.3.R.3		
6	B	159426A	1	2	2	6.3.R.4		
6	B	159426A	2	3	2	6.3.R.4		
6	B	159426A	3	3	2	6.3.R.4		
6	B	159426A	4	3	2	6.3.R.1		
6	B	159430A	1	2	2	6.4.R.3		
6	B	159430A	2	2	2	6.4.R.3		
6	B	159430A	3	2	2	6.4.R.3		
6	B	159430A	4	2	2	6.4.R.4		
6	B	159432A	1	2	2	6.2.R.2		
6	B	159432A	2	2	2	6.2.R.2		
6	B	159432A	3	1	2	6.2.R.2		
6	B	159432A	4	1	2	6.2.R.2		
6	B	181867A	1	2	2	6.4.R.3		
6	B	181867A	2	2	2	6.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	B	181867A	3	2	2	6.4.R.3		
6	B	181867A	4	2	2	6.4.R.3		
6	B	181880A	1	2	2	6.2.R.1		
6	B	181880A	2	2	2	6.2.R.3		
6	B	181880A	3	2	2	6.2.R.3		
6	B	181880A	4	2	2	6.2.R.3		
6	B	181882A	1	2	2	6.2.R.3		
6	B	181882A	2	3	2	6.2.R.3		
6	B	181882A	3	2	2	6.2.R.3		
6	B	181882A	4	2	2	6.2.R.3		
6	B	181883A	1	2	2	6.3.R.6		
6	B	181883A	2	2	2	6.3.R.6		
6	B	181883A	3	2	2	6.3.R.6		
6	B	181883A	4	2	2	6.3.R.2		
6	B	181886A	1	3	2	6.6.R.2		
6	B	181886A	2	2	2	6.6.R.3		
6	B	181886A	3	3	2	6.6.R.3		
6	B	181886A	4	2	2	6.6.R.3		
6	B	181888A	1	2	2	6.4.R.3		
6	B	181888A	2	2	2	6.4.R.3		
6	B	181888A	3	2	2	6.4.R.3		
6	B	181888A	4	2	2	6.4.R.4		
6	B	181889A	1	1	2	6.4.R.2		
6	B	181889A	2	1	2	6.4.R.2		
6	B	181889A	3	1	2	6.4.R.2		
6	B	181889A	4	1	2	6.4.R.2		
6	B	181893A	1	3	2	6.6.R.2		
6	B	181893A	2	2	2	6.6.R.2		
6	B	181893A	3	3	2	6.6.R.3		
6	B	181893A	4	2	1	6.6.R.3	6.8.R	
6	B	181904A	1	2	2	6.2.R.2		
6	B	181904A	2	2	2	6.2.R.2		
6	B	181904A	3	1	2	6.2.R.2		
6	B	181904A	4	1	2	6.2.R.2		
6	B	181909A	1	2	2	6.3.R.6		
6	B	181909A	2	2	2	6.4.R.4		
6	B	181909A	3	2	2	6.3.R.3		
6	B	181909A	4	2	2	6.4.R.4		
6	B	485439	1	2	2	6.2.R.1		
6	B	485439	2	2	2	6.2.R.1		
6	B	485439	3	3	2	6.2.R.1		
6	B	485439	4	2	2	6.2.R.1		
6	B	485692	1	1	2	6.2.R.2		
6	B	485692	2	2	2	6.2.R.2		
6	B	485692	3	2	2	6.2.R.2		
6	B	485692	4	1	2	6.2.R.2		
6	B	485694	1	2	2	6.2.R.1		
6	B	485694	2	2	2	6.2.R.1		
6	B	485694	3	3	2	6.2.R.1		
6	B	485694	4	2	2	6.2.R.1		
6	B	485696	1	2	2	6.4.R.3		
6	B	485696	2	3	2	6.4.R.3		
6	B	485696	3	3	2	6.4.R.3		
6	B	485696	4	2	2	6.4.R.3		
6	B	486474	1	1	2	6.5.W.1		
6	B	486474	2	2	2	6.5.W.1		
6	B	486474	3	2	2	6.5.W.1		
6	B	486474	4	1	2	6.5.W.1		
6	B	486482	1	1	2	6.5.R.3		
6	B	486482	2	1	2	6.5.R.3		
6	B	486482	3	2	2	6.5.R.3		
6	B	486482	4	1	2	6.5.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	B	486494	1	1	2	6.5.R.2		
6	B	486494	2	1	2	6.5.R.2		
6	B	486494	3	1	2	6.5.R.2		
6	B	486494	4	1	2	6.5.R.2		
6	B	486504	1	2	2	6.5.W.2		
6	B	486504	2	2	2	6.5.W.2		
6	B	486504	3	2	2	6.5.W.2		
6	B	486504	4	2	2	6.5.W.2		
6	B	486517	1	2	2	6.5.W.5		
6	B	486517	2	2	2	6.5.W.5		
6	B	486517	3	2	2	6.5.W.5		
6	B	486517	4	2	2	6.5.W.5		
6	B	486523	1	1	2	6.5.R.1		
6	B	486523	2	1	2	6.5.W.2		
6	B	486523	3	2	2	6.5.R.1		
6	B	486523	4	1	2	6.5.R.1		
6	C	147258A	1	2	2	6.3.R.6		
6	C	147258A	2	3	2	6.3.R.7		
6	C	147258A	3	3	2	6.3.R.7		
6	C	147258A	4	2	2	6.3.R.6		
6	C	147260A	1	2	2	6.2.R.1		
6	C	147260A	2	2	2	6.2.R.3		
6	C	147260A	3	2	2	6.2.R.3		
6	C	147260A	4	2	2	6.2.R.3		
6	C	147261A	1	2	2	6.2.R.2		
6	C	147261A	2	2	2	6.2.R.2		
6	C	147261A	3	1	2	6.2.R.2		
6	C	147261A	4	2	2	6.2.R.2		
6	C	149526A	1	1	2	6.4.R.5		
6	C	149526A	2	1	2	6.4.R.5		
6	C	149526A	3	2	2	6.4.R.4		
6	C	149526A	4	2	2	6.4.R.5		
6	C	149531A	1	2	2	6.2.R.1		
6	C	149531A	2	3	2	6.2.R.3		
6	C	149531A	3	2	2	6.2.R.3		
6	C	149531A	4	3	2	6.2.R.3		
6	C	149536A	1	2	2	6.3.R.6		
6	C	149536A	2	2	2	6.3.R.6		
6	C	149536A	3	2	2	6.3.R.6		
6	C	149536A	4	3	2	6.3.R.6		
6	C	149538A	1	2	2	6.2.R.2		
6	C	149538A	2	2	2	6.2.R.2		
6	C	149538A	3	1	2	6.2.R.2		
6	C	149538A	4	1	2	6.2.R.2		
6	C	149587A	1	2	2	6.2.R.2		
6	C	149587A	2	2	2	6.2.R.2		
6	C	149587A	3	1	2	6.2.R.2		
6	C	149587A	4	2	2	6.2.R.2		
6	C	149592A	1	2	2	6.6.R.3		
6	C	149592A	2	1	2	6.4.R.5		
6	C	149592A	3	2	2	6.4.R.4		
6	C	149592A	4	2	1	6.4.R.4	6.8.R	
6	C	149718A	1	2	2	6.4.R.3		
6	C	149718A	2	2	2	6.4.R.3		
6	C	149718A	3	2	2	6.4.R.3		
6	C	149718A	4	2	2	6.4.R.3		
6	C	149724A	1	2	2	6.2.R.1		
6	C	149724A	2	2	2	6.2.R.3		
6	C	149724A	3	2	2	6.2.R.1		
6	C	149724A	4	2	2	6.2.R.3		
6	C	149726A	1	2	2	6.6.R.3		
6	C	149726A	2	2	2	6.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	C	149726A	3	1	2	6.2.R.2		
6	C	149726A	4	2	2	6.2.R.2		
6	C	158760A	1	2	2	6.2.R.1		
6	C	158760A	2	3	2	6.3.R.7		
6	C	158760A	3	3	2	6.3.R.7		
6	C	158760A	4	3	2	6.3.R.7		
6	C	158775A	1	2	2	6.2.R.3		
6	C	158775A	2	3	2	6.2.R.3		
6	C	158775A	3	3	2	6.2.R.3		
6	C	158775A	4	2	2	6.2.R.3		
6	C	158782A	1	1	2	6.2.R.1		
6	C	158782A	2	2	2	6.2.R.3		
6	C	158782A	3	2	2	6.2.R.1		
6	C	158782A	4	2	2	6.2.R.3		
6	C	158827A	1	2	2	6.2.R.2		
6	C	158827A	2	2	2	6.2.R.2		
6	C	158827A	3	1	2	6.2.R.2		
6	C	158827A	4	2	2	6.2.R.2		
6	C	158877A	1	1	2	6.3.R.4		
6	C	158877A	2	1	2	6.3.R.3		
6	C	158877A	3	2	2	6.3.R.4		
6	C	158877A	4	2	2	6.3.R.4		
6	C	159272A	1	1	2	6.4.R.2		
6	C	159272A	2	2	2	6.4.R.2		
6	C	159272A	3	1	2	6.4.R.2		
6	C	159272A	4	2	2	6.4.R.2		
6	C	159273A	1	2	2	6.4.R.3		
6	C	159273A	2	2	2	6.4.R.3		
6	C	159273A	3	2	2	6.4.R.3		
6	C	159273A	4	2	2	6.4.R.4		
6	C	159344A	1	2	2	6.4.R.3		
6	C	159344A	2	1	2	6.4.R.3		
6	C	159344A	3	2	2	6.4.R.3		
6	C	159344A	4	2	2	6.4.R.4		
6	C	159346A	1	2	2	6.3.R.4		
6	C	159346A	2	2	2	6.3.R.4		
6	C	159346A	3	3	2	6.3.R.4		
6	C	159346A	4	2	2	6.3.R.4		
6	C	159353A	1	2	2	6.3.R.4		
6	C	159353A	2	3	2	6.3.R.4		
6	C	159353A	3	3	2	6.3.R.4		
6	C	159353A	4	2	2	6.3.R.4		
6	C	159418A	1	3	2	6.6.R.3		
6	C	159418A	2	2	2	6.6.R.2		
6	C	159418A	3	3	2	6.6.R.3		
6	C	159418A	4	2	1	6.6.R.3	6.8.R	
6	C	181821A	1	2	2	6.2.R.1		
6	C	181821A	2	3	2	6.3.R.7		
6	C	181821A	3	3	2	6.3.R.7		
6	C	181821A	4	3	2	6.3.R.7		
6	C	181824A	1	2	2	6.2.R.2		
6	C	181824A	2	2	2	6.2.R.2		
6	C	181824A	3	1	2	6.2.R.2		
6	C	181824A	4	2	2	6.2.R.2		
6	C	181832A	1	2	2	6.6.R.3		
6	C	181832A	2	2	2	6.6.R.3		
6	C	181832A	3	3	2	6.6.R.3		
6	C	181832A	4	2	1	6.6.R.3	6.8.R	
6	C	485437	1	2	2	6.4.R.3		
6	C	485437	2	2	2	6.4.R.3		
6	C	485437	3	2	2	6.4.R.3		
6	C	485437	4	2	2	6.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	C	485690	1	2	2	6.4.R.3		
6	C	485690	2	2	2	6.4.R.3		
6	C	485690	3	2	2	6.4.R.3		
6	C	485690	4	2	2	6.4.R.3		
6	C	485704	1	2	2	6.2.R.2		
6	C	485704	2	1	2	6.2.R.2		
6	C	485704	3	1	2	6.2.R.2		
6	C	485704	4	1	2	6.2.R.2		
6	C	485706	1	2	2	6.3.R.4		
6	C	485706	2	3	2	6.3.R.7		
6	C	485706	3	3	2	6.3.R.7		
6	C	485706	4	3	2	6.3.R.7		
6	C	485708	1	2	2	6.3.R.7		
6	C	485708	2	3	2	6.3.R.7		
6	C	485708	3	3	2	6.3.R.7		
6	C	485708	4	3	2	6.3.R.7		
6	C	485710	1	2	2	6.4.R.3		
6	C	485710	2	2	2	6.4.R.3		
6	C	485710	3	2	2	6.4.R.3		
6	C	485710	4	2	2	6.4.R.3		
6	C	486538	1	1	2	6.5.W.1		
6	C	486538	2	1	2	6.5.W.1		
6	C	486538	3	1	2	6.5.W.1		
6	C	486538	4	1	2	6.5.W.1		
6	C	486553	1	1	2	6.5.R.3		
6	C	486553	2	1	2	6.5.R.3		
6	C	486553	3	1	2	6.5.R.3		
6	C	486553	4	1	2	6.5.R.3		
6	C	486562	1	2	2	6.5.W.2		
6	C	486562	2	2	2	6.5.W.2		
6	C	486562	3	3	2	6.5.W.2		
6	C	486562	4	1	2	6.5.W.2		
6	C	486565	1	1	2	6.5.R.2		
6	C	486565	2	1	2	6.5.R.2		
6	C	486565	3	1	2	6.5.R.2		
6	C	486565	4	1	2	6.5.R.2		
6	C	486567	1	1	2	6.5.W.5		
6	C	486567	2	1	2	6.5.W.4		
6	C	486567	3	2	2	6.5.W.5		
6	C	486567	4	2	2	6.5.W.5		
6	C	486570	1	1	2	6.5.W.4		
6	C	486570	2	2	2	6.5.W.4		
6	C	486570	3	2	2	6.5.W.4		
6	C	486570	4	2	2	6.5.W.4		
7	A	148104A	1	2	2	7.3.R.4		
7	A	148104A	2	2	2	7.4.R.4		
7	A	148104A	3	2	2	7.4.R.4		
7	A	148104A	4	3	2	7.4.R.4		
7	A	148117A	1	2	2	7.2.R.2		
7	A	148117A	2	2	2	7.2.R.2		
7	A	148117A	3	1	2	7.2.R.2		
7	A	148117A	4	2	2	7.2.R.2		
7	A	148759A	1	2	2	7.4.R.4		
7	A	148759A	2	2	2	7.4.R.4		
7	A	148759A	3	3	2	7.4.R.4		
7	A	148759A	4	3	2	7.4.R.4		
7	A	148760A	1	2	2	7.3.R.4		
7	A	148760A	2	2	2	7.3.R.4		
7	A	148760A	3	2	2	7.3.R.4		
7	A	148760A	4	2	2	7.3.R.4		
7	A	148762A	1	2	2	7.2.R.1		
7	A	148762A	2	3	2	7.2.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	148762A	3	2	2	7.2.R.3		
7	A	148762A	4	3	2	7.2.R.3		
7	A	148785A	1	2	2	7.2.R.3		
7	A	148785A	2	2	2	7.2.R.1		
7	A	148785A	3	3	2	7.3.R.1		
7	A	148785A	4	3	2	7.2.R.3		
7	A	148823A	1	2	2	7.3.R.3		
7	A	148823A	2	2	2	7.3.R.3		
7	A	148823A	3	3	2	7.3.R.3		
7	A	148823A	4	3	2	7.3.R.3		
7	A	148831A	1	1	2	7.3.R.3		
7	A	148831A	2	2	2	7.3.R.3		
7	A	148831A	3	2	2	7.3.R.3		
7	A	148831A	4	2	2	7.3.R.3		
7	A	148859A	1	1	2	7.4.R.5		
7	A	148859A	2	1	2	7.4.R.5		
7	A	148859A	3	2	2	7.4.R.5		
7	A	148859A	4	2	2	7.4.R.5		
7	A	148866A	1	3	2	7.2.R.1		
7	A	148866A	2	3	2	7.3.W.4		
7	A	148866A	3	3	2	7.3.W.4		
7	A	148866A	4	3	2	7.3.W.4		
7	A	148935A	1	2	2	7.2.R.1		
7	A	148935A	2	2	2	7.2.R.3		
7	A	148935A	3	2	2	7.2.R.3		
7	A	148935A	4	2	2	7.2.R.3		
7	A	148944A	1	2	2	7.2.R.1		
7	A	148944A	2	2	2	7.2.R.3		
7	A	148944A	3	2	2	7.2.R.3		
7	A	148944A	4	2	2	7.2.R.3		
7	A	148946A	1	2	2	7.3.R.2		
7	A	148946A	2	2	2	7.2.R.2		
7	A	148946A	3	1	2	7.2.R.2		
7	A	148946A	4	2	2	7.2.R.2		
7	A	148948A	1	2	2	7.3.R.7		
7	A	148948A	2	3	2	7.3.R.7		
7	A	148948A	3	3	2	7.3.R.7		
7	A	148948A	4	3	2	7.3.R.7		
7	A	148950A	1	2	2	7.3.R.6		
7	A	148950A	2	3	2	7.3.R.7		
7	A	148950A	3	3	2	7.3.R.7		
7	A	148950A	4	3	2	7.3.R.7		
7	A	148952A	1	2	2	7.6.R.3		
7	A	148952A	2	2	2	7.6.R.3		
7	A	148952A	3	2	2	7.6.R.3		
7	A	148952A	4	2	2	7.6.R.3		
7	A	154639A	1	2	2	7.6.R.2		
7	A	154639A	2	2	2	7.6.R.3		
7	A	154639A	3	2	2	7.6.R.2		
7	A	154639A	4	2	2	7.6.R.3		
7	A	158719A	1	2	2	7.2.R.1		
7	A	158719A	2	2	2	7.2.R.1		
7	A	158719A	3	2	2	7.2.R.1		
7	A	158719A	4	3	2	7.2.R.3		
7	A	158724A	1	2	2	7.3.R.5		
7	A	158724A	2	2	2	7.3.R.5		
7	A	158724A	3	2	2	7.3.R.5		
7	A	158724A	4	2	2	7.3.R.5		
7	A	158810A	1	1	2	7.3.R.4		
7	A	158810A	2	1	2	7.3.R.4		
7	A	158810A	3	2	2	7.3.R.4		
7	A	158810A	4	2	2	7.3.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	158826A	1	2	2	7.4.R.3		
7	A	158826A	2	2	2	7.4.R.3		
7	A	158826A	3	2	2	7.4.R.3		
7	A	158826A	4	2	2	7.4.R.3		
7	A	158845A	1	2	2	7.3.R.1		
7	A	158845A	2	2	2	7.2.R.3		
7	A	158845A	3	2	2	7.2.R.3		
7	A	158845A	4	3	2	7.3.R.1		
7	A	158849A	1	2	2	7.6.R.3		
7	A	158849A	2	2	2	7.6.R.3		
7	A	158849A	3	2	2	7.6.R.3		
7	A	158849A	4	2	1	7.6.R.3	7.8.R	
7	A	159102A	1	2	2	7.4.R.4		
7	A	159102A	2	2	2	7.4.R.4		
7	A	159102A	3	2	2	7.4.R.4		
7	A	159102A	4	2	2	7.4.R.4		
7	A	159111A	1	2	2	7.2.R.1		
7	A	159111A	2	2	2	7.2.R.1		
7	A	159111A	3	2	2	7.2.R.3		
7	A	159111A	4	3	2	7.2.R.3		
7	A	159114A	1	2	2	7.2.R.1		
7	A	159114A	2	3	2	7.2.R.3		
7	A	159114A	3	2	2	7.2.R.3		
7	A	159114A	4	2	2	7.2.R.3		
7	A	159118A	1	2	2	7.6.R.3		
7	A	159118A	2	2	2	7.6.R.3		
7	A	159118A	3	2	2	7.6.R.3		
7	A	159118A	4	2	2	7.6.R.3		
7	A	159120A	1	1	2	7.4.R.2		
7	A	159120A	2	1	2	7.4.R.2		
7	A	159120A	3	1	2	7.4.R.2		
7	A	159120A	4	1	2	7.4.R.2		
7	A	159122A	1	2	2	7.2.R.1		
7	A	159122A	2	2	2	7.2.R.3		
7	A	159122A	3	2	2	7.2.R.1		
7	A	159122A	4	3	2	7.2.R.3		
7	A	159133A	1	3	2	7.3.R.6		
7	A	159133A	2	2	2	7.3.R.6		
7	A	159133A	3	3	2	7.3.R.6		
7	A	159133A	4	3	2	7.3.R.6		
7	A	159137A	1	2	2	7.6.R.3		
7	A	159137A	2	2	2	7.6.R.3		
7	A	159137A	3	2	2	7.6.R.3		
7	A	159137A	4	2	2	7.6.R.3		
7	A	159393A	1	2	2	7.4.R.3		
7	A	159393A	2	2	2	7.4.R.3		
7	A	159393A	3	2	2	7.4.R.3		
7	A	159393A	4	2	2	7.4.R.3		
7	A	159394A	1	2	2	7.3.R.4		
7	A	159394A	2	2	2	7.3.R.4		
7	A	159394A	3	2	2	7.3.R.4		
7	A	159394A	4	2	2	7.3.R.4		
7	A	159646A	1	3	2	7.2.R.3		
7	A	159646A	2	2	2	7.2.R.3		
7	A	159646A	3	2	2	7.3.R.7		
7	A	159646A	4	2	2	7.2.R.3		
7	A	160457A	1	2	2	7.2.R.2		
7	A	160457A	2	2	2	7.2.R.2		
7	A	160457A	3	2	2	7.2.R.2		
7	A	160457A	4	2	2	7.2.R.2		
7	A	160475A	1	2	2	7.4.R.4		
7	A	160475A	2	1	2	7.3.R.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	160475A	3	2	2	7.4.R.4		
7	A	160475A	4	2	2	7.4.R.4		
7	A	160498A	1	2	2	7.2.R.1		
7	A	160498A	2	2	2	7.2.R.1		
7	A	160498A	3	2	2	7.2.R.1		
7	A	160498A	4	3	2	7.2.R.3		
7	A	160508A	1	2	2	7.3.R.2		
7	A	160508A	2	2	2	7.3.R.2		
7	A	160508A	3	3	2	7.3.R.2		
7	A	160508A	4	3	2	7.3.R.2		
7	A	160511A	1	2	2	7.6.R.3		
7	A	160511A	2	2	2	7.6.R.3		
7	A	160511A	3	2	2	7.6.R.3		
7	A	160511A	4	2	1	7.6.R.3	7.8.R	
7	A	160937A	1	2	2	7.2.R.1		
7	A	160937A	2	2	2	7.2.R.3		
7	A	160937A	3	2	2	7.3.R.1		
7	A	160937A	4	2	2	7.2.R.1		
7	A	160940A	1	2	2	7.6.R.3		
7	A	160940A	2	2	2	7.6.R.3		
7	A	160940A	3	2	2	7.6.R.3		
7	A	160940A	4	2	2	7.6.R.3		
7	A	182584A	1	2	2	7.2.R.3		
7	A	182584A	2	2	2	7.2.R.3		
7	A	182584A	3	3	2	7.2.R.3		
7	A	182584A	4	2	2	7.2.R.3		
7	A	182586A	1	2	2	7.3.R.3		
7	A	182586A	2	3	2	7.3.R.3		
7	A	182586A	3	3	2	7.3.R.3		
7	A	182586A	4	2	2	7.2.R.3		
7	A	182596A	1	2	2	7.3.R.2		
7	A	182596A	2	3	2	7.3.R.2		
7	A	182596A	3	3	2	7.3.R.2		
7	A	182596A	4	3	2	7.3.R.2		
7	A	182597A	1	2	2	7.2.R.2		
7	A	182597A	2	2	2	7.2.R.2		
7	A	182597A	3	1	2	7.2.R.2		
7	A	182597A	4	2	2	7.2.R.2		
7	A	485447	1	2	2	7.2.R.1		
7	A	485447	2	2	2	7.2.R.3		
7	A	485447	3	2	2	7.2.R.1		
7	A	485447	4	3	2	7.2.R.3		
7	A	485449	1	2	2	7.2.R.2		
7	A	485449	2	2	2	7.2.R.2		
7	A	485449	3	1	2	7.2.R.2		
7	A	485449	4	2	2	7.2.R.2		
7	A	485451	1	2	2	7.3.R.4		
7	A	485451	2	2	2	7.3.R.4		
7	A	485451	3	3	2	7.3.R.4		
7	A	485451	4	2	2	7.3.R.4		
7	A	485453	1	2	2	7.6.R.3		
7	A	485453	2	2	2	7.6.R.3		
7	A	485453	3	3	2	7.6.R.3		
7	A	485453	4	2	2	7.6.R.3	7.8.R	
7	A	485455	1	2	2	7.3.R.4		
7	A	485455	2	3	2	7.3.R.4		
7	A	485455	3	3	2	7.3.R.4		
7	A	485455	4	3	2	7.3.R.4		
7	A	486286	1	1	2	7.5.W.1		
7	A	486286	2	2	2	7.5.W.1		
7	A	486286	3	2	2	7.5.W.1		
7	A	486286	4	2	2	7.5.W.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	486294	1	1	2	7.5.R.1		
7	A	486294	2	2	2	7.5.W.3		
7	A	486294	3	2	2	7.5.W.3		
7	A	486294	4	2	2	7.5.R.1		
7	A	486317	1	1	2	7.5.R.3		
7	A	486317	2	2	2	7.5.R.3		
7	A	486317	3	1	2	7.5.R.3		
7	A	486317	4	2	2	7.5.R.3		
7	A	486331	1	1	2	7.5.W.3		
7	A	486331	2	2	2	7.5.R.1		
7	A	486331	3	2	2	7.5.W.3		
7	A	486331	4	2	2	7.5.R.1		
7	A	486333	1	1	2	7.5.R.4		
7	A	486333	2	2	2	7.5.R.4		
7	A	486333	3	2	2	7.5.R.4		
7	A	486333	4	2	2	7.5.R.4		
7	A	486338	1	2	2	7.5.W.2		
7	A	486338	2	1	2	7.5.R.2		
7	A	486338	3	2	2	7.5.R.2		
7	A	486338	4	1	2	7.5.R.2		
7	B	148190A	1	2	2	7.3.R.2		
7	B	148190A	2	2	2	7.3.R.2		
7	B	148190A	3	3	2	7.3.R.2		
7	B	148190A	4	2	2	7.3.R.2		
7	B	148194A	1	2	2	7.3.R.6		
7	B	148194A	2	2	2	7.2.R.2		
7	B	148194A	3	1	2	7.2.R.2		
7	B	148194A	4	2	2	7.2.R.2		
7	B	148205A	1	2	2	7.4.R.3		
7	B	148205A	2	2	2	7.4.R.3		
7	B	148205A	3	2	2	7.4.R.3		
7	B	148205A	4	2	2	7.4.R.3		
7	B	148229A	1	2	2	7.3.R.3		
7	B	148229A	2	3	2	7.3.R.3		
7	B	148229A	3	3	2	7.3.R.7		
7	B	148229A	4	3	2	7.3.R.3		
7	B	148235A	1	2	2	7.3.R.6		
7	B	148235A	2	3	2	7.3.R.7		
7	B	148235A	3	3	2	7.3.R.7		
7	B	148235A	4	3	2	7.3.R.7		
7	B	148772A	1	1	2	7.3.R.2		
7	B	148772A	2	2	2	7.3.R.2		
7	B	148772A	3	2	2	7.3.R.2		
7	B	148772A	4	2	2	7.3.R.2		
7	B	148797A	1	2	2	7.2.W.2		
7	B	148797A	2	3	2	7.2.W.2		
7	B	148797A	3	2	2	7.2.W.2		
7	B	148797A	4	2	2	7.2.W.2		
7	B	148801A	1	2	2	7.2.R.2		
7	B	148801A	2	2	2	7.2.R.2		
7	B	148801A	3	1	2	7.2.R.2		
7	B	148801A	4	2	2	7.2.R.2		
7	B	148806A	1	2	2	7.2.R.1		
7	B	148806A	2	2	2	7.2.R.3		
7	B	148806A	3	2	2	7.2.R.3		
7	B	148806A	4	2	2	7.2.R.3		
7	B	148809A	1	2	2	7.3.R.6		
7	B	148809A	2	2	2	7.3.R.6		
7	B	148809A	3	3	2	7.3.R.6		
7	B	148809A	4	3	2	7.3.R.6		
7	B	148812A	1	2	2	7.2.R.1		
7	B	148812A	2	2	2	7.2.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	B	148812A	3	2	2	7.2.R.3		
7	B	148812A	4	2	2	7.2.R.3		
7	B	154710A	1	2	2	7.4.R.4		
7	B	154710A	2	2	2	7.4.R.4		
7	B	154710A	3	2	2	7.4.R.4		
7	B	154710A	4	3	2	7.4.R.4		
7	B	154720A	1	2	2	7.2.R.2		
7	B	154720A	2	2	2	7.2.R.2		
7	B	154720A	3	1	2	7.2.R.2		
7	B	154720A	4	2	2	7.2.R.2		
7	B	154730A	1	2	2	7.3.R.6		
7	B	154730A	2	2	2	7.3.R.6		
7	B	154730A	3	2	2	7.3.R.6		
7	B	154730A	4	3	2	7.3.R.6		
7	B	159033A	1	2	2	7.4.R.3		
7	B	159033A	2	2	2	7.4.R.3		
7	B	159033A	3	2	2	7.4.R.3		
7	B	159033A	4	2	2	7.4.R.3		
7	B	159046A	1	2	2	7.3.R.3		
7	B	159046A	2	3	2	7.3.R.3		
7	B	159046A	3	3	2	7.3.R.3		
7	B	159046A	4	2	2	7.3.R.3		
7	B	160522A	1	2	2	7.3.R.6		
7	B	160522A	2	2	2	7.3.R.6		
7	B	160522A	3	2	2	7.3.R.7		
7	B	160522A	4	2	2	7.3.R.6		
7	B	160526A	1	2	2	7.3.R.4		
7	B	160526A	2	2	2	7.3.R.4		
7	B	160526A	3	2	2	7.3.R.4		
7	B	160526A	4	2	2	7.3.R.4		
7	B	160594A	1	2	2	7.2.R.2		
7	B	160594A	2	2	2	7.2.R.2		
7	B	160594A	3	1	2	7.2.R.2		
7	B	160594A	4	2	2	7.2.R.2		
7	B	160974A	1	2	2	7.6.R.3		
7	B	160974A	2	2	2	7.6.R.3		
7	B	160974A	3	2	2	7.6.R.3		
7	B	160974A	4	2	2	7.6.R.3		
7	B	161009A	1	2	2	7.4.R.3		
7	B	161009A	2	2	2	7.4.R.3		
7	B	161009A	3	2	2	7.4.R.3		
7	B	161009A	4	2	2	7.4.R.3		
7	B	161013A	1	2	2	7.3.R.4		
7	B	161013A	2	2	2	7.3.R.4		
7	B	161013A	3	2	2	7.3.W.1		
7	B	161013A	4	2	2	7.3.R.4		
7	B	161015A	1	2	2	7.6.R.3		
7	B	161015A	2	2	2	7.6.R.3		
7	B	161015A	3	3	2	7.6.R.3		
7	B	161015A	4	2	2	7.6.R.3	7.8.R	
7	B	161017A	1	2	2	7.2.W.2		
7	B	161017A	2	3	2	7.2.W.2		
7	B	161017A	3	2	2	7.2.W.2		
7	B	161017A	4	2	2	7.2.W.2		
7	B	485445	1	2	2	7.6.R.3		
7	B	485445	2	2	2	7.6.R.3		
7	B	485445	3	3	2	7.6.R.3		
7	B	485445	4	3	2	7.6.R.3		
7	B	485457	1	2	2	7.4.R.3		
7	B	485457	2	2	2	7.4.R.3		
7	B	485457	3	2	2	7.4.R.3		
7	B	485457	4	2	2	7.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	B	485459	1	3	2	7.6.W.3		
7	B	485459	2	2		7.6.W.3		
7	B	485459	3	2	1	7.6.W.3		
7	B	485459	4	2	2	7.6.W.3		
7	B	485461	1	2	2	7.2.R.1		
7	B	485461	2	2	2	7.2.R.1		
7	B	485461	3	2	2	7.2.R.1		
7	B	485461	4	3	2	7.2.R.1		
7	B	485463	1	2	2	7.6.R.3		
7	B	485463	2	2	2	7.6.R.3		
7	B	485463	3	2	2	7.6.R.3		
7	B	485463	4	2	2	7.6.R.3	7.8.R	
7	B	485465	1	2	2	7.2.R.2		
7	B	485465	2	2	2	7.2.R.2		
7	B	485465	3	1	2	7.2.R.2		
7	B	485465	4	2	2	7.2.R.2		
7	B	486284	1	2	2	7.2.R.1		
7	B	486284	2	2	2	7.2.R.1		
7	B	486284	3	2	2	7.2.R.1		
7	B	486284	4	2	2	7.2.R.1		
7	B	486288	1	2	2	7.2.R.2		
7	B	486288	2	2	2	7.2.R.2		
7	B	486288	3	1	2	7.2.R.2		
7	B	486288	4	1	2	7.2.R.2		
7	B	486444	1	1	2	7.5.R.2		
7	B	486444	2	2	2	7.5.R.2		
7	B	486444	3	2	2	7.5.R.2		
7	B	486444	4	2	2	7.5.R.2		
7	B	486448	1	1	2	7.5.W.1		
7	B	486448	2	2	2	7.5.W.1		
7	B	486448	3	2	2	7.5.W.1		
7	B	486448	4	2	2	7.5.W.1		
7	B	486472	1	1	2	7.5.R.1		
7	B	486472	2	2	2	7.5.W.1		
7	B	486472	3	2	2	7.5.W.3		
7	B	486472	4	2	2	7.5.R.1		
7	B	486477	1	1	2	7.5.R.4		
7	B	486477	2	2	2	7.5.R.4		
7	B	486477	3	2	2	7.5.R.4		
7	B	486477	4	2	2	7.5.R.4		
7	B	486519	1	1	2	7.5.R.2		
7	B	486519	2	1	2	7.5.R.2		
7	B	486519	3	2	2	7.5.R.2		
7	B	486519	4	2	2	7.5.R.2		
7	B	486529	1	2	2	7.5.R.4		
7	B	486529	2	2	2	7.5.R.2		
7	B	486529	3	2	2	7.5.R.4		
7	B	486529	4	2	2	7.5.R.4		
7	C	148763A	1	2	2	7.3.R.4		
7	C	148763A	2	2	2	7.3.R.4		
7	C	148763A	3	2	2	7.3.R.4		
7	C	148763A	4	2	2	7.3.R.4		
7	C	148765A	1	2	2	7.4.R.3		
7	C	148765A	2	2	2	7.4.R.3		
7	C	148765A	3	2	2	7.4.R.3		
7	C	148765A	4	2	2	7.4.R.3		
7	C	148777A	1	1	2	7.2.R.1		
7	C	148777A	2	2	2	7.2.R.3		
7	C	148777A	3	2	2	7.2.R.3		
7	C	148777A	4	2	2	7.2.R.3		
7	C	148780A	1	2	2	7.6.R.3		
7	C	148780A	2	2	2	7.6.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	C	148780A	3	2	2	7.6.R.3		
7	C	148780A	4	2	2	7.6.R.3	7.8.R	
7	C	148795A	1	1	2	7.2.R.2		
7	C	148795A	2	2	2	7.2.R.2		
7	C	148795A	3	1	2	7.2.R.2		
7	C	148795A	4	2	2	7.2.R.2		
7	C	148796A	1	1	2	7.4.R.2		
7	C	148796A	2	2	2	7.4.R.2		
7	C	148796A	3	1	2	7.4.R.2		
7	C	148796A	4	2	2	7.4.R.2		
7	C	148800A	1	2	2	7.3.R.3		
7	C	148800A	2	2	2	7.3.R.3		
7	C	148800A	3	2	2	7.3.R.3		
7	C	148800A	4	3	2	7.3.R.3		
7	C	158765A	1	1	2	7.4.R.2		
7	C	158765A	2	1	2	7.4.R.2		
7	C	158765A	3	1	2	7.4.R.2		
7	C	158765A	4	2	2	7.4.R.2		
7	C	158766A	1	2	2	7.3.R.6		
7	C	158766A	2	2	2	7.2.R.3		
7	C	158766A	3	2	2	7.2.R.3		
7	C	158766A	4	2	2	7.2.R.3		
7	C	158768A	1	1	2	7.2.R.2		
7	C	158768A	2	2	2	7.2.R.2		
7	C	158768A	3	1	2	7.2.R.2		
7	C	158768A	4	2	2	7.2.R.2		
7	C	158769A	1	2	2	7.6.R.2		
7	C	158769A	2	2	2	7.6.R.3		
7	C	158769A	3	2	2	7.6.R.3		
7	C	158769A	4	2	2	7.6.R.3		
7	C	158819A	1	2	2	7.4.R.4		
7	C	158819A	2	2	2	7.4.R.4		
7	C	158819A	3	2	2	7.4.R.4		
7	C	158819A	4	3	2	7.4.R.4		
7	C	158833A	1	2	2	7.3.R.6		
7	C	158833A	2	2	2	7.2.R.3		
7	C	158833A	3	2	2	7.3.R.3		
7	C	158833A	4	3	2	7.3.R.3		
7	C	158847A	1	2	2	7.3.R.6		
7	C	158847A	2	2	2	7.3.R.7		
7	C	158847A	3	2	2	7.3.R.7		
7	C	158847A	4	2	2	7.3.R.4		
7	C	158871A	1	2	2	7.3.R.6		
7	C	158871A	2	2	2	7.3.R.6		
7	C	158871A	3	2	2	7.3.R.6		
7	C	158871A	4	2	2	7.3.R.6		
7	C	158888A	1	2	2	7.2.R.1		
7	C	158888A	2	2	2	7.2.R.1		
7	C	158888A	3	2	2	7.2.R.1		
7	C	158888A	4	2	2	7.2.R.3		
7	C	158892A	1	2	2	7.3.R.5		
7	C	158892A	2	2	2	7.3.R.5		
7	C	158892A	3	2	2	7.3.R.5		
7	C	158892A	4	2	2	7.3.R.5		
7	C	158896A	1	1	2	7.2.R.2		
7	C	158896A	2	2	2	7.2.R.2		
7	C	158896A	3	1	2	7.2.R.2		
7	C	158896A	4	2	2	7.2.R.2		
7	C	158906A	1	2	2	7.3.R.6		
7	C	158906A	2	2	2	7.2.R.3		
7	C	158906A	3	2	2	7.3.W.4		
7	C	158906A	4	2	2	7.3.W.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	C	160692A	1	2	2	7.3.R.2		
7	C	160692A	2	2	2	7.3.R.2		
7	C	160692A	3	3	2	7.3.R.2		
7	C	160692A	4	3	2	7.3.R.2		
7	C	160706A	1	2	2	7.2.R.2		
7	C	160706A	2	2	2	7.2.R.2		
7	C	160706A	3	1	2	7.2.R.2		
7	C	160706A	4	2	2	7.2.R.2		
7	C	160835A	1	2	2	7.6.R.2		
7	C	160835A	2	2	2	7.6.R.3		
7	C	160835A	3	2	2	7.6.R.3		
7	C	160835A	4	2	2	7.6.R.3	7.8.R	
7	C	161047A	1	2	2	7.3.R.3		
7	C	161047A	2	2	2	7.3.R.3		
7	C	161047A	3	3	2	7.3.R.3		
7	C	161047A	4	3	2	7.3.R.3		
7	C	485467	1	2	2	7.3.R.3		
7	C	485467	2	2	2	7.2.R.2		
7	C	485467	3	1	2	7.2.R.2		
7	C	485467	4	2	2	7.2.R.2		
7	C	486290	1	2	2	7.3.R.5		
7	C	486290	2	2	2	7.3.R.5		
7	C	486290	3	2	2	7.3.R.5		
7	C	486290	4	2	2	7.3.R.5		
7	C	486292	1	3	2	7.6.W.3		
7	C	486292	2	2	2	7.6.W.3		
7	C	486292	3	2	2	7.6.W.3		
7	C	486292	4	2	2	7.6.W.3		
7	C	486298	1	2	2	7.3.R.1		
7	C	486298	2	2	2	7.3.R.1		
7	C	486298	3	3	2	7.3.R.1		
7	C	486298	4	3	2	7.3.R.1		
7	C	486300	1	2	2	7.3.R.3		
7	C	486300	2	2	2	7.2.R.2		
7	C	486300	3	1	2	7.2.R.2		
7	C	486300	4	2	2	7.2.R.2		
7	C	486302	1	2	2	7.2.R.1		
7	C	486302	2	2	2	7.2.R.3		
7	C	486302	3	2	2	7.2.R.3		
7	C	486302	4	2	2	7.2.R.3		
7	C	486304	1	2	2	7.6.W.3		
7	C	486304	2	3	2	7.6.R.1		
7	C	486304	3	2	2	7.6.R.3		
7	C	486304	4	2	2	7.6.R.1		
7	C	486306	1	2	2	7.2.R.1		
7	C	486306	2	2	2	7.2.R.1		
7	C	486306	3	2	2	7.2.R.1		
7	C	486306	4	3	2	7.2.R.3		
7	C	486595	1	2	2	7.5.R.1		
7	C	486595	2	2	2	7.5.W.3		
7	C	486595	3	2	2	7.5.R.1		
7	C	486595	4	2	2	7.5.R.1		
7	C	486597	1	1	2	7.5.R.2		
7	C	486597	2	2	2	7.5.R.2		
7	C	486597	3	2	2	7.5.R.2		
7	C	486597	4	2	2	7.5.R.2		
7	C	486607	1	1	2	7.5.R.1		
7	C	486607	2	2	2	7.5.W.3		
7	C	486607	3	2	2	7.5.R.1		
7	C	486607	4	2	2	7.5.R.1		
7	C	486613	1	1	2	7.5.W.1		
7	C	486613	2	2	2	7.5.W.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	C	486613	3	1	2	7.5.W.1		
7	C	486613	4	1	2	7.5.W.1		
7	C	486661	1	1	2	7.5.R.4		
7	C	486661	2	2	2	7.5.R.4		
7	C	486661	3	2	2	7.5.R.4		
7	C	486661	4	2	2	7.5.R.4		
7	C	486665	1	2	2	7.5.R.2		
7	C	486665	2	2	2	7.5.R.2		
7	C	486665	3	2	2	7.5.W.2		
7	C	486665	4	2	2	7.5.R.2		
8	A	148177A	1	2	2	8.3.R.6		
8	A	148177A	2	3	2	8.3.R.4		
8	A	148177A	3	3	2	8.3.R.4		
8	A	148177A	4	3	2	8.3.R.4		
8	A	148187A	1	2	2	8.4.R.3		
8	A	148187A	2	2	2	8.4.R.3		
8	A	148187A	3	2	2	8.4.R.4		
8	A	148187A	4	2	2	8.4.R.3		
8	A	148189A	1	2	2	8.2.R.2		
8	A	148189A	2	2	2	8.2.R.3		
8	A	148189A	3	1	2	8.2.R.2		
8	A	148189A	4	2	2	8.2.R.2		
8	A	148191A	1	2	2	8.3.R.1		
8	A	148191A	2	2	1	8.3.R.1		
8	A	148191A	3	2	1	8.3.R.1		
8	A	148191A	4	2	2	8.3.R.1		
8	A	149371A	1	2	2	8.3.R.4		
8	A	149371A	2	2	2	8.3.R.3		
8	A	149371A	3	2	2	8.3.R.4		
8	A	149371A	4	2	2	8.3.R.4		
8	A	149373A	1	2	2	8.3.R.5		
8	A	149373A	2	2	0	8.3.R.5	7.3.R.5	
8	A	149373A	3	2	1	8.3.R.5	7.3.R.5	
8	A	149373A	4	2	1	8.3.R.5	7.3.R.5	
8	A	149374A	1	2	2	8.2.R.2		
8	A	149374A	2	2	2	8.2.R.3		
8	A	149374A	3	2	2	8.2.R.2		
8	A	149374A	4	2	2	8.2.R.2		
8	A	149500A	1	2	2	8.3.R.3		
8	A	149500A	2	2	2	8.3.R.3		
8	A	149500A	3	2	2	8.3.R.3		
8	A	149500A	4	2	2	8.3.R.3		
8	A	149507A	1	2	2	8.2.R.2		
8	A	149507A	2	2	2	8.2.R.2		
8	A	149507A	3	1	2	8.2.R.2		
8	A	149507A	4	2	2	8.2.R.2		
8	A	149580A	1	2	2	8.3.R.6		
8	A	149580A	2	2	2	8.2.R.3		
8	A	149580A	3	2	2	8.3.R.5		
8	A	149580A	4	2	2	8.3.R.5		
8	A	149583A	1	2	2	8.4.R.3		
8	A	149583A	2	2	2	8.4.R.3		
8	A	149583A	3	2	2	8.4.R.2		
8	A	149583A	4	2	2	8.4.R.3		
8	A	149591A	1	2	2	8.2.R.3		
8	A	149591A	2	2	2	8.2.R.3		
8	A	149591A	3	2	2	8.2.R.1		
8	A	149591A	4	3	2	8.3.R.5		
8	A	149597A	1	2	2	8.3.R.7		
8	A	149597A	2	2	2	8.3.R.7		
8	A	149597A	3	3	2	8.3.R.1		
8	A	149597A	4	3	2	8.2.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	149600A	1	2	2	8.3.R.7		
8	A	149600A	2	2	2	8.3.R.7		
8	A	149600A	3	2	2	8.3.R.3		
8	A	149600A	4	3	2	8.3.R.3		
8	A	149603A	1	2	2	8.6.R.3		
8	A	149603A	2	2	2	8.6.R.3		
8	A	149603A	3	2	2	8.6.R.3		
8	A	149603A	4	2	2	8.6.R.3		
8	A	149650A	1	2	2	8.2.R.3		
8	A	149650A	2	2	2	8.2.R.1		
8	A	149650A	3	2	2	8.2.R.1		
8	A	149650A	4	2	2	8.2.R.3		
8	A	149653A	1	2	2	8.3.R.6		
8	A	149653A	2	2	2	8.2.R.3		
8	A	149653A	3	2	2	8.3.R.5		
8	A	149653A	4	3	2	8.3.R.5		
8	A	149688A	1	2	2	8.4.R.3		
8	A	149688A	2	2	2	8.4.R.3		
8	A	149688A	3	2	2	8.4.R.3		
8	A	149688A	4	2	2	8.4.R.3		
8	A	149689A	1	2	2	8.3.R.6		
8	A	149689A	2	2	2	8.3.R.1		
8	A	149689A	3	3	2	8.3.R.3		
8	A	149689A	4	2	2	8.2.R.3		
8	A	149700A	1	2	2	8.3.R.3		
8	A	149700A	2	2	2	8.2.R.2		
8	A	149700A	3	1	2	8.2.R.2		
8	A	149700A	4	2	2	8.2.R.2		
8	A	149721A	1	2	2	8.4.R.3		
8	A	149721A	2	2	2	8.4.R.3		
8	A	149721A	3	2	2	8.4.R.3		
8	A	149721A	4	2	2	8.4.R.3		
8	A	149744A	1	2	2	8.3.R.5		
8	A	149744A	2	1	0	8.3.R.5		
8	A	149744A	3	2	1	8.3.R.5	7.3.R.5	
8	A	149744A	4	2	1	8.3.R.5	7.3.R.5	
8	A	160000A	1	2	2	8.2.R.3		
8	A	160000A	2	2	2	8.2.R.3		
8	A	160000A	3	2	2	8.2.R.3		
8	A	160000A	4	2	2	8.2.R.3		
8	A	160467A	1	2	2	8.6.R.3		
8	A	160467A	2	2	2	8.6.R.3		
8	A	160467A	3	2	2	8.6.R.3		
8	A	160467A	4	2	1	8.6.R.3	8.8.R	
8	A	160770A	1	2	2	8.3.R.4		
8	A	160770A	2	2	2	8.3.R.3		
8	A	160770A	3	2	2	8.3.R.4		
8	A	160770A	4	2	2	8.3.R.4		
8	A	160771A	1	2	2	8.3.R.6		
8	A	160771A	2	2	2	8.2.W.3		
8	A	160771A	3	2	2	8.2.R.1		
8	A	160771A	4	2	2	8.3.R.6		
8	A	160775A	1	2	2	8.3.R.3		
8	A	160775A	2	2	2	8.3.R.3		
8	A	160775A	3	2	2	8.3.R.3		
8	A	160775A	4	2	2	8.3.R.3		
8	A	160779A	1	1	2	8.4.R.2		
8	A	160779A	2	1	2	8.4.R.2		
8	A	160779A	3	2	2	8.4.R.3		
8	A	160779A	4	2	2	8.4.R.2		
8	A	160780A	1	2	2	8.4.R.3		
8	A	160780A	2	2	2	8.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	160780A	3	2	2	8.4.R.3		
8	A	160780A	4	2	2	8.4.R.3		
8	A	160782A	1	2	2	8.2.R.1		
8	A	160782A	2	2	2	8.2.R.3		
8	A	160782A	3	2	2	8.3.R.5		
8	A	160782A	4	3	2	8.3.R.5		
8	A	160783A	1	2	2	8.3.R.6		
8	A	160783A	2	2	2	8.3.R.6		
8	A	160783A	3	2	2	8.3.R.6		
8	A	160783A	4	2	2	8.3.R.6		
8	A	160784A	1	2	2	8.4.R.3		
8	A	160784A	2	2	2	8.4.R.3		
8	A	160784A	3	2	2	8.4.R.3		
8	A	160784A	4	2	2	8.4.R.3		
8	A	160785A	1	2	2	8.4.R.4		
8	A	160785A	2	2	2	8.4.R.4		
8	A	160785A	3	2	2	8.4.R.4		
8	A	160785A	4	3	2	8.4.R.4		
8	A	160787A	1	2	2	8.2.R.1		
8	A	160787A	2	2	2	8.2.R.3		
8	A	160787A	3	2	2	8.2.R.1		
8	A	160787A	4	3	2	8.2.R.1		
8	A	160788A	1	2	2	8.3.R.3		
8	A	160788A	2	2	2	8.3.R.3		
8	A	160788A	3	3	2	8.3.R.3		
8	A	160788A	4	3	2	8.3.R.3		
8	A	160789A	1	1	2	8.3.R.3		
8	A	160789A	2	2	2	8.2.R.3		
8	A	160789A	3	1	2	8.2.R.2		
8	A	160789A	4	2	2	8.2.R.2		
8	A	160790A	1	2	2	8.6.R.3		
8	A	160790A	2	2	2	8.6.R.3		
8	A	160790A	3	2	2	8.6.R.3		
8	A	160790A	4	2	1	8.6.R.3	8.8.R	
8	A	160872A	1	2	2	8.4.R.3		
8	A	160872A	2	2	2	8.4.R.3		
8	A	160872A	3	2	2	8.4.R.3		
8	A	160872A	4	2	2	8.4.R.3		
8	A	160873A	1	2	2	8.4.R.4		
8	A	160873A	2	2	2	8.4.R.4		
8	A	160873A	3	2	2	8.4.R.4		
8	A	160873A	4	3	2	8.4.R.4		
8	A	160875A	1	2	2	8.3.R.6		
8	A	160875A	2	2	2	8.3.R.6		
8	A	160875A	3	2	2	8.3.R.6		
8	A	160875A	4	2	2	8.3.R.6		
8	A	160876A	1	2	2	8.3.R.5		
8	A	160876A	2	2	0	8.3.R.5	7.3.R.5	
8	A	160876A	3	2	2	8.3.R.5	7.3.R.5	
8	A	160876A	4	2	1	8.3.R.5	7.3.R.5	
8	A	160877A	1	2	2	8.6.R.3		
8	A	160877A	2	2	2	8.6.R.3		
8	A	160877A	3	2	2	8.6.R.3		
8	A	160877A	4	2	1	8.6.R.3	8.8.R	
8	A	160992A	1	2	2	8.3.R.2		
8	A	160992A	2	2	2	8.3.R.2		
8	A	160992A	3	2	2	8.3.R.2		
8	A	160992A	4	2	2	8.3.R.2		
8	A	485469	1	2	2	8.2.R.2		
8	A	485469	2	2	2	8.6.R.3		
8	A	485469	3	2	2	8.6.R.3		
8	A	485469	4	2	1	8.6.R.3	8.8.R	

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	485473	1	2	2	8.6.R.1		
8	A	485473	2	2	2	8.6.R.1		
8	A	485473	3	2	2	8.6.R.1		
8	A	485473	4	3	2	8.6.R.1		
8	A	485479	1	2	2	8.6.R.3		
8	A	485479	2	2	2	8.6.R.3		
8	A	485479	3	2	2	8.6.R.3		
8	A	485479	4	3	2	8.6.R.3		
8	A	485485	1	2	2	8.2.R.3		
8	A	485485	2	2	2	8.2.R.3		
8	A	485485	3	2	2	8.2.R.1		
8	A	485485	4	2	2	8.2.R.3		
8	A	485506	1	2	2	8.6.R.3		
8	A	485506	2	2	2	8.6.R.3		
8	A	485506	3	2	2	8.6.R.3		
8	A	485506	4	2	1	8.6.R.3	8.8.R	
8	A	485510	1	3	2	8.6.W.2		
8	A	485510	2	2	2	8.6.W.2		
8	A	485510	3	2	2	8.6.R.1		
8	A	485510	4	3	2	8.6.R.1		
8	A	486738	1	1	2	8.5.R.1		
8	A	486738	2	1	2	8.5.R.1		
8	A	486738	3	2	2	8.5.R.1		
8	A	486738	4	2	2	8.5.R.1		
8	A	486744	1	2	2	8.5.R.3		
8	A	486744	2	2	2	8.5.R.2		
8	A	486744	3	2	2	8.5.R.3		
8	A	486744	4	2	2	8.5.R.3		
8	A	486754	1	2	2	8.5.W.5		
8	A	486754	2	1	2	8.5.W.5		
8	A	486754	3	2	2	8.5.W.5		
8	A	486754	4	2	2	8.5.W.5		
8	A	486757	1	2	2	8.5.W.4		
8	A	486757	2	2	2	8.5.R.2		
8	A	486757	3	2	2	8.5.R.2		
8	A	486757	4	2	2	8.5.R.2		
8	A	486763	1	1	2	8.5.W.1		
8	A	486763	2	2	2	8.5.W.1		
8	A	486763	3	2	2	8.5.W.1		
8	A	486763	4	1	2	8.5.W.1		
8	A	486998	1	2	2	8.5.W.2		
8	A	486998	2	2	2	8.5.W.2		
8	A	486998	3	2	2	8.5.W.2		
8	A	486998	4	2	2	8.5.W.2		
8	A	487006	1	2	2	8.5.R.3		
8	A	487006	2	2	2	8.5.R.4		
8	A	487006	3	2	2	8.5.R.3		
8	A	487006	4	2	2	8.5.R.3		
8	B	141500A	1	4	2	8.3.W.3	8.3.W.4	
8	B	141500A	2	4	2	8.3.W.3	8.3.W.4	
8	B	141500A	3	4	2	8.3.W.3	8.3.W.4	
8	B	141500A	4	4	2	8.3.W.3	8.3.W.4	
8	B	148080A	1	2	2	8.3.R.5		
8	B	148080A	2	2	0	8.3.R.5		
8	B	148080A	3	2	1	8.3.R.5	7.3.R.5	
8	B	148080A	4	2	1	8.3.R.5	7.3.R.5	
8	B	148085A	1	2	2	8.2.R.1		
8	B	148085A	2	2	2	8.2.R.1		
8	B	148085A	3	3	2	8.2.R.1		
8	B	148085A	4	3	2	8.2.R.1		
8	B	148088A	1	2	2	8.3.R.6		
8	B	148088A	2	2	2	8.3.R.6		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	B	148088A	3	2	2	8.3.R.6		
8	B	148088A	4	2	2	8.3.R.6		
8	B	148133A	1	2	2	8.3.R.3		
8	B	148133A	2	2	2	8.3.R.3		
8	B	148133A	3	2	2	8.3.R.3		
8	B	148133A	4	2	2	8.3.R.3		
8	B	148134A	1	2	2	8.3.R.4		
8	B	148134A	2	2	2	8.3.R.4		
8	B	148134A	3	2	2	8.3.R.4		
8	B	148134A	4	2	2	8.3.R.4		
8	B	148136A	1	2	2	8.3.R.4		
8	B	148136A	2	2	2	8.3.R.4		
8	B	148136A	3	2	2	8.3.R.4		
8	B	148136A	4	2	2	8.3.R.4		
8	B	148141A	1	2	2	8.6.R.1		
8	B	148141A	2	2	2	8.6.R.1		
8	B	148141A	3	2	2	8.6.R.1		
8	B	148141A	4	3	2	8.3.R.7		
8	B	160461A	1	2	2	8.2.R.3		
8	B	160461A	2	2	2	8.2.R.3		
8	B	160461A	3	2	2	8.2.R.3		
8	B	160461A	4	2	2	8.2.R.3		
8	B	160464A	1	2	2	8.4.R.4		
8	B	160464A	2	2	2	8.4.R.4		
8	B	160464A	3	2	2	8.4.R.4		
8	B	160464A	4	3	2	8.4.R.4		
8	B	160469A	1	2	2	8.6.R.3		
8	B	160469A	2	2	2	8.6.R.3		
8	B	160469A	3	2	2	8.6.R.3		
8	B	160469A	4	2	1	8.6.R.3	8.8.R	
8	B	160742A	1	2	2	8.3.R.6		
8	B	160742A	2	2	2	8.2.R.3		
8	B	160742A	3	2	1	8.4.R.1		
8	B	160742A	4	2	2	8.2.R.1		
8	B	160745A	1	2	2	8.3.R.6		
8	B	160745A	2	2	2	8.3.R.6		
8	B	160745A	3	2	2	8.3.R.6		
8	B	160745A	4	2	2	8.3.R.6		
8	B	160765A	1	2	2	8.3.R.4		
8	B	160765A	2	2	2	8.3.R.4		
8	B	160765A	3	2	2	8.3.R.4		
8	B	160765A	4	2	2	8.3.R.4		
8	B	160766A	1	2	2	8.4.R.3		
8	B	160766A	2	2	2	8.4.R.3		
8	B	160766A	3	2	2	8.4.R.3		
8	B	160766A	4	2	2	8.4.R.3		
8	B	160767A	1	2	2	8.2.R.3		
8	B	160767A	2	2	2	8.2.R.2		
8	B	160767A	3	1	2	8.3.R.3		
8	B	160767A	4	2	2	8.2.R.3		
8	B	160795A	1	2	2	8.3.R.6		
8	B	160795A	2	2	2	8.2.R.3		
8	B	160795A	3	2	2	8.2.R.3		
8	B	160795A	4	2	2	8.2.R.3		
8	B	160800A	1	2	2	8.3.R.2		
8	B	160800A	2	2	2	8.2.R.3		
8	B	160800A	3	3	2	8.3.R.2		
8	B	160800A	4	2	2	8.3.R.2		
8	B	160802A	1	2	2	8.2.R.2		
8	B	160802A	2	2	2	8.2.R.3		
8	B	160802A	3	1	2	8.2.R.2		
8	B	160802A	4	2	2	8.2.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	B	160920A	1	2	2	8.3.R.3		
8	B	160920A	2	2	2	8.3.R.6		
8	B	160920A	3	2	2	8.3.R.3		
8	B	160920A	4	2	2	8.4.R.1		
8	B	160930A	1	2	2	8.4.R.3		
8	B	160930A	2	2	2	8.2.R.3		
8	B	160930A	3	2	2	8.4.R.3		
8	B	160930A	4	2	2	8.4.R.3		
8	B	160935A	1	2	2	8.2.R.1		
8	B	160935A	2	2	2	8.2.R.1		
8	B	160935A	3	2	2	8.2.R.1		
8	B	160935A	4	3	2	8.2.R.1		
8	B	160938A	1	2	2	8.2.R.2		
8	B	160938A	2	2	2	8.2.R.2		
8	B	160938A	3	1	2	8.3.R.3		
8	B	160938A	4	2	2	8.2.R.2		
8	B	160939A	1	2	2	8.2.X.2		
8	B	160939A	2	2	2	8.2.R.3		
8	B	160939A	3	2	2	8.3.R.5		
8	B	160939A	4	2	2	8.3.R.5		
8	B	160941A	1	2	2	8.6.R.3		
8	B	160941A	2	2	2	8.6.R.3		
8	B	160941A	3	2	2	8.6.R.3		
8	B	160941A	4	2	1	8.6.R.3	8.8.R	
8	B	160989A	1	2	2	8.2.R.1		
8	B	160989A	2	2	2	8.2.R.1		
8	B	160989A	3	2	2	8.2.R.1		
8	B	160989A	4	3	2	8.4.R.1		
8	B	160993A	1	2	2	8.6.R.3		
8	B	160993A	2	2	2	8.6.R.3		
8	B	160993A	3	2	2	8.6.R.3		
8	B	160993A	4	2	2	8.6.R.3		
8	B	485481	1	2	2	8.2.R.1		
8	B	485481	2	2	2	8.2.R.1		
8	B	485481	3	2	2	8.2.R.1		
8	B	485481	4	3	2	8.2.R.1		
8	B	485483	1	3	2	8.6.W.2		
8	B	485483	2	2	2	8.6.R.1		
8	B	485483	3	2	2	8.6.R.1		
8	B	485483	4	3	2	8.6.R.1		
8	B	485487	1	2	2	8.4.R.3		
8	B	485487	2	2	2	8.4.R.3		
8	B	485487	3	2	2	8.4.R.3		
8	B	485487	4	2	2	8.4.R.3		
8	B	485489	1	2	2	8.3.R.7		
8	B	485489	2	3	2	8.2.R.1		
8	B	485489	3	3	2	8.3.R.7		
8	B	485489	4	3	2	8.3.R.7		
8	B	485491	1	3	2	8.6.W.3		
8	B	485491	2	2	2	8.6.W.3		
8	B	485491	3	2	2	8.3.W.3		
8	B	485491	4	2	2	8.6.W.3		
8	B	487037	1	2	2	8.5.R.3		
8	B	487037	2	2	2	8.5.R.2		
8	B	487037	3	2	2	8.5.R.3		
8	B	487037	4	2	2	8.5.R.3		
8	B	487053	1	3	2	8.5.W.4		
8	B	487053	2	3	2	8.5.R.2		
8	B	487053	3	2	2	8.5.R.2		
8	B	487053	4	2	2	8.5.R.2		
8	B	487071	1	2	2	8.5.R.2		
8	B	487071	2	2	2	8.5.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	B	487071	3	2	2	8.5.R.2		
8	B	487071	4	2	2	8.5.R.2		
8	B	487144	1	2	2	8.5.W.5		
8	B	487144	2	2	2	8.5.W.5		
8	B	487144	3	2	2	8.5.W.5		
8	B	487144	4	2	2	8.5.R.3		
8	B	487170	1	2	2	8.5.R.3		
8	B	487170	2	2	2	8.5.R.3		
8	B	487170	3	2	2	8.5.R.3		
8	B	487170	4	2	2	8.5.R.3		
8	B	487254	1	2	2	8.5.W.2		
8	B	487254	2	3	2	8.5.W.2		
8	B	487254	3	2	2	8.5.W.2		
8	B	487254	4	2	2	8.5.W.2		
8	B	487282	1	2	2	8.5.R.1		
8	B	487282	2	2	2	8.5.R.1		
8	B	487282	3	2	2	8.5.R.1		
8	B	487282	4	2	2	8.5.R.1		
8	C	148071A	1	2	2	8.2.R.2		
8	C	148071A	2	2	2	8.2.R.2		
8	C	148071A	3	1	2	8.2.R.2		
8	C	148071A	4	2	2	8.2.R.2		
8	C	149416A	1	2	2	8.2.R.1		
8	C	149416A	2	3	2	8.2.R.1		
8	C	149416A	3	2	2	8.3.W.3		
8	C	149416A	4	2	2	8.2.R.1		
8	C	149426A	1	2	2	8.3.R.4		
8	C	149426A	2	2	2	8.3.R.6		
8	C	149426A	3	2	2	8.4.R.1		
8	C	149426A	4	2	2	8.3.R.4		
8	C	149431A	1	2	2	8.3.R.7		
8	C	149431A	2	3	2	8.3.R.7		
8	C	149431A	3	3	2	8.3.R.7		
8	C	149431A	4	3	2	8.3.R.7		
8	C	149619A	1	2	2	8.2.R.3		
8	C	149619A	2	2	2	8.2.R.1		
8	C	149619A	3	2	2	8.5.R.1		
8	C	149619A	4	2	2	8.2.R.1		
8	C	149623A	1	2	2	8.3.R.4		
8	C	149623A	2	2	2	8.3.R.4		
8	C	149623A	3	3	2	8.3.R.4		
8	C	149623A	4	2	2	8.3.R.4		
8	C	149626A	1	2	2	8.3.R.6		
8	C	149626A	2	2	2	8.3.R.6		
8	C	149626A	3	2	2	8.4.R.1		
8	C	149626A	4	2	2	8.4.R.1		
8	C	149771A	1	2	2	8.2.R.3		
8	C	149771A	2	2	2	8.2.R.3		
8	C	149771A	3	2	2	8.2.R.3		
8	C	149771A	4	2	2	8.2.R.3		
8	C	149772A	1	2	2	8.2.R.2		
8	C	149772A	2	2	2	8.2.R.2		
8	C	149772A	3	1	2	8.2.R.2		
8	C	149772A	4	2	2	8.2.R.2		
8	C	160472A	1	2	2	8.4.R.4		
8	C	160472A	2	2	2	8.4.R.4		
8	C	160472A	3	2	2	8.4.R.4		
8	C	160472A	4	3	2	8.4.R.4		
8	C	160477A	1	2	2	8.3.R.3		
8	C	160477A	2	2	2	8.3.R.6		
8	C	160477A	3	2	2	8.4.R.1		
8	C	160477A	4	2	2	8.4.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	C	160576A	1	2	2	8.4.R.3		
8	C	160576A	2	2	2	8.4.R.3		
8	C	160576A	3	2	2	8.4.R.3		
8	C	160576A	4	2	2	8.4.R.3		
8	C	160584A	1	2	2	8.3.R.5		
8	C	160584A	2	2	0	8.3.R.5	7.3.R.5	
8	C	160584A	3	2	1	8.3.R.5	7.3.R.5	
8	C	160584A	4	2	1	8.3.R.5	7.3.R.5	
8	C	160726A	1	2	2	8.4.R.4		
8	C	160726A	2	3	2	8.4.R.4		
8	C	160726A	3	2	2	8.4.R.4		
8	C	160726A	4	3	2	8.4.R.4		
8	C	160729A	1	3	2	8.3.R.6		
8	C	160729A	2	2	2	8.3.R.6		
8	C	160729A	3	2	2	8.3.R.6		
8	C	160729A	4	2	2	8.3.R.6		
8	C	160791A	1	2	2	8.3.R.6		
8	C	160791A	2	2	2	8.2.R.3		
8	C	160791A	3	2	2	8.4.R.1		
8	C	160791A	4	2	2	8.4.R.1		
8	C	160836A	1	2	2	8.2.R.3		
8	C	160836A	2	2	2	8.2.R.1		
8	C	160836A	3	2	2	8.2.R.3		
8	C	160836A	4	2	2	8.2.R.3		
8	C	160946A	1	3	2	8.3.R.2		
8	C	160946A	2	2	2	8.3.R.2		
8	C	160946A	3	3	2	8.3.R.2		
8	C	160946A	4	2	2	8.3.R.2		
8	C	160947A	1	2	2	8.3.R.3		
8	C	160947A	2	2	2	8.3.R.3		
8	C	160947A	3	2	2	8.3.R.3		
8	C	160947A	4	2	2	8.3.R.3		
8	C	160955A	1	2	2	8.4.R.3		
8	C	160955A	2	2	2	8.4.R.3		
8	C	160955A	3	2	2	8.4.R.3		
8	C	160955A	4	2	2	8.4.R.3		
8	C	160956A	1	2	2	8.2.R.3		
8	C	160956A	2	2	2	8.2.R.3		
8	C	160956A	3	2	2	8.2.R.3		
8	C	160956A	4	2	2	8.2.R.3		
8	C	160963A	1	2	2	8.4.R.3		
8	C	160963A	2	2	2	8.4.R.3		
8	C	160963A	3	2	2	8.4.R.3		
8	C	160963A	4	2	2	8.4.R.3		
8	C	485471	1	3	2	8.6.W.3		
8	C	485471	2	2	2	8.6.W.3		
8	C	485471	3	2	2	8.6.W.3		
8	C	485471	4	2	2	8.6.W.3		
8	C	485475	1	2	2	8.3.R.2		
8	C	485475	2	2	2	8.3.R.2		
8	C	485475	3	3	2	8.3.R.2		
8	C	485475	4	2	2	8.3.R.2		
8	C	485477	1	2	2	8.6.R.3		
8	C	485477	2	2	2	8.6.R.3		
8	C	485477	3	2	2	8.6.R.3		
8	C	485477	4	2	2	8.6.R.3		
8	C	485493	1	3	2	8.6.W.3		
8	C	485493	2	2	2	8.6.W.3		
8	C	485493	3	2	2	8.6.W.3		
8	C	485493	4	2	2	8.6.W.3		
8	C	485495	1	2	2	8.4.R.3		
8	C	485495	2	2	2	8.4.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	C	485495	3	2	2	8.4.R.3		
8	C	485495	4	2	2	8.4.R.3		
8	C	485497	1	1	2	8.2.R.2		
8	C	485497	2	2	2	8.2.R.2		
8	C	485497	3	1	2	8.2.R.2		
8	C	485497	4	2	2	8.2.R.2		
8	C	485500	1	3	2	8.6.W.2		
8	C	485500	2	2	2	8.6.R.1		
8	C	485500	3	2	2	8.6.R.1		
8	C	485500	4	3	2	8.6.R.1		
8	C	485504	1	2	2	8.6.R.3		
8	C	485504	2	2	2	8.6.R.3		
8	C	485504	3	2	2	8.6.R.3		
8	C	485504	4	2	2	8.6.R.3		
8	C	486340	1	3	2	8.6.W.2		
8	C	486340	2	2	2	8.6.R.1		
8	C	486340	3	2	2	8.6.R.1		
8	C	486340	4	3	2	8.6.R.1		
8	C	486390	1	2	2	8.5.W.3		
8	C	486390	2	2	2	8.5.R.1		
8	C	486390	3	1	2	8.5.R.1		
8	C	486390	4	2	2	8.5.R.1		
8	C	486392	1	1	2	8.5.R.3		
8	C	486392	2	2	2	8.5.R.3		
8	C	486392	3	2	2	8.5.R.3		
8	C	486392	4	2	2	8.5.R.3		
8	C	486394	1	1	2	8.5.R.4		
8	C	486394	2	2	2	8.5.R.4		
8	C	486394	3	2	2	8.5.R.4		
8	C	486394	4	2	2	8.5.R.3		
8	C	486398	1	2	2	8.5.W.4		
8	C	486398	2	2	2	8.5.W.4		
8	C	486398	3	2	2	8.5.R.2		
8	C	486398	4	2	2	8.5.R.2		
8	C	486401	1	2	2	8.5.R.1		
8	C	486401	2	2	2	8.5.R.1		
8	C	486401	3	2	2	8.5.R.1		
8	C	486401	4	2	2	8.5.R.1		
8	C	486404	1	2	2	8.5.W.5		
8	C	486404	2	2	2	8.5.W.5		
8	C	486404	3	2	2	8.5.W.5		
8	C	486404	4	2	2	8.5.R.3		
8	C	486410	1	2	2	8.5.W.2		
8	C	486410	2	2	2	8.5.W.2		
8	C	486410	3	2	2	8.5.W.2		
8	C	486410	4	2	2	8.5.W.2		
10	A	144273A	1	1	2	10.5.W.3		
10	A	144273A	2	1	2	10.3.R.7		
10	A	144273A	3	1	2	10.4.W.2		
10	A	144273A	4	1	2	10.4.R.3		
10	A	144279A	1	1	2	10.5.W.1		
10	A	144279A	2	2	1	10.5.W.3		
10	A	144279A	3	2	2	10.4.W.2		
10	A	144279A	4	2	2	10.5.R		
10	A	144283A	1	1	2	10.5.W.1		
10	A	144283A	2	2	1	10.5.W.3		
10	A	144283A	3	3	2	10.2.W.4		
10	A	144283A	4	2	2	10.5.W.1		
10	A	144284A	1	1	2	10.5.W.1		
10	A	144284A	2	2	2	10.5.W.3		
10	A	144284A	3	3	2	10.2.W.4		
10	A	144284A	4	2	2	10.5.W.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	144285A	1	2	2	10.5.W.3		
10	A	144285A	2	2	2	10.5.W.3		
10	A	144285A	3	2	2	10.2.W.4		
10	A	144285A	4	2	2	10.5.R		
10	A	144286A	1	1	2	10.5.W.1		
10	A	144286A	2	1	2	10.5.W.3		
10	A	144286A	3	1	2	10.2.W.4		
10	A	144286A	4	1	2	10.5.W.1		
10	A	156851A	1	3	2	10.3.R.6		
10	A	156851A	2	2	2	10.4.R.5		
10	A	156851A	3	2	2	10.3.R.7		
10	A	156851A	4	3	2	10.3.R.7		
10	A	156855A	1	4	2	10.3.R.7		
10	A	156855A	2	3	2	10.3.R.7		
10	A	156855A	3	4	2	10.3.R.7		
10	A	156855A	4	3	2	10.3.R.7		
10	A	156932A	1	2	2	10.4.R.3		
10	A	156932A	2	2	2	10.4.R.3		
10	A	156932A	3	2	2	10.4.R.3		
10	A	156932A	4	2	2	10.4.R.3		
10	A	167520A	1	2	2	10.3.R.4		
10	A	167520A	2	2	2	10.3.R.4		
10	A	167520A	3	3	2	10.2.R.2		
10	A	167520A	4	2	2	10.2.R.2		
10	A	167522A	1	2	2	10.4.R.3		
10	A	167522A	2	2	2	10.3.R.4		
10	A	167522A	3	2	2	10.4.R.3		
10	A	167522A	4	2	2	10.3.R.4		
10	A	167523A	1	2	2	10.3.R.4		
10	A	167523A	2	3	2	10.3.R.4		
10	A	167523A	3	3	2	10.2.R.2		
10	A	167523A	4	3	2	10.3.R.4		
10	A	171238A	1	3	2	10.3.R.4		
10	A	171238A	2	2	2	10.3.R.5		
10	A	171238A	3	2	2	10.3.R.4		
10	A	171238A	4	2	2	10.3.R.4		
10	A	171245A	1	2	2	10.4.R.3		
10	A	171245A	2	2	2	10.4.R.4		
10	A	171245A	3	3	2	10.4.R.1		
10	A	171245A	4	2	2	10.4.R.4		
10	A	171285A	1	3	2	10.3.R.3		
10	A	171285A	2	3	0	10.2.R.2		
10	A	171285A	3	3	2	10.2.R.2		
10	A	171285A	4	3	1	10.3.R.3		
10	A	171325A	1	2	1	10.2.R.2		
10	A	171325A	2	1	0	10.7.R.2		
10	A	171325A	3	1	2	10.3.R.7		
10	A	171325A	4	2	2	10.2.R.2		
10	A	171390A	1	1	2	10.4.R.5		
10	A	171390A	2	2	2	10.4.R.5		
10	A	171390A	3	3	2	10.4.R.3		
10	A	171390A	4	2	2	10.4.R.4		
10	A	171418A	1	3	2	10.2.R.1		
10	A	171418A	2	2	2	10.3.R.3		
10	A	171418A	3	3	2	10.3.R.3		
10	A	171418A	4	3	2	10.3.R.3		
10	A	171435A	1	2	2	10.3.R.3		
10	A	171435A	2	3	1	10.3.R.7	10.3.R.3	
10	A	171435A	3	2	2	10.2.R.2		
10	A	171435A	4	2	2	10.3.R.3		
10	A	171476A	1	3	1	10.3.R.3	10.3.R.4	
10	A	171476A	2	3	2	10.2.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	171476A	3	4	2	10.3.R.3		
10	A	171476A	4	3	2	10.3.R.4		
10	A	171586A	1	3	2	10.5.W.1		
10	A	171586A	2	3	1	10.2.W.4		
10	A	171586A	3	3	2	10.2.W.4		
10	A	171586A	4	3	1	10.2.W.4		
10	A	171648A	1	1	2	10.5.W.3		
10	A	171648A	2	2	1	10.2.W.4	10.5.R	10.5.W.3
10	A	171648A	3	2	1	10.5.R		
10	A	171648A	4	2	2	10.5.R		
10	A	171661A	1	1	2	10.5.W.1		
10	A	171661A	2	1	1	10.5.W.1	10.5.W.3	
10	A	171661A	3	1	2	10.5.W.3		
10	A	171661A	4	1	2	10.5.R		
10	A	171711A	1	1	2	10.5.W.1		
10	A	171711A	2	2	1	10.5.R	10.5.W.3	10.5.W.1
10	A	171711A	3	2	2	10.5.R		
10	A	171711A	4	2	2	10.5.R		
10	A	171974A	1	2	2	10.2.R.2		
10	A	171974A	2	2	2	10.3.R.6		
10	A	171974A	3	3	2	10.2.R.2		
10	A	171974A	4	2	2	10.6.R.3		
10	A	171988A	1	2	2	10.4.R.3		
10	A	171988A	2	2	2	10.5.W.3		
10	A	171988A	3	2	2	10.4.R.3		
10	A	171988A	4	2	2	10.3.R.4		
10	A	171996A	1	3	2	10.4.R.3		
10	A	171996A	2	2	2	10.4.R.3		
10	A	171996A	3	3	2	10.4.R.4		
10	A	171996A	4	3	2	10.3.R.5		
10	A	172025A	1	2	2	10.2.R.2		
10	A	172025A	2	2	2	10.5.W.3		
10	A	172025A	3	2	2	10.2.R.2		
10	A	172025A	4	2	2	10.2.R.2		
10	A	172397A	1	1	2	10.2.R.1		
10	A	172397A	2	2	2	10.2.R.2		
10	A	172397A	3	1	2	10.2.R.1		
10	A	172397A	4	2	2	10.2.R.1		
10	A	172406A	1	2	2	10.2.R.1		
10	A	172406A	2	2	2	10.3.R.4		
10	A	172406A	3	1	2	10.2.R.1		
10	A	172406A	4	2	2	10.2.R.1		
10	A	172606A	1	3	2	10.2.R.2		
10	A	172606A	2	2	2	10.2.R.2		
10	A	172606A	3	4	2	10.2.R.2		
10	A	172606A	4	3	2	10.3.R.5		
10	A	179051A	1	2	2	10.2.R.2		
10	A	179051A	2	2	2	10.2.R.2		
10	A	179051A	3	2	2	10.2.R.2		
10	A	179051A	4	2	2	10.2.R.2		
10	A	179057A	1	2	1	10.4.R.2	10.4.R.3	
10	A	179057A	2	1	2	10.4.R.2		
10	A	179057A	3	1	1	10.4.R.2		
10	A	179057A	4	1	2	10.4.R.3		
10	A	179099A	1	3	2	10.3.R.4		
10	A	179099A	2	3	2	10.3.R.4		
10	A	179099A	3	3	2	10.3.R.4		
10	A	179099A	4	3	2	10.3.R.4		
10	A	179264A	1	2	1	10.2.R.2		
10	A	179264A	2	2	1	10.2.R.2		
10	A	179264A	3	2	2	10.2.R.2		
10	A	179264A	4	3	2	10.3.R.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	179265A	1	3	2	10.3.R.4		
10	A	179265A	2	2	2	10.3.R.3		
10	A	179265A	3	3	2	10.3.R.4		
10	A	179265A	4	2	2	10.3.R.4		
10	A	179267A	1	3	2	10.2.R.1		
10	A	179267A	2	2	2	10.3.R.2		
10	A	179267A	3	3	2	10.2.R.2		
10	A	179267A	4	3	2	10.2.R.1		
10	A	179269A	1	2	2	10.2.R.1		
10	A	179269A	2	2	2	10.2.R.1		
10	A	179269A	3	2	2	10.2.R.1		
10	A	179269A	4	2	2	10.2.R.1		
10	A	179270A	1	3	2	10.2.R.2		
10	A	179270A	2	2	2	10.2.R.2		
10	A	179270A	3	3	2	10.2.R.2		
10	A	179270A	4	2	2	10.2.R.2		
10	A	179273A	1	2	2	10.4.R.3		
10	A	179273A	2	2	2	10.4.R.3		
10	A	179273A	3	2	2	10.2.R.2		
10	A	179273A	4	2	2	10.4.R.3		
10	A	179303A	1	3	2	10.2.R.2		
10	A	179303A	2	2	2	10.2.R.2		
10	A	179303A	3	3	2	10.2.R.2		
10	A	179303A	4	3	2	10.2.R.2		
10	A	179336A	1	2	2	10.4.R.3		
10	A	179336A	2	2	2	10.4.R.3		
10	A	179336A	3	2	2	10.4.R.3		
10	A	179336A	4	3	2	10.4.R.4		
10	A	180276A	1	3	1	10.3.R.2	10.4.R.3	
10	A	180276A	2	3	2	10.2.R.1		
10	A	180276A	3	3	2	10.3.R.5		
10	A	180276A	4	3	2	10.3.R.4		
10	A	180730A	1	2	2	10.2.R.1		
10	A	180730A	2	2	2	10.2.R.1		
10	A	180730A	3	2	2	10.2.R.2		
10	A	180730A	4	2	2	10.2.R.2		
10	A	180738A	1	3	1	10.3.R.7	10.8.R	
10	A	180738A	2	3	2	10.8.R		
10	A	180738A	3	3	2	10.3.R.7		
10	A	180738A	4	3	2	10.3.R.7		
10	A	180741A	1	3	2	10.2.R.2		
10	A	180741A	2	2	2	10.2.R.1		
10	A	180741A	3	2	2	10.2.R.1		
10	A	180741A	4	2	2	10.2.R.1		
10	A	180744A	1	2	2	10.2.R.2		
10	A	180744A	2	3	2	10.3.R.6		
10	A	180744A	3	3	2	10.3.R.6		
10	A	180744A	4	3	1	10.3.R.6		
10	A	180756A	1	3	2	10.3.R.7		
10	A	180756A	2	3	2	10.3.R.7		
10	A	180756A	3	3	1	10.2.R.2		
10	A	180756A	4	3	2	10.3.R.7		
10	A	180758A	1	3	2	10.3.R.6		
10	A	180758A	2	3	2	10.3.R.6		
10	A	180758A	3	2	2	10.3.R.6		
10	A	180758A	4	3	2	10.3.R.6		
10	A	180762A	1	3	1	10.3.R.7		
10	A	180762A	2	3	2	10.2.R.1		
10	A	180762A	3	3	2	10.3.R.7		
10	A	180762A	4	3	2	10.3.R.7		
10	A	180769A	1	4	2	10.3.R.7		
10	A	180769A	2	4	2	10.3.R.X		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	180769A	3	3	2	10.3.R.7		
10	A	180769A	4	3	2	10.3.R.2		
10	A	180774A	1	2	2	10.2.R.1		
10	A	180774A	2	2	2	10.2.R.1		
10	A	180774A	3	2	2	10.2.R.1		
10	A	180774A	4	2	2	10.2.R.1		
10	A	180776A	1	2	1	10.3.R.2		
10	A	180776A	2	3	2	10.1.R.2		
10	A	180776A	3	2	2	10.3.R.2		
10	A	180776A	4	3	2	10.3.R.2		
10	A	180794A	1	1	1	10.3.R.4	10.7.R.1	
10	A	180794A	2	2	2	10.3.R.4		
10	A	180794A	3	2	2	10.3.R.4		
10	A	180794A	4	2	2	10.3.R.4		
10	A	180972A	1	1	1	10.6.W.3		
10	A	180972A	2	1	2	10.6.W.3		
10	A	180972A	3	1	2	10.6.W.3		
10	A	180972A	4	1	2	10.3.W.3		
10	A	180974A	1	1	1	10.6.W.3		
10	A	180974A	2	1	2	10.6.W.3		
10	A	180974A	3	2	2	10.6.W.3		
10	A	180974A	4	1	2	10.6.W.3		
10	A	180975A	1	1	1	10.6.W.3		
10	A	180975A	2	1	2	10.6.W.3		
10	A	180975A	3	1	2	10.6.W.3		
10	A	180975A	4	1	2	10.6.W.3		
10	A	180978A	1	1	1	10.6.W.3		
10	A	180978A	2	1	2	10.6.W.3		
10	A	180978A	3	1	2	10.6.W.3		
10	A	180978A	4	1	2	10.6.W.3		
10	A	485518	1	2	2	10.4.R.5		
10	A	485518	2	2	2	10.2.R.1		
10	A	485518	3	2	2	10.4.R.3		
10	A	485518	4	2	2	10.4.R.3		
10	A	485527	1	2	2	10.2.R.1		
10	A	485527	2	2	2	10.3.R.1		
10	A	485527	3	3	2	10.3.R.5		
10	A	485527	4	3	2	10.3.R.7		
10	A	485529	1	3	1	10.2.R.2	10.3.R.7	
10	A	485529	2	3	1	10.2.R.2	10.3.R.7	
10	A	485529	3	3	2	10.2.R.2		
10	A	485529	4	3	2	10.3.R.7		
10	A	485540	1	3	2	10.3.R.7		
10	A	485540	2	2	2	10.2.R.1		
10	A	485540	3	2	2	10.3.R.6		
10	A	485540	4	3	2	10.3.R.6		
10	A	485542	1	3	2	10.3.R.2		
10	A	485542	2	3	1	10.3.R.6		
10	A	485542	3	2	2	10.3.R.6		
10	A	485542	4	3	2	10.3.R.6		
10	A	494974	1	3	1	10.3.R.7		
10	A	494974	2	3	1	10.3.R.7		
10	A	494974	3	3	2	10.3.R.5		
10	A	494974	4	3	2	10.3.R.5		
10	A	499622	1	2	2	10.2.R.1		
10	A	499622	2	3	1	10.2.R.2	10.3.R.7	
10	A	499622	3	3	2	10.2.R.1		
10	A	499622	4	2	2	10.2.R.1		
10	A	499624	1	2	2	10.3.R.4		
10	A	499624	2	3	2	10.3.R.4		
10	A	499624	3	3	2	10.3.R.4		
10	A	499624	4	2	2	10.2.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	B	141068A	1	2	1	10.3.R.7	10.4.R.4	
10	B	141068A	2	2	1	10.3.R.1		
10	B	141068A	3	3	1	10.3.R.1	10.2.R.2	
10	B	141068A	4	1	2	10.5.W.3		
10	B	141069A	1	1	2	10.4.R.2		
10	B	141069A	2	1	2	10.4.R.2		
10	B	141069A	3	2	1	10.4.R.2	10.4.R.3	
10	B	141069A	4	1	2	10.4.R.2		
10	B	141079A	1	2	2	10.3.R.3		
10	B	141079A	2	2	2	10.3.R.3		
10	B	141079A	3	2	2	10.2.R.1		
10	B	141079A	4	2	2	10.2.R.1		
10	B	141082A	1	2	2	10.4.R.3		
10	B	141082A	2	2	2	10.4.R.3		
10	B	141082A	3	2	2	10.4.R.3		
10	B	141082A	4	1	2	10.4.R.3		
10	B	156951A	1	1	2	10.6.W.3		
10	B	156951A	2	1	1	10.6.W.4		
10	B	156951A	3	2	2	10.5.W.3		
10	B	156951A	4	1	2	10.6.W.3		
10	B	156953A	1	1	2	10.6.W.3		
10	B	156953A	2	1	1	10.6.W.4		
10	B	156953A	3	2	2	10.5.W.3		
10	B	156953A	4	1	2	10.6.W.3		
10	B	156955A	1	1	2	10.6.W.3		
10	B	156955A	2	1	1	10.6.W.4		
10	B	156955A	3	2	2	10.5.W.3		
10	B	156955A	4	1	2	10.6.W.3		
10	B	156956A	1	1	2	10.6.W.3		
10	B	156956A	2	1	1	10.6.W.X		
10	B	156956A	3	2	2	10.5.W.3		
10	B	156956A	4	1	2	10.6.W.3		
10	B	166884A	1	3	2	10.3.R.4		
10	B	166884A	2	2	2	10.3.R.4		
10	B	166884A	3	3	2	10.2.R.2		
10	B	166884A	4	3	2	10.2.R.2		
10	B	166890A	1	3	1	10.3.R.5		
10	B	166890A	2	3	1	10.2.R.2	10.3.R.7	
10	B	166890A	3	3	1	10.3.R.6	10.3.R.7	
10	B	166890A	4	3	2	10.2.R.1		
10	B	166896A	1	2	1	10.2.R.1	10.3.R.4	
10	B	166896A	2	2	2	10.3.R.3		
10	B	166896A	3	2	2	10.3.R.3		
10	B	166896A	4	3	2	10.3.R.3		
10	B	173001A	1	2	1	10.5.W.3	10.5.R	
10	B	173001A	2	2	1	10.5.R		
10	B	173001A	3	2	2	10.5.R		
10	B	173001A	4	2	2	10.5.R		
10	B	173012A	1	1	2	10.5.W.1		
10	B	173012A	2	2	2	10.5.W.3		
10	B	173012A	3	2	2	10.5.W.1		
10	B	173012A	4	2	1	10.5.W.1	10.5.R	
10	B	173016A	1	2	1	10.5.W.2	10.5.W.1	
10	B	173016A	2	2	2	10.5.W.3		
10	B	173016A	3	2	2	10.5.W.1		
10	B	173016A	4	3	2	10.5.R		
10	B	173024A	1	2	1	10.5.W.2	10.5.W.1	
10	B	173024A	2	2	2	10.5.W.3		
10	B	173024A	3	2	2	10.5.W.1		
10	B	173024A	4	3	2	10.5.R		
10	B	174109A	1	2	2	10.2.R.2		
10	B	174109A	2	2	1	10.3.R.2	10.3.R.6	

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	B	174109A	3	2	2	10.2.R.2		
10	B	174109A	4	2	2	10.2.R.1		
10	B	174113A	1	2	1	10.4.R.4	10.4.R.3	
10	B	174113A	2	2	2	10.4.R.2		
10	B	174113A	3	3	1	10.4.R.2	10.4.R.3	
10	B	174113A	4	2	2	10.4.R.2		
10	B	174533A	1	2	2	10.2.R.1		
10	B	174533A	2	2	2	10.2.R.1		
10	B	174533A	3	2	2	10.2.R.2		
10	B	174533A	4	2	1	10.2.R.2	10.3.R.5	
10	B	174825A	1	2	2	10.4.R.3		
10	B	174825A	2	2	2	10.4.R.3		
10	B	174825A	3	3	2	10.4.R.3		
10	B	174825A	4	2	2	10.2.R.2		
10	B	174944A	1	3	2	10.3.R.3		
10	B	174944A	2	3	1	10.2.R.1	10.5.R	
10	B	174944A	3	2	2	10.2.R.2		
10	B	174944A	4	3	2	10.3.R.5		
10	B	174953A	1	2	2	10.3.R.4		
10	B	174953A	2	2	2	10.3.R.4		
10	B	174953A	3	2	2	10.3.R.4		
10	B	174953A	4	2	2	10.3.R.4		
10	B	174954A	1	3	1	10.3.R.6	10.3.R.1	
10	B	174954A	2	3	2	10.2.R.2		
10	B	174954A	3	3	2	10.2.R.2		
10	B	174954A	4	3	2	10.3.R.1		
10	B	174955A	1	3	2	10.5.R		
10	B	174955A	2	3	0		10.5.R	10.5.W.2
10	B	174955A	3	3	2	10.2.R.2		
10	B	174955A	4	3	2	10.5.R		
10	B	175003A	1	3	2	10.3.R.3		
10	B	175003A	2	2	1	10.X.R.4		
10	B	175003A	3	2	2	10.3.R.4		
10	B	175003A	4	2	2	10.2.R.2		
10	B	175033A	1	3	2	10.3.R.4		
10	B	175033A	2	2	2	10.X.R.3		
10	B	175033A	3	3	2	10.4.R.4		
10	B	175033A	4	2	2	10.4.R.1		
10	B	175211A	1	2	2	10.3.R.4		
10	B	175211A	2	2	2	10.3.R.3		
10	B	175211A	3	2	2	10.3.R.3		
10	B	175211A	4	2	2	10.3.R.3		
10	B	175263A	1	2	2	10.3.R.4		
10	B	175263A	2	2	2	10.3.R.5		
10	B	175263A	3	2	2	10.3.R.4		
10	B	175263A	4	3	2	10.3.R.4		
10	B	175441A	1	3	1	10.3.R.3	10.3.R.4	
10	B	175441A	2	2	2	10.3.R.4		
10	B	175441A	3	3	2	10.3.R.4		
10	B	175441A	4	3	2	10.3.R.4		
10	B	175466A	1	2	2	10.3.R.4		
10	B	175466A	2	2	2	10.3.R.4		
10	B	175466A	3	2	2	10.4.R.3		
10	B	175466A	4	3	2	10.3.R.4		
10	B	178427A	1	2		10.3.R.3		
10	B	178427A	2	2	2	10.4.R.4		
10	B	178427A	3	3	1	10.4.R.4	10.4.R.3	
10	B	178427A	4	2	2	10.4.R.4		
10	B	180486A	1	2	2	10.3.R.3		
10	B	180486A	2	2	2	10.2.R.1		
10	B	180486A	3	3	2	10.2.R.2		
10	B	180486A	4	2	2	10.3.R.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	B	180495A	1	3	1	10.6.R.3	10.3.R.5	
10	B	180495A	2	3	1	10.6.R.3	10.3.R.5	
10	B	180495A	3	3	2	10.3.R.1		
10	B	180495A	4	2	2	10.6.R.3		
10	B	180512A	1	2	2	10.3.R.7		
10	B	180512A	2	1	1	10.3.R.5	10.2.R.2	
10	B	180512A	3	1	2	10.2.R.1		
10	B	180512A	4	3	2	10.3.R.5		
10	B	180515A	1	3	2	10.6.W.2		
10	B	180515A	2	2	2	10.2.R.1		
10	B	180515A	3	3	2	10.2.R.2		
10	B	180515A	4	2	2	10.2.R.2		
10	B	180518A	1	2	2	10.2.R.2		
10	B	180518A	2	2	1	10.2.R.2		
10	B	180518A	3	2	1	10.2.R.2	10.3.R.6	
10	B	180518A	4	2	2	10.2.R.2		
10	B	485520	1	2	2	10.6.W.2		
10	B	485520	2	2	2	10.6.R.1		
10	B	485520	3	3	1	10.6.R.3	10.8.R	
10	B	485520	4	3	2	10.6.R.1		
10	B	485522	1	2	2	10.8.R		
10	B	485522	2	2	2	10.8.R		
10	B	485522	3	3	1	10.6.R.3	10.8.R	
10	B	485522	4	2	2	10.6.R.2		
10	B	485533	1	2	2	10.8.R		
10	B	485533	2	2	2	10.8.R		
10	B	485533	3	2	1	10.6.R.2	10.6.R.3	
10	B	485533	4	2	2	10.3.R.7		
10	B	485536	1	1	1	10.4.R.5	10.4.R.3	
10	B	485536	2	2	2	10.4.R.5		
10	B	485536	3	2	2	10.4.R.3		
10	B	485536	4	1	2	10.4.R.5		
10	B	485545	1	2	2	10.3.R.7		
10	B	485545	2	3	1	10.2.R.2	10.2.R.1	10.7.R.1
10	B	485545	3	3	1	10.2.R.1	10.2.R.2	
10	B	485545	4	3	2	10.3.R.6		
10	B	489583	1	4	2	10.3.W.5		
10	B	489583	2	4	2	10.3.W.5		
10	B	489583	3	3	1	10.2.W.1	10.3.W.2	10.3.W.2
10	B	489583	4	3	2	10.3.W.4		
10	B	499627	1	2	2	10.2.R.1		
10	B	499627	2	2	2	10.3.R.3		
10	B	499627	3	3	2	10.2.R.1		
10	B	499627	4	3	2	10.2.R.2		
10	B	499629	1	2	1	10.3.R.3		
10	B	499629	2	2	2	10.2.R.1		
10	B	499629	3	3		10.2.R.1		
10	B	499629	4	3	2	10.2.R.1		
10	C	144222A	1	1	2	10.5.W.1		
10	C	144222A	2	1	2	10.5.W.3		
10	C	144222A	3	2	1	10.5.W.3	10.2.W.4	
10	C	144222A	4	1	2	10.5.W.1		
10	C	144223A	1	1	2	10.5.W.1		
10	C	144223A	2	1	2	10.5.W.3		
10	C	144223A	3	2	1	10.5.W.3	10.2.W.4	
10	C	144223A	4	1	2	10.5.W.2		
10	C	144225A	1	1	2	10.5.W.1		
10	C	144225A	2	2	2	10.5.W.3		
10	C	144225A	3	2	1	10.5.W.3	10.2.W.4	
10	C	144225A	4	2	2	10.5.W.2		
10	C	144226A	1	1	2	10.5.W.1		
10	C	144226A	2	1	2	10.5.W.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	C	144226A	3	2	1	10.5.W.3	10.2.W.4	
10	C	144226A	4	2	2	10.5.R		
10	C	157488A	1	2	2	10.6.W.3		
10	C	157488A	2	1	1	10.6.W.3		
10	C	157488A	3	3	2	10.2.R.2		
10	C	157488A	4	1	2	10.6.R.2		
10	C	157489A	1	1	2	10.6.W.3		
10	C	157489A	2	1	1	10.6.W.3		
10	C	157489A	3	2	1	10.5.W.3	10.2.W.4	
10	C	157489A	4	1	2	10.6.W.3		
10	C	157490A	1	1	2	10.6.W.3		
10	C	157490A	2	1	1	10.6.W.3		
10	C	157490A	3	2	1	10.5.W.3	10.2.W.4	
10	C	157490A	4	1	2	10.6.W.3		
10	C	166485A	1	3	1	10.3.R.1	10.3.R.2	
10	C	166485A	2	2	2	10.3.R.2		
10	C	166485A	3	3	1	10.2.R.2	10.3.R.2	
10	C	166485A	4	3	2	10.3.R.2		
10	C	167402A	1	3	2	10.3.R.4		
10	C	167402A	2	3	1	10.7.R.1	10.3.R.7	10.3.R.4
10	C	167402A	3	2	1	10.2.R.2	10.3.R.4	
10	C	167402A	4	3	2	10.3.R.3		
10	C	167409A	1	2	2	10.2.R.2		
10	C	167409A	2	2	2	10.2.R.2		
10	C	167409A	3	3	2	10.2.R.2		
10	C	167409A	4	3	2	10.2.R.2		
10	C	171726A	1	2	2	10.4.R.3		
10	C	171726A	2	2	2	10.4.R.3		
10	C	171726A	3	2	2	10.4.R.3		
10	C	171726A	4	2	2	10.4.R.4		
10	C	171754A	1	2	2	10.4.R.3		
10	C	171754A	2	2	2	10.4.R.3		
10	C	171754A	3	2	2	10.4.R.3		
10	C	171754A	4	2	2	10.4.R.4		
10	C	171757A	1	2	2	10.2.R.2		
10	C	171757A	2	2	2	10.2.R.2		
10	C	171757A	3	3	2	10.2.R.2		
10	C	171757A	4	2	2	10.3.R.4		
10	C	171763A	1	2	2	10.3.R.4		
10	C	171763A	2	3	1	10.3.R.5	10.3.R.7	
10	C	171763A	3	3	1	10.2.R.1	10.3.R.7	
10	C	171763A	4	3	2	10.3.R.2		
10	C	171766A	1	2	1	10.2.R.2		
10	C	171766A	2	2	0			
10	C	171766A	3	3	1	10.2.R.1	10.3.R.7	
10	C	171766A	4	3	2	10.2.R.2		
10	C	171817A	1	3	2	10.3.R.4		
10	C	171817A	2	2	1	10.2.R.2	10.3.R.3	
10	C	171817A	3	3	1	10.2.R.2	10.3.R.4	
10	C	171817A	4	3	2	10.3.R.5		
10	C	171911A	1	2	2	10.3.R.4		
10	C	171911A	2	2	2	10.3.R.4		
10	C	171911A	3	3	2	10.3.R.4		
10	C	171911A	4	3	2	10.3.R.4		
10	C	171923A	1	3	2	10.2.R.2		
10	C	171923A	2	3	2	10.2.R.2		
10	C	171923A	3	3	2	10.2.R.2		
10	C	171923A	4	3	2	10.2.R.2		
10	C	173042A	1	2	2	10.4.R.5		
10	C	173042A	2	2	2	10.4.R.5		
10	C	173042A	3	2	2	10.4.R.5		
10	C	173042A	4	1	2	10.4.R.5		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	C	173049A	1	3	2	10.4.R.4		
10	C	173049A	2	3	1	10.4.R.4		
10	C	173049A	3	2	1	10.4.R.4	10.4.R.3	
10	C	173049A	4	3	2	10.4.R.4		
10	C	173106A	1	2	2	10.6.R.1		
10	C	173106A	2	2	1	10.6.R.3		
10	C	173106A	3	3	2	10.2.R.1		
10	C	173106A	4	3	2	10.3.R.2		
10	C	173131A	1	3	2	10.2.R.2		
10	C	173131A	2	2	2	10.2.R.2		
10	C	173131A	3	3	2	10.2.R.2		
10	C	173131A	4	2	2	10.3.R.2		
10	C	173168A	1	3	2	10.3.R.1		
10	C	173168A	2	2	2	10.2.R.2		
10	C	173168A	3	3	2	10.3.R.5		
10	C	173168A	4	2	2	10.2.R.2		
10	C	173320A	1	2	2	10.2.R.1		
10	C	173320A	2	2	2	10.2.R.1		
10	C	173320A	3	3	2	10.2.R.1		
10	C	173320A	4	2	2	10.2.R.1		
10	C	175456A	1	2	2	10.3.R.3		
10	C	175456A	2	2	2	10.2.R.1		
10	C	175456A	3	3	2	10.2.R.1		
10	C	175456A	4	2	2	10.2.R.1		
10	C	175461A	1	2	2	10.3.R.2		
10	C	175461A	2	2	2	10.3.R.6		
10	C	175461A	3	2	2	10.2.R.1		
10	C	175461A	4	2	2	10.3.R.5		
10	C	175503A	1	3	2	10.3.R.4		
10	C	175503A	2	3	2	10.2.R.1		
10	C	175503A	3	3	2	10.2.R.1		
10	C	175503A	4	2	2	10.2.R.1		
10	C	175505A	1	2	2	10.3.R.3		
10	C	175505A	2	2	2	10.3.R.6		
10	C	175505A	3	2	2	10.2.R.1		
10	C	175505A	4	2	2	10.3.R.5		
10	C	175612A	1	2	2	10.3.R.3		
10	C	175612A	2	2	2	10.3.R.4		
10	C	175612A	3	2	2	10.3.R.3		
10	C	175612A	4	3	2	10.3.R.3		
10	C	175735A	1	2	2	10.4.R.3		
10	C	175735A	2	2	2	10.4.R.3		
10	C	175735A	3	2	2	10.4.R.3		
10	C	175735A	4	1	2	10.4.R.3		
10	C	181086A	1	2	2	10.3.R.2		
10	C	181086A	2	2	2	10.2.R.2		
10	C	181086A	3	3	2	10.2.R.1		
10	C	181086A	4	2	2	10.3.R.5		
10	C	181087A	1	2	2	10.3.R.3		
10	C	181087A	2	2	2	10.4.R.3		
10	C	181087A	3	2	1	10.2.R.1	10.2.R.2	
10	C	181087A	4	2	2	10.2.R.2		
10	C	181096A	1	2	2	10.3.R.3		
10	C	181096A	2	2	2	10.3.R.3		
10	C	181096A	3	3	1	10.3.R.3	10.3.R.7	
10	C	181096A	4	3	2	10.3.R.3		
10	C	181310A	1	2	2	10.3.R.4		
10	C	181310A	2	1	2	10.3.R.4		
10	C	181310A	3	2	2	10.3.R.4		
10	C	181310A	4	2	2	10.3.R.4		
10	C	485515	1	2	2	10.6.W.2		
10	C	485515	2	2	1	10.6.R.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	C	485515	3	3	2	10.6.R.3		
10	C	485515	4	3	2	10.6.R.1		
10	C	485547	1	3	2	10.6.W.2		
10	C	485547	2	2	1	10.6.R.1		
10	C	485547	3	3	1	10.8.X	10.6.R.3	
10	C	485547	4	3	2	10.6.R.1		
10	C	485551	1	2	1	10.4.R.3	10.4.R.5	
10	C	485551	2	2	2	10.4.R.5		
10	C	485551	3	2	2	10.4.R.3		
10	C	485551	4	1	2	10.4.R.5		
10	C	485554	1	3	2	10.3.R.4		
10	C	485554	2	2	2	10.2.R.2		
10	C	485554	3	3	1	10.2.R.2	10.3.R.4	
10	C	485554	4	3	2	10.3.R.5		
10	C	485556	1	3	2	10.3.R.2		
10	C	485556	2	2	2	10.3.R.2		
10	C	485556	3	3	1	10.3.R.2	10.3.R.7	
10	C	485556	4	3	2	10.3.R.2		
10	C	499638	1	2	2	10.4.R.3		
10	C	499638	2	2	2	10.2.R.1		
10	C	499638	3	2	2	10.2.R.1		
10	C	499638	4	2	2	10.3.R.5		
10	C	499647	1	2	2	10.4.R.3		
10	C	499647	2	2	2	10.2.R.1		
10	C	499647	3	3	2	10.2.R.1		
10	C	499647	4	2	2	10.4.R.2		
10	C	504439	1	1	2	10.6.W.3		
10	C	504439	2	1	1	10.6.W.3		
10	C	504439	3	2	1	10.5.W.3	10.2.W.4	
10	C	504439	4	1	2	10.6.W.3		

Math Panelist Data

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	146908A	1	1	2	3.A.2.2		
3	A	146908A	2	1	2	3.A.2.2		
3	A	146908A	3	1	2	3.A.2.2		
3	A	146908A	4	1	2	3.A.2.2		
3	A	146908A	5	1	2	3.A.2.2		
3	A	146922A	1	2	2	3.N.1.2		
3	A	146922A	2	2	2	3.N.1.1		
3	A	146922A	3	1	2	3.N.1.1		
3	A	146922A	4	1	2	3.N.1.1		
3	A	146922A	5	2	2	3.D.1.1		
3	A	146947A	1	1	2	3.GM.2.7		
3	A	146947A	2	2	2	3.GM.2.1		
3	A	146947A	3	1	2	3.GM.2.1		
3	A	146947A	4	2	2	3.GM.2.1		
3	A	146947A	5	1	2	3.GM.2.1		
3	A	146955A	1	1	2	3.GM.1.3		
3	A	146955A	2	1	2	3.GM.1.3		
3	A	146955A	3	1	2	3.GM.1.3		
3	A	146955A	4	1	2	3.GM.1.3		
3	A	146955A	5	1	2	3.GM.1.3		
3	A	147044A	1	1	2	3.GM.3.2		
3	A	147044A	2	2	2	3.GM.3.2		
3	A	147044A	3	2	2	3.GM.3.2		
3	A	147044A	4	2	2	3.GM.3.2		
3	A	147044A	5	2	2	3.GM.3.2		
3	A	147064A	1	1	2	3.A.2.2		
3	A	147064A	2	1	2	3.A.2.2		
3	A	147064A	3	1	2	3.A.2.2		
3	A	147064A	4	1	2	3.A.2.2		
3	A	147064A	5	1	2	3.A.2.2		
3	A	147330A	1	1	2	3.N.1.2		
3	A	147330A	2	1	2	3.N.1.2		
3	A	147330A	3	1	2	3.N.1.2		
3	A	147330A	4	1	2	3.N.1.2		
3	A	147330A	5	1	2	3.N.1.2		
3	A	147387A	1	1	2	3.N.1.3		
3	A	147387A	2	3	2	3.N.1.4		
3	A	147387A	3	1	1	3.N.1.4		
3	A	147387A	4	1	2	3.N.1.4		
3	A	147387A	5	2	2	3.N.1.4		
3	A	147510A	1	2	2	3.D.1.2		
3	A	147510A	2	2	2	3.D.1.2		
3	A	147510A	3	2	2	3.D.1.2		
3	A	147510A	4	2	2	3.D.1.2		
3	A	147510A	5	2	2	3.D.1.2		
3	A	147532A	1	1	2	3.N.2.2		
3	A	147532A	2	1	2	3.N.2.2		
3	A	147532A	3	1	2	3.N.2.2		
3	A	147532A	4	2	2	3.N.2.2		
3	A	147532A	5	1	2	3.N.2.3		
3	A	147533A	1	1	2	3.N.2.5		
3	A	147533A	2	3	2	3.A.1.1		
3	A	147533A	3	2	1	3.A.1.1		
3	A	147533A	4	1	2	3.A.1.1		
3	A	147533A	5	1	2	3.A.1.1		
3	A	147542A	1	1	2	3.N.1.2		
3	A	147542A	2	1	2	3.N.1.2		
3	A	147542A	3	1	2	3.N.1.2		
3	A	147542A	4	1	2	3.N.1.2		
3	A	147542A	5	1	2	3.N.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	147712A	1	2	2	3.A.1.2		
3	A	147712A	2	2	2	3.A.1.1		
3	A	147712A	3	1	2	3.A.1.1		
3	A	147712A	4	2	2	3.A.1.1		
3	A	147712A	5	2	2	3.A.1.1		
3	A	147718A	1	2	2	3.N.2.5		
3	A	147718A	2	1	2	3.N.2.5		
3	A	147718A	3	1	2	3.N.2.5		
3	A	147718A	4	2	2	3.N.2.5		
3	A	147718A	5	1	2	3.N.2.5		
3	A	147728A	1	2	2	3.N.2.4		
3	A	147728A	2	2	2	3.N.2.4		
3	A	147728A	3	2	2	3.N.2.4		
3	A	147728A	4	2	2	3.N.2.4		
3	A	147728A	5	2	2	3.N.2.4		
3	A	147741A	1	1	2	3.D.1.2		
3	A	147741A	2	2	2	3.A.1.1		
3	A	147741A	3	2	2	3.A.1.1		
3	A	147741A	4	2	2	3.A.1.1		
3	A	147741A	5	2	2	3.A.1.1		
3	A	147742A	1	3	2	3.A.1.2		
3	A	147742A	2	3	2	3.A.1.1		
3	A	147742A	3	2	2	3.A.1.1		
3	A	147742A	4	3	2	3.A.1.1		
3	A	147742A	5	3	2	3.A.1.1		
3	A	148041A	1	1	2	3.D.1.1		
3	A	148041A	2	3	2	3.D.1.1		
3	A	148041A	3	2	2	3.D.1.2		
3	A	148041A	4	2	2	3.D.1.2		
3	A	148041A	5	2	2	3.D.1.2		
3	A	148514A	1	1	2	3.N.3.4		
3	A	148514A	2	2	2	3.N.3.4		
3	A	148514A	3	2	2	3.N.3.4		
3	A	148514A	4	2	2	3.N.3.4		
3	A	148514A	5	2	2	3.N.3.4		
3	A	150651A	1	2	2	3.N.2.5		
3	A	150651A	2	2	2	3.N.2.5		
3	A	150651A	3	1	2	3.N.2.3		
3	A	150651A	4	2	2	3.N.2.5		
3	A	150651A	5	2	2	3.N.2.5		
3	A	150663A	1	1	2	3.GM.1.1		
3	A	150663A	2	2	2	3.GM.1.1		
3	A	150663A	3	1	1	3.GM.1.X		
3	A	150663A	4	2	2	3.GM.1.1		
3	A	150663A	5	2	2	3.GM.1.1		
3	A	151406A	1	1	2	3.GM.1.3		
3	A	151406A	2	2	2	3.GM.1.3		
3	A	151406A	3	1	2	3.GM.1.3		
3	A	151406A	4	1	2	3.GM.1.3		
3	A	151406A	5	1	2	3.GM.1.3		
3	A	151560A	1	1	2	3.N.2.6		
3	A	151560A	2	2	1	3.N.2.7	3.N.2.6	
3	A	151560A	3	1	2	3.N.2.7		
3	A	151560A	4	1	2	3.N.2.7		
3	A	151560A	5	1	2	3.N.2.7		
3	A	152255A	1	1	2	3.GM.2.4		
3	A	152255A	2	1	2	3.GM.2.4		
3	A	152255A	3	1	2	3.GM.2.4		
3	A	152255A	4	1	2	3.GM.2.4		
3	A	152255A	5	1	2	3.GM.2.4		
3	A	152320A	1	1	2	3.GM.2.4		
3	A	152320A	2	2	2	3.GM.2.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	152320A	3	2	2	3.GM.2.4		
3	A	152320A	4	1	2	3.GM.2.4		
3	A	152320A	5	1	2	3.GM.2.4		
3	A	152325A	1	1	2	3.GM.2.5		
3	A	152325A	2	1	2	3.GM.2.4		
3	A	152325A	3	1	2	3.GM.2.4		
3	A	152325A	4	1	2	3.GM.2.4		
3	A	152325A	5	1	2	3.GM.2.4		
3	A	152349A	1	2	2	3.N.3.4		
3	A	152349A	2	2	2	3.N.3.4		
3	A	152349A	3	1	2	3.N.3.4		
3	A	152349A	4	2	2	3.N.3.4		
3	A	152349A	5	2	2	3.N.3.3		
3	A	152422A	1	3	2	3.D.1.2		
3	A	152422A	2	3	1	3.D.1.1		
3	A	152422A	3	2	2	3.GM.1.3		
3	A	152422A	4	2	2	3.D.1.2		
3	A	152422A	5	3	2	3.D.1.2		
3	A	152471A	1	2	2	3.D.1.2		
3	A	152471A	2	2	2	3.D.1.1		
3	A	152471A	3	2	2	3.D.1.2		
3	A	152471A	4	2	2	3.D.1.1		
3	A	152471A	5	2	2	3.D.1.1		
3	A	152546A	1	1	2	3.GM.3.1		
3	A	152546A	2	1	2	3.GM.3.1		
3	A	152546A	3	1	2	3.GM.3.1		
3	A	152546A	4	1	2	3.GM.3.1		
3	A	152546A	5	1	2	3.GM.3.1		
3	A	152598A	1	2	2	3.GM.3.2		
3	A	152598A	2	2	2	3.GM.3.2		
3	A	152598A	3	2	2	3.GM.3.2		
3	A	152598A	4	2	2	3.GM.3.2		
3	A	152598A	5	2	2	3.GM.3.2		
3	A	152623A	1	1	2	3.GM.2.6		
3	A	152623A	2	1	2	3.GM.2.6		
3	A	152623A	3	1	2	3.GM.2.6		
3	A	152623A	4	2	2	3.GM.2.6		
3	A	152623A	5	1	2	3.GM.2.6		
3	A	152759A	1	2	2	3.N.2.4		
3	A	152759A	2	2	2	3.N.2.4		
3	A	152759A	3	2	2	3.N.2.4		
3	A	152759A	4	2	2	3.N.2.4		
3	A	152759A	5	2	2	3.N.2.4		
3	A	152864A	1	1	2	3.GM.1.3		
3	A	152864A	2	1	2	3.GM.1.3		
3	A	152864A	3	1	2	3.GM.1.3		
3	A	152864A	4	1	2	3.GM.1.3		
3	A	152864A	5	1	2	3.GM.1.3		
3	A	153154A	1	1	2	3.N.2.2		
3	A	153154A	2	1	2	3.N.2.1		
3	A	153154A	3	1	2	3.N.2.1		
3	A	153154A	4	1	2	3.N.2.1		
3	A	153154A	5	1	2	3.N.2.2		
3	A	154329A	1	1	2	3.N.1.2		
3	A	154329A	2	2	2	3.N.1.2		
3	A	154329A	3	1	2	3.N.1.1		
3	A	154329A	4	1	2	3.N.1.1		
3	A	154329A	5	1	2	3.N.1.2		
3	A	154484A	1	1	2	3.N.1.4		
3	A	154484A	2	2	2	3.N.1.4		
3	A	154484A	3	2	2	3.N.1.4		
3	A	154484A	4	1	2	3.N.1.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	154484A	5	2	2	3.N.1.4		
3	A	154758A	1	2	2	3.D.1.2		
3	A	154758A	2	2	2	3.D.1.2		
3	A	154758A	3	3	2	3.D.1.2		
3	A	154758A	4	2	2	3.D.1.2		
3	A	154758A	5	3	2	3.D.1.2		
3	A	155162A	1	1	2	3.GM.2.1		
3	A	155162A	2	1	2	3.GM.2.2		
3	A	155162A	3	1	2	3.GM.2.8		
3	A	155162A	4	2	2	3.GM.2.2		
3	A	155162A	5	2	2	3.GM.2.2		
3	A	155260A	1	2	2	3.N.1.4		
3	A	155260A	2	2	2	3.N.1.4		
3	A	155260A	3	1	2	3.N.1.4		
3	A	155260A	4	1	2	3.N.1.4		
3	A	155260A	5	2	2	3.N.1.4		
3	A	155268A	1	1	2	3.N.2.1		
3	A	155268A	2	1	2	3.N.2.1		
3	A	155268A	3	1	2	3.N.2.1		
3	A	155268A	4	1	2	3.N.2.1		
3	A	155268A	5	1	1	3.N.2.1		
3	A	155314A	1	1	2	3.N.2.5		
3	A	155314A	2	2	2	3.N.2.3		
3	A	155314A	3	2	2	3.D.1.2		
3	A	155314A	4	2	2	3.N.2.3		
3	A	155314A	5	2	2	3.D.1.2		
3	A	155455A	1	2	2	3.GM.2.6		
3	A	155455A	2	2	1	3.GM.2.6	3.N.2.5	
3	A	155455A	3	2	2	3.GM.2.6		
3	A	155455A	4	2	2	3.GM.2.6		
3	A	155455A	5	2	2	3.GM.2.6		
3	A	155478A	1	1	2	3.GM.2.1		
3	A	155478A	2	2	2	3.GM.2.1		
3	A	155478A	3	2	2	3.GM.2.1		
3	A	155478A	4	2	2	3.GM.2.1		
3	A	155478A	5	2	2	3.GM.2.1		
3	A	155495A	1	2	2	3.D.1.2		
3	A	155495A	2	2	2	3.D.1.2		
3	A	155495A	3	2	2	3.D.1.2		
3	A	155495A	4	2	2	3.D.1.2		
3	A	155495A	5	1	2	3.D.1.1		
3	A	155594A	1	3	2	3.D.1.2		
3	A	155594A	2	2	2	3.A.1.2		
3	A	155594A	3	1	2	3.A.1.2		
3	A	155594A	4	2	2	3.A.1.2		
3	A	155594A	5	2	2	3.A.1.2		
3	A	155999A	1	1	2	3.GM.1.1		
3	A	155999A	2	1	2	3.GM.1.1		
3	A	155999A	3	1	1	3.GM.1.X		
3	A	155999A	4	1	2	3.GM.1.1		
3	A	155999A	5	1	2	3.GM.1.1		
3	A	156046A	1	2	2	3.N.3.4		
3	A	156046A	2	2	2	3.N.3.4		
3	A	156046A	3	2	2	3.D.1.2		
3	A	156046A	4	1	2	3.N.3.4		
3	A	156046A	5	1	2	3.N.3.4		
3	A	161166A	1	2	2	3.D.1.2		
3	A	161166A	2	2	2	3.D.1.1		
3	A	161166A	3	3	2	3.D.1.2		
3	A	161166A	4	2	2	3.D.1.1		
3	A	161166A	5	2	2	3.D.1.1		
3	A	184065A	1	1	2	3.N.2.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	A	184065A	2	1	2	3.A.2.1		
3	A	184065A	3	1	2	3.N.2.2		
3	A	184065A	4	1	2	3.A.2.1		
3	A	184065A	5	2	2	3.A.2.1		
3	A	479031	1	1	2	3.N.3.1		
3	A	479031	2	1	2	3.N.3.1		
3	A	479031	3	1	2	3.N.3.1		
3	A	479031	4	1	2	3.N.3.1		
3	A	479031	5	1	2	3.N.3.1		
3	A	479113	1	1	2	3.N.3.1		
3	A	479113	2	1	2	3.N.3.4		
3	A	479113	3	1	2	3.N.3.3		
3	A	479113	4	1	2	3.N.3.3		
3	A	479113	5	1	2	3.N.3.3		
3	A	479117	1	1	2	3.N.3.1		
3	A	479117	2	1	2	3.N.3.1		
3	A	479117	3	1	2	3.N.3.1		
3	A	479117	4	1	2	3.N.3.4		
3	A	479117	5	1	2	3.N.3.3		
3	A	479121	1	1	2	3.N.3.3		
3	A	479121	2	2	2	3.N.3.3		
3	A	479121	3	1	2	3.N.3.3		
3	A	479121	4	1	2	3.N.X.X		
3	A	479121	5	3	2	3.N.3.3		
3	A	479123	1	1	2	3.N.4.1		
3	A	479123	2	2	2	3.N.4.1		
3	A	479123	3	2	2	3.N.4.1		
3	A	479123	4	2	2	3.N.4.1		
3	A	479123	5	2	2	3.N.4.1		
3	A	479125	1	1	2	3.N.4.1		
3	A	479125	2	1	2	3.N.4.1		
3	A	479125	3	1	2	3.N.4.1		
3	A	479125	4	2	2	3.N.4.1		
3	A	479125	5	1	2	3.N.4.1		
3	A	479138	1	3	2	3.N.4.2		
3	A	479138	2	3	2	3.N.4.2		
3	A	479138	3	3	2	3.N.4.2		
3	A	479138	4	2	2	3.N.4.2		
3	A	479138	5	2	2	3.N.4.2		
3	B	146911A	1	1	2	3.GM.2.7		
3	B	146911A	2	1	2	3.GM.2.1		
3	B	146911A	3	1	2	3.GM.2.1		
3	B	146911A	4	2	2	3.GM.2.1		
3	B	146911A	5	2	1	3.GM.2.1		
3	B	147300A	1	1	2	3.N.3.4		
3	B	147300A	2	2	2	3.N.3.4		
3	B	147300A	3	1	2	3.N.3.4		
3	B	147300A	4	1	2	3.N.3.4		
3	B	147300A	5	2	2	3.N.3.4		
3	B	147503A	1	1	2	3.D.1.2		
3	B	147503A	2	2	2	3.D.1.2		
3	B	147503A	3	2	2	3.D.1.2		
3	B	147503A	4	2	2	3.D.1.2		
3	B	147503A	5	2	2	3.D.1.1		
3	B	147528A	1	2	2	3.N.2.5		
3	B	147528A	2	1	2	3.N.2.5		
3	B	147528A	3	1	2	3.N.2.5		
3	B	147528A	4	2	2	3.N.2.5		
3	B	147528A	5	1	2	3.N.2.5		
3	B	147530A	1	1	2	3.D.1.2		
3	B	147530A	2	2	2	3.D.1.2		
3	B	147530A	3	1	1	3.D.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	B	147530A	4	1	2	3.D.1.1		
3	B	147530A	5	2	2	3.D.1.2		
3	B	147708A	1	2	2	3.N.2.3		
3	B	147708A	2	1	2	3.N.2.5		
3	B	147708A	3	1	2	3.N.2.5		
3	B	147708A	4	2	2	3.N.2.5		
3	B	147708A	5	2	2	3.N.2.5		
3	B	147722A	1	2	2	3.A.1.1		
3	B	147722A	2	2	2	3.A.1.1		
3	B	147722A	3	1	2	3.A.2.1		
3	B	147722A	4	2	2	3.A.1.1		
3	B	147722A	5	2	2	3.A.1.1		
3	B	147746A	1	1	2	3.N.1.4		
3	B	147746A	2	2	2	3.N.1.4		
3	B	147746A	3	1	2	3.N.1.4		
3	B	147746A	4	1	2	3.N.1.4		
3	B	147746A	5	2	2	3.N.1.4		
3	B	148162A	1	2	2	3.GM.2.1		
3	B	148162A	2	2	2	3.GM.2.2		
3	B	148162A	3	1	2	3.GM.2.8		
3	B	148162A	4	2	2	3.GM.2.2		
3	B	148162A	5	2	2	3.GM.2.2		
3	B	148230A	1	1	2	3.GM.1.3		
3	B	148230A	2	2	2	3.GM.1.3		
3	B	148230A	3	1	2	3.GM.1.3		
3	B	148230A	4	1	2	3.GM.1.3		
3	B	148230A	5	1	2	3.GM.1.3		
3	B	148671A	1	3	2	3.D.1.2		
3	B	148671A	2	3	1	3.D.1.1	3.D.1.2	
3	B	148671A	3	2	2	3.D.1.2		
3	B	148671A	4	3	2	3.D.1.1		
3	B	148671A	5	3	2	3.D.1.2		
3	B	149309A	1	2	2	3.A.1.2		
3	B	149309A	2	2	2	3.A.1.2		
3	B	149309A	3	1	2	3.A.1.2		
3	B	149309A	4	2	2	3.A.1.2		
3	B	149309A	5	2	2	3.A.1.2		
3	B	150658A	1	2	2	3.N.2.4		
3	B	150658A	2	2	2	3.N.2.4		
3	B	150658A	3	2	2	3.X.2.4		
3	B	150658A	4	2	2	3.N.2.4		
3	B	150658A	5	2	2	3.N.2.4		
3	B	151471A	1	1	2	3.A.1.1		
3	B	151471A	2	1	2	3.A.1.1		
3	B	151471A	3	1	2	3.A.1.1		
3	B	151471A	4	2	2	3.A.1.1		
3	B	151471A	5	2	2	3.A.1.1		
3	B	151522A	1	2	2	3.A.1.2		
3	B	151522A	2	1	2	3.A.1.2		
3	B	151522A	3	1	2	3.A.1.2		
3	B	151522A	4	2	2	3.A.1.2		
3	B	151522A	5	1	2	3.A.1.2		
3	B	152580A	1	1	2	3.GM.2.6		
3	B	152580A	2	1	2	3.GM.2.6		
3	B	152580A	3	1	2	3.GM.2.6		
3	B	152580A	4	1	2	3.GM.2.6		
3	B	152580A	5	2	2	3.GM.2.6		
3	B	152739A	1	2	2	3.N.2.3		
3	B	152739A	2	2	2	3.GM.2.1		
3	B	152739A	3	1	2	3.N.2.5		
3	B	152739A	4	2	2	3.N.2.5		
3	B	152739A	5	2	2	3.GM.2.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	B	152842A	1	2	2	3.GM.2.1		
3	B	152842A	2	1	2	3.N.2.5		
3	B	152842A	3	2	2	3.GM.2.1		
3	B	152842A	4	2	2	3.GM.2.1		
3	B	152842A	5	1	2	3.N.2.5		
3	B	152845A	1	2	2	3.GM.2.2		
3	B	152845A	2	2	2	3.GM.2.2		
3	B	152845A	3	1	2	3.GM.2.8		
3	B	152845A	4	2	2	3.GM.2.2		
3	B	152845A	5	2	2	3.GM.2.2		
3	B	152857A	1	1	2	3.GM.1.3		
3	B	152857A	2	2	2	3.GM.1.3		
3	B	152857A	3	1	2	3.GM.1.3		
3	B	152857A	4	1	2	3.GM.1.3		
3	B	152857A	5	2	2	3.GM.2.1		
3	B	152884A	1	1	1	3.GM.2.8	3.A.1.1	
3	B	152884A	2	3	2	3.GM.2.2		
3	B	152884A	3	2	2	3.X.2.8		
3	B	152884A	4	2	2	3.GM.2.2		
3	B	152884A	5	2	2	3.GM.2.2		
3	B	154307A	1	2	1	3.N.2.2	3.D.1.2	
3	B	154307A	2	3	2	3.N.2.1		
3	B	154307A	3	2	1	3.N.2.2	3.D.1.2	
3	B	154307A	4	2	2	3.D.1.2		
3	B	154307A	5	3	2	3.D.1.2		
3	B	154340A	1	1	2	3.N.2.5		
3	B	154340A	2	1	2	3.N.1.1		
3	B	154340A	3	1	2	3.N.1.1		
3	B	154340A	4	1	2	3.N.1.1		
3	B	154340A	5	1	2	3.N.1.1		
3	B	154482A	1	1	2	3.N.1.4		
3	B	154482A	2	1	2	3.N.1.4		
3	B	154482A	3	1	2	3.N.1.4		
3	B	154482A	4	1	2	3.N.1.4		
3	B	154482A	5	1	2	3.N.1.4		
3	B	155226A	1	1	2	3.GM.1.3		
3	B	155226A	2	2	2	3.GM.2.1		
3	B	155226A	3	1	2	3.GM.1.3		
3	B	155226A	4	1	2	3.GM.1.3		
3	B	155226A	5	1	2	3.GM.1.3		
3	B	155264A	1	1	2	3.N.1.1		
3	B	155264A	2	1	2	3.N.1.2		
3	B	155264A	3	1	2	3.N.1.2		
3	B	155264A	4	1	2	3.N.1.2		
3	B	155264A	5	1	2	3.N.1.1		
3	B	155265A	1	2	2	3.D.1.2		
3	B	155265A	2	2	2	3.D.1.2		
3	B	155265A	3	1	2	3.D.1.1		
3	B	155265A	4	2	2	3.D.1.1		
3	B	155265A	5	2	2	3.D.1.1		
3	B	155404A	1	1	2	3.N.2.2		
3	B	155404A	2	2	2	3.N.2.1		
3	B	155404A	3	1	2	3.N.2.1		
3	B	155404A	4	1	2	3.N.2.1		
3	B	155404A	5	2	2	3.N.2.1		
3	B	155550A	1	1	2	3.N.1.2		
3	B	155550A	2	1	2	3.N.1.2		
3	B	155550A	3	1	2	3.N.1.2		
3	B	155550A	4	1	2	3.N.1.2		
3	B	155550A	5	1	2	3.N.1.2		
3	B	155617A	1	3	2	3.GM.1.2		
3	B	155617A	2	2	2	3.GM.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	B	155617A	3	1	2	3.GM.1.X		
3	B	155617A	4	1	2	3.GM.1.1		
3	B	155617A	5	2	1	3.GM.1.1		
3	B	155918A	1	1	2	3.GM.3.1		
3	B	155918A	2	1	2	3.GM.3.1		
3	B	155918A	3	1	2	3.GM.3.1		
3	B	155918A	4	1	2	3.GM.3.1		
3	B	155918A	5	1	2	3.GM.3.1		
3	B	155934A	1	1	2	3.GM.3.1		
3	B	155934A	2	2	2	3.GM.3.1		
3	B	155934A	3	1	2	3.GM.3.1		
3	B	155934A	4	1	2	3.GM.3.1		
3	B	155934A	5	1	2	3.GM.3.1		
3	B	156014A	1	3	2	3.D.1.2		
3	B	156014A	2	2	2	3.D.1.1		
3	B	156014A	3	2	2	3.X.1.2		
3	B	156014A	4	2	2	3.D.1.1		
3	B	156014A	5	2	2	3.D.1.1		
3	B	184068A	1	1	2	3.A.2.1		
3	B	184068A	2	2	2	3.A.2.1		
3	B	184068A	3	1	2	3.X.2.1		
3	B	184068A	4	2	2	3.A.2.1		
3	B	184068A	5	2	2	3.A.2.1		
3	B	187104A	1	1	2	3.A.2.2		
3	B	187104A	2	1	2	3.A.2.2		
3	B	187104A	3	1	2	3.A.2.2		
3	B	187104A	4	1	2	3.A.2.2		
3	B	187104A	5	1	2	3.A.2.2		
3	B	479103	1	1	2	3.N.3.1		
3	B	479103	2	1	2	3.N.3.1		
3	B	479103	3	1	2	3.N.3.1		
3	B	479103	4	1	2	3.N.3.1		
3	B	479103	5	1	2	3.N.3.1		
3	B	479107	1	1	2	3.N.3.1		
3	B	479107	2	1	2	3.N.3.1		
3	B	479107	3	1	2	3.N.3.1		
3	B	479107	4	1	2	3.N.3.1		
3	B	479107	5	1	2	3.N.3.1		
3	B	479111	1	1	2	3.N.3.1		
3	B	479111	2	2	2	3.N.3.2		
3	B	479111	3	1	2	3.N.3.1		
3	B	479111	4	1	0	3.N.3.2		
3	B	479111	5	2	2	3.N.3.2		
3	B	479127	1	2	2	3.N.4.1		
3	B	479127	2	2	2	3.N.4.1		
3	B	479127	3	1	2	3.N.4.2		
3	B	479127	4	2	2	3.N.4.1		
3	B	479127	5	2	2	3.N.4.1		
3	B	479131	1	2	2	3.N.4.1		
3	B	479131	2	1	2	3.N.4.1		
3	B	479131	3	1	2	3.N.4.2		
3	B	479131	4	2	2	3.N.4.1		
3	B	479131	5	2	2	3.N.4.2		
3	B	479140	1	2	2	3.N.4.1		
3	B	479140	2	2	2	3.N.4.1		
3	B	479140	3	2	2	3.N.4.1		
3	B	479140	4	2	2	3.N.4.1		
3	B	479140	5	2	2	3.N.4.1		
3	C	147026A	1	1	2	3.N.1.1		
3	C	147026A	2	2	2	3.N.1.2		
3	C	147026A	3	1	2	3.N.1.2		
3	C	147026A	4	1	2	3.N.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	C	147026A	5	3	2	3.N.2.4		
3	C	147055A	1	2	2	3.N.2.3		
3	C	147055A	2	1	2	3.N.2.5		
3	C	147055A	3	1	2	3.N.2.5		
3	C	147055A	4	2	2	3.N.2.5		
3	C	147055A	5	2	2	3.N.2.5		
3	C	147073A	1	1	2	3.N.2.2		
3	C	147073A	2	1	2	3.A.2.1		
3	C	147073A	3	1	2	3.N.2.1		
3	C	147073A	4	2	2	3.N.2.2		
3	C	147073A	5	1	2	3.N.2.2		
3	C	147382A	1	1	2	3.N.1.2		
3	C	147382A	2	1	2	3.N.1.2		
3	C	147382A	3	1	2	3.N.1.2		
3	C	147382A	4	1	2	3.N.1.2		
3	C	147382A	5	1	2	3.N.1.1		
3	C	147423A	1	2	2	3.A.1.1		
3	C	147423A	2	3	2	3.GM.1.1		
3	C	147423A	3	2	2	3.GM.1.X		
3	C	147423A	4	1	2	3.GM.1.1		
3	C	147423A	5	2	2	3.GM.1.1		
3	C	147726A	1	1	2	3.N.1.2		
3	C	147726A	2	1	2	3.N.1.2		
3	C	147726A	3	1	2	3.N.1.1		
3	C	147726A	4	1	2	3.N.1.1		
3	C	147726A	5	1	2	3.N.1.1		
3	C	147727A	1	2	2	3.GM.3.2		
3	C	147727A	2	2	2	3.GM.3.2		
3	C	147727A	3	2	2	3.GM.3.2		
3	C	147727A	4	2	2	3.GM.3.2		
3	C	147727A	5	2	2	3.GM.1.2		
3	C	147966A	1	1	2	3.A.2.2		
3	C	147966A	2	1	2	3.A.2.2		
3	C	147966A	3	1	2	3.A.2.2		
3	C	147966A	4	1	2	3.A.2.2		
3	C	147966A	5	2	2	3.GM.1.3		
3	C	149283A	1	2	2	3.GM.2.7		
3	C	149283A	2	3	2	3.GM.2.2		
3	C	149283A	3	1	2	3.GM.2.2		
3	C	149283A	4	2	2	3.GM.2.2		
3	C	149283A	5	2	1	3.GM.2.2	3.GM.2.8	
3	C	149306A	1	1	2	3.GM.1.3		
3	C	149306A	2	1	2	3.GM.1.3		
3	C	149306A	3	1	2	3.GM.1.3		
3	C	149306A	4	1	2	3.GM.1.3		
3	C	149306A	5	2	2	3.GM.1.3		
3	C	150648A	1	1	2	3.N.1.2		
3	C	150648A	2	2	2	3.N.1.2		
3	C	150648A	3	2	2	3.N.1.1		
3	C	150648A	4	2	2	3.N.1.1		
3	C	150648A	5	3	2	3.N.1.4		
3	C	151003A	1	2	2	3.A.1.1		
3	C	151003A	2	2	2	3.A.1.1		
3	C	151003A	3	2	2	3.A.1.1		
3	C	151003A	4	2	2	3.A.1.1		
3	C	151003A	5	1	2	3.GM.1.3		
3	C	151006A	1	2	2	3.A.1.1		
3	C	151006A	2	2	2	3.A.1.1		
3	C	151006A	3	2	2	3.A.1.1		
3	C	151006A	4	2	2	3.A.1.1		
3	C	151006A	5	1	2	3.A.1.1		
3	C	151476A	1	1	2	3.A.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	C	151476A	2	1	2	3.A.1.1		
3	C	151476A	3	1	2	3.A.1.2		
3	C	151476A	4	2	2	3.A.1.2		
3	C	151476A	5	2	2	3.A.1.1		
3	C	152031A	1	2	2	3.N.2.2		
3	C	152031A	2	2	2	3.A.1.2		
3	C	152031A	3	1	2	3.A.1.2		
3	C	152031A	4	2	2	3.A.1.2		
3	C	152031A	5	2	2	3.A.1.1		
3	C	152620A	1	1	2	3.GM.2.6		
3	C	152620A	2	1	2	3.GM.2.6		
3	C	152620A	3	1	2	3.GM.2.6		
3	C	152620A	4	1	2	3.GM.2.6		
3	C	152620A	5	2	2	3.GM.2.6		
3	C	152867A	1	1	2	3.GM.1.3		
3	C	152867A	2	2	2	3.GM.1.3		
3	C	152867A	3	1	2	3.GM.1.3		
3	C	152867A	4	1	2	3.GM.1.3		
3	C	152867A	5	1	2	3.GM.1.3		
3	C	153168A	1	1	2	3.N.2.2		
3	C	153168A	2	1	2	3.N.2.2		
3	C	153168A	3	1	2	3.N.2.1		
3	C	153168A	4	2	2	3.N.2.2		
3	C	153168A	5	1	2	3.A.2.2		
3	C	153974A	1	1	2	3.GM.2.6		
3	C	153974A	2	1	2	3.GM.2.6		
3	C	153974A	3	1	2	3.GM.2.6		
3	C	153974A	4	1	2	3.GM.2.6		
3	C	153974A	5	1	2	3.GM.2.6		
3	C	154516A	1	2	1	3.N.2.4	3.D.1.2	
3	C	154516A	2	2	2	3.D.1.2		
3	C	154516A	3	2	2	3.D.1.2		
3	C	154516A	4	2	2	3.D.1.2		
3	C	154516A	5	3	2	3.D.1.2		
3	C	154533A	1	1	2	3.D.1.X		
3	C	154533A	2	2	2	3.N.2.3		
3	C	154533A	3	2	2	3.D.1.2		
3	C	154533A	4	2	2	3.D.1.2		
3	C	154533A	5	2	2	3.D.1.2		
3	C	154553A	1	2	2	3.GM.2.1		
3	C	154553A	2	2	2	3.GM.2.1		
3	C	154553A	3	2	2	3.GM.2.1		
3	C	154553A	4	2	2	3.GM.2.1		
3	C	154553A	5	2	2	3.GM.2.1		
3	C	154760A	1	2	2	3.D.1.2		
3	C	154760A	2	1	2	3.D.1.2		
3	C	154760A	3	2	2	3.D.1.2		
3	C	154760A	4	2	2	3.D.1.2		
3	C	154760A	5	2	2	3.D.1.2		
3	C	155185A	1	2	1	3.GM.2.8	3.N.2.8	
3	C	155185A	2	2	2	3.GM.2.2		
3	C	155185A	3	1	2	3.GM.2.2		
3	C	155185A	4	2	2	3.GM.2.2		
3	C	155185A	5	2	2	3.GM.3.1		
3	C	155196A	1	2	2	3.N.2.3		
3	C	155196A	2	1	2	3.N.2.5		
3	C	155196A	3	1	2	3.N.2.5		
3	C	155196A	4	2	2	3.N.2.5		
3	C	155196A	5	2	2	3.N.2.5		
3	C	155261A	1	1	2	3.GM.3.1		
3	C	155261A	2	2	2	3.GM.3.1		
3	C	155261A	3	1	2	3.GM.3.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	C	155261A	4	1	2	3.GM.3.1		
3	C	155261A	5	1	2	3.GM.3.1		
3	C	155486A	1	2	2	3.N.2.5		
3	C	155486A	2	2	2	3.N.1.4		
3	C	155486A	3	1	2	3.N.1.4		
3	C	155486A	4	1	2	3.N.1.4		
3	C	155486A	5	2	2	3.N.1.4		
3	C	155501A	1	2	2	3.N.2.4		
3	C	155501A	2	2	2	3.N.2.4		
3	C	155501A	3	1	2	3.N.2.4		
3	C	155501A	4	2	2	3.N.2.4		
3	C	155501A	5	2	2	3.N.2.4		
3	C	155525A	1	2	2	3.D.1.2		
3	C	155525A	2	2	2	3.D.1.2		
3	C	155525A	3	2	2	3.D.1.2		
3	C	155525A	4	2	2	3.D.1.1		
3	C	155525A	5	3	2	3.D.1.1		
3	C	156021A	1	1	2	3.N.2.2		
3	C	156021A	2	1	2	3.N.2.1		
3	C	156021A	3	1	2	3.N.2.1		
3	C	156021A	4	1	2	3.N.2.1		
3	C	156021A	5	2	2	3.N.2.1		
3	C	184059A	1	1	2	3.A.2.1		
3	C	184059A	2	2	2	3.A.2.1		
3	C	184059A	3	1	2	3.A.2.1		
3	C	184059A	4	2	2	3.A.2.1		
3	C	184059A	5	2	2	3.A.2.1		
3	C	479105	1	1	2	3.N.3.1		
3	C	479105	2	1	2	3.N.3.1		
3	C	479105	3	1	2	3.N.3.1		
3	C	479105	4	1	2	3.N.3.1		
3	C	479105	5	1	2	3.N.3.1		
3	C	479109	1	1	2	3.N.3.1		
3	C	479109	2	1	2	3.N.3.1		
3	C	479109	3	1	2	3.N.3.1		
3	C	479109	4	1	2	3.N.3.1		
3	C	479109	5	1	2	3.N.3.1		
3	C	479115	1	1	2	3.N.3.3		
3	C	479115	2	2	2	3.N.3.1		
3	C	479115	3	2	2	3.N.3.1		
3	C	479115	4	2	2	3.N.3.2		
3	C	479115	5	3	2	3.N.3.2		
3	C	479119	1	1	2	3.N.3.3		
3	C	479119	2	2	2	3.N.3.3		
3	C	479119	3	1	2	3.N.3.3		
3	C	479119	4	1	2	3.N.3.3		
3	C	479119	5	2	2	3.N.3.3		
3	C	479129	1	2	2	3.N.4.1		
3	C	479129	2	1	2	3.N.4.1		
3	C	479129	3	1	2	3.N.4.1		
3	C	479129	4	2	2	3.N.4.1		
3	C	479129	5	2	2	3.A.1.1		
3	C	479136	1	2	2	3.N.4.2		
3	C	479136	2	2	2	3.N.4.2		
3	C	479136	3	2	2	3.N.4.2		
3	C	479136	4	2	2	3.N.4.2		
3	C	479136	5	2	2	3.N.4.2		
3	C	479142	1	1	2	3.N.4.2		
3	C	479142	2	2	2	3.N.4.2		
3	C	479142	3	2	2	3.N.4.2		
3	C	479142	4	2	2	3.N.4.2		
3	C	479142	5	2	2	3.N.4.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
3	C	488998	1	3	2	3.D.1.2		
3	C	488998	2	3	2	3.D.1.1		
3	C	488998	3	2	2	3.D.1.2		
3	C	488998	4	3	2	3.D.1.1		
3	C	488998	5	3	2	3.D.1.2		
4	A	146938A	1	2	2	4.N.1.4		
4	A	146938A	2	2	1	4.N.1.4	4.N.1.6	
4	A	146938A	3	2	1	4.N.1.4	4.N.1.6	
4	A	146938A	4	2	2	4.N.1.4		
4	A	146938A	5	2	1	4.N.1.4	4.N.1.6	
4	A	146944A	1	1	2	4.GM.1.3		
4	A	146944A	2	2	2	4.GM.1.2		
4	A	146944A	3	1	1	4.GM.1.2		
4	A	146944A	4	1	2	4.GM.1.2		
4	A	146944A	5	1	2	4.GM.1.2		
4	A	147295A	1	2	2	4.N.2.4		
4	A	147295A	2	2	2	4.N.2.4		
4	A	147295A	3	1	2	4.N.2.4		
4	A	147295A	4	1	2	4.N.2.4		
4	A	147295A	5	2	2	4.N.2.4		
4	A	147318A	1	1	2	4.N.2.6		
4	A	147318A	2	1	2	4.N.2.6		
4	A	147318A	3	1	2	4.N.2.6		
4	A	147318A	4	1	2	4.N.2.6		
4	A	147318A	5	1	2	4.N.2.6		
4	A	147319A	1	1	2	4.GM.1.1		
4	A	147319A	2	1	2	4.GM.1.1		
4	A	147319A	3	1	2	4.GM.1.1		
4	A	147319A	4	1	2	4.GM.1.1		
4	A	147319A	5	1	2	4.GM.1.1		
4	A	147505A	1	1	2	4.N.2.2		
4	A	147505A	2	1	2	4.A.2.1		
4	A	147505A	3	1	2	4.A.2.1		
4	A	147505A	4	2	2	4.A.2.1		
4	A	147505A	5	1	2	4.A.2.1		
4	A	147525A	1	2	2	4.GM.3.1		
4	A	147525A	2	2	2	4.GM.3.1		
4	A	147525A	3	2	2	4.GM.3.1		
4	A	147525A	4	2	2	4.GM.3.1		
4	A	147525A	5	2	2	4.GM.3.1		
4	A	147975A	1	1	2	4.GM.1.2		
4	A	147975A	2	2	1	4.GM.1.2	4.GM.1.3	
4	A	147975A	3	2	2	4.GM.1.3		
4	A	147975A	4	1	2	4.GM.1.2		
4	A	147975A	5	2	2	4.GM.1.2		
4	A	148234A	1	2	2	4.N.3.1		
4	A	148234A	2	1	2	4.N.3.1		
4	A	148234A	3	1	2	4.N.3.1		
4	A	148234A	4	2	2	4.N.3.1		
4	A	148234A	5	2	2	4.N.3.1		
4	A	148301A	1	2	2	4.GM.2.3		
4	A	148301A	2	2	2	4.GM.2.2		
4	A	148301A	3	2	2	4.GM.2.2		
4	A	148301A	4	2	2	4.GM.2.2		
4	A	148301A	5	2	2	4.GM.2.2		
4	A	148346A	1	2	2	4.N.1.6		
4	A	148346A	2	2	2	4.N.1.6		
4	A	148346A	3	1	2	4.N.1.6		
4	A	148346A	4	2	2	4.N.1.6		
4	A	148346A	5	2	2	4.N.1.6		
4	A	148500A	1	2	2	4.D.1.3		
4	A	148500A	2	2	2	4.A.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	148500A	3	2	1	4.A.1.X		
4	A	148500A	4	2	2	4.GM.2.5		
4	A	148500A	5	3	2	4.A.1.1		
4	A	148627A	1	1	2	4.N.2.7		
4	A	148627A	2	2	2	4.N.2.7		
4	A	148627A	3	1	2	4.N.2.7		
4	A	148627A	4	1	2	4.N.2.7		
4	A	148627A	5	2	2	4.N.2.7		
4	A	148648A	1	3	2	4.A.1.3		
4	A	148648A	2	2	2	4.A.1.1		
4	A	148648A	3	2	2	4.A.1.1		
4	A	148648A	4	2	2	4.A.1.1		
4	A	148648A	5	3	1	4.A.1.3	4.A.1.2	
4	A	148649A	1	1	2	4.N.2.2		
4	A	148649A	2	2	1	4.N.2.8		
4	A	148649A	3	2	1	4.N.2.5	4.N.2.7	
4	A	148649A	4	2	1	4.N.2.8		
4	A	148649A	5	1	2	4.N.2.1		
4	A	148654A	1	1	2	4.N.2.7		
4	A	148654A	2	1	2	4.N.2.7		
4	A	148654A	3	3	2	4.N.2.7		
4	A	148654A	4	1	2	4.N.2.7		
4	A	148654A	5	2	2	4.N.2.7		
4	A	148675A	1	3	2	4.N.1.1		
4	A	148675A	2	2	2	4.N.1.1		
4	A	148675A	3	1	1	4.N.1.1		
4	A	148675A	4	2	2	4.N.1.1		
4	A	148675A	5	2	1	4.N.1.1		
4	A	149642A	1	3	2	4.D.1.2		
4	A	149642A	2	3	2	4.D.1.2		
4	A	149642A	3	3	1	4.D.1.X		
4	A	149642A	4	1	2	4.D.1.2		
4	A	149642A	5	2	2	4.D.1.2		
4	A	150227A	1	1	2	4.D.1.1		
4	A	150227A	2	2	2	4.D.1.2		
4	A	150227A	3	2	2	4.D.1.3		
4	A	150227A	4	2	1	4.D.1.2		
4	A	150227A	5	1	2	4.D.1.2		
4	A	150664A	1	1	2	4.N.2.8		
4	A	150664A	2	1	2	4.N.2.2		
4	A	150664A	3	1	2	4.N.2.2		
4	A	150664A	4	1	2	4.N.2.2		
4	A	150664A	5	2	2	4.N.2.8		
4	A	150722A	1	1	2	4.GM.1.2		
4	A	150722A	2	2	2	4.GM.1.2		
4	A	150722A	3	2	2	4.GM.1.2		
4	A	150722A	4	1	2	4.GM.1.2		
4	A	150722A	5	1	2	4.GM.1.2		
4	A	150856A	1	1	2	4.GM.1.3		
4	A	150856A	2	2	2	4.GM.1.2		
4	A	150856A	3	1	2	4.GM.1.2		
4	A	150856A	4	1	2	4.GM.1.2		
4	A	150856A	5	1	2	4.GM.1.2		
4	A	151071A	1	1	2	4.A.1.3		
4	A	151071A	2	2	2	4.A.1.3		
4	A	151071A	3	1	1	4.A.2.1		
4	A	151071A	4	1	2	4.A.1.3		
4	A	151071A	5	1	2	4.A.1.3		
4	A	151278A	1	1	2	4.GM.1.1		
4	A	151278A	2	1	2	4.GM.1.1		
4	A	151278A	3	1	2	4.GM.1.1		
4	A	151278A	4	1	2	4.GM.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	151278A	5	1	2	4.GM.1.1		
4	A	151506A	1	2	2	4.GM.3.1		
4	A	151506A	2	2	2	4.GM.3.1		
4	A	151506A	3	2	2	4.GM.3.1		
4	A	151506A	4	2	2	4.GM.3.1		
4	A	151506A	5	2	2	4.GM.3.1		
4	A	151519A	1	2	2	4.N.3.1		
4	A	151519A	2	1	2	4.N.3.1		
4	A	151519A	3	2	2	4.N.3.1		
4	A	151519A	4	2	2	4.N.3.1		
4	A	151519A	5	2	2	4.N.3.1		
4	A	151554A	1	1	2	4.N.1.1		
4	A	151554A	2	1	2	4.A.2.1		
4	A	151554A	3	1	2	4.A.X.X		
4	A	151554A	4	1	2	4.A.2.1		
4	A	151554A	5	2	2	4.A.2.2		
4	A	151556A	1	1	2	4.N.1.1		
4	A	151556A	2	2	2	4.A.2.1		
4	A	151556A	3	1	2	4.N.2.1		
4	A	151556A	4	2	2	4.N.1.1		
4	A	151556A	5	1	1	4.A.2.1		
4	A	152197A	1	1	2	4.N.1.5		
4	A	152197A	2	2	2	4.N.2.7		
4	A	152197A	3	2	2	4.N.2.7		
4	A	152197A	4	2	1	4.N.2.7		
4	A	152197A	5	2	2	4.N.2.7		
4	A	152206A	1	2	2	4.N.1.5		
4	A	152206A	2	3	2	4.D.1.2		
4	A	152206A	3	2	2	4.D.1.2		
4	A	152206A	4	2	2	4.D.1.2		
4	A	152206A	5	2	1	4.D.1.2		
4	A	152343A	1	1	2	4.N.2.2		
4	A	152343A	2	2	2	4.N.2.2		
4	A	152343A	3	1	2	4.N.2.1		
4	A	152343A	4	2	2	4.N.2.2		
4	A	152343A	5	1	2	4.N.2.1		
4	A	152353A	1	2	2	4.N.2.4		
4	A	152353A	2	1	2	4.N.2.4		
4	A	152353A	3	1	2	4.N.2.4		
4	A	152353A	4	1	2	4.N.2.4		
4	A	152353A	5	2	2	4.N.2.4		
4	A	152518A	1	1	2	4.D.1.3		
4	A	152518A	2	2	2	4.D.1.1		
4	A	152518A	3	2	2	4.D.1.3		
4	A	152518A	4	2	2	4.D.1.1		
4	A	152518A	5	2	2	4.D.1.1		
4	A	152776A	1	1	2	4.D.1.1		
4	A	152776A	2	2	2	4.D.1.2		
4	A	152776A	3	1	2	4.D.1.2		
4	A	152776A	4	2	2	4.D.1.2		
4	A	152776A	5	2	2	4.D.1.2		
4	A	152789A	1	1	2	4.GM.1.1		
4	A	152789A	2	1	2	4.GM.1.1		
4	A	152789A	3	2	2	4.GM.1.1		
4	A	152789A	4	1	2	4.GM.1.1		
4	A	152789A	5	1	2	4.GM.1.1		
4	A	152874A	1	1	2	4.N.2.7		
4	A	152874A	2	2	2	4.N.2.7		
4	A	152874A	3	2	2	4.N.2.7		
4	A	152874A	4	2	2	4.GM.2.5		
4	A	152874A	5	2	2	4.N.2.7		
4	A	152904A	1	1	2	4.N.1.7		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	152904A	2	2	2	4.A.2.1		
4	A	152904A	3	2	2	4.N.1.7		
4	A	152904A	4	2	2	4.N.1.7		
4	A	152904A	5	2	2	4.N.1.7		
4	A	152988A	1	2	2	4.N.1.5		
4	A	152988A	2	1	2	4.N.1.3		
4	A	152988A	3	1	2	4.N.1.3		
4	A	152988A	4	2	2	4.N.1.3		
4	A	152988A	5	2	2	4.N.1.4		
4	A	153171A	1	3	2	4.A.2.2		
4	A	153171A	2	3	2	4.A.2.2		
4	A	153171A	3	3	1	4.N.1.7		
4	A	153171A	4	2	2	4.A.2.1		
4	A	153171A	5	3	1	4.A.2.1		
4	A	153189A	1	1	2	4.N.1.1		
4	A	153189A	2	2	2	4.N.1.1		
4	A	153189A	3	1	2	4.N.1.1		
4	A	153189A	4	1	2	4.N.1.1		
4	A	153189A	5	3	1	4.N.1.5	4.N.1.1	
4	A	153325A	1	1	2	4.N.2.2		
4	A	153325A	2	2	2	4.N.2.2		
4	A	153325A	3	1	2	4.N.2.2		
4	A	153325A	4	2	2	4.N.2.2		
4	A	153325A	5	1	2	4.N.2.2		
4	A	153346A	1	2	2	4.X.X.X		
4	A	153346A	2	1	2	4.A.2.2		
4	A	153346A	3	1	2	4.A.2.2		
4	A	153346A	4	2	2	4.A.2.2		
4	A	153346A	5	2	2	4.A.2.1		
4	A	153941A	1	2	2	4.GM.3.1		
4	A	153941A	2	1	2	4.GM.3.1		
4	A	153941A	3	1	2	4.GM.3.1		
4	A	153941A	4	2	2	4.GM.3.1		
4	A	153941A	5	2	2	4.GM.3.1		
4	A	154479A	1	1	2	4.N.1.1		
4	A	154479A	2	2	2	4.A.1.2		
4	A	154479A	3	1	2	4.A.1.2		
4	A	154479A	4	2	2	4.A.1.2		
4	A	154479A	5	2	2	4.A.1.2		
4	A	154619A	1	2	2	4.A.1.2		
4	A	154619A	2	2	2	4.A.1.2		
4	A	154619A	3	1	2	4.A.1.2		
4	A	154619A	4	2	2	4.A.1.2		
4	A	154619A	5	3	2	4.A.1.2		
4	A	155121A	1	2	2	4.A.2.1		
4	A	155121A	2	2	2	4.A.2.1		
4	A	155121A	3	1	2	4.A.2.1		
4	A	155121A	4	1	2	4.A.2.1		
4	A	155121A	5	2	2	4.A.2.1		
4	A	155167A	1	2	2	4.A.2.2		
4	A	155167A	2	1	2	4.A.2.2		
4	A	155167A	3	2	2	4.A.2.2		
4	A	155167A	4	2	2	4.A.2.2		
4	A	155167A	5	2	2	4.A.2.1		
4	A	155220A	1	1	2	4.GM.2.1		
4	A	155220A	2	1	2	4.GM.2.1		
4	A	155220A	3	1	2	4.GM.2.1		
4	A	155220A	4	1	2	4.GM.2.1		
4	A	155220A	5	1	2	4.GM.2.1		
4	A	156018A	1	2	2	4.N.1.4		
4	A	156018A	2	2	2	4.N.1.4		
4	A	156018A	3	1	2	4.N.1.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	A	156018A	4	2	2	4.N.1.3		
4	A	156018A	5	2	2	4.N.1.4		
4	A	156031A	1	2	2	4.N.1.4		
4	A	156031A	2	2	2	4.N.1.4		
4	A	156031A	3	1	2	4.N.1.4		
4	A	156031A	4	2	2	4.N.1.4		
4	A	156031A	5	2	2	4.N.1.4		
4	A	181118A	1	1	1	4.D.1.3		
4	A	181118A	2	1	2	4.D.1.3		
4	A	181118A	3	2	2	4.D.1.3		
4	A	181118A	4	2	2	4.D.1.1		
4	A	181118A	5	2	2	4.D.1.2		
4	A	184121A	1	2	2	4.N.1.5		
4	A	184121A	2	1	2	4.N.3.1		
4	A	184121A	3	1	2	4.N.3.1		
4	A	184121A	4	2	2	4.N.3.1		
4	A	184121A	5	1	2	4.N.3.1		
4	A	184215A	1	1	2	4.N.1.1		
4	A	184215A	2	1	2	4.N.1.6		
4	A	184215A	3	1	2	4.N.1.6		
4	A	184215A	4	2	2	4.N.1.6		
4	A	184215A	5	2	2	4.N.1.6		
4	A	184241A	1	2	2	4.N.3.1		
4	A	184241A	2	2	2	4.N.3.1		
4	A	184241A	3	2	2	4.N.3.1		
4	A	184241A	4	2	2	4.N.3.1		
4	A	184241A	5	2	2	4.N.3.1		
4	A	479500	1	2	2	4.D.1.3		
4	A	479500	2	2	2	4.D.1.1		
4	A	479500	3	2	2	4.D.1.3	4.D.1.3	
4	A	479500	4	2	2	4.D.1.1		
4	A	479500	5	2	2	4.D.1.1		
4	A	479507	1	1	2	4.GM.2.1		
4	A	479507	2	1	2	4.GM.2.1		
4	A	479507	3	1	2	4.GM.2.1		
4	A	479507	4	1	2	4.GM.2.1		
4	A	479507	5	1	2	4.GM.2.1		
4	A	479932	1	1	2	4.GM.2.5		
4	A	479932	2	1	2	4.GM.2.5		
4	A	479932	3	1	1	4.GM.2.4		
4	A	479932	4	1	2	4.GM.2.5		
4	A	479932	5	1	2	4.GM.2.5		
4	B	147410A	1	2	2	4.N.3.1		
4	B	147410A	2	1	2	4.N.3.1		
4	B	147410A	3	1	2	4.N.3.1		
4	B	147410A	4	2	2	4.N.3.1		
4	B	147410A	5	2	2	4.N.3.1		
4	B	147734A	1	1	2	4.N.2.2		
4	B	147734A	2	1	2	4.N.2.8		
4	B	147734A	3	2	1	4.N.2.2		
4	B	147734A	4	1	2	4.N.2.8		
4	B	147734A	5	2	2	4.N.2.8		
4	B	148069A	1	2	2	4.A.2.2		
4	B	148069A	2	1	2	4.A.2.2		
4	B	148069A	3	1	2	4.A.2.2		
4	B	148069A	4	2	2	4.A.2.1		
4	B	148069A	5	2	2	4.A.2.2		
4	B	148236A	1	2	2	4.N.1.6		
4	B	148236A	2	1	2	4.N.1.6		
4	B	148236A	3	1	2	4.N.1.3		
4	B	148236A	4	2	2	4.N.1.6		
4	B	148236A	5	2	2	4.N.1.6		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	B	148258A	1	3	2	4.A.1.3		
4	B	148258A	2	2	2	4.GM.2.3		
4	B	148258A	3	1	2	4.A.1.3		
4	B	148258A	4	2	2	4.A.1.3		
4	B	148258A	5	2	2	4.A.1.3		
4	B	148261A	1	2	2	4.GM.3.1		
4	B	148261A	2	1	2	4.GM.3.1		
4	B	148261A	3	1	2	4.GM.3.1		
4	B	148261A	4	2	2	4.GM.3.1		
4	B	148261A	5	2	2	4.GM.3.1		
4	B	148287A	1	1	2	4.N.2.6		
4	B	148287A	2	1	2	4.N.2.6		
4	B	148287A	3	1	2	4.N.2.6		
4	B	148287A	4	1	2	4.N.2.6		
4	B	148287A	5	1	2	4.N.2.6		
4	B	148664A	1	1	2	4.GM.1.1		
4	B	148664A	2	1	2	4.GM.1.1		
4	B	148664A	3	1	2	4.GM.1.1		
4	B	148664A	4	1	2	4.GM.1.1		
4	B	148664A	5	1	2	4.GM.1.1		
4	B	149250A	1	1	2	4.D.1.2		
4	B	149250A	2	2	2	4.D.1.2		
4	B	149250A	3	1	2	4.D.1.2		
4	B	149250A	4	2	2	4.D.1.2		
4	B	149250A	5	2	2	4.D.1.2		
4	B	149486A	1	1	2	4.D.1.2		
4	B	149486A	2	2	2	4.D.1.2		
4	B	149486A	3	2	2	4.D.1.2		
4	B	149486A	4	2	2	4.D.1.2		
4	B	149486A	5	2	2	4.D.1.1		
4	B	150584A	1	1	2	4.GM.1.1		
4	B	150584A	2	1	2	4.GM.1.1		
4	B	150584A	3	1	2	4.GM.1.1		
4	B	150584A	4	1	2	4.GM.1.1		
4	B	150584A	5	1	2	4.GM.1.1		
4	B	150931A	1	1	2	4.GM.2.3		
4	B	150931A	2	1	2	4.GM.2.2		
4	B	150931A	3	1	2	4.GM.2.2		
4	B	150931A	4	1	2	4.GM.2.2		
4	B	150931A	5	1	2	4.GM.2.2		
4	B	151080A	1	2	2	4.A.1.1		
4	B	151080A	2	1	2	4.A.1.2		
4	B	151080A	3	2	2	4.A.1.2		
4	B	151080A	4	2	2	4.A.1.2		
4	B	151080A	5	3	2	4.A.1.2		
4	B	151515A	1	2	2	4.GM.3.1		
4	B	151515A	2	2	2	4.GM.3.1		
4	B	151515A	3	2	2	4.GM.3.1		
4	B	151515A	4	2	2	4.GM.3.1		
4	B	151515A	5	2	2	4.GM.3.1		
4	B	151549A	1	1	2	4.N.1.1		
4	B	151549A	2	1	2	4.N.1.1		
4	B	151549A	3	1	2	4.N.1.1		
4	B	151549A	4	1	2	4.N.1.1		
4	B	151549A	5	1	2	4.N.1.1		
4	B	151553A	1	1	2	4.N.1.1		
4	B	151553A	2	1	2	4.A.2.1		
4	B	151553A	3	1	2	4.N.1.1		
4	B	151553A	4	2	2	4.A.2.1		
4	B	151553A	5	2	2	4.A.2.1		
4	B	152039A	1	1	2	4.GM.1.2		
4	B	152039A	2	2	2	4.GM.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	B	152039A	3	2	2	4.GM.1.2		
4	B	152039A	4	1	2	4.GM.1.2		
4	B	152039A	5	2	2	4.GM.1.2		
4	B	152143A	1	1	2	4.N.2.6		
4	B	152143A	2	1	2	4.N.2.6		
4	B	152143A	3	1	2	4.N.2.6		
4	B	152143A	4	1	2	4.N.2.6		
4	B	152143A	5	1	2	4.N.2.6		
4	B	152166A	1	1	2	4.D.1.2		
4	B	152166A	2	2	2	4.D.1.2		
4	B	152166A	3	2	2	4.D.1.3		
4	B	152166A	4	2	1	4.D.1.2		
4	B	152166A	5	2	1	4.D.1.2		
4	B	152185A	1	1	2	4.N.2.6		
4	B	152185A	2	1	2	4.N.2.6		
4	B	152185A	3	1	2	4.N.2.6		
4	B	152185A	4	1	2	4.N.2.6		
4	B	152185A	5	1	2	4.N.2.6		
4	B	152193A	1	2	2	4.N.2.7		
4	B	152193A	2	2	2	4.N.2.7		
4	B	152193A	3	1	2	4.N.2.7		
4	B	152193A	4	2	2	4.N.2.6		
4	B	152193A	5	2	2	4.N.2.7		
4	B	152758A	1	1	2	4.N.1.5		
4	B	152758A	2	1	2	4.A.2.2		
4	B	152758A	3	1	2	4.A.2.2		
4	B	152758A	4	1	2	4.A.2.2		
4	B	152758A	5	1	2	4.A.2.2		
4	B	153082A	1	2	2	4.N.2.4		
4	B	153082A	2	2	2	4.N.2.4		
4	B	153082A	3	1	2	4.N.2.4		
4	B	153082A	4	1	2	4.N.2.4		
4	B	153082A	5	2	2	4.N.2.4		
4	B	153185A	1	1	2	4.GM.1.1		
4	B	153185A	2	1	2	4.GM.1.1		
4	B	153185A	3	1	2	4.GM.2.1		
4	B	153185A	4	1	2	4.GM.1.1		
4	B	153185A	5	1	2	4.GM.1.1		
4	B	153188A	1	1	2	4.A.1.2		
4	B	153188A	2	1	2	4.A.1.1		
4	B	153188A	3	2	2	4.A.1.2		
4	B	153188A	4	2	1	4.A.1.1	4.A.1.2	
4	B	153188A	5	2	2	4.A.1.3		
4	B	153328A	1	3	2	4.N.1.5		
4	B	153328A	2	2	2	4.N.1.1		
4	B	153328A	3	1	2	4.N.1.1		
4	B	153328A	4	1	2	4.N.1.1		
4	B	153328A	5	1	2	4.N.1.1		
4	B	153935A	1	1	2	4.GM.1.1		
4	B	153935A	2	2	2	4.GM.1.1		
4	B	153935A	3	1	2	4.GM.1.1		
4	B	153935A	4	1	2	4.GM.1.1		
4	B	153935A	5	1	2	4.GM.1.1		
4	B	153938A	1	2	2	4.GM.2.3		
4	B	153938A	2	2	2	4.GM.2.2		
4	B	153938A	3	2	2	4.GM.2.2		
4	B	153938A	4	2	2	4.GM.2.2		
4	B	153938A	5	1	2	4.GM.2.2		
4	B	153951A	1	2	2	4.A.2.2		
4	B	153951A	2	1	2	4.A.2.2		
4	B	153951A	3	1	2	4.A.2.2		
4	B	153951A	4	2	2	4.A.2.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	B	153951A	5	2	2	4.A.2.2		
4	B	154024A	1	3	2	4.N.1.7		
4	B	154024A	2	2	2	4.N.1.7		
4	B	154024A	3	3	1	4.N.1.7		
4	B	154024A	4	2	2	4.A.2.2		
4	B	154024A	5	3	1	4.N.1.7		
4	B	154501A	1	1	2	4.N.2.8		
4	B	154501A	2	2	2	4.N.2.2		
4	B	154501A	3	1	2	4.N.2.8		
4	B	154501A	4	2	2	4.N.2.8		
4	B	154501A	5	2	2	4.N.2.8		
4	B	154512A	1	1	2	4.N.2.8		
4	B	154512A	2	1	2	4.N.2.2		
4	B	154512A	3	1	2	4.N.2.1		
4	B	154512A	4	1	2	4.N.2.8		
4	B	154512A	5	2	2	4.N.2.8		
4	B	155192A	1	1	2	4.A.1.3		
4	B	155192A	2	1	2	4.A.1.2		
4	B	155192A	3	1	2	4.A.1.2		
4	B	155192A	4	2	2	4.A.1.2		
4	B	155192A	5	2	2	4.A.1.2		
4	B	155207A	1	2	2	4.N.2.6		
4	B	155207A	2	1	2	4.N.3.1		
4	B	155207A	3	1	2	4.N.3.1		
4	B	155207A	4	2	2	4.N.3.1		
4	B	155207A	5	2	2	4.N.3.1		
4	B	156019A	1	2	2	4.N.1.4		
4	B	156019A	2	1	2	4.N.1.4		
4	B	156019A	3	1	2	4.N.1.4		
4	B	156019A	4	2	2	4.N.1.4		
4	B	156019A	5	2	2	4.N.1.4		
4	B	163993A	1	1	2	4.A.1.1		
4	B	163993A	2	2	2	4.D.1.2		
4	B	163993A	3	1	2	4.D.1.2		
4	B	163993A	4	2	2	4.D.1.2		
4	B	163993A	5	2	2	4.D.1.2		
4	B	184099A	1	2	2	4.N.1.4		
4	B	184099A	2	1	2	4.N.1.4		
4	B	184099A	3	2	2	4.N.1.4		
4	B	184099A	4	2	2	4.N.1.4		
4	B	184099A	5	2	2	4.N.1.4		
4	B	184250A	1	2	2	4.N.3.1		
4	B	184250A	2	1	2	4.N.3.1		
4	B	184250A	3	1	2	4.N.3.1		
4	B	184250A	4	2	2	4.N.3.1		
4	B	184250A	5	2	2	4.N.3.1		
4	B	479502	1	2	2	4.D.1.3		
4	B	479502	2	1	2	4.D.1.3		
4	B	479502	3	1	2	4.D.1.3		
4	B	479502	4	1	2	4.D.1.3		
4	B	479502	5	2	2	4.D.1.3		
4	B	479555	1	2	2	4.GM.2.3		
4	B	479555	2	1	2	4.GM.2.5		
4	B	479555	3	1	2	4.GM.2.3		
4	B	479555	4	2	2	4.GM.2.3		
4	B	479555	5	2	2	4.GM.2.3		
4	B	479919	1	1	2	4.GM.2.4		
4	B	479919	2	1	2	4.GM.2.4		
4	B	479919	3	2	1	4.GM.2.4		
4	B	479919	4	1	2	4.GM.2.4		
4	B	479919	5	1	2	4.GM.2.4		
4	B	491952	1	1	2	4.N.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	B	491952	2	1	2	4.A.2.1		
4	B	491952	3	1	2	4.A.2.1		
4	B	491952	4	1	2	4.N.1.1		
4	B	491952	5	1	1	4.N.1.1	4.A.2.1	
4	C	146927A	1	1	2	4.GM.2.3		
4	C	146927A	2	2	2	4.GM.2.2		
4	C	146927A	3	2	2	4.GM.2.2		
4	C	146927A	4	2	2	4.GM.2.2		
4	C	146927A	5	2	2	4.GM.2.2		
4	C	146941A	1	2	2	4.N.1.6		
4	C	146941A	2	1	2	4.N.1.6		
4	C	146941A	3	1	2	4.N.1.6		
4	C	146941A	4	2	2	4.N.1.6		
4	C	146941A	5	2	2	4.N.1.6		
4	C	146951A	1	1	2	4.GM.1.2		
4	C	146951A	2	1	2	4.GM.1.2		
4	C	146951A	3	1	2	4.GM.1.2		
4	C	146951A	4	1	2	4.GM.1.2		
4	C	146951A	5	1	2	4.GM.1.2		
4	C	147022A	1	1	2	4.A.1.3		
4	C	147022A	2	1	2	4.A.1.3		
4	C	147022A	3	1	1	4.A.1.3		
4	C	147022A	4	2	2	4.A.1.3		
4	C	147022A	5	1	2	4.A.1.3		
4	C	147045A	1	2	2	4.N.1.5		
4	C	147045A	2	1	2	4.N.3.1		
4	C	147045A	3	1	2	4.N.3.1		
4	C	147045A	4	2	2	4.N.3.1		
4	C	147045A	5	2	2	4.N.3.1		
4	C	147409A	1	1	2	4.N.2.2		
4	C	147409A	2	2	2	4.N.2.2		
4	C	147409A	3	1	2	4.N.2.2		
4	C	147409A	4	1	2	4.N.2.8		
4	C	147409A	5	2	2	4.N.2.8		
4	C	147515A	1	2	2	4.N.3.1		
4	C	147515A	2	1	2	4.N.3.1		
4	C	147515A	3	1	1	4.N.3.1		
4	C	147515A	4	2	2	4.N.3.1		
4	C	147515A	5	2	2	4.N.3.1		
4	C	148259A	1	1	2	4.GM.2.3		
4	C	148259A	2	2	2	4.GM.2.2		
4	C	148259A	3	2	2	4.GM.2.2		
4	C	148259A	4	2	2	4.GM.2.2		
4	C	148259A	5	2	2	4.GM.2.2		
4	C	148264A	1	2	2	4.N.1.6		
4	C	148264A	2	1	2	4.N.1.6		
4	C	148264A	3	1	2	4.N.1.6		
4	C	148264A	4	2	2	4.N.1.6		
4	C	148264A	5	2	2	4.N.1.6		
4	C	148669A	1	1	2	4.N.2.7		
4	C	148669A	2	2	2	4.N.2.7		
4	C	148669A	3	1	0	4.N.2.X		
4	C	148669A	4	1	2	4.N.2.7		
4	C	148669A	5	1	2	4.N.2.7		
4	C	149223A	1	1	2	4.N.1.1		
4	C	149223A	2	1	2	4.A.2.2		
4	C	149223A	3	1	2	4.A.2.2		
4	C	149223A	4	2	2	4.A.2.2		
4	C	149223A	5	2	2	4.A.2.2		
4	C	149254A	1	2	2	4.N.1.7		
4	C	149254A	2	2	2	4.A.2.1		
4	C	149254A	3	1	2	4.N.1.7		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	C	149254A	4	2	2	4.N.1.7		
4	C	149254A	5	2	2	4.A.2.1		
4	C	149286A	1	2	2	4.N.1.7		
4	C	149286A	2	2	2	4.A.2.2		
4	C	149286A	3	1	2	4.N.1.7		
4	C	149286A	4	2	2	4.N.1.7		
4	C	149286A	5	2	2	4.N.1.7		
4	C	149504A	1	1	2	4.D.1.1		
4	C	149504A	2	2	2	4.D.1.2		
4	C	149504A	3	2	2	4.D.1.2		
4	C	149504A	4	2	2	4.D.1.2		
4	C	149504A	5	1	2	4.D.1.2		
4	C	149723A	1	1	2	4.GM.1.2		
4	C	149723A	2	1	2	4.GM.1.2		
4	C	149723A	3	1	2	4.GM.1.2		
4	C	149723A	4	1	2	4.GM.1.2		
4	C	149723A	5	1	2	4.GM.1.2		
4	C	150204A	1	1	2	4.D.1.1		
4	C	150204A	2	2	2	4.D.1.2		
4	C	150204A	3	2	2	4.D.1.3		
4	C	150204A	4	1	2	4.D.1.2		
4	C	150204A	5	2	1	4.D.1.2	4.D.X	
4	C	150642A	1	1	2	4.GM.1.3		
4	C	150642A	2	2	2	4.GM.1.3		
4	C	150642A	3	1	2	4.GM.1.3		
4	C	150642A	4	2	2	4.GM.1.3		
4	C	150642A	5	1	2	4.GM.1.3		
4	C	150654A	1	1	2	4.N.2.2		
4	C	150654A	2	1	2	4.N.2.2		
4	C	150654A	3	1	2	4.N.2.2		
4	C	150654A	4	1	2	4.N.2.8		
4	C	150654A	5	2	2	4.N.2.2		
4	C	150858A	1	1	2	4.GM.1.2		
4	C	150858A	2	1	2	4.GM.1.2		
4	C	150858A	3	1	2	4.GM.1.2		
4	C	150858A	4	1	2	4.GM.1.2		
4	C	150858A	5	2	2	4.GM.1.2		
4	C	151081A	1	2	2	4.D.1.3		
4	C	151081A	2	2	2	4.A.1.2		
4	C	151081A	3	2	2	4.A.1.2		
4	C	151081A	4	2	2	4.A.1.2		
4	C	151081A	5	2	2	4.A.1.2		
4	C	151289A	1	1	2	4.GM.1.1		
4	C	151289A	2	1	2	4.GM.1.1		
4	C	151289A	3	1	2	4.GM.1.1		
4	C	151289A	4	1	2	4.GM.1.1		
4	C	151289A	5	1	2	4.GM.1.1		
4	C	151513A	1	2	2	4.GM.3.1		
4	C	151513A	2	2	2	4.GM.3.1		
4	C	151513A	3	1	2	4.GM.3.1		
4	C	151513A	4	2	2	4.GM.3.1		
4	C	151513A	5	2	2	4.GM.3.1		
4	C	151550A	1	1	2	4.N.1.1		
4	C	151550A	2	1	2	4.N.1.1		
4	C	151550A	3	1	2	4.N.1.1		
4	C	151550A	4	2	2	4.N.1.1		
4	C	151550A	5	2	2	4.N.1.1		
4	C	151561A	1	1	2	4.N.1.1		
4	C	151561A	2	1	2	4.N.1.1		
4	C	151561A	3	1	2	4.N.1.1		
4	C	151561A	4	1	2	4.N.1.1		
4	C	151561A	5	2	2	4.N.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	C	151997A	1	2	2	4.N.1.4		
4	C	151997A	2	2	1	4.N.1.4	4.N.1.X	
4	C	151997A	3	2	0	4.N.1.4		
4	C	151997A	4	2	2	4.N.1.6		
4	C	151997A	5	2	1	4.N.1.4	4.N.1.6	
4	C	152152A	1	1	2	4.N.2.6		
4	C	152152A	2	1	2	4.N.2.6		
4	C	152152A	3	1	2	4.N.2.6		
4	C	152152A	4	1	2	4.N.2.6		
4	C	152152A	5	1	2	4.N.2.6		
4	C	152355A	1	2	2	4.N.2.4		
4	C	152355A	2	1	2	4.N.2.4		
4	C	152355A	3	1	2	4.N.2.4		
4	C	152355A	4	1	2	4.N.2.4		
4	C	152355A	5	2	2	4.N.2.4		
4	C	152635A	1	2	2	4.GM.3.2		
4	C	152635A	2	1	2	4.GM.3.1		
4	C	152635A	3	2	2	4.GM.3.2		
4	C	152635A	4	2	2	4.GM.3.1		
4	C	152635A	5	2	2	4.GM.3.1		
4	C	152872A	1	2	2	4.A.1.2		
4	C	152872A	2	2	2	4.A.1.2		
4	C	152872A	3	1	2	4.A.1.2		
4	C	152872A	4	2	2	4.A.1.1		
4	C	152872A	5	2	2	4.A.1.3		
4	C	152881A	1	1	2	4.N.2.6		
4	C	152881A	2	1	2	4.N.2.6		
4	C	152881A	3	1	2	4.N.2.6		
4	C	152881A	4	1	2	4.N.2.6		
4	C	152881A	5	1	2	4.N.2.8		
4	C	152985A	1	3	2	4.A.1.3		
4	C	152985A	2	1	2	4.A.1.3		
4	C	152985A	3	2	2	4.A.1.3		
4	C	152985A	4	2	2	4.A.1.3		
4	C	152985A	5	1	2	4.A.1.3		
4	C	153206A	1	2	2	4.N.2.7		
4	C	153206A	2	2	2	4.N.2.7		
4	C	153206A	3	1	2	4.N.2.7		
4	C	153206A	4	2	2	4.N.2.7		
4	C	153206A	5	2	2	4.N.2.7		
4	C	153327A	1	2	2	4.N.1.6		
4	C	153327A	2	1	2	4.N.1.6		
4	C	153327A	3	1	2	4.N.1.6		
4	C	153327A	4	2	2	4.N.1.6		
4	C	153327A	5	2	2	4.N.1.6		
4	C	154503A	1	1	2	4.N.2.8		
4	C	154503A	2	1	2	4.N.2.2		
4	C	154503A	3	1	2	4.N.2.2		
4	C	154503A	4	1	2	4.N.2.8		
4	C	154503A	5	2	2	4.N.2.8		
4	C	155948A	1	2	2	4.N.3.1		
4	C	155948A	2	1	2	4.N.3.1		
4	C	155948A	3	1	2	4.N.3.1		
4	C	155948A	4	2	2	4.N.3.1		
4	C	155948A	5	2	2	4.N.3.1		
4	C	161617A	1	1	2	4.D.1.2		
4	C	161617A	2	2	2	4.D.1.2		
4	C	161617A	3	2	2	4.D.1.2		
4	C	161617A	4	2	2	4.D.1.2		
4	C	161617A	5	2	2	4.D.1.2		
4	C	163986A	1	1	2	4.D.1.1		
4	C	163986A	2	2	2	4.D.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
4	C	163986A	3	2	1	4.D.1.X		
4	C	163986A	4	1	2	4.D.1.2		
4	C	163986A	5	1	2	4.D.1.2		
4	C	184203A	1	3	2	4.N.1.7		
4	C	184203A	2	1	2	4.A.2.1		
4	C	184203A	3	1	2	4.A.2.1		
4	C	184203A	4	1	2	4.N.1.7		
4	C	184203A	5	2	2	4.A.2.2		
4	C	184213A	1	2	2	4.N.1.5		
4	C	184213A	2	1	1	4.N.1.5	4.N.1.4	
4	C	184213A	3	2	2	4.N.1.4		
4	C	184213A	4	2	2	4.N.1.4		
4	C	184213A	5	2	2	4.N.1.4		
4	C	479504	1	2	2	4.D.1.3		
4	C	479504	2	2	2	4.D.1.2		
4	C	479504	3	2	2	4.D.1.3		
4	C	479504	4	2	2	4.D.1.3		
4	C	479504	5	2	2	4.D.1.3		
4	C	479917	1	1	2	4.GM.2.3		
4	C	479917	2	2	2	4.GM.2.3		
4	C	479917	3	1	2	4.GM.2.3		
4	C	479917	4	1	2	4.GM.2.3		
4	C	479917	5	1	2	4.GM.2.3		
4	C	479930	1	1	2	4.GM.2.4		
4	C	479930	2	1	2	4.GM.2.4		
4	C	479930	3	1	2	4.GM.2.4		
4	C	479930	4	1	2	4.GM.2.4		
4	C	479930	5	1	2	4.GM.2.4		
5	A	146915A	1	1	2	5.N.3.2		
5	A	146915A	2	1	2	5.N.2.4		
5	A	146915A	3	1	2	5.N.2.3		
5	A	146915A	4	1	2	5.N.2.4		
5	A	146915A	5	2	2	5.N.2.3		
5	A	146930A	1	2	2	5.N.1.1		
5	A	146930A	2	2	2	5.N.1.1		
5	A	146930A	3	1	2	5.N.1.1		
5	A	146930A	4	2	2	5.N.1.1		
5	A	146930A	5	1	2	5.N.1.1		
5	A	147291A	1	2	2	5.D.1.1		
5	A	147291A	2	1	2	5.D.1.1		
5	A	147291A	3	1	2	5.D.1.1		
5	A	147291A	4	2	2	5.D.1.1		
5	A	147291A	5	2	2	5.D.1.1		
5	A	147537A	1	1	2	5.N.2.1		
5	A	147537A	2	1	2	5.N.2.1		
5	A	147537A	3	1	2	5.N.2.1		
5	A	147537A	4	1	2	5.N.2.1		
5	A	147537A	5	1	2	5.N.2.1		
5	A	147753A	1	1	2	5.A.2.1		
5	A	147753A	2	1	2	5.A.2.1		
5	A	147753A	3	1	2	5.A.2.3		
5	A	147753A	4	2	2	5.A.2.1		
5	A	147753A	5	1	2	5.A.2.1		
5	A	147990A	1	2	2	5.N.3.3		
5	A	147990A	2	2	2	5.N.3.3		
5	A	147990A	3	1	2	5.N.2.3		
5	A	147990A	4	2	2	5.N.3.3		
5	A	147990A	5	2	2	5.N.3.3		
5	A	148011A	1	1	2	5.GM.3.4		
5	A	148011A	2	1	2	5.N.3.3		
5	A	148011A	3	1	2	5.N.3.3		
5	A	148011A	4	2	2	5.N.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	148011A	5	2	2	5.N.3.3		
5	A	148173A	1	1	2	5.GM.1.1		
5	A	148173A	2	1	2	5.GM.1.1		
5	A	148173A	3	1	2	5.GM.1.1		
5	A	148173A	4	1	2	5.GM.1.1		
5	A	148173A	5	1	2	5.GM.1.1		
5	A	148629A	1	2	2	5.N.1.1		
5	A	148629A	2	2	2	5.N.1.4		
5	A	148629A	3	1	2	5.N.1.4		
5	A	148629A	4	2	2	5.N.1.4		
5	A	148629A	5	2	0	5.N.1.1		
5	A	148659A	1	2	2	5.N.1.4		
5	A	148659A	2	1	2	5.N.1.4		
5	A	148659A	3	1	2	5.N.1.4		
5	A	148659A	4	2	2	5.N.1.4		
5	A	148659A	5	2	2	5.N.1.4		
5	A	148852A	1	2	2	5.GM.2.3		
5	A	148852A	2	1	2	5.GM.2.3		
5	A	148852A	3	1	2	5.GM.2.3		
5	A	148852A	4	2	2	5.GM.2.3		
5	A	148852A	5	2	2	5.GM.2.3		
5	A	149230A	1	1	2	5.N.2.4		
5	A	149230A	2	1	2	5.N.2.4		
5	A	149230A	3	1	2	5.N.2.4		
5	A	149230A	4	2	2	5.N.2.2		
5	A	149230A	5	2	2	5.N.2.4		
5	A	149244A	1	2	2	5.A.2.1		
5	A	149244A	2	1	2	5.A.2.1		
5	A	149244A	3	1	2	5.A.2.1		
5	A	149244A	4	2	2	5.A.2.1		
5	A	149244A	5	2	2	5.A.2.1		
5	A	149246A	1	1	2	5.GM.3.1		
5	A	149246A	2	2	2	5.GM.1.1		
5	A	149246A	3	1	2	5.GM.3.1		
5	A	149246A	4	1	2	5.GM.1.1		
5	A	149246A	5	1	2	5.GM.3.1		
5	A	149258A	1	1	2	5.N.2.2		
5	A	149258A	2	1	2	5.A.2.2		
5	A	149258A	3	1	2	5.N.2.2		
5	A	149258A	4	1	0	5.N.2.2		
5	A	149258A	5	1	2	5.N.2.2		
5	A	149261A	1	1	2	5.N.2.3		
5	A	149261A	2	2	2	5.N.2.3		
5	A	149261A	3	1	2	5.N.2.3		
5	A	149261A	4	1	1	5.N.2.3		
5	A	149261A	5	2	2	5.N.2.3		
5	A	149274A	1	2	2	5.GM.3.4		
5	A	149274A	2	1	2	5.GM.3.4		
5	A	149274A	3	1	2	5.GM.3.4		
5	A	149274A	4	2	2	5.GM.3.4		
5	A	149274A	5	2	2	5.GM.3.4		
5	A	149384A	1	2	2	5.N.3.3		
5	A	149384A	2	2	2	5.A.1.1		
5	A	149384A	3	2	2	5.A.1.1	5.N.3.3	
5	A	149384A	4	2	2	5.A.1.1		
5	A	149384A	5	2	2	5.A.1.1		
5	A	149559A	1	1	2	5.A.1.1		
5	A	149559A	2	2	2	5.A.1.1		
5	A	149559A	3	2	2	5.A.1.1		
5	A	149559A	4	2	2	5.A.1.1		
5	A	149559A	5	2	2	5.A.1.1		
5	A	149624A	1	2	0	5.N.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	149624A	2	2	1	5.D.1.2	5.N.3.3	
5	A	149624A	3	1	2	5.N.3.1		
5	A	149624A	4	2	2	5.N.3.1		
5	A	149624A	5	2	2	5.A.1.1		
5	A	149640A	1	3	2	4.D.1.1		
5	A	149640A	2	2	2	5.D.1.1		
5	A	149640A	3	1	2	5.D.1.1		
5	A	149640A	4	2	2	5.D.1.1		
5	A	149640A	5	2	2	5.D.1.1		
5	A	150631A	1	2	2	5.A.1.1		
5	A	150631A	2	1	2	5.A.1.1		
5	A	150631A	3	1	2	5.A.1.1		
5	A	150631A	4	2	2	5.A.1.1		
5	A	150631A	5	2	2	5.A.1.1		
5	A	150689A	1	2	2	5.A.2.3		
5	A	150689A	2	2	2	5.A.2.3		
5	A	150689A	3	1	2	5.A.2.3		
5	A	150689A	4	2	2	5.A.2.3		
5	A	150689A	5	2	2	5.A.2.3		
5	A	150711A	1	2	2	5.A.2.3		
5	A	150711A	2	2	2	5.A.2.3		
5	A	150711A	3	1	2	5.A.2.3		
5	A	150711A	4	2	2	5.A.2.3		
5	A	150711A	5	2	2	5.A.2.3		
5	A	152807A	1	3	2	5.A.1.1		
5	A	152807A	2	1	2	5.A.1.1		
5	A	152807A	3	1	2	5.A.1.1		
5	A	152807A	4	2	2	5.A.1.1		
5	A	152807A	5	2	2	5.A.1.1		
5	A	152859A	1	2	2	5.N.3.1		
5	A	152859A	2	2	2	5.N.3.1		
5	A	152859A	3	1	2	5.N.3.1		
5	A	152859A	4	2	2	5.N.3.3		
5	A	152859A	5	2	2	5.N.3.1		
5	A	152878A	1	2	2	5.N.1.2		
5	A	152878A	2	1	2	5.N.1.4		
5	A	152878A	3	1	2	5.N.1.4		
5	A	152878A	4	2	2	5.N.1.4		
5	A	152878A	5	2	2	5.N.1.4		
5	A	152897A	1	1	2	5.GM.3.4		
5	A	152897A	2	1	2	5.GM.3.4		
5	A	152897A	3	1	2	5.GM.3.4		
5	A	152897A	4	2	2	5.GM.3.4		
5	A	152897A	5	2	2	5.GM.3.4		
5	A	152933A	1	1	2	5.GM.1.2		
5	A	152933A	2	1	2	5.GM.1.2		
5	A	152933A	3	1	1	5.GM.1.2		
5	A	152933A	4	1	2	5.GM.1.2		
5	A	152933A	5	1	1	5.GM.1.2	5.GM.1.3	
5	A	152946A	1	2	2	5.N.3.3		
5	A	152946A	2	1	2	5.N.3.3		
5	A	152946A	3	1	2	5.N.3.3		
5	A	152946A	4	2	2	5.N.3.3		
5	A	152946A	5	2	2	5.N.3.3		
5	A	153075A	1	3	2	5.N.3.3		
5	A	153075A	2	2	2	5.N.3.3		
5	A	153075A	3	1	2	5.GM.3.3		
5	A	153075A	4	2	2	5.N.3.3		
5	A	153075A	5	2	2	5.N.3.3		
5	A	153107A	1	2	2	5.N.3.3		
5	A	153107A	2	2	2	5.N.3.3		
5	A	153107A	3	2	2	5.N.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	153107A	4	2	2	5.N.3.3		
5	A	153107A	5	2	2	5.N.3.3		
5	A	153162A	1	1	2	5.N.2.1		
5	A	153162A	2	1	2	5.N.2.1		
5	A	153162A	3	1	2	5.N.2.1		
5	A	153162A	4	1	2	5.N.2.1		
5	A	153162A	5	1	2	5.N.2.1		
5	A	153165A	1	1	2	5.N.2.3		
5	A	153165A	2	1	2	5.N.2.3		
5	A	153165A	3	1	2	5.N.2.3		
5	A	153165A	4	1	1	5.N.2.3	5.N.2.2	
5	A	153165A	5	1	2	5.N.2.3		
5	A	153420A	1	1	2	5.A.2.1		
5	A	153420A	2	2	2	5.A.2.1		
5	A	153420A	3	1	2	5.A.2.1		
5	A	153420A	4	2	2	5.A.2.1		
5	A	153420A	5	1	2	5.A.2.1		
5	A	153972A	1	2	2	5.N.1.1		
5	A	153972A	2	1	2	5.N.1.1		
5	A	153972A	3	1	2	5.N.1.3		
5	A	153972A	4	1	1	5.N.1.1		
5	A	153972A	5	2	2	5.N.1.4		
5	A	154312A	1	1	2	5.GM.1.3		
5	A	154312A	2	2	2	5.GM.1.3		
5	A	154312A	3	1	2	5.GM.1.3		
5	A	154312A	4	1	2	5.GM.1.3		
5	A	154312A	5	1	2	5.GM.3.1		
5	A	154530A	1	2	2	5.GM.3.4		
5	A	154530A	2	1	2	5.GM.3.4		
5	A	154530A	3	1	2	5.GM.3.4		
5	A	154530A	4	2	2	5.GM.3.4		
5	A	154530A	5	2	2	5.GM.3.4		
5	A	154532A	1	2	2	5.GM.3.3		
5	A	154532A	2	1	2	5.GM.3.3		
5	A	154532A	3	1	2	5.GM.3.3		
5	A	154532A	4	2	2	5.GM.3.3		
5	A	154532A	5	2	2	5.GM.3.3		
5	A	155234A	1	2	2	5.N.2.4		
5	A	155234A	2	2	2	5.N.2.4		
5	A	155234A	3	2	2	5.N.2.4		
5	A	155234A	4	2	2	5.N.2.1		
5	A	155234A	5	1	2	5.N.2.1		
5	A	155328A	1	2	2	5.N.1.3		
5	A	155328A	2	2	2	5.N.1.3		
5	A	155328A	3	1	2	5.N.1.3		
5	A	155328A	4	2	2	5.N.1.3		
5	A	155328A	5	2	2	5.N.2.4		
5	A	155434A	1	1	2	5.A.2.1		
5	A	155434A	2	1	2	5.A.2.1		
5	A	155434A	3	1	2	5.A.2.1		
5	A	155434A	4	2	2	5.A.2.1		
5	A	155434A	5	2	2	5.A.2.1		
5	A	155462A	1	2	2	5.N.3.3		
5	A	155462A	2	2	2	5.N.3.3		
5	A	155462A	3	1	2	5.N.3.3		
5	A	155462A	4	2	2	5.N.3.3		
5	A	155462A	5	2	2	5.N.3.3		
5	A	155474A	1	2	2	5.N.3.1		
5	A	155474A	2	2	2	5.N.3.1		
5	A	155474A	3	1	2	5.N.3.1		
5	A	155474A	4	2	2	5.N.3.3		
5	A	155474A	5	2	2	5.N.3.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	155479A	1	2	2	5.N.2.4		
5	A	155479A	2	2	2	5.N.1.3		
5	A	155479A	3	1	2	5.N.1.2		
5	A	155479A	4	2	2	5.N.1.3		
5	A	155479A	5	2	2	5.N.2.4		
5	A	155489A	1	2	2	5.D.1.1		
5	A	155489A	2	2	2	5.D.1.1		
5	A	155489A	3	1	2	5.D.1.1		
5	A	155489A	4	2	2	5.D.1.1		
5	A	155489A	5	2	2	5.D.1.1		
5	A	156035A	1	1	2	5.GM.1.2		
5	A	156035A	2	1	2	5.GM.1.2		
5	A	156035A	3	1	2	5.GM.1.2		
5	A	156035A	4	1	2	5.GM.1.2		
5	A	156035A	5	1	2	5.GM.1.2		
5	A	161469A	1	1	1	5.A.1.1		
5	A	161469A	2	2	2	5.D.1.2		
5	A	161469A	3	1	2	5.D.1.2		
5	A	161469A	4	2	2	5.D.1.2		
5	A	161469A	5	1	2	5.D.1.2		
5	A	181426A	1	1	2	5.GM.1.2		
5	A	181426A	2	2	2	5.GM.1.2		
5	A	181426A	3	1	2	5.GM.1.2		
5	A	181426A	4	2	2	5.GM.1.2		
5	A	181426A	5	1	2	5.GM.1.2		
5	A	184261A	1	2	2	5.D.1.1		
5	A	184261A	2	2	2	5.D.1.1		
5	A	184261A	3	2	2	5.D.1.1		
5	A	184261A	4	2	2	5.D.1.1		
5	A	184261A	5	1	2	5.D.1.1		
5	A	184263A	1	2	2	5.D.1.1		
5	A	184263A	2	1	2	5.D.1.1		
5	A	184263A	3	1	2	5.D.1.1		
5	A	184263A	4	2	2	5.D.1.1		
5	A	184263A	5	1	2	5.D.1.1		
5	A	187127A	1	2	2	5.N.1.1		
5	A	187127A	2	1	2	5.N.1.1		
5	A	187127A	3	1	2	5.N.1.2		
5	A	187127A	4	2	2	5.N.1.2		
5	A	187127A	5	2	2	5.N.1.2		
5	A	187144A	1	2	2	5.GM.2.3		
5	A	187144A	2	3	2	5.GM.2.3		
5	A	187144A	3	2	2	5.GM.2.3		
5	A	187144A	4	2	2	5.GM.2.3		
5	A	187144A	5	2	2	5.GM.2.3		
5	A	187163A	1	2	2	5.D.1.1		
5	A	187163A	2	1	2	5.D.1.1		
5	A	187163A	3	1	2	5.D.1.1		
5	A	187163A	4	2	2	5.D.1.1		
5	A	187163A	5	1	2	5.D.1.1		
5	A	484706	1	1	2	5.GM.2.1		
5	A	484706	2	2	2	5.GM.2.2		
5	A	484706	3	1	2	5.GM.2.1		
5	A	484706	4	2	2	5.GM.2.1		
5	A	484706	5	1	2	5.GM.2.1		
5	A	484712	1	3	2	5.GM.2.2		
5	A	484712	2	2	2	5.GM.2.2		
5	A	484712	3	1	2	5.GM.2.2		
5	A	484712	4	2	2	5.GM.2.2		
5	A	484712	5	2	2	5.GM.2.2		
5	A	489954	1	2	2	5.A.1.1		
5	A	489954	2	2	1	5.A.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	A	489954	3	2	2	5.A.1.X		
5	A	489954	4	2	2	5.A.1.1		
5	A	489954	5	2	2	5.A.1.1		
5	B	146959A	1	2	2	5.D.1.1		
5	B	146959A	2	2	2	5.D.1.1		
5	B	146959A	3	1	2	5.D.1.1		
5	B	146959A	4	2	2	5.D.1.1		
5	B	146959A	5	1	2	5.D.1.1		
5	B	147925A	1	1	2	5.N.2.1		
5	B	147925A	2	1	2	5.N.2.1		
5	B	147925A	3	1	2	5.N.2.1		
5	B	147925A	4	1	2	5.N.2.1		
5	B	147925A	5	1	2	5.N.2.1		
5	B	148098A	1	2	2	5.N.2.4		
5	B	148098A	2	1	2	5.N.2.4		
5	B	148098A	3	1	2	5.N.2.1		
5	B	148098A	4	1	2	5.N.2.2		
5	B	148098A	5	1	2	5.N.2.4		
5	B	148635A	1	2	2	5.N.1.4		
5	B	148635A	2	1	2	5.N.1.4		
5	B	148635A	3	1	2	5.N.1.4		
5	B	148635A	4	2	2	5.D.1.1		
5	B	148635A	5	2	2	5.N.1.4		
5	B	149241A	1	2	2	5.N.2.2		
5	B	149241A	2	2	2	5.N.3.3		
5	B	149241A	3	2	2	5.N.3.3		
5	B	149241A	4	2	2	5.N.3.3		
5	B	149241A	5	2	2	5.N.3.3		
5	B	149255A	1	1	2	5.N.3.2		
5	B	149255A	2	2	1	5.N.3.2	5.N.3.3	
5	B	149255A	3	2	2	5.N.2.1		
5	B	149255A	4	2	1	5.N.3.3	5.N.3.2	
5	B	149255A	5	2	2	5.N.3.3		
5	B	149284A	1	1	2	5.GM.3.4		
5	B	149284A	2	1	2	5.GM.3.4		
5	B	149284A	3	1	2	5.GM.3.4		
5	B	149284A	4	2	2	5.GM.3.4		
5	B	149284A	5	2	2	5.GM.3.X		
5	B	149289A	1	2	2	5.N.1.3		
5	B	149289A	2	1	2	5.N.1.1		
5	B	149289A	3	1	2	5.N.1.3		
5	B	149289A	4	2	2	5.N.2.3		
5	B	149289A	5	2	2	5.N.1.2		
5	B	149290A	1	1	2	5.N.2.4		
5	B	149290A	2	1	2	5.N.2.4		
5	B	149290A	3	1	2	5.N.2.4		
5	B	149290A	4	1	2	5.N.2.4		
5	B	149290A	5	1	2	5.N.2.4		
5	B	149622A	1	2	2	5.A.1.1		
5	B	149622A	2	2	2	5.A.1.1		
5	B	149622A	3	1	1	5.A.1.1		
5	B	149622A	4	2	2	5.A.1.1		
5	B	149622A	5	2	2	5.A.1.1		
5	B	149639A	1	2	2	5.A.1.1		
5	B	149639A	2	2	2	5.A.1.1		
5	B	149639A	3	2	2	5.A.1.1		
5	B	149639A	4	2	2	5.A.1.1		
5	B	149639A	5	2	2	5.A.1.1		
5	B	150183A	1	1	2	5.GM.1.2		
5	B	150183A	2	1	2	5.GM.1.2		
5	B	150183A	3	1	1	5.GM.1.X		
5	B	150183A	4	1	2	5.GM.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	B	150183A	5	1	2	5.GM.1.3		
5	B	150273A	1	2	1	5.GM.1.2		
5	B	150273A	2	2	2	5.GM.1.2		
5	B	150273A	3	1	1	5.GM.1.X		
5	B	150273A	4	1	2	5.GM.1.2		
5	B	150273A	5	3	1	5.GM.1.2		
5	B	150433A	1	1	2	5.GM.3.4		
5	B	150433A	2	1	2	5.GM.3.4		
5	B	150433A	3	1	2	5.GM.3.4		
5	B	150433A	4	2	2	5.GM.3.4		
5	B	150433A	5	2	2	5.GM.3.4		
5	B	150703A	1	1	2	5.GM.1.1		
5	B	150703A	2	2	2	5.GM.1.1		
5	B	150703A	3	1	2	5.GM.1.1		
5	B	150703A	4	1	2	5.GM.1.1		
5	B	150703A	5	1	2	5.GM.1.1		
5	B	152006A	1	2	2	5.N.1.4		
5	B	152006A	2	1	1	5.A.2.1	5.N.1.X	
5	B	152006A	3	1	1	5.N.1.4		
5	B	152006A	4	2	2	5.D.1.1		
5	B	152006A	5	1	1	5.A.2.1		
5	B	153076A	1	2	2	5.N.3.3		
5	B	153076A	2	2	2	5.N.3.3		
5	B	153076A	3	2	2	5.N.3.3		
5	B	153076A	4	2	2	5.N.3.3		
5	B	153076A	5	2	2	5.N.3.3		
5	B	153308A	1	2	2	5.A.1.1		
5	B	153308A	2	2	2	5.A.1.1		
5	B	153308A	3	2	2	5.A.1.1		
5	B	153308A	4	2	2	5.A.1.1		
5	B	153308A	5	2	2	5.A.1.1		
5	B	153416A	1	1	2	5.A.1.1		
5	B	153416A	2	1	2	5.A.2.1		
5	B	153416A	3	1	2	5.A.2.1		
5	B	153416A	4	2	2	5.N.3.3		
5	B	153416A	5	1	2	5.A.2.1		
5	B	153942A	1	1	2	5.N.2.3		
5	B	153942A	2	2	2	5.N.2.3		
5	B	153942A	3	2	2	5.N.2.3		
5	B	153942A	4	1	2	5.N.2.3		
5	B	153942A	5	3	1	5.N.2.3		
5	B	153950A	1	2	2	5.D.1.1		
5	B	153950A	2	1	2	5.D.1.1		
5	B	153950A	3	1	2	5.D.1.1		
5	B	153950A	4	2	2	5.N.1.4		
5	B	153950A	5	1	2	5.D.1.1		
5	B	153979A	1	2	2	5.N.1.1		
5	B	153979A	2	1	2	5.N.1.1		
5	B	153979A	3	1	2	5.N.1.1		
5	B	153979A	4	2	2	5.A.2.1		
5	B	153979A	5	2	2	5.N.1.2	5.N.1.4	
5	B	154022A	1	2	2	5.N.3.3		
5	B	154022A	2	1	2	5.N.3.3		
5	B	154022A	3	1	2	5.N.3.3		
5	B	154022A	4	2	2	5.N.1.4		
5	B	154022A	5	2	2	5.N.3.3		
5	B	154031A	1	2	2	5.N.3.3		
5	B	154031A	2	1	2	5.N.3.3		
5	B	154031A	3	1	2	5.N.3.3		
5	B	154031A	4	2	2	5.N.3.3		
5	B	154031A	5	2	2	5.N.3.3		
5	B	154536A	1	2	2	5.GM.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	B	154536A	2	1	2	5.GM.3.3		
5	B	154536A	3	1	2	5.GM.3.3		
5	B	154536A	4	2	2	5.GM.3.3		
5	B	154536A	5	2	2	5.GM.3.3		
5	B	155145A	1	1	2	5.A.2.1		
5	B	155145A	2	1	2	5.A.2.1		
5	B	155145A	3	1	2	5.A.2.1		
5	B	155145A	4	2	2	5.GM.2.2		
5	B	155145A	5	1	2	5.A.2.1		
5	B	155155A	1	2	2	5.D.1.1		
5	B	155155A	2	2	2	5.D.1.1		
5	B	155155A	3	1	2	5.D.1.1		
5	B	155155A	4	2	2	5.D.1.1		
5	B	155155A	5	2	2	5.D.1.1		
5	B	155215A	1	1	2	5.A.2.1		
5	B	155215A	2	1	2	5.A.2.1		
5	B	155215A	3	1	2	5.A.2.1		
5	B	155215A	4	2	2	5.A.2.1		
5	B	155215A	5	1	2	5.A.2.1		
5	B	155232A	1	2	2	5.N.2.4		
5	B	155232A	2	1	2	5.N.2.4		
5	B	155232A	3	1	2	5.N.2.4		
5	B	155232A	4	2	2	5.A.2.1		
5	B	155232A	5	1	2	5.N.2.4		
5	B	155337A	1	2	2	5.N.3.3		
5	B	155337A	2	1	2	5.N.3.3		
5	B	155337A	3	1	2	5.N.3.3		
5	B	155337A	4	1	2	5.N.2.4		
5	B	155337A	5	2	2	5.N.3.3		
5	B	155403A	1	2	2	5.D.1.1		
5	B	155403A	2	2	2	5.D.1.1		
5	B	155403A	3	1	2	5.D.1.1		
5	B	155403A	4	2	2	5.D.1.1		
5	B	155403A	5	1	2	5.D.1.1		
5	B	155409A	1	1	2	5.N.2.3		
5	B	155409A	2	2	2	5.N.2.3		
5	B	155409A	3	1	2	5.N.2.3		
5	B	155409A	4	2	2	5.N.1.2		
5	B	155409A	5	1	2	5.N.2.3		
5	B	155515A	1	2	2	5.N.1.2		
5	B	155515A	2	1	2	5.N.1.2		
5	B	155515A	3	1	2	5.N.1.2		
5	B	155515A	4	2	2	5.N.1.2		
5	B	155515A	5	2	1	5.N.1.2	5.N.1.4	
5	B	155523A	1	1	2	5.N.2.1		
5	B	155523A	2	1	2	5.N.2.1		
5	B	155523A	3	1	2	5.N.2.1		
5	B	155523A	4	2	2	5.D.1.1		
5	B	155523A	5	1	2	5.N.2.1		
5	B	184306A	1	2	2	5.D.1.1		
5	B	184306A	2	2	2	5.D.1.1		
5	B	184306A	3	1	2	5.D.1.1		
5	B	184306A	4	2	1	5.N.1.4		
5	B	184306A	5	1	2	5.D.1.1		
5	B	187147A	1	2	2	5.N.3.3		
5	B	187147A	2	2	2	5.D.1.2		
5	B	187147A	3	1	2	5.D.1.1		
5	B	187147A	4	2	2	5.D.1.1		
5	B	187147A	5	2	2	5.N.3.3		
5	B	187149A	1	3	2	5.N.3.3		
5	B	187149A	2	3	2	5.N.3.3		
5	B	187149A	3	2	2	5.N.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	B	187149A	4	2	2	5.N.1.4		
5	B	187149A	5	3	2	5.N.3.3		
5	B	484714	1	1	2	5.GM.1.3		
5	B	484714	2	3	2	5.GM.2.2		
5	B	484714	3	1	2	5.GM.1.3		
5	B	484714	4	1	2	5.N.2.1		
5	B	484714	5	1	2	5.GM.1.3		
5	B	484718	1	2	2	5.GM.2.3		
5	B	484718	2	1	2	5.GM.2.3		
5	B	484718	3	1	2	5.GM.2.3		
5	B	484718	4	2	2	5.GM.2.3		
5	B	484718	5	2	2	5.GM.2.3		
5	B	489964	1	3	2	5.A.1.1		
5	B	489964	2	2	1	5.A.2.2	5.A.2.3	
5	B	489964	3	2	1	5.N.3.3	5.A.1.1	
5	B	489964	4	2	2	5.A.1.1		
5	B	489964	5	2	2	5.A.2.1		
5	B	489998	1	2	2	5.A.2.3		
5	B	489998	2	2	2	5.A.2.3		
5	B	489998	3	1	2	5.A.2.3		
5	B	489998	4	2	2	5.A.2.3		
5	B	489998	5	2	2	5.A.2.3		
5	C	147747A	1	2	2	5.N.1.2		
5	C	147747A	2	1	2	5.N.1.2		
5	C	147747A	3	1	2	5.N.1.3		
5	C	147747A	4	2	2	5.N.1.2		
5	C	147747A	5	2	1	5.N.1.2	5.N.1.4	
5	C	147932A	1	1	2	5.N.1.2		
5	C	147932A	2	2	2	5.N.3.3		
5	C	147932A	3	2	2	5.N.2.2		
5	C	147932A	4	1	2	5.N.2.1		
5	C	147932A	5	2	2	5.N.3.3		
5	C	147968A	1	1	2	5.N.2.2		
5	C	147968A	2	2	2	5.N.2.2		
5	C	147968A	3	1	2	5.N.2.2		
5	C	147968A	4	2	2	5.N.2.2		
5	C	147968A	5	1	2	5.N.2.2		
5	C	148222A	1	2	2	5.N.1.1		
5	C	148222A	2	1	2	5.N.1.1		
5	C	148222A	3	2	2	5.N.1.1		
5	C	148222A	4	2	2	5.N.1.1		
5	C	148222A	5	2	2	5.N.1.1		
5	C	148344A	1	2	2	5.D.1.1		
5	C	148344A	2	1	2	5.D.1.1		
5	C	148344A	3	1	2	5.D.1.1		
5	C	148344A	4	2	2	5.D.1.1		
5	C	148344A	5	1	2	5.D.1.1		
5	C	148644A	1	2	2	5.N.1.4		
5	C	148644A	2	2	0	5.N.1.4		
5	C	148644A	3	2	1	5.N.1.4		
5	C	148644A	4	2	1	5.N.1.4	5.N.1.1	
5	C	148644A	5	2	1	5.N.1.4		
5	C	149232A	1	1	2	5.N.2.2		
5	C	149232A	2	1	2	5.N.2.2		
5	C	149232A	3	1	2	5.N.2.2		
5	C	149232A	4	1	1	5.N.2.2		
5	C	149232A	5	1	2	5.N.2.2		
5	C	149275A	1	2	2	5.N.3.3		
5	C	149275A	2	1	2	5.N.3.3		
5	C	149275A	3	1	2	5.N.3.3		
5	C	149275A	4	2	2	5.N.3.3		
5	C	149275A	5	2	2	5.N.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	C	149280A	1	2	2	5.N.3.3		
5	C	149280A	2	2	2	5.N.3.3		
5	C	149280A	3	2	2	5.N.3.3		
5	C	149280A	4	2	2	5.N.1.4		
5	C	149280A	5	2	2	5.N.3.3		
5	C	149292A	1	3	2	5.D.1.1		
5	C	149292A	2	1	2	5.D.1.1		
5	C	149292A	3	1	2	5.D.1.1		
5	C	149292A	4	2	2	5.D.1.1		
5	C	149292A	5	1	2	5.D.1.1		
5	C	149305A	1	2	2	5.GM.3.3		
5	C	149305A	2	1	2	5.GM.3.3		
5	C	149305A	3	2	2	5.GM.3.3		
5	C	149305A	4	2	2	5.N.1.4		
5	C	149305A	5	2	2	5.GM.3.3		
5	C	149310A	1	2	2	5.N.2.4		
5	C	149310A	2	1	2	5.N.2.4		
5	C	149310A	3	1	2	5.N.2.4		
5	C	149310A	4	1	2	5.N.2.4		
5	C	149310A	5	1	2	5.N.2.4		
5	C	149611A	1	2	2	5.N.3.1		
5	C	149611A	2	2	2	5.N.3.1		
5	C	149611A	3	2	2	5.N.3.1		
5	C	149611A	4	2	2	5.N.1.4		
5	C	149611A	5	2	2	5.N.3.3		
5	C	150239A	1	1	2	5.GM.1.2		
5	C	150239A	2	2	2	5.GM.1.2		
5	C	150239A	3	1	1	5.GM.1.2		
5	C	150239A	4	2	2	5.GM.1.2		
5	C	150239A	5	1	2	5.GM.1.2		
5	C	150267A	1	2	2	5.N.3.3		
5	C	150267A	2	2	2	5.N.1.4		
5	C	150267A	3	2	2	5.N.1.4		
5	C	150267A	4	2	2	5.N.1.4		
5	C	150267A	5	2	2	5.N.1.4		
5	C	150628A	1	3	2	5.A.1.1		
5	C	150628A	2	2	2	5.A.1.1		
5	C	150628A	3	2	2	5.A.1.1		
5	C	150628A	4	2	2	5.A.1.1		
5	C	150628A	5	2	2	5.A.1.1		
5	C	151248A	1	1	2	5.GM.1.3		
5	C	151248A	2	2	2	5.GM.1.3		
5	C	151248A	3	1	2	5.GM.1.3		
5	C	151248A	4	1	2	5.GM.1.3		
5	C	151248A	5	1	2	5.GM.1.3		
5	C	152041A	1	2	2	5.N.1.4		
5	C	152041A	2	1	0	5.N.1.4		
5	C	152041A	3	1	2	5.N.1.4		
5	C	152041A	4	2	1	5.N.1.4	5.N.1.1	
5	C	152041A	5	2	1	5.N.1.4		
5	C	152898A	1	2	2	5.GM.3.3		
5	C	152898A	2	1	2	5.GM.3.3		
5	C	152898A	3	1	2	5.GM.3.3		
5	C	152898A	4	2	2	5.GM.3.3		
5	C	152898A	5	2	2	5.GM.3.3		
5	C	152989A	1	2	2	5.A.1.1		
5	C	152989A	2	1	2	5.A.1.1		
5	C	152989A	3	1	2	5.A.1.1		
5	C	152989A	4	2	2	5.A.1.1		
5	C	152989A	5	2	2	5.A.1.1		
5	C	153144A	1	1	2	5.N.1.2		
5	C	153144A	2	1	2	5.N.2.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	C	153144A	3	1	2	5.N.2.1		
5	C	153144A	4	1	2	5.N.2.1		
5	C	153144A	5	1	2	5.N.2.1		
5	C	153163A	1	1	2	5.A.2.1		
5	C	153163A	2	1	2	5.A.2.1		
5	C	153163A	3	2	2	5.A.1.2		
5	C	153163A	4	2	2	5.A.2.1		
5	C	153163A	5	2	2	5.A.2.1		
5	C	154046A	1	2	2	5.N.2.3		
5	C	154046A	2	2	2	5.N.2.3		
5	C	154046A	3	2	2	5.N.2.3		
5	C	154046A	4	1	2	5.N.2.3		
5	C	154046A	5	1	2	5.N.2.3		
5	C	154048A	1	2	2	5.N.3.2		
5	C	154048A	2	2	2	5.N.3.3		
5	C	154048A	3	2	2	5.N.3.3		
5	C	154048A	4	2	2	5.N.3.3		
5	C	154048A	5	2	2	5.N.3.3		
5	C	154551A	1	2	2	5.N.3.3		
5	C	154551A	2	1	2	5.N.3.3		
5	C	154551A	3	1	2	5.N.3.3		
5	C	154551A	4	2	2	5.N.3.3		
5	C	154551A	5	2	2	5.N.3.3		
5	C	155103A	1	2	2	5.GM.3.4		
5	C	155103A	2	2	1	5.GM.3.4	5.N.1.4	
5	C	155103A	3	2	2	5.GM.3.4		
5	C	155103A	4	2	2	5.GM.3.4		
5	C	155103A	5	2	2	5.GM.3.4		
5	C	155134A	1	1	2	5.N.1.2		
5	C	155134A	2	1	2	5.N.2.4		
5	C	155134A	3	2	2	5.N.2.4		
5	C	155134A	4	1	2	5.N.2.1		
5	C	155134A	5	1	1	5.N.2.1	5.N.2.2	
5	C	155157A	1	3	2	5.D.1.1		
5	C	155157A	2	2	2	5.D.1.2		
5	C	155157A	3	1	2	5.D.1.1		
5	C	155157A	4	2	2	5.D.1.1		
5	C	155157A	5	1	2	5.D.1.1		
5	C	155329A	1	2	2	5.N.1.2		
5	C	155329A	2	1	2	5.N.1.3		
5	C	155329A	3	1	2	5.N.1.3		
5	C	155329A	4	2	2	5.N.1.3		
5	C	155329A	5	2	2	5.N.1.2		
5	C	155335A	1	1	2	5.GM.3.1		
5	C	155335A	2	1	2	5.GM.1.1		
5	C	155335A	3	1	2	5.GM.3.1		
5	C	155335A	4	1	2	5.GM.1.1		
5	C	155335A	5	1	2	5.GM.3.1		
5	C	155469A	1	2	2	5.N.3.3		
5	C	155469A	2	1	2	5.N.3.3		
5	C	155469A	3	1	2	5.N.3.3		
5	C	155469A	4	2	2	5.N.3.3		
5	C	155469A	5	2	2	5.N.3.3		
5	C	155505A	1	1	2	5.A.2.1		
5	C	155505A	2	1	2	5.A.2.1		
5	C	155505A	3	2	2	5.A.2.1		
5	C	155505A	4	2	2	5.A.2.1		
5	C	155505A	5	1	2	5.A.2.1		
5	C	155520A	1	1	2	5.A.2.1		
5	C	155520A	2	2	2	5.A.2.1		
5	C	155520A	3	1	2	5.A.1.2		
5	C	155520A	4	2	2	5.A.2.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
5	C	155520A	5	1	2	5.A.2.1		
5	C	161578A	1	3	2	5.A.1.1		
5	C	161578A	2	3	2	5.A.1.1		
5	C	161578A	3	1	2	5.A.1.1		
5	C	161578A	4	2	2	5.A.1.1		
5	C	161578A	5	2	2	5.A.1.1		
5	C	161603A	1	1	2	5.N.3.4		
5	C	161603A	2	2	2	5.N.2.3		
5	C	161603A	3	1	2	5.N.2.2		
5	C	161603A	4	1	2	5.N.2.3		
5	C	161603A	5	2	2	5.N.2.3		
5	C	163872A	1	2	2	5.D.1.1		
5	C	163872A	2	2	2	5.D.1.1		
5	C	163872A	3	1	2	5.D.1.1		
5	C	163872A	4	2	2	5.D.1.1		
5	C	163872A	5	2	2	5.D.1.1		
5	C	184260A	1	2	2	5.D.1.1		
5	C	184260A	2	2	2	5.D.1.1		
5	C	184260A	3	1	2	5.D.1.1		
5	C	184260A	4	2	2	5.D.1.1		
5	C	184260A	5	1	2	5.D.1.1		
5	C	184319A	1	2	2	5.D.1.1		
5	C	184319A	2	2	2	5.D.1.1		
5	C	184319A	3	2	2	5.D.1.1		
5	C	184319A	4	2	2	5.D.1.1		
5	C	184319A	5	1	2	5.D.1.1		
5	C	187209A	1	1	2	5.A.2.1		
5	C	187209A	2	2	2	5.A.2.1		
5	C	187209A	3	3	2	5.A.2.2		
5	C	187209A	4	2	2	5.A.2.1		
5	C	187209A	5	1	2	5.A.2.1		
5	C	484704	1	1	2	5.GM.2.1		
5	C	484704	2	1	2	5.GM.2.1		
5	C	484704	3	2	2	5.GM.2.1		
5	C	484704	4	2	2	5.GM.2.1		
5	C	484704	5	1	2	5.GM.2.1		
5	C	484716	1	1	2	5.GM.1.3		
5	C	484716	2	2	2	5.GM.2.2		
5	C	484716	3	2	2	5.GM.2.2		
5	C	484716	4	2	2	5.GM.2.2		
5	C	484716	5	2	2	5.GM.2.2		
5	C	489975	1	2	2	5.N.2.3		
5	C	489975	2	2	2	5.A.1.1		
5	C	489975	3	2	1	5.A.1.1		
5	C	489975	4	2	2	5.A.1.1		
5	C	489975	5	3	1	5.A.1.1	5.N.3.3	
6	A	147412A	1	1	2	6.N.1.4		
6	A	147412A	2	2	1	6.N.1.2		
6	A	147412A	3	1	2	6.N.1.4		
6	A	147412A	4	1	1	6.N.1.2	6.N.1.2	
6	A	147412A	5	1	2	6.N.1.4		
6	A	147432A	1	1	2	6.N.4.4		
6	A	147432A	2	1	2	6.N.1.4		
6	A	147432A	3	2	2	6.N.1.4		
6	A	147432A	4	2	2	6.A.X.X		
6	A	147432A	5	2	2	6.N.1.4		
6	A	147578A	1	1	2	6.A.1.1		
6	A	147578A	2	1	2	6.A.1.1		
6	A	147578A	3	1	2	6.A.1.1		
6	A	147578A	4	1	2	6.A.1.1		
6	A	147578A	5	1	2	6.A.1.1		
6	A	148159A	1	1	2	6.GM.4.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	148159A	2	1	2	6.GM.4.4		
6	A	148159A	3	1	2	6.GM.4.4		
6	A	148159A	4	1	2	6.GM.4.4		
6	A	148159A	5	1	2	6.GM.4.4		
6	A	148179A	1	1	2	6.GM.1.2		
6	A	148179A	2	1	2	6.GM.1.1		
6	A	148179A	3	2	2	6.GM.1.2		
6	A	148179A	4	1	2	6.GM.1.2		
6	A	148179A	5	2	2	6.GM.1.2		
6	A	148231A	1	1	2	6.D.2.1		
6	A	148231A	2	1	2	6.D.2.1		
6	A	148231A	3	2	2	6.D.2.1		
6	A	148231A	4	1	2	6.D.2.1		
6	A	148231A	5	1	2	6.D.2.1		
6	A	148642A	1	1	2	6.GM.3.1		
6	A	148642A	2	1	2	6.GM.3.1		
6	A	148642A	3	1	2	6.GM.3.1		
6	A	148642A	4	1	2	6.GM.3.1		
6	A	148642A	5	1	2	6.GM.3.1		
6	A	148926A	1	1	2	6.GM.4.1		
6	A	148926A	2	1	2	6.GM.4.2		
6	A	148926A	3	1	2	6.GM.4.1		
6	A	148926A	4	1	2	6.GM.4.X		
6	A	148926A	5	1	2	6.GM.4.1		
6	A	149140A	1	1	2	6.N.3.2		
6	A	149140A	2	2	2	6.N.4.1		
6	A	149140A	3	2	2	6.N.3.3		
6	A	149140A	4	1	2	6.N.4.4		
6	A	149140A	5	2	2	6.N.3.3		
6	A	149231A	1	2	2	6.N.4.4		
6	A	149231A	2	1	2	6.A.3.1		
6	A	149231A	3	2	2	6.N.3.4		
6	A	149231A	4	2	2	6.A.3.1		
6	A	149231A	5	2	2	6.N.3.4		
6	A	149234A	1	1	2	6.GM.3.2		
6	A	149234A	2	1	2	6.GM.3.2		
6	A	149234A	3	2	2	6.GM.3.2		
6	A	149234A	4	1	2	6.GM.3.2		
6	A	149234A	5	2	2	6.GM.3.2		
6	A	149259A	1	1	2	6.N.1.2		
6	A	149259A	2	1	2	6.N.1.2		
6	A	149259A	3	1	2	6.N.1.2		
6	A	149259A	4	1	2	6.N.1.2		
6	A	149259A	5	2	2	6.N.1.2		
6	A	149333A	1	1	2	6.A.1.3		
6	A	149333A	2	1	2	6.A.3.1		
6	A	149333A	3	1	2	6.A.3.1		
6	A	149333A	4	2	2	6.A.1.3		
6	A	149333A	5	1	2	6.A.3.1		
6	A	149511A	1	1	2	6.D.1.1		
6	A	149511A	2	1	2	6.D.1.1		
6	A	149511A	3	1	2	6.D.1.1		
6	A	149511A	4	1	2	6.D.1.1		
6	A	149511A	5	1	2	6.D.1.1		
6	A	149730A	1	1	2	6.GM.4.1		
6	A	149730A	2	1	2	6.GM.4.2		
6	A	149730A	3	1	2	6.GM.4.1		
6	A	149730A	4	1	2	6.GM.4.1		
6	A	149730A	5	1	2	6.GM.4.1		
6	A	150604A	1	2	2	6.N.3.3		
6	A	150604A	2	2	2	6.N.3.3		
6	A	150604A	3	2	2	6.N.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	150604A	4	1	2	6.N.3.3		
6	A	150604A	5	2	2	6.N.3.3		
6	A	150723A	1	1	2	6.A.3.1		
6	A	150723A	2	1	2	6.A.3.2		
6	A	150723A	3	1	2	6.A.1.3		
6	A	150723A	4	2	2	6.A.2.1		
6	A	150723A	5	1	2	6.A.1.3		
6	A	150972A	1	1	2	6.D.1.1		
6	A	150972A	2	1	2	6.D.1.1		
6	A	150972A	3	1	2	6.D.1.1		
6	A	150972A	4	1	2	6.D.1.1		
6	A	150972A	5	1	2	6.D.1.1		
6	A	150977A	1	1	2	6.D.1.1		
6	A	150977A	2	1	2	6.D.1.1		
6	A	150977A	3	1	2	6.D.1.1		
6	A	150977A	4	1	2	6.D.1.1		
6	A	150977A	5	1	2	6.D.1.1		
6	A	150989A	1	1	2	6.D.1.1		
6	A	150989A	2	1	2	6.D.1.1		
6	A	150989A	3	1	2	6.D.1.1		
6	A	150989A	4	1	2	6.D.1.1		
6	A	150989A	5	1	2	6.D.1.1		
6	A	151145A	1	1	2	6.N.3.2		
6	A	151145A	2	1	2	6.N.1.3		
6	A	151145A	3	2	2	6.N.3.3		
6	A	151145A	4	1	2	6.N.4.4		
6	A	151145A	5	2	2	6.N.1.4		
6	A	151235A	1	2	2	6.N.4.4		
6	A	151235A	2	2	2	6.N.4.4		
6	A	151235A	3	2	2	6.N.4.4		
6	A	151235A	4	2	2	6.A.3.2		
6	A	151235A	5	2	2	6.N.4.4		
6	A	151316A	1	1	2	6.N.4.4		
6	A	151316A	2	2	2	6.N.4.1		
6	A	151316A	3	2	1	6.N.4.3	6.N.4.1	
6	A	151316A	4	1	2	6.A.3.1		
6	A	151316A	5	2	1	6.N.4.3	6.N.4.1	
6	A	151710A	1	1	2	6.A.X.X		
6	A	151710A	2	1	2	6.A.3.1		
6	A	151710A	3	1	2	6.A.3.1		
6	A	151710A	4	2	2	6.A.3.2		
6	A	151710A	5	1	2	6.A.3.1		
6	A	151782A	1	2	2	6.GM.1.1		
6	A	151782A	2	2	2	6.GM.1.1		
6	A	151782A	3	2	2	6.GM.1.1		
6	A	151782A	4	2	1	6.GM.1.1		
6	A	151782A	5	2	2	6.GM.1.1		
6	A	151835A	1	1	2	6.GM.2.1		
6	A	151835A	2	1	2	6.GM.2.1		
6	A	151835A	3	1	2	6.GM.2.1		
6	A	151835A	4	1	2	6.GM.2.1		
6	A	151835A	5	1	2	6.GM.2.1		
6	A	151933A	1	1	2	6.GM.2.1		
6	A	151933A	2	1	2	6.GM.2.2		
6	A	151933A	3	1	2	6.GM.2.1		
6	A	151933A	4	1	2	6.GM.2.1		
6	A	151933A	5	1	2	6.GM.2.1		
6	A	152527A	1	1	2	6.A.2.1		
6	A	152527A	2	1	2	6.A.2.1		
6	A	152527A	3	2	2	6.A.2.1		
6	A	152527A	4	2	2	6.A.2.1		
6	A	152527A	5	1	2	6.A.2.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	152824A	1	1	2	6.N.4.4		
6	A	152824A	2	2	2	6.N.4.4		
6	A	152824A	3	2	2	6.N.4.4		
6	A	152824A	4	2	2	6.N.4.4		
6	A	152824A	5	2	2	6.N.4.4		
6	A	152853A	1	2	2	6.N.4.4		
6	A	152853A	2	2	2	6.N.4.4		
6	A	152853A	3	2	2	6.N.4.4		
6	A	152853A	4	2	2	6.N.4.4		
6	A	152853A	5	2	2	6.N.4.4		
6	A	152877A	1	1	2	6.N.1.2		
6	A	152877A	2	1	2	6.N.1.2		
6	A	152877A	3	2	2	6.N.1.2		
6	A	152877A	4	1	2	6.N.1.4		
6	A	152877A	5	2	2	6.N.1.2		
6	A	153103A	1	1	2	6.A.1.3		
6	A	153103A	2	1	2	6.A.3.2		
6	A	153103A	3	1	2	6.A.1.3		
6	A	153103A	4	2	2	6.A.3.1		
6	A	153103A	5	1	2	6.A.1.3		
6	A	153315A	1	1	2	6.N.4.4		
6	A	153315A	2	1	2	6.N.4.3		
6	A	153315A	3	2	2	6.N.4.3		
6	A	153315A	4	2	2	6.N.4.4		
6	A	153315A	5	2	2	6.N.4.3		
6	A	153382A	1	1	2	6.N.4.1		
6	A	153382A	2	1	2	6.N.4.1		
6	A	153382A	3	2	2	6.N.4.4		
6	A	153382A	4	2	1	6.GM.3.2		
6	A	153382A	5	2	2	6.N.4.4		
6	A	153601A	1	1	2	6.N.2.3		
6	A	153601A	2	1	2	6.N.2.3		
6	A	153601A	3	1	2	6.N.2.3		
6	A	153601A	4	1	2	6.N.1.1		
6	A	153601A	5	1	2	6.N.2.2		
6	A	153952A	1	1	2	6.A.2.1		
6	A	153952A	2	1	2	6.A.2.1		
6	A	153952A	3	1	2	6.A.2.1		
6	A	153952A	4	1	2	6.A.2.1		
6	A	153952A	5	1	2	6.A.2.1		
6	A	155174A	1	1	2	6.A.3.2		
6	A	155174A	2	2	2	6.A.3.2		
6	A	155174A	3	2	2	6.A.3.2		
6	A	155174A	4	2	2	6.A.1.3		
6	A	155174A	5	1	2	6.A.1.3		
6	A	155177A	1	1	2	6.A.3.1		
6	A	155177A	2	1	2	6.A.3.2		
6	A	155177A	3	1	2	6.A.3.2		
6	A	155177A	4	1	2	6.A.3.1		
6	A	155177A	5	1	2	6.A.3.2		
6	A	155184A	1	1	2	6.GM.4.2		
6	A	155184A	2	1	2	6.GM.4.2		
6	A	155184A	3	1	2	6.GM.4.2		
6	A	155184A	4	1	2	6.GM.1.1		
6	A	155184A	5	1	2	6.GM.4.2		
6	A	155298A	1	1	2	6.N.4.4		
6	A	155298A	2	1	2	6.N.4.4		
6	A	155298A	3	1	2	6.N.4.4		
6	A	155298A	4	1	2	6.N.4.4		
6	A	155298A	5	1	2	6.N.4.4		
6	A	155464A	1	1	2	6.GM.4.2		
6	A	155464A	2	1	2	6.GM.4.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	155464A	3	1	2	6.GM.4.2		
6	A	155464A	4	1	2	6.GM.4.2		
6	A	155464A	5	1	2	6.GM.4.2		
6	A	161493A	1	2	2	6.N.3.3		
6	A	161493A	2	2	2	6.N.3.3		
6	A	161493A	3	2	2	6.N.3.3		
6	A	161493A	4	2	1	6.N.3.3		
6	A	161493A	5	2	2	6.N.3.3		
6	A	181240A	1	1	2	6.N.4.4		
6	A	181240A	2	1	2	6.N.2.3		
6	A	181240A	3	1	2	6.N.2.3		
6	A	181240A	4	2	2	6.A.2.1		
6	A	181240A	5	2	2	6.N.2.3		
6	A	181415A	1	1	2	6.N.2.3		
6	A	181415A	2	2	2	6.N.4.4		
6	A	181415A	3	1	2	6.N.2.3		
6	A	181415A	4	1	2	6.N.4.4		
6	A	181415A	5	1	2	6.N.2.2		
6	A	184316A	1	1	2	6.D.2.1		
6	A	184316A	2	1	2	6.D.2.1		
6	A	184316A	3	1	2	6.D.2.1		
6	A	184316A	4	1	2	6.D.2.1		
6	A	184316A	5	1	2	6.D.2.1		
6	A	479041	1	1	2	6.D.1.3		
6	A	479041	2	1	2	6.D.1.3		
6	A	479041	3	1	2	6.D.1.3		
6	A	479041	4	2	2	6.D.1.3		
6	A	479041	5	1	2	6.D.1.3		
6	A	479047	1	2	2	6.GM.1.1		
6	A	479047	2	2	2	6.GM.1.1		
6	A	479047	3	3	2	6.GM.1.3		
6	A	479047	4	3	1	6.GM.1.3		
6	A	479047	5	2	2	6.GM.1.3		
6	A	479049	1	2	2	6.GM.2.2		
6	A	479049	2	2	2	6.GM.2.2		
6	A	479049	3	2	2	6.GM.2.2		
6	A	479049	4	2	1	6.GM.1.3		
6	A	479049	5	2	2	6.GM.2.2		
6	A	479057	1	1	2	6.N.2.2		
6	A	479057	2	1	2	6.N.2.2		
6	A	479057	3	1	2	6.N.2.2		
6	A	479057	4	1	2	6.N.1.1		
6	A	479057	5	1	2	6.N.2.2		
6	A	479065	1	2	2	6.N.3.1		
6	A	479065	2	1	2	6.N.3.1		
6	A	479065	3	2	2	6.N.3.1		
6	A	479065	4	1	2	6.N.3.1		
6	A	479065	5	2	2	6.N.3.1		
6	A	479069	1	1	2	6.N.3.4		
6	A	479069	2	1	2	6.N.3.2		
6	A	479069	3	1	2	6.N.3.2		
6	A	479069	4	1	2	6.N.3.4		
6	A	479069	5	1	2	6.N.3.2		
6	A	479079	1	2	2	6.N.3.3		
6	A	479079	2	2	2	6.N.3.3		
6	A	479079	3	2	2	6.N.3.3		
6	A	479079	4	2	2	6.N.3.3		
6	A	479079	5	2	2	6.N.3.3		
6	A	479083	1	1	2	6.N.4.4		
6	A	479083	2	1	2	6.A.3.2		
6	A	479083	3	1	2	6.N.4.4		
6	A	479083	4	2	2	6.GM.3.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	A	479083	5	1	2	6.N.4.4		
6	A	479095	1	1	2	6.A.2.1		
6	A	479095	2	1	2	6.A.2.1		
6	A	479095	3	1	2	6.A.2.1		
6	A	479095	4	1	2	6.A.2.1		
6	A	479095	5	1	2	6.A.2.1		
6	A	479097	1	1	2	6.GM.2.1		
6	A	479097	2	1	2	6.GM.2.1		
6	A	479097	3	2	2	6.GM.2.1		
6	A	479097	4	1	2	6.GM.2.1		
6	A	479097	5	2	2	6.GM.2.1		
6	A	479146	1	1	2	6.D.2.3		
6	A	479146	2	2	2	6.D.2.3		
6	A	479146	3	2	2	6.D.2.2		
6	A	479146	4	2	1	6.D.2.2		
6	A	479146	5	2	2	6.D.2.2		
6	A	492692	1	1	2	6.A.2.1		
6	A	492692	2	2	2	6.A.2.1		
6	A	492692	3	2	2	6.A.2.1		
6	A	492692	4	2	2	6.A.2.1		
6	A	492692	5	2	2	6.A.2.1		
6	B	146958A	1	1	2	6.D.2.2		
6	B	146958A	2	1	2	6.D.2.2		
6	B	146958A	3	1	2	6.D.2.2		
6	B	146958A	4	1	2	6.D.2.1		
6	B	146958A	5	1	2	6.D.2.2		
6	B	147326A	1	1	2	6.N.1.4		
6	B	147326A	2	1	2	6.N.1.1		
6	B	147326A	3	1	2	6.N.1.4		
6	B	147326A	4	1	2	6.N.1.4		
6	B	147326A	5	1	2	6.N.1.4		
6	B	147995A	1	1	2	6.A.1.2		
6	B	147995A	2	1	2	6.A.3.1		
6	B	147995A	3	2	2	6.A.3.1		
6	B	147995A	4	2	2	6.A.3.1		
6	B	147995A	5	2	2	6.A.3.1		
6	B	148828A	1	1	2	6.GM.4.2		
6	B	148828A	2	1	2	6.GM.4.1		
6	B	148828A	3	1	2	6.GM.4.1		
6	B	148828A	4	1	2	6.GM.4.1		
6	B	148828A	5	1	2	6.GM.4.1		
6	B	148847A	1	1	2	6.GM.4.1		
6	B	148847A	2	1	2	6.GM.4.1		
6	B	148847A	3	1	2	6.GM.4.2		
6	B	148847A	4	1	2	6.GM.4.1		
6	B	148847A	5	1	2	6.GM.4.1		
6	B	149224A	1	1	2	6.GM.4.4		
6	B	149224A	2	1	2	6.GM.4.4		
6	B	149224A	3	1	2	6.GM.4.4		
6	B	149224A	4	1	2	6.GM.4.4		
6	B	149224A	5	1	2	6.GM.4.4		
6	B	149405A	1	1	2	6.A.1.2		
6	B	149405A	2	1	2	6.A.3.1		
6	B	149405A	3	1	2	6.A.3.1		
6	B	149405A	4	2	2	6.A.3.1		
6	B	149405A	5	1	2	6.A.3.2		
6	B	149470A	1	1	2	6.A.3.1		
6	B	149470A	2	1	2	6.A.3.1		
6	B	149470A	3	1	2	6.A.3.1		
6	B	149470A	4	1	2	6.A.3.1		
6	B	149470A	5	1	2	6.A.3.1		
6	B	149750A	1	2	2	6.GM.1.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	B	149750A	2	1	2	6.GM.1.3		
6	B	149750A	3	1	2	6.GM.1.2		
6	B	149750A	4	1	2	6.GM.1.2		
6	B	149750A	5	1	2	6.GM.1.2		
6	B	150617A	1	1	2	6.GM.4.2		
6	B	150617A	2	1	2	6.GM.4.2		
6	B	150617A	3	1	2	6.GM.4.2		
6	B	150617A	4	1	1	6.GM.4.1		
6	B	150617A	5	1	2	6.GM.4.2		
6	B	150963A	1	1	2	6.N.4.3		
6	B	150963A	2	1	2	6.N.4.3		
6	B	150963A	3	1	2	6.N.4.3		
6	B	150963A	4	2	2	6.N.4.3		
6	B	150963A	5	1	2	6.N.4.3		
6	B	151512A	1	2	2	6.N.2.1		
6	B	151512A	2	1	2	6.N.4.1		
6	B	151512A	3	2	1	6.N.1.6	6.N.4.1	
6	B	151512A	4	2	2	6.N.2.1		
6	B	151512A	5	2	1	6.N.1.6	6.N.4.1	
6	B	152379A	1	2	2	6.N.4.3		
6	B	152379A	2	2	2	6.N.4.3		
6	B	152379A	3	2	2	6.N.4.3		
6	B	152379A	4	1	2	6.N.4.4		
6	B	152379A	5	1	2	6.N.4.3		
6	B	152531A	1	1	2	6.A.2.1		
6	B	152531A	2	1	2	6.A.2.1		
6	B	152531A	3	1	2	6.A.2.1		
6	B	152531A	4	2	2	6.A.2.1		
6	B	152531A	5	1	2	6.A.2.1		
6	B	152633A	1	1	2	6.N.4.1		
6	B	152633A	2	1	2	6.N.4.1		
6	B	152633A	3	1	2	6.N.4.4		
6	B	152633A	4	1	2	6.N.4.3		
6	B	152633A	5	1	2	6.N.4.1		
6	B	152666A	1	1	2	6.D.1.1		
6	B	152666A	2	1	2	6.D.1.1		
6	B	152666A	3	1	2	6.D.1.1		
6	B	152666A	4	1	2	6.D.1.1		
6	B	152666A	5	1	2	6.D.1.1		
6	B	152840A	1	1	2	6.A.1.3		
6	B	152840A	2	1	2	6.A.3.2		
6	B	152840A	3	1	2	6.A.1.3		
6	B	152840A	4	2	2	6.A.3.1		
6	B	152840A	5	1	2	6.A.1.3		
6	B	152908A	1	1	2	6.D.1.1		
6	B	152908A	2	1	2	6.D.1.1		
6	B	152908A	3	1	2	6.D.1.1		
6	B	152908A	4	1	2	6.D.1.1		
6	B	152908A	5	1	2	6.D.1.1		
6	B	153088A	1	1	2	6.GM.3.1		
6	B	153088A	2	1	2	6.GM.3.1		
6	B	153088A	3	1	2	6.N.4.1		
6	B	153088A	4	1	2	6.GM.3.1		
6	B	153088A	5	1	2	6.GM.3.1		
6	B	153098A	1	1	2	6.GM.3.1		
6	B	153098A	2	1	2	6.GM.3.1		
6	B	153098A	3	1	2	6.N.4.1		
6	B	153098A	4	1	2	6.GM.3.1		
6	B	153098A	5	1	2	6.N.4.1		
6	B	153298A	1	2	2	6.GM.1.1		
6	B	153298A	2	1	2	6.GM.1.1		
6	B	153298A	3	1	2	6.GM.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	B	153298A	4	1	2	6.GM.1.3		
6	B	153298A	5	1	2	6.GM.1.1		
6	B	153512A	1	1	2	6.A.3.2		
6	B	153512A	2	1	2	6.A.3.1		
6	B	153512A	3	1	2	6.A.3.1		
6	B	153512A	4	1	2	6.A.3.1		
6	B	153512A	5	1	2	6.A.3.1		
6	B	154011A	1	1	2	6.N.2.3		
6	B	154011A	2	1	2	6.N.2.3		
6	B	154011A	3	1	2	6.A.2.1		
6	B	154011A	4	2	2	6.A.2.1		
6	B	154011A	5	1	2	6.A.2.1		
6	B	154500A	1	1	2	6.N.4.4		
6	B	154500A	2	1	2	6.N.1.3		
6	B	154500A	3	1	2	6.N.1.4		
6	B	154500A	4	1	2	6.N.4.2		
6	B	154500A	5	1	2	6.N.1.4		
6	B	155138A	1	1	2	6.A.3.1		
6	B	155138A	2	1	2	6.A.3.1		
6	B	155138A	3	2	2	6.A.3.1		
6	B	155138A	4	2	2	6.A.3.1		
6	B	155138A	5	2	2	6.A.3.1		
6	B	155218A	1	1	2	6.N.1.1		
6	B	155218A	2	1	2	6.N.1.2		
6	B	155218A	3	1	2	6.N.1.2		
6	B	155218A	4	1	2	6.N.1.2		
6	B	155218A	5	1	2	6.N.1.2		
6	B	155496A	1	1	2	6.N.1.1		
6	B	155496A	2	1	2	6.N.1.2		
6	B	155496A	3	1	2	6.N.1.2		
6	B	155496A	4	1	2	6.N.1.1		
6	B	155496A	5	1	2	6.N.1.2		
6	B	187093A	1	2	2	6.N.4.4		
6	B	187093A	2	1	2	6.N.4.2		
6	B	187093A	3	1	2	6.N.4.2		
6	B	187093A	4	1	2	6.N.4.2		
6	B	187093A	5	1	2	6.N.4.2		
6	B	187119A	1	1	2	6.N.1.1		
6	B	187119A	2	1	2	6.N.1.1		
6	B	187119A	3	1	2	6.N.1.1		
6	B	187119A	4	1	2	6.N.1.1		
6	B	187119A	5	1	2	6.N.1.1		
6	B	479039	1	1	2	6.N.1.5		
6	B	479039	2	2	2	6.N.4.4		
6	B	479039	3	1	2	6.A.2.1		
6	B	479039	4	1	2	6.A.2.1		
6	B	479039	5	1	2	6.A.3.2		
6	B	479043	1	1	2	6.D.1.3		
6	B	479043	2	1	2	6.D.1.3		
6	B	479043	3	2	2	6.D.1.3		
6	B	479043	4	1	2	6.D.1.3		
6	B	479043	5	2	2	6.D.1.3		
6	B	479051	1	1	2	6.GM.2.2		
6	B	479051	2	1	2	6.GM.2.2		
6	B	479051	3	1	2	6.GM.2.2		
6	B	479051	4	2	2	6.GM.1.2		
6	B	479051	5	1	2	6.GM.2.2		
6	B	479055	1	1	2	6.N.2.1		
6	B	479055	2	1	2	6.N.2.1		
6	B	479055	3	2	2	6.N.2.1		
6	B	479055	4	1	2	6.N.4.1		
6	B	479055	5	2	2	6.N.2.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	B	479061	1	1	2	6.N.3.1		
6	B	479061	2	1	2	6.N.3.1		
6	B	479061	3	1	2	6.N.3.1		
6	B	479061	4	1	2	6.N.3.2		
6	B	479061	5	1	2	6.N.3.1		
6	B	479067	1	1	2	6.N.3.1		
6	B	479067	2	1	2	6.N.3.1		
6	B	479067	3	1	2	6.N.3.1		
6	B	479067	4	2	2	6.N.3.1		
6	B	479067	5	1	2	6.N.3.1		
6	B	479071	1	1	2	6.N.3.2		
6	B	479071	2	1	2	6.N.3.2		
6	B	479071	3	1	2	6.N.3.2		
6	B	479071	4	1	2	6.N.3.3		
6	B	479071	5	2	2	6.N.3.2		
6	B	479077	1	2	2	6.N.3.3		
6	B	479077	2	2	2	6.N.4.4		
6	B	479077	3	2	2	6.N.4.4		
6	B	479077	4	2	2	6.N.4.4		
6	B	479077	5	2	2	6.N.4.4		
6	B	479085	1	2	2	6.N.3.3		
6	B	479085	2	1	2	6.N.3.1		
6	B	479085	3	1	2	6.N.3.1		
6	B	479085	4	2	2	6.N.3.3		
6	B	479085	5	1	2	6.N.3.1		
6	B	479101	1	1	2	6.GM.2.1		
6	B	479101	2	1	2	6.A.2.1		
6	B	479101	3	1	2	6.GM.2.1		
6	B	479101	4	1	2	6.GM.2.1		
6	B	479101	5	1	2	6.GM.2.1		
6	B	479133	1	2	2	6.D.2.2		
6	B	479133	2	1	2	6.D.2.2		
6	B	479133	3	1	2	6.D.2.2		
6	B	479133	4	2	2	6.D.2.2		
6	B	479133	5	1	2	6.D.2.2		
6	C	148275A	1	1	2	6.GM.3.1		
6	C	148275A	2	1	2	6.GM.3.1		
6	C	148275A	3	1	2	6.GM.3.1		
6	C	148275A	4	1	2	6.GM.3.1		
6	C	148275A	5	1	2	6.GM.3.1		
6	C	148336A	1	1	2	6.D.2.2		
6	C	148336A	2	1	2	6.D.2.1		
6	C	148336A	3	1	2	6.D.2.1		
6	C	148336A	4	1	2	6.D.2.1		
6	C	148336A	5	1	2	6.D.2.1		
6	C	148897A	1	1	2	6.N.1.1		
6	C	148897A	2	2	2	6.N.2.3		
6	C	148897A	3	1	2	6.N.2.3		
6	C	148897A	4	2	2	6.N.1.1		
6	C	148897A	5	1	2	6.N.2.3		
6	C	149062A	1	2	2	6.GM.1.1		
6	C	149062A	2	1	2	6.GM.1.1		
6	C	149062A	3	2	2	6.GM.1.1		
6	C	149062A	4	1	2	6.GM.1.1		
6	C	149062A	5	1	2	6.GM.1.1		
6	C	149245A	1	1	2	6.A.1.3		
6	C	149245A	2	1	2	6.A.3.1		
6	C	149245A	3	1	2	6.A.3.1		
6	C	149245A	4	2	2	6.A.3.1		
6	C	149245A	5	1	2	6.A.3.1		
6	C	149271A	1	2	2	6.GM.3.2		
6	C	149271A	2	1	2	6.N.1.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	C	149271A	3	2	2	6.GM.3.2		
6	C	149271A	4	2	2	6.GM.3.2		
6	C	149271A	5	2	2	6.GM.3.2		
6	C	149335A	1	1	2	6.N.1.2		
6	C	149335A	2	1	2	6.N.1.2		
6	C	149335A	3	1	2	6.N.1.2		
6	C	149335A	4	2	2	6.A.3.1		
6	C	149335A	5	1	2	6.N.1.2		
6	C	149341A	1	1	2	6.N.2.3		
6	C	149341A	2	1	2	6.N.2.3		
6	C	149341A	3	1	2	6.A.2.1		
6	C	149341A	4	1	2	6.N.1.1		
6	C	149341A	5	1	2	6.A.2.1		
6	C	149380A	1	2	2	6.N.4.4		
6	C	149380A	2	2	2	6.N.4.4		
6	C	149380A	3	2	2	6.N.4.4		
6	C	149380A	4	1	2	6.N.2.3		
6	C	149380A	5	2	2	6.N.4.4		
6	C	150270A	1	2	2	6.A.1.3		
6	C	150270A	2	2	2	6.N.4.4		
6	C	150270A	3	1	2	6.N.4.3		
6	C	150270A	4	2	2	6.A.1.3		
6	C	150270A	5	1	2	6.N.4.3		
6	C	150912A	1	1	2	6.GM.4.1		
6	C	150912A	2	1	2	6.GM.4.1		
6	C	150912A	3	1	2	6.GM.4.1		
6	C	150912A	4	1	2	6.GM.4.1		
6	C	150912A	5	1	2	6.GM.4.1		
6	C	151921A	1	1	2	6.GM.4.1		
6	C	151921A	2	1	2	6.GM.4.1		
6	C	151921A	3	1	2	6.GM.4.1		
6	C	151921A	4	1	2	6.GM.4.1		
6	C	151921A	5	1	2	6.GM.4.1		
6	C	152301A	1	1	2	6.N.4.1		
6	C	152301A	2	1	2	6.N.1.1		
6	C	152301A	3	1	2	6.N.1.4		
6	C	152301A	4	2	2	6.N.1.1		
6	C	152301A	5	1	2	6.N.1.4		
6	C	152528A	1	1	2	6.A.2.1		
6	C	152528A	2	1	2	6.A.2.1		
6	C	152528A	3	1	2	6.A.2.1		
6	C	152528A	4	1	2	6.A.2.1		
6	C	152528A	5	1	2	6.A.2.1		
6	C	152754A	1	1	2	6.A.1.2		
6	C	152754A	2	1	2	6.A.3.1		
6	C	152754A	3	1	2	6.A.3.1		
6	C	152754A	4	1	2	6.A.2.1		
6	C	152754A	5	1	2	6.A.3.1		
6	C	152830A	1	2	2	6.GM.3.2		
6	C	152830A	2	1	2	6.N.2.3		
6	C	152830A	3	2	2	6.GM.3.2		
6	C	152830A	4	1	2	6.GM.3.2		
6	C	152830A	5	2	2	6.GM.3.2		
6	C	152834A	1	1	2	6.D.1.1		
6	C	152834A	2	1	2	6.D.1.1		
6	C	152834A	3	1	2	6.D.1.1		
6	C	152834A	4	1	2	6.D.1.1		
6	C	152834A	5	1	2	6.D.1.1		
6	C	152906A	1	1	2	6.N.3.3		
6	C	152906A	2	1	2	6.N.1.4		
6	C	152906A	3	1	2	6.N.1.4		
6	C	152906A	4	1	2	6.N.1.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	C	152906A	5	1	2	6.N.1.4		
6	C	152957A	1	1	2	6.N.4.4		
6	C	152957A	2	1	2	6.N.4.1		
6	C	152957A	3	1	2	6.N.4.4		
6	C	152957A	4	2	2	6.N.2.1		
6	C	152957A	5	1	2	6.N.4.4		
6	C	153270A	1	1	2	6.D.1.1		
6	C	153270A	2	1	2	6.D.1.1		
6	C	153270A	3	1	2	6.D.1.1		
6	C	153270A	4	1	2	6.D.1.1		
6	C	153270A	5	1	2	6.D.1.1		
6	C	153445A	1	2	2	6.N.4.4		
6	C	153445A	2	2	2	6.N.4.3		
6	C	153445A	3	2	2	6.N.4.4		
6	C	153445A	4	2	2	6.N.4.4		
6	C	153445A	5	2	2	6.N.4.4		
6	C	153988A	1	1	2	6.GM.4.2		
6	C	153988A	2	1	2	6.GM.4.2		
6	C	153988A	3	1	2	6.GM.4.2		
6	C	153988A	4	1	1	6.GM.4.2		
6	C	153988A	5	1	2	6.GM.4.2		
6	C	155323A	1	1	2	6.N.1.1		
6	C	155323A	2	1	2	6.N.1.2		
6	C	155323A	3	1	2	6.N.1.2		
6	C	155323A	4	1	2	6.N.1.2		
6	C	155323A	5	1	2	6.N.1.2		
6	C	155450A	1	1	2	6.A.1.2		
6	C	155450A	2	1	2	6.A.3.1		
6	C	155450A	3	2	2	6.A.3.1		
6	C	155450A	4	2	2	6.A.3.1		
6	C	155450A	5	2	2	6.A.3.1		
6	C	181405A	1	2	2	6.N.4.4		
6	C	181405A	2	1	2	6.N.4.1		
6	C	181405A	3	2	2	6.N.4.3		
6	C	181405A	4	1	2	6.N.4.1		
6	C	181405A	5	2	2	6.N.4.3		
6	C	181448A	1	1	2	6.A.1.1		
6	C	181448A	2	1	2	6.A.1.1		
6	C	181448A	3	2	2	6.A.1.1		
6	C	181448A	4	1	1	6.A.1.1		
6	C	181448A	5	2	2	6.A.1.1		
6	C	181455A	1	2	2	6.A.1.3		
6	C	181455A	2	1	2	6.A.3.1		
6	C	181455A	3	1	2	6.A.3.1		
6	C	181455A	4	2	2	6.A.2.1		
6	C	181455A	5	1	2	6.A.3.1		
6	C	181997A	1	2	2	6.GM.1.3		
6	C	181997A	2	1	1	6.GM.1.1	6.GM.1.3	
6	C	181997A	3	2	1	6.GM.1.1	6.GM.1.2	
6	C	181997A	4	2	2	6.GM.1.3		
6	C	181997A	5	2	1	6.GM.1.1	6.GM.1.2	
6	C	187116A	1	1	2	6.N.1.1		
6	C	187116A	2	2	2	6.N.2.3		
6	C	187116A	3	1	2	6.N.1.2		
6	C	187116A	4	1	2	6.N.1.1		
6	C	187116A	5	1	2	6.N.1.2		
6	C	187202A	1	2	2	6.A.1.3		
6	C	187202A	2	2	2	6.N.4.3		
6	C	187202A	3	1	2	6.N.4.3		
6	C	187202A	4	2	2	6.N.4.4		
6	C	187202A	5	1	2	6.N.4.3		
6	C	479045	1	1	2	6.D.1.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
6	C	479045	2	2	2	6.D.1.3		
6	C	479045	3	2	2	6.D.1.3		
6	C	479045	4	1	2	6.D.1.3		
6	C	479045	5	2	2	6.D.1.3		
6	C	479053	1	1	2	6.GM.2.2		
6	C	479053	2	1	2	6.GM.2.1		
6	C	479053	3	2	2	6.GM.2.2		
6	C	479053	4	1	2	6.GM.1.2		
6	C	479053	5	2	2	6.GM.2.2		
6	C	479059	1	1	2	6.N.1.1		
6	C	479059	2	1	2	6.N.2.2		
6	C	479059	3	1	2	6.N.1.1		
6	C	479059	4	1	2	6.N.1.1		
6	C	479059	5	1	2	6.N.1.1		
6	C	479063	1	2	2	6.N.3.2		
6	C	479063	2	1	2	6.N.1.2		
6	C	479063	3	2	2	6.N.3.2		
6	C	479063	4	1	2	6.D.1.1		
6	C	479063	5	2	2	6.N.3.2		
6	C	479073	1	2	2	6.N.3.2		
6	C	479073	2	1	2	6.N.3.2		
6	C	479073	3	1	2	6.N.3.2		
6	C	479073	4	1	2	6.N.3.2		
6	C	479073	5	1	2	6.N.3.2		
6	C	479075	1	2	2	6.N.3.2		
6	C	479075	2	1	2	6.N.3.2		
6	C	479075	3	1	2	6.N.3.2		
6	C	479075	4	1	2	6.N.4.4		
6	C	479075	5	2	2	6.N.3.2		
6	C	479081	1	2	2	6.N.3.3		
6	C	479081	2	2	2	6.N.4.4		
6	C	479081	3	2	1	6.N.4.4	6.N.4.3	
6	C	479081	4	2	2	6.N.4.4		
6	C	479081	5	2	1	6.N.4.3	6.N.4.4	
6	C	479087	1	2	2	6.N.3.1		
6	C	479087	2	2	2	6.N.3.1		
6	C	479087	3	1	2	6.N.3.1		
6	C	479087	4	2	2	6.N.3.3		
6	C	479087	5	2	2	6.N.3.1		
6	C	479093	1	1	2	6.A.1.3		
6	C	479093	2	2	2	6.A.2.1		
6	C	479093	3	2	2	6.A.2.1		
6	C	479093	4	2	2	6.A.2.1		
6	C	479093	5	2	2	6.A.2.1		
6	C	479099	1	1	2	6.GM.2.1		
6	C	479099	2	2	2	6.GM.2.1		
6	C	479099	3	1	2	6.GM.2.1		
6	C	479099	4	2	2	6.GM.2.1		
6	C	479099	5	1	2	6.GM.2.1		
6	C	479148	1	1	2	6.D.2.1		
6	C	479148	2	1	2	6.D.2.2		
6	C	479148	3	2	2	6.D.2.2		
6	C	479148	4	2	2	6.D.2.2		
6	C	479148	5	2	2	6.D.2.2		
7	A	147576A	1	1	2	7.N.2.5		
7	A	147576A	2	2	2	7.A.4.2		
7	A	147576A	3	1	2	7.A.4.2		
7	A	147576A	4	2	2	7.A.4.2		
7	A	147576A	5	1	2	7.A.4.2		
7	A	148154A	1	1	2	7.D.2.1		
7	A	148154A	2	1	2	7.D.2.2		
7	A	148154A	3	1	2	7.D.2.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	148154A	4	2	2	7.A.1.2		
7	A	148154A	5	1	2	7.D.2.1		
7	A	148171A	1	1	2	7.N.1.2		
7	A	148171A	2	2	1	7.N.1.2	7.N.1.3	
7	A	148171A	3	2	2	7.N.1.2		
7	A	148171A	4	2	2	7.GM.4.3		
7	A	148171A	5	1	2	7.N.1.2		
7	A	148193A	1	2	2	7.A.3.2		
7	A	148193A	2	2	2	7.A.3.2		
7	A	148193A	3	2	2	7.A.3.2		
7	A	148193A	4	2	2	7.A.3.2		
7	A	148193A	5	2	2	7.A.3.2		
7	A	148330A	1	1	2	7.N.2.5		
7	A	148330A	2	2	2	7.A.4.2		
7	A	148330A	3	1	2	7.A.4.2		
7	A	148330A	4	2	2	7.GM.2.2		
7	A	148330A	5	1	2	7.A.4.2		
7	A	148478A	1	2	2	7.A.3.1		
7	A	148478A	2	2	2	7.D.1.1		
7	A	148478A	3	2	2	7.D.1.1		
7	A	148478A	4	2	2	7.D.2.1		
7	A	148478A	5	2	2	7.D.1.1		
7	A	148524A	1	2	2	7.GM.4.3		
7	A	148524A	2	1	2	7.GM.4.3		
7	A	148524A	3	2	2	7.GM.4.3		
7	A	148524A	4	1	2	7.GM.4.3		
7	A	148524A	5	1	2	7.GM.4.3		
7	A	148527A	1	2	2	7.GM.4.2		
7	A	148527A	2	1	2	7.GM.4.1		
7	A	148527A	3	1	2	7.GM.4.2		
7	A	148527A	4	1	2	7.N.2.4		
7	A	148527A	5	1	2	7.GM.4.2		
7	A	148912A	1	1	2	7.A.2.1		
7	A	148912A	2	1	2	7.A.2.3		
7	A	148912A	3	1	2	7.A.2.3		
7	A	148912A	4	2	2	7.N.2.5		
7	A	148912A	5	1	2	7.A.2.3		
7	A	148934A	1	1	2	7.N.2.3		
7	A	148934A	2	1	2	7.A.2.2		
7	A	148934A	3	1	2	7.A.2.2		
7	A	148934A	4	2	2	7.N.1.3		
7	A	148934A	5	1	2	7.A.2.2		
7	A	149102A	1	1	2	7.A.3.3		
7	A	149102A	2	1	2	7.N.1.2		
7	A	149102A	3	1	2	7.N.1.2		
7	A	149102A	4	2	2	7.N.1.2		
7	A	149102A	5	1	2	7.N.1.2		
7	A	149256A	1	1	2	7.GM.4.1		
7	A	149256A	2	1	2	7.GM.4.1		
7	A	149256A	3	1	2	7.GM.4.1		
7	A	149256A	4	2	2	7.GM.4.3		
7	A	149256A	5	1	2	7.GM.4.1		
7	A	149308A	1	1	2	7.GM.4.2		
7	A	149308A	2	1	2	7.GM.4.1		
7	A	149308A	3	1	2	7.GM.4.1		
7	A	149308A	4	1	2	7.GM.4.1		
7	A	149308A	5	1	2	7.GM.4.1		
7	A	149705A	1	2	2	7.N.2.3		
7	A	149705A	2	1	2	7.N.2.3		
7	A	149705A	3	1	2	7.N.2.3		
7	A	149705A	4	2	2	7.N.2.5		
7	A	149705A	5	1	2	7.N.2.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	149708A	1	1	2	7.N.1.3		
7	A	149708A	2	1	2	7.N.1.3		
7	A	149708A	3	1	2	7.N.1.3		
7	A	149708A	4	2	2	7.N.1.3		
7	A	149708A	5	1	2	7.N.1.3		
7	A	149759A	1	2	2	7.A.2.3		
7	A	149759A	2	2	2	7.A.2.3		
7	A	149759A	3	1	2	7.A.2.2		
7	A	149759A	4	2	2	7.D.2.2		
7	A	149759A	5	1	2	7.A.3.2		
7	A	150199A	1	2	2	7.GM.4.2		
7	A	150199A	2	1	2	7.GM.4.1		
7	A	150199A	3	1	2	7.GM.4.2		
7	A	150199A	4	2	2	7.A.4.1		
7	A	150199A	5	1	2	7.GM.4.2		
7	A	150232A	1	2	2	7.A.3.1		
7	A	150232A	2	2	2	7.A.3.1		
7	A	150232A	3	2	2	7.A.3.1		
7	A	150232A	4	2	2	7.A.3.1		
7	A	150232A	5	1	2	7.A.3.1		
7	A	150618A	1	1	2	7.D.2.1		
7	A	150618A	2	1	2	7.D.2.2		
7	A	150618A	3	2	2	7.D.2.2		
7	A	150618A	4	2	2	7.D.2.2		
7	A	150618A	5	2	2	7.D.2.2		
7	A	150629A	1	2	2	7.D.2.2		
7	A	150629A	2	1	2	7.D.2.2		
7	A	150629A	3	2	2	7.D.2.1		
7	A	150629A	4	2	2	7.GM.3.2		
7	A	150629A	5	1	2	7.D.2.1		
7	A	150870A	1	1	2	7.GM.4.3		
7	A	150870A	2	1	2	7.GM.4.3		
7	A	150870A	3	1	2	6.GM.4.3		
7	A	150870A	4	2	2	7.GM.2.2		
7	A	150870A	5	1	2	7.GM.4.3		
7	A	150891A	1	2	2	7.A.3.1		
7	A	150891A	2	2	2	7.A.3.1		
7	A	150891A	3	1	2	7.A.3.1		
7	A	150891A	4	2	2	7.A.3.1		
7	A	150891A	5	1	2	7.A.3.1		
7	A	151738A	1	2	2	7.N.2.5		
7	A	151738A	2	2	2	7.GM.4.2		
7	A	151738A	3	1	2	7.A.4.2		
7	A	151738A	4	2	2	7.A.2.4		
7	A	151738A	5	1	2	7.A.4.2		
7	A	151849A	1	2	2	7.D.2.3		
7	A	151849A	2	2	2	7.D.2.2		
7	A	151849A	3	2	2	7.D.2.3		
7	A	151849A	4	2	2	7.A.2.1		
7	A	151849A	5	2	2	7.D.2.3		
7	A	151879A	1	1	2	7.D.1.1		
7	A	151879A	2	1	2	7.D.1.1		
7	A	151879A	3	1	2	7.D.1.1		
7	A	151879A	4	2	2	7.D.1.1		
7	A	151879A	5	1	2	7.D.1.1		
7	A	151991A	1	1	1	7.N.2.5		
7	A	151991A	2	1	2	7.N.2.5		
7	A	151991A	3	1	2	7.N.2.5		
7	A	151991A	4	2	2	7.GM.1.1		
7	A	151991A	5	1	2	7.N.2.5		
7	A	152051A	1	1	2	7.GM.2.2		
7	A	152051A	2	1	2	7.GM.2.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	152051A	3	1	2	7.GM.2.2		
7	A	152051A	4	2	2	7.GM.2.2		
7	A	152051A	5	1	2	7.GM.2.2		
7	A	152056A	1	1	2	7.N.1.2		
7	A	152056A	2	2	2	7.N.1.2		
7	A	152056A	3	2	2	6.N.1.2		
7	A	152056A	4	1	2	7.N.1.2		
7	A	152056A	5	2	2	7.N.1.2		
7	A	152288A	1	2	2	7.GM.2.2		
7	A	152288A	2	2	2	7.GM.2.2		
7	A	152288A	3	2	2	7.GM.2.2		
7	A	152288A	4	2	2	7.A.2.3		
7	A	152288A	5	2	2	7.GM.2.2		
7	A	152901A	1	1	2	7.D.1.2		
7	A	152901A	2	2	2	7.D.1.1		
7	A	152901A	3	2	2	7.D.1.1		
7	A	152901A	4	2	2	7.D.1.1		
7	A	152901A	5	2	2	7.D.1.1		
7	A	152915A	1	2	2	7.GM.3.2		
7	A	152915A	2	2	2	7.GM.3.2		
7	A	152915A	3	1	2	7.GM.3.2		
7	A	152915A	4	2	2	7.GM.3.1		
7	A	152915A	5	1	2	7.GM.3.2		
7	A	153291A	1	1	2	7.N.2.5		
7	A	153291A	2	2	2	7.GM.4.2		
7	A	153291A	3	1	2	7.A.4.1		
7	A	153291A	4	2	2	7.GM.4.2		
7	A	153291A	5	1	2	7.A.4.2		
7	A	153299A	1	1	2	7.A.4.1		
7	A	153299A	2	2	2	7.A.4.2		
7	A	153299A	3	1	2	7.A.4.2		
7	A	153299A	4	1	2	7.A.4.1		
7	A	153299A	5	1	2	7.A.4.2		
7	A	153452A	1	2	1	7.GM.3.1		
7	A	153452A	2	2	2	7.GM.3.2		
7	A	153452A	3	1	2	7.GM.3.2		
7	A	153452A	4	2	2	7.GM.3.2		
7	A	153452A	5	1	2	7.GM.3.2		
7	A	153504A	1	2	2	7.N.2.5		
7	A	153504A	2	2	2	7.A.4.2		
7	A	153504A	3	1	2	7.A.4.2		
7	A	153504A	4	2	2	7.A.4.2		
7	A	153504A	5	1	2	7.A.4.2		
7	A	154028A	1	1	2	7.D.2.1		
7	A	154028A	2	1	2	7.D.2.2		
7	A	154028A	3	1	2	7.D.2.2		
7	A	154028A	4	2	2	7.D.2.2		
7	A	154028A	5	1	2	7.D.2.2		
7	A	155126A	1	1	2	7.GM.4.1		
7	A	155126A	2	1	2	7.GM.4.1		
7	A	155126A	3	1	2	7.GM.4.1		
7	A	155126A	4	2	2	7.GM.4.2		
7	A	155126A	5	1	2	7.GM.4.1		
7	A	155443A	1	2	2	7.D.1.2		
7	A	155443A	2	1	2	7.D.1.2		
7	A	155443A	3	2	2	7.D.1.2		
7	A	155443A	4	2	2	7.D.1.2		
7	A	155443A	5	2	2	7.D.1.2		
7	A	181978A	1	1	2	7.N.1.3		
7	A	181978A	2	1	2	7.N.1.2		
7	A	181978A	3	2	2	7.N.1.2		
7	A	181978A	4	1	2	7.N.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	181978A	5	2	2	7.N.1.2		
7	A	181984A	1	1	2	7.N.1.3		
7	A	181984A	2	2	2	7.N.1.3		
7	A	181984A	3	1	2	7.N.1.2		
7	A	181984A	4	2	2	7.GM.4.1		
7	A	181984A	5	1	2	7.N.1.2		
7	A	182010A	1	2	2	7.GM.3.2		
7	A	182010A	2	2	2	7.GM.3.2		
7	A	182010A	3	2	2	7.GM.3.2		
7	A	182010A	4	2	2	7.GM.3.1		
7	A	182010A	5	2	2	7.GM.3.2		
7	A	182015A	1	2	2	7.GM.2.2		
7	A	182015A	2	1	2	7.GM.2.2		
7	A	182015A	3	2	2	7.GM.2.2		
7	A	182015A	4	2	2	7.A.4.1		
7	A	182015A	5	2	2	7.GM.2.2		
7	A	182026A	1	2	2	7.D.1.1		
7	A	182026A	2	2	2	7.D.1.1		
7	A	182026A	3	2	2	7.D.1.1		
7	A	182026A	4	2	2	7.D.1.1		
7	A	182026A	5	2	2	7.D.1.1		
7	A	183739A	1	2	2	7.A.3.1		
7	A	183739A	2	2	2	7.A.3.2		
7	A	183739A	3	1	2	7.A.3.1		
7	A	183739A	4	2	2	7.D.1.1		
7	A	183739A	5	2	2	7.A.3.1		
7	A	480259	1	1	2	7.A.1.1		
7	A	480259	2	1	2	7.A.1.1		
7	A	480259	3	2	2	7.A.2.1		
7	A	480259	4	2	2	7.A.3.2		
7	A	480259	5	1	2	7.A.2.1		
7	A	480272	1	1	2	7.A.1.2		
7	A	480272	2	1	2	7.A.1.2		
7	A	480272	3	1	2	7.A.1.2		
7	A	480272	4	2	2	7.D.2.1		
7	A	480272	5	1	2	7.A.1.2		
7	A	480287	1	1	2	7.A.1.2		
7	A	480287	2	1	2	7.A.1.2		
7	A	480287	3	1	2	7.A.2.1		
7	A	480287	4	2	2	7.A.2.1		
7	A	480287	5	1	2	7.A.2.1		
7	A	480295	1	1	2	7.A.2.1		
7	A	480295	2	1	2	7.A.2.2		
7	A	480295	3	1	2	7.A.2.1		
7	A	480295	4	2	2	7.GM.3.2		
7	A	480295	5	1	2	7.A.2.1		
7	A	480301	1	3	2	7.GM.1.1		
7	A	480301	2	1	2	7.GM.1.1		
7	A	480301	3	2	2	7.GM.1.1		
7	A	480301	4	2	2	7.GM.2.2		
7	A	480301	5	2	2	7.GM.1.1		
7	A	480307	1	3	2	7.GM.1.2		
7	A	480307	2	2	2	7.GM.1.2		
7	A	480307	3	2	2	7.GM.1.2		
7	A	480307	4	2	2	7.GM.1.2		
7	A	480307	5	2	2	7.GM.1.2		
7	A	480339	1	1	2	7.N.2.4		
7	A	480339	2	1	2	7.N.2.4		
7	A	480339	3	1	2	7.N.2.5		
7	A	480339	4	2	2	7.N.2.5		
7	A	480339	5	1	2	7.N.2.5		
7	A	480358	1	2	2	7.N.2.5		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	A	480358	2	2	2	7.A.4.2		
7	A	480358	3	2	2	7.A.4.2		
7	A	480358	4	2	2	7.A.4.2		
7	A	480358	5	1	2	7.A.4.2		
7	A	480373	1	2	2	7.GM.4.3		
7	A	480373	2	1	2	7.GM.4.3		
7	A	480373	3	2	2	7.GM.4.3		
7	A	480373	4	1	2	7.A.2.2		
7	A	480373	5	2	2	7.GM.4.3		
7	A	480375	1	1	2	7.D.1.2		
7	A	480375	2	2	2	7.D.1.2		
7	A	480375	3	2	2	7.D.1.2		
7	A	480375	4	2	2	7.D.1.2		
7	A	480375	5	2	2	7.D.1.2		
7	A	480378	1	1	2	7.D.1.2		
7	A	480378	2	1	2	7.D.1.2		
7	A	480378	3	3	2	7.D.1.2		
7	A	480378	4	2	2	7.D.1.2		
7	A	480378	5	3	2	7.D.1.2		
7	A	489119	1	2	2	7.GM.3.2		
7	A	489119	2	1	2	7.GM.3.2		
7	A	489119	3	1	2	7.GM.3.2		
7	A	489119	4	2	2	7.GM.3.2		
7	A	489119	5	1	2	7.GM.3.2		
7	A	490454	1	2	2	7.GM.3.2		
7	A	490454	2	1	2	7.GM.3.2		
7	A	490454	3	2	2	7.GM.3.2		
7	A	490454	4	2	2	7.GM.3.2		
7	A	490454	5	2	2	7.GM.3.2		
7	B	147366A	1	2	2	7.N.2.3		
7	B	147366A	2	2	2	7.N.2.3		
7	B	147366A	3	2	2	7.N.2.3		
7	B	147366A	4	2	2	7.N.2.3		
7	B	147366A	5	1	2	7.N.2.3		
7	B	147541A	1	1	2	7.D.2.1		
7	B	147541A	2	1	2	7.D.2.2		
7	B	147541A	3	1	2	7.D.2.2		
7	B	147541A	4	1	2	7.D.2.1		
7	B	147541A	5	1	2	7.D.2.2		
7	B	148711A	1	1	2	7.D.2.1		
7	B	148711A	2	1	2	7.D.2.2		
7	B	148711A	3	2	2	7.D.2.2		
7	B	148711A	4	2	2	7.D.2.3		
7	B	148711A	5	2	2	7.D.2.2		
7	B	148722A	1	1	2	7.D.1.1		
7	B	148722A	2	1	2	7.D.1.1		
7	B	148722A	3	1	2	7.D.1.1		
7	B	148722A	4	2	2	7.D.1.1		
7	B	148722A	5	1	2	7.D.1.1		
7	B	148725A	1	2	2	7.A.3.3		
7	B	148725A	2	2	2	7.A.3.1		
7	B	148725A	3	2	2	7.A.3.1		
7	B	148725A	4	2	2	7.N.2.3		
7	B	148725A	5	2	2	7.A.3.1		
7	B	148739A	1	2	2	7.A.2.3		
7	B	148739A	2	2	2	7.A.3.1		
7	B	148739A	3	2	2	7.A.2.2		
7	B	148739A	4	2	2	7.A.3.1		
7	B	148739A	5	2	2	7.A.2.2		
7	B	148929A	1	1	2	7.A.3.3		
7	B	148929A	2	1	2	7.A.3.2		
7	B	148929A	3	1	2	7.A.3.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	B	148929A	4	2	2	7.A.2.3		
7	B	148929A	5	1	2	7.A.3.2		
7	B	149061A	1	1	2	7.D.1.1		
7	B	149061A	2	1	2	7.N.1.2		
7	B	149061A	3	1	2	7.N.1.2		
7	B	149061A	4	2	2	7.N.1.2		
7	B	149061A	5	1	2	7.N.1.2		
7	B	149081A	1	1	2	7.A.2.1		
7	B	149081A	2	1	2	7.A.2.3		
7	B	149081A	3	1	2	7.A.2.3		
7	B	149081A	4	1	2	7.N.1.1		
7	B	149081A	5	1	2	7.A.2.3		
7	B	149204A	1	1	2	7.A.4.2		
7	B	149204A	2	2	2	7.A.4.2		
7	B	149204A	3	1	2	7.A.4.2		
7	B	149204A	4	2	2	7.A.4.2		
7	B	149204A	5	1	2	7.A.4.2		
7	B	149537A	1	1	2	7.GM.4.1		
7	B	149537A	2	1	2	7.GM.4.1		
7	B	149537A	3	1	2	7.GM.4.1		
7	B	149537A	4	2	2	7.GM.4.1		
7	B	149537A	5	1	2	7.GM.4.1		
7	B	150237A	1	2	2	7.A.2.1		
7	B	150237A	2	1	2	7.D.1.2		
7	B	150237A	3	1	2	7.D.1.2		
7	B	150237A	4	2	2	7.GM.4.2		
7	B	150237A	5	1	2	7.D.1.2		
7	B	150264A	1	2	2	7.A.2.4		
7	B	150264A	2	1	2	7.GM.4.2		
7	B	150264A	3	2	2	7.GM.4.2		
7	B	150264A	4	2	2	7.GM.4.2		
7	B	150264A	5	2	2	7.GM.4.2		
7	B	150952A	1	2	2	7.GM.2.2		
7	B	150952A	2	1	2	7.GM.2.2		
7	B	150952A	3	2	2	7.GM.2.2		
7	B	150952A	4	2	2	7.GM.2.2		
7	B	150952A	5	1	2	7.GM.2.2		
7	B	151811A	1	1	2	7.N.1.2		
7	B	151811A	2	1	2	7.N.1.2		
7	B	151811A	3	1	2	7.N.1.2		
7	B	151811A	4	2	2	7.N.1.2		
7	B	151811A	5	1	2	7.N.1.2		
7	B	151850A	1	2	1	7.GM.4.1		
7	B	151850A	2	1	2	7.N.2.5		
7	B	151850A	3	1	2	7.N.2.5		
7	B	151850A	4	2	2	7.N.2.5		
7	B	151850A	5	1	2	7.N.2.5		
7	B	152029A	1	2	2	7.A.3.3		
7	B	152029A	2	2	2	7.A.3.1		
7	B	152029A	3	1	2	7.A.3.1		
7	B	152029A	4	2	2	7.A.3.1		
7	B	152029A	5	1	2	7.A.3.1		
7	B	152745A	1	1	2	7.A.4.2		
7	B	152745A	2	2	2	7.A.4.2		
7	B	152745A	3	1	2	7.A.4.2		
7	B	152745A	4	2	2	7.N.2.6		
7	B	152745A	5	1	2	7.A.4.2		
7	B	152819A	1	2	2	7.GM.4.2		
7	B	152819A	2	1	2	7.GM.4.1		
7	B	152819A	3	1	2	7.GM.4.2		
7	B	152819A	4	2	2	7.GM.4.3		
7	B	152819A	5	1	2	7.GM.4.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	B	153294A	1	2	2	7.GM.4.3		
7	B	153294A	2	1	2	7.GM.4.3		
7	B	153294A	3	1	2	7.GM.4.3		
7	B	153294A	4	2	2	7.GM.4.3		
7	B	153294A	5	1	2	7.GM.4.3		
7	B	153485A	1	1	2	7.GM.3.2		
7	B	153485A	2	1	2	7.GM.3.2		
7	B	153485A	3	1	2	7.GM.3.2		
7	B	153485A	4	2	2	7.GM.3.1		
7	B	153485A	5	1	2	7.GM.3.2		
7	B	153922A	1	1	2	7.N.2.3		
7	B	153922A	2	1	2	7.N.2.3		
7	B	153922A	3	1	2	7.N.2.3		
7	B	153922A	4	2	2	7.GM.4.1		
7	B	153922A	5	1	2	7.N.2.3		
7	B	161470A	1	2	2	7.D.2.1		
7	B	161470A	2	1	2	7.D.2.2		
7	B	161470A	3	2	2	7.D.2.1		
7	B	161470A	4	2	2	7.D.2.1		
7	B	161470A	5	2	2	7.D.2.1		
7	B	181941A	1	2	2	7.A.3.3		
7	B	181941A	2	2	2	7.A.3.2		
7	B	181941A	3	2	2	7.A.3.1		
7	B	181941A	4	2	2	7.N.2.3		
7	B	181941A	5	2	2	7.A.3.1		
7	B	182005A	1	2	2	7.GM.3.1		
7	B	182005A	2	1	2	7.GM.3.2		
7	B	182005A	3	1	2	7.GM.3.2		
7	B	182005A	4	2	2	7.GM.3.1		
7	B	182005A	5	1	2	7.GM.3.2		
7	B	182027A	1	1	2	7.D.1.1		
7	B	182027A	2	2	2	7.D.1.1		
7	B	182027A	3	1	2	7.D.1.1		
7	B	182027A	4	2	2	7.D.1.1		
7	B	182027A	5	1	2	7.D.1.1		
7	B	182028A	1	2	2	7.D.1.1		
7	B	182028A	2	2	2	7.D.1.1		
7	B	182028A	3	2	2	7.D.1.1		
7	B	182028A	4	2	2	7.A.2.3		
7	B	182028A	5	2	2	7.D.1.1		
7	B	182033A	1	1	2	7.A.2.3		
7	B	182033A	2	1	2	7.A.2.3		
7	B	182033A	3	1	2	7.A.2.3		
7	B	182033A	4	2	2	7.D.2.1		
7	B	182033A	5	1	2	7.A.2.3		
7	B	480264	1	1	2	7.A.2.1		
7	B	480264	2	2	2	7.A.2.1		
7	B	480264	3	1	2	7.A.2.1		
7	B	480264	4	2	2	7.A.2.1		
7	B	480264	5	2	2	7.A.2.1		
7	B	480281	1	2	2	7.A.1.1		
7	B	480281	2	2	2	7.A.2.1		
7	B	480281	3	2	2	7.A.1.1		
7	B	480281	4	2	2	7.A.2.4		
7	B	480281	5	2	2	7.A.1.1		
7	B	480289	1	2	2	7.A.1.2		
7	B	480289	2	2	2	7.A.2.1		
7	B	480289	3	2	2	7.A.1.2		
7	B	480289	4	2	2	7.A.1.2		
7	B	480289	5	2	2	7.A.1.2		
7	B	480297	1	1	2	7.A.2.1		
7	B	480297	2	1	2	7.A.2.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	B	480297	3	1	2	7.A.2.1		
7	B	480297	4	2	2	7.A.1.1		
7	B	480297	5	1	2	7.A.2.1		
7	B	480303	1	2	2	7.GM.1.1		
7	B	480303	2	1	2	7.GM.1.1		
7	B	480303	3	1	2	7.GM.1.1		
7	B	480303	4	2	2	7.D.1.2		
7	B	480303	5	2	2	7.GM.1.1		
7	B	480311	1	2	2	7.GM.1.2		
7	B	480311	2	1	2	7.GM.1.2		
7	B	480311	3	2	2	7.GM.1.2		
7	B	480311	4	2	2	7.GM.1.2		
7	B	480311	5	2	2	7.GM.1.2		
7	B	480333	1	1	2	7.N.1.3		
7	B	480333	2	1	2	7.N.1.3		
7	B	480333	3	1	2	7.N.1.3		
7	B	480333	4	2	2	7.D.1.1		
7	B	480333	5	1	2	7.N.1.3		
7	B	480343	1	1	2	7.N.2.6		
7	B	480343	2	1	2	7.N.2.6		
7	B	480343	3	1	2	7.N.2.6		
7	B	480343	4	1	2	7.N.2.6		
7	B	480343	5	1	2	7.N.2.6		
7	B	480360	1	1	2	7.A.4.1		
7	B	480360	2	2	2	7.A.4.1		
7	B	480360	3	2	2	7.A.4.1		
7	B	480360	4	2	2	7.A.4.1		
7	B	480360	5	2	2	7.A.4.1		
7	B	480371	1	2	2	7.GM.4.3		
7	B	480371	2	1	2	7.GM.4.3		
7	B	480371	3	1	2	7.GM.4.3		
7	B	480371	4	2	2	7.GM.3.1		
7	B	480371	5	2	2	7.GM.4.3		
7	B	489176	1	2	2	7.GM.3.2		
7	B	489176	2	1	2	7.GM.3.2		
7	B	489176	3	2	2	7.GM.3.2		
7	B	489176	4	2	2	7.GM.3.1		
7	B	489176	5	1	2	7.GM.3.2		
7	B	490609	1	1	2	7.D.1.2		
7	B	490609	2	1	2	7.D.1.2		
7	B	490609	3	2	2	7.D.1.2		
7	B	490609	4	2	2	7.D.1.2		
7	B	490609	5	1	2	7.D.1.2		
7	B	492694	1	2	2	7.GM.4.3		
7	B	492694	2	1	2	7.GM.4.3		
7	B	492694	3	2	2	7.GM.4.3		
7	B	492694	4	2	2	7.GM.4.3		
7	B	492694	5	2	2	7.GM.4.3		
7	C	148009A	1	1	2	7.D.1.1		
7	C	148009A	2	2	2	7.D.1.1		
7	C	148009A	3	1	2	7.D.1.1		
7	C	148009A	4	2	2	7.D.1.1		
7	C	148009A	5	1	2	7.D.1.1		
7	C	148268A	1	1	2	7.A.3.3		
7	C	148268A	2	1	2	7.A.3.2		
7	C	148268A	3	1	2	7.A.3.2		
7	C	148268A	4	2	2	7.A.3.2		
7	C	148268A	5	1	2	7.A.3.2		
7	C	148530A	1	1	2	7.A.3.3		
7	C	148530A	2	1	2	7.A.3.2		
7	C	148530A	3	1	2	7.A.3.3		
7	C	148530A	4	2	2	7.A.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	C	148530A	5	1	2	7.A.3.3		
7	C	148704A	1	1	2	7.D.1.1		
7	C	148704A	2	1	2	7.D.1.1		
7	C	148704A	3	1	2	7.D.1.1		
7	C	148704A	4	1	2	7.D.1.1		
7	C	148704A	5	1	2	7.D.1.1		
7	C	148826A	1	1	2	7.N.1.2		
7	C	148826A	2	1	2	7.N.1.2		
7	C	148826A	3	1	2	7.N.1.2		
7	C	148826A	4	1	2	7.N.1.2		
7	C	148826A	5	1	2	7.N.1.2		
7	C	149063A	1	1	2	7.A.4.2		
7	C	149063A	2	2	2	7.A.4.2		
7	C	149063A	3	1	2	7.A.4.2		
7	C	149063A	4	2	2	7.A.4.2		
7	C	149063A	5	1	2	7.A.4.2		
7	C	149208A	1	1	2	7.N.1.2		
7	C	149208A	2	2	1	7.N.1.2	7.N.1.3	
7	C	149208A	3	1	2	7.N.1.2		
7	C	149208A	4	2	2	7.A.4.2		
7	C	149208A	5	1	2	7.N.1.2		
7	C	149233A	1	1	2	7.D.1.2		
7	C	149233A	2	1	2	7.D.1.2		
7	C	149233A	3	1	2	7.D.1.2		
7	C	149233A	4	2	2	7.D.1.2		
7	C	149233A	5	1	2	7.D.1.2		
7	C	149295A	1	1	2	7.D.2.1		
7	C	149295A	2	1	2	7.D.2.2		
7	C	149295A	3	2	2	7.D.2.1		
7	C	149295A	4	2	2	7.D.2.1		
7	C	149295A	5	1	2	7.D.2.1		
7	C	149298A	1	1	2	7.GM.4.1		
7	C	149298A	2	1	2	7.GM.4.1		
7	C	149298A	3	1	2	7.GM.4.1		
7	C	149298A	4	2	2	7.A.2.4		
7	C	149298A	5	1	2	7.GM.4.1		
7	C	149482A	1	1	2	7.GM.4.1		
7	C	149482A	2	1	2	7.GM.4.1		
7	C	149482A	3	1	2	7.GM.4.1		
7	C	149482A	4	2	2	7.GM.4.1		
7	C	149482A	5	1	2	7.GM.4.1		
7	C	149719A	1	1	2	7.D.2.1		
7	C	149719A	2	1	2	7.D.2.2		
7	C	149719A	3	2	2	7.D.2.2		
7	C	149719A	4	2	2	7.D.2.2		
7	C	149719A	5	2	2	7.D.2.2		
7	C	149732A	1	1	2	7.A.4.2		
7	C	149732A	2	2	2	7.A.4.2		
7	C	149732A	3	1	2	7.A.4.2		
7	C	149732A	4	2	2	7.N.2.3		
7	C	149732A	5	1	2	7.A.4.2		
7	C	150189A	1	1	2	7.D.1.1		
7	C	150189A	2	1	2	7.D.1.1		
7	C	150189A	3	1	2	7.D.1.1		
7	C	150189A	4	2	2	7.D.1.1		
7	C	150189A	5	1	2	7.D.1.1		
7	C	150897A	1	2	2	7.A.2.1		
7	C	150897A	2	2	2	7.A.2.3		
7	C	150897A	3	1	2	7.D.1.2		
7	C	150897A	4	2	2	7.A.1.2		
7	C	150897A	5	2	2	7.D.1.2		
7	C	150953A	1	1	2	7.N.2.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	C	150953A	2	1	2	7.D.1.2		
7	C	150953A	3	1	2	7.D.1.2		
7	C	150953A	4	2	2	7.D.1.2		
7	C	150953A	5	1	2	7.D.1.2		
7	C	151733A	1	2	2	7.A.4.2		
7	C	151733A	2	2	2	7.A.4.2		
7	C	151733A	3	1	2	7.A.4.2		
7	C	151733A	4	2	2	7.N.2.6		
7	C	151733A	5	1	2	7.A.4.2		
7	C	151964A	1	2	2	7.A.3.1		
7	C	151964A	2	2	2	7.A.3.1		
7	C	151964A	3	1	2	7.A.3.1		
7	C	151964A	4	2	2	7.GM.3.1		
7	C	151964A	5	1	2	7.A.3.1		
7	C	151987A	1	2	2	7.A.2.3		
7	C	151987A	2	1	2	7.A.2.3		
7	C	151987A	3	1	2	7.A.2.3		
7	C	151987A	4	2	2	7.A.2.4		
7	C	151987A	5	1	2	7.A.2.3		
7	C	152007A	1	2	2	7.A.2.2		
7	C	152007A	2	2	2	7.A.2.2		
7	C	152007A	3	2	2	7.A.2.2		
7	C	152007A	4	2	2	7.A.2.2		
7	C	152007A	5	2	2	7.A.2.2		
7	C	152009A	1	2	2	7.A.2.2		
7	C	152009A	2	1	2	7.A.2.2		
7	C	152009A	3	2	2	7.A.2.2		
7	C	152009A	4	2	2	7.A.2.2		
7	C	152009A	5	2	2	7.A.2.2		
7	C	152045A	1	1	2	7.A.4.2		
7	C	152045A	2	2	2	7.A.4.2		
7	C	152045A	3	1	1	7.N.2.3	7.A.4.2	
7	C	152045A	4	2	2	7.GM.3.1		
7	C	152045A	5	1	2	7.N.2.3		
7	C	152137A	1	2	2	7.GM.2.2		
7	C	152137A	2	1	2	7.GM.2.1		
7	C	152137A	3	2	2	7.GM.2.2		
7	C	152137A	4	2	2	7.GM.2.1		
7	C	152137A	5	2	2	7.GM.2.2		
7	C	153499A	1	2	2	7.GM.3.2		
7	C	153499A	2	1	2	7.GM.3.2		
7	C	153499A	3	1	2	7.GM.3.2		
7	C	153499A	4	2	2	7.GM.3.2		
7	C	153499A	5	1	2	7.GM.3.2		
7	C	163883A	1	1	2	7.D.2.1		
7	C	163883A	2	1	2	7.D.2.2		
7	C	163883A	3	1	2	7.D.2.1		
7	C	163883A	4	2	2	7.D.2.1		
7	C	163883A	5	1	2	7.D.2.1		
7	C	181998A	1	2	2	7.GM.3.2		
7	C	181998A	2	1	2	7.GM.3.2		
7	C	181998A	3	1	2	7.GM.3.2		
7	C	181998A	4	1	2	7.GM.3.1		
7	C	181998A	5	1	2	7.GM.3.2		
7	C	183907A	1	2	2	7.A.4.2		
7	C	183907A	2	2	2	7.A.4.2		
7	C	183907A	3	1	2	7.A.4.2		
7	C	183907A	4	2	2	7.A.4.2		
7	C	183907A	5	1	2	7.A.4.2		
7	C	187098A	1	1	2	7.GM.4.2		
7	C	187098A	2	1	2	7.GM.4.1		
7	C	187098A	3	1	2	7.GM.4.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
7	C	187098A	4	2	2	7.GM.4.1		
7	C	187098A	5	1	2	7.GM.4.1		
7	C	480267	1	2	2	7.A.2.1		
7	C	480267	2	2	2	7.A.2.1		
7	C	480267	3	2	2	7.A.2.1		
7	C	480267	4	2	2	7.A.2.1		
7	C	480267	5	2	2	7.A.2.1		
7	C	480274	1	1	2	7.A.1.1		
7	C	480274	2	1	2	7.A.1.2		
7	C	480274	3	1	2	7.A.1.1		
7	C	480274	4	2	2	7.A.1.1		
7	C	480274	5	2	2	7.A.1.1		
7	C	480293	1	1	2	7.A.1.2		
7	C	480293	2	1	2	7.A.2.1		
7	C	480293	3	1	2	7.A.2.1		
7	C	480293	4	2	2	7.A.2.1		
7	C	480293	5	1	2	7.A.2.1		
7	C	480299	1	1	2	7.A.1.2		
7	C	480299	2	1	2	7.A.2.1		
7	C	480299	3	1	2	7.A.2.1		
7	C	480299	4	2	2	7.A.2.1		
7	C	480299	5	1	2	7.A.2.1		
7	C	480305	1	3	2	7.GM.1.1		
7	C	480305	2	2	2	7.GM.1.1		
7	C	480305	3	1	2	7.GM.1.1		
7	C	480305	4	2	2	7.GM.1.1		
7	C	480305	5	2	2	7.GM.1.1		
7	C	480315	1	2	2	7.GM.1.2		
7	C	480315	2	1	2	7.GM.1.2		
7	C	480315	3	2	2	7.GM.1.2		
7	C	480315	4	2	2	7.GM.1.2		
7	C	480315	5	2	2	7.GM.1.2		
7	C	480335	1	1	2	7.N.1.3		
7	C	480335	2	1	2	7.N.1.3		
7	C	480335	3	1	2	7.N.1.3		
7	C	480335	4	2	2	7.N.1.1		
7	C	480335	5	1	2	7.N.1.3		
7	C	480350	1	1	2	7.N.2.6		
7	C	480350	2	1	2	7.N.2.6		
7	C	480350	3	1	2	7.N.2.6		
7	C	480350	4	2	2	7.D.1.2		
7	C	480350	5	1	2	7.N.2.6		
7	C	480380	1	1	2	7.D.1.1		
7	C	480380	2	1	2	7.D.1.2		
7	C	480380	3	2	2	7.D.1.2		
7	C	480380	4	2	2	7.D.1.2		
7	C	480380	5	2	2	7.D.1.2		
7	C	489216	1	2	2	7.GM.3.1		
7	C	489216	2	1	2	7.GM.3.2		
7	C	489216	3	1	2	7.GM.3.2		
7	C	489216	4	2	2	7.GM.3.1		
7	C	489216	5	1	2	7.GM.3.2		
7	C	490048	1	2	2	7.A.3.1		
7	C	490048	2	1	2	7.A.3.2		
7	C	490048	3	1	2	7.A.3.2		
7	C	490048	4	2	2	7.A.3.2		
7	C	490048	5	1	2	7.A.3.2		
8	A	147999A	1	1	2	PA.A.4.3		
8	A	147999A	2	2	2	PA.A.4.2		
8	A	147999A	3	1	2	PA.A.4.2		
8	A	147999A	4	2	2	PA.A.4.2		
8	A	147999A	5	2	2	PA.A.4.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	148061A	1	2	2	PA.A.2.4		
8	A	148061A	2	1	2	PA.A.2.4		
8	A	148061A	3	2	2	PA.A.2.4		
8	A	148061A	4	2	2	PA.A.2.3		
8	A	148061A	5	2	2	PA.A.2.4		
8	A	148303A	1	2	2	PA.A.3.1		
8	A	148303A	2	1	2	PA.A.4.1		
8	A	148303A	3	1	2	PA.A.4.3		
8	A	148303A	4	2	2	PA.A.4.3		
8	A	148303A	5	1	2	PA.A.4.3		
8	A	148310A	1	2	2	PA.A.4.2		
8	A	148310A	2	2	2	PA.A.4.2		
8	A	148310A	3	2	2	PA.A.4.2		
8	A	148310A	4	2	2	PA.A.4.3		
8	A	148310A	5	2	2	PA.A.4.2		
8	A	148327A	1	2	2	PA.N.1.2		
8	A	148327A	2	1	2	PA.N.1.3		
8	A	148327A	3	2	2	PA.N.1.3		
8	A	148327A	4	2	2	PA.N.1.3		
8	A	148327A	5	2	2	PA.N.1.3		
8	A	148376A	1	2	2	PA.A.4.1		
8	A	148376A	2	2	2	PA.A.4.1		
8	A	148376A	3	2	2	PA.A.4.1		
8	A	148376A	4	2	2	PA.A.4.1		
8	A	148376A	5	2	2	PA.A.4.1		
8	A	148379A	1	1	2	PA.N.1.2		
8	A	148379A	2	1	2	PA.N.1.2		
8	A	148379A	3	1	2	PA.N.1.2		
8	A	148379A	4	1	2	PA.N.1.3		
8	A	148379A	5	1	2	PA.N.1.2		
8	A	148689A	1	1	2	PA.GM.1.1		
8	A	148689A	2	1	2	PA.GM.1.1		
8	A	148689A	3	1	2	PA.GM.1.1		
8	A	148689A	4	2	2	PA.GM.1.2		
8	A	148689A	5	1	2	PA.GM.1.1		
8	A	148889A	1	1	2	PA.N.1.5		
8	A	148889A	2	1	2	PA.N.1.5		
8	A	148889A	3	1	2	PA.N.1.5		
8	A	148889A	4	1	2	PA.N.1.5		
8	A	148889A	5	1	2	PA.N.1.5		
8	A	149067A	1	1	2	PA.A.2.3		
8	A	149067A	2	1	2	PA.A.2.3		
8	A	149067A	3	1	2	PA.A.2.3		
8	A	149067A	4	2	2	PA.A.2.3		
8	A	149067A	5	1	2	PA.A.2.3		
8	A	149710A	1	2	2	PA.N.1.5		
8	A	149710A	2	1	2	PA.N.1.5		
8	A	149710A	3	1	2	PA.N.1.5		
8	A	149710A	4	2	2	PA.N.1.5		
8	A	149710A	5	1	2	PA.N.1.5		
8	A	150184A	1	2	2	PA.A.4.2		
8	A	150184A	2	1	2	PA.A.4.2		
8	A	150184A	3	1	2	PA.A.4.2		
8	A	150184A	4	2	2	PA.A.1.2		
8	A	150184A	5	1	2	PA.A.4.2		
8	A	150198A	1	2	2	PA.GM.2.3		
8	A	150198A	2	1	2	PA.GM.2.3		
8	A	150198A	3	1	2	PA.GM.2.3		
8	A	150198A	4	2	2	PA.GM.2.1		
8	A	150198A	5	1	2	PA.GM.2.3		
8	A	150202A	1	1	2	PA.A.4.3		
8	A	150202A	2	1	2	PA.A.4.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	150202A	3	1	2	PA.A.4.3		
8	A	150202A	4	2	2	PA.A.4.1		
8	A	150202A	5	1	2	PA.A.4.3		
8	A	150215A	1	1	2	PA.A.2.4		
8	A	150215A	2	1	2	PA.A.2.4		
8	A	150215A	3	2	2	PA.A.2.4		
8	A	150215A	4	2	2	PA.A.2.5		
8	A	150215A	5	2	2	PA.A.2.4		
8	A	150223A	1	2	2	PA.GM.2.3		
8	A	150223A	2	2	2	PA.GM.2.3		
8	A	150223A	3	1	2	PA.GM.2.3		
8	A	150223A	4	2	2	PA.GM.2.1		
8	A	150223A	5	1	2	PA.GM.2.3		
8	A	150226A	1	1	2	PA.GM.1.1		
8	A	150226A	2	1	2	PA.GM.1.1		
8	A	150226A	3	2	2	PA.GM.1.1		
8	A	150226A	4	2	2	PA.GM.1.1		
8	A	150226A	5	2	2	PA.GM.1.1		
8	A	151253A	1	2	2	PA.N.1.1		
8	A	151253A	2	1	2	PA.N.1.1		
8	A	151253A	3	1	2	PA.N.1.5		
8	A	151253A	4	2	2	PA.N.1.5		
8	A	151253A	5	1	2	PA.N.1.5		
8	A	151283A	1	2	2	PA.N.1.5		
8	A	151283A	2	1	2	PA.N.1.5		
8	A	151283A	3	2	2	PA.N.1.5		
8	A	151283A	4	2	2	PA.GM.2.1		
8	A	151283A	5	2	2	PA.N.1.5		
8	A	151931A	1	2	2	PA.GM.2.3		
8	A	151931A	2	1	2	PA.GM.2.3		
8	A	151931A	3	1	2	PA.GM.2.3		
8	A	151931A	4	2	2	PA.GM.2.3		
8	A	151931A	5	1	2	PA.GM.2.3		
8	A	152296A	1	1	2	PA.N.1.1		
8	A	152296A	2	1	2	PA.A.1.1		
8	A	152296A	3	1	2	PA.N.1.1		
8	A	152296A	4	2	2	PA.A.1.1		
8	A	152296A	5	1	2	PA.N.1.1		
8	A	153271A	1	3	2	PA.GM.1.1		
8	A	153271A	2	1	2	PA.GM.1.1		
8	A	153271A	3	2	2	PA.GM.1.1		
8	A	153271A	4	2	2	PA.GM.1.2		
8	A	153271A	5	2	2	PA.GM.1.1		
8	A	153423A	1	2	2	PA.GM.1.1		
8	A	153423A	2	1	2	PA.GM.1.1		
8	A	153423A	3	1	2	PA.GM.1.1		
8	A	153423A	4	2	2	PA.GM.1.2		
8	A	153423A	5	1	2	PA.GM.1.1		
8	A	153554A	1	1	2	PA.N.1.2		
8	A	153554A	2	1	2	PA.N.1.2		
8	A	153554A	3	2	2	PA.N.1.2		
8	A	153554A	4	2	2	PA.N.1.3		
8	A	153554A	5	1	2	PA.N.1.2		
8	A	154320A	1	1	2	PA.A.1.2		
8	A	154320A	2	1	2	PA.A.2.4		
8	A	154320A	3	1	2	PA.A.2.4		
8	A	154320A	4	2	2	PA.A.1.2		
8	A	154320A	5	1	2	PA.A.2.4		
8	A	161462A	1	1	2	PA.A.2.4		
8	A	161462A	2	1	2	PA.A.2.4		
8	A	161462A	3	2	2	PA.A.2.4		
8	A	161462A	4	2	2	PA.A.1.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	161462A	5	1	2	PA.A.2.4		
8	A	183763A	1	1	2	PA.A.2.4		
8	A	183763A	2	1	2	PA.A.2.4		
8	A	183763A	3	2	2	PA.A.2.4		
8	A	183763A	4	2	2	PA.A.2.4		
8	A	183763A	5	2	2	PA.A.2.4		
8	A	183764A	1	1	2	PA.A.2.4		
8	A	183764A	2	1	2	PA.A.2.4		
8	A	183764A	3	2	2	PA.A.2.4		
8	A	183764A	4	2	2	PA.A.2.2		
8	A	183764A	5	1	2	PA.A.2.4		
8	A	183795A	1	2	2	PA.A.4.2		
8	A	183795A	2	2	2	PA.A.4.2		
8	A	183795A	3	2	2	PA.A.4.2		
8	A	183795A	4	2	2	PA.A.4.2		
8	A	183795A	5	1	2	PA.A.4.2		
8	A	183885A	1	2	2	PA.N.1.3		
8	A	183885A	2	1	2	PA.N.1.3		
8	A	183885A	3	2	2	PA.N.1.3		
8	A	183885A	4	2	2	PA.N.1.3		
8	A	183885A	5	2	2	PA.N.1.3		
8	A	484750	1	1	2	PA.A.3.2		
8	A	484750	2	2	2	PA.A.3.2		
8	A	484750	3	3	2	PA.A.3.2		
8	A	484750	4	2	2	PA.N.1.1		
8	A	484750	5	3	2	PA.A.3.2		
8	A	484764	1	1	2	PA.D.1.3		
8	A	484764	2	2	2	PA.A.2.4		
8	A	484764	3	2	2	PA.D.1.3		
8	A	484764	4	2	2	PA.D.1.3		
8	A	484764	5	2	2	PA.D.1.3		
8	A	484766	1	1	2	PA.D.1.3		
8	A	484766	2	1	2	PA.D.1.3		
8	A	484766	3	2	2	PA.D.1.3		
8	A	484766	4	2	2	PA.D.1.3		
8	A	484766	5	2	2	PA.D.1.3		
8	A	484772	1	1	2	PA.A.1.1		
8	A	484772	2	1	2	PA.A.1.1		
8	A	484772	3	1	2	PA.A.1.1		
8	A	484772	4	2	2	PA.D.2.3		
8	A	484772	5	1	2	PA.A.1.1		
8	A	484815	1	1	2	PA.A.1.1		
8	A	484815	2	1	2	PA.A.1.1		
8	A	484815	3	1	2	PA.A.1.1		
8	A	484815	4	2	2	PA.D.2.3		
8	A	484815	5	1	2	PA.A.1.1		
8	A	484821	1	1	2	PA.A.1.2		
8	A	484821	2	1	2	PA.A.1.2		
8	A	484821	3	1	2	PA.A.4.3		
8	A	484821	4	2	2	PA.A.4.1		
8	A	484821	5	1	2	PA.A.4.3		
8	A	484823	1	1	2	PA.A.1.2		
8	A	484823	2	1	2	PA.A.1.2		
8	A	484823	3	1	2	PA.A.1.2		
8	A	484823	4	2	2	PA.A.1.2		
8	A	484823	5	1	2	PA.A.1.2		
8	A	484828	1	1	2	PA.X.2.1		
8	A	484828	2	1	2	PA.A.1.3		
8	A	484828	3	1	2	PA.A.1.3		
8	A	484828	4	2	2	PA.A.2.3		
8	A	484828	5	1	2	PA.A.1.3		
8	A	484841	1	2	2	PA.A.1.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	484841	2	2	2	PA.A.1.3		
8	A	484841	3	1	2	PA.A.1.3		
8	A	484841	4	2	2	PA.A.1.1		
8	A	484841	5	1	2	PA.A.1.3		
8	A	484847	1	2	2	PA.A.4.1		
8	A	484847	2	2	2	PA.A.3.1		
8	A	484847	3	1	2	PA.A.3.1		
8	A	484847	4	2	2	PA.A.3.1		
8	A	484847	5	1	2	PA.A.3.1		
8	A	484853	1	1	2	PA.A.4.1		
8	A	484853	2	2	2	PA.A.3.1		
8	A	484853	3	1	2	PA.A.3.1		
8	A	484853	4	2	2	PA.A.3.1		
8	A	484853	5	1	2	PA.A.3.1		
8	A	484855	1	3	2	PA.GM.2.1		
8	A	484855	2	2	2	PA.GM.2.1		
8	A	484855	3	2	2	PA.GM.2.1		
8	A	484855	4	2	2	PA.GM.2.1		
8	A	484855	5	2	2	PA.GM.2.1		
8	A	484860	1	2	2	PA.GM.2.4		
8	A	484860	2	1	2	PA.GM.2.4		
8	A	484860	3	2	2	PA.GM.2.4		
8	A	484860	4	2	2	PA.GM.2.2		
8	A	484860	5	2	2	PA.GM.2.4		
8	A	484862	1	3	2	PA.D.1.1		
8	A	484862	2	2	2	PA.D.1.1		
8	A	484862	3	2	2	PA.D.1.1		
8	A	484862	4	2	2	PA.D.1.1		
8	A	484862	5	2	2	PA.D.1.1		
8	A	484866	1	2	2	PA.D.1.1		
8	A	484866	2	2	2	PA.D.1.1		
8	A	484866	3	2	2	PA.D.1.1		
8	A	484866	4	2	2	PA.D.1.1		
8	A	484866	5	2	2	PA.D.1.1		
8	A	484871	1	1	2	PA.D.1.1		
8	A	484871	2	1	2	PA.D.1.1		
8	A	484871	3	2	2	PA.D.1.1		
8	A	484871	4	2	2	PA.D.1.1		
8	A	484871	5	1	2	PA.D.1.1		
8	A	484873	1	3	2	PA.D.1.1		
8	A	484873	2	2	2	PA.D.1.1		
8	A	484873	3	2	2	PA.D.1.1		
8	A	484873	4	2	2	PA.D.1.1		
8	A	484873	5	2	2	PA.D.1.1		
8	A	484879	1	2	2	PA.D.2.1		
8	A	484879	2	1	2	PA.D.2.1		
8	A	484879	3	1	2	PA.D.2.1		
8	A	484879	4	2	2	PA.D.2.1		
8	A	484879	5	2	2	PA.D.2.1		
8	A	484881	1	1	2	PA.D.2.2		
8	A	484881	2	1	2	PA.D.1.3		
8	A	484881	3	1	2	PA.D.2.2		
8	A	484881	4	2	2	PA.D.2.2		
8	A	484881	5	1	2	PA.D.2.2		
8	A	484891	1	2	2	PA.D.2.2		
8	A	484891	2	1	2	PA.D.2.2		
8	A	484891	3	1	2	PA.D.2.2		
8	A	484891	4	1	2	PA.D.2.2		
8	A	484891	5	1	2	PA.D.2.2		
8	A	484984	1	2	2	PA.D.2.1		
8	A	484984	2	2	2	PA.D.2.1		
8	A	484984	3	2	2	PA.D.2.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	A	484984	4	2	2	PA.D.2.1		
8	A	484984	5	2	2	PA.D.2.2		
8	A	490067	1	2	2	PA.GM.2.4		
8	A	490067	2	2	2	PA.GM.2.4		
8	A	490067	3	1	2	PA.GM.2.4		
8	A	490067	4	2	2	PA.GM.2.2		
8	A	490067	5	1	2	PA.GM.2.4		
8	A	490116	1	2	2	PA.GM.2.4		
8	A	490116	2	2	2	PA.GM.2.4		
8	A	490116	3	2	2	PA.GM.2.4		
8	A	490116	4	2	2	PA.GM.2.2		
8	A	490116	5	2	2	PA.GM.2.4		
8	A	490151	1	2	2	PA.GM.1.1		
8	A	490151	2	1	2	PA.GM.1.1		
8	A	490151	3	2	2	PA.GM.1.1		
8	A	490151	4	2	2	PA.N.1.5		
8	A	490151	5	2	2	PA.GM.1.1		
8	A	490178	1	2	2	PA.A.4.2		
8	A	490178	2	2	2	PA.A.4.2		
8	A	490178	3	2	2	PA.A.4.2		
8	A	490178	4	2	2	PA.A.1.2		
8	A	490178	5	2	2	PA.A.4.2		
8	A	490353	1	2	2	PA.GM.2.2		
8	A	490353	2	1	2	PA.GM.2.2		
8	A	490353	3	1	2	PA.GM.2.2		
8	A	490353	4	2	2	PA.GM.2.2		
8	A	490353	5	1	2	PA.GM.2.2		
8	A	499651	1	1	2	PA.N.1.4		
8	A	499651	2	2	2	PA.N.1.4		
8	A	499651	3	1	2	PA.N.1.4		
8	A	499651	4	2	2	PA.N.1.4		
8	A	499651	5	1	2	PA.N.1.4		
8	B	148321A	1	2	2	PA.A.4.1		
8	B	148321A	2	2	2	PA.A.3.2		
8	B	148321A	3	2	2	PA.A.4.X		
8	B	148321A	4	2	2	PA.A.4.3		
8	B	148321A	5	2	2	PA.A.4.X		
8	B	148368A	1	2	2	PA.A.4.1		
8	B	148368A	2	2	2	PA.A.4.2		
8	B	148368A	3	2	2	PA.A.4.2		
8	B	148368A	4	2	2	PA.A.4.3		
8	B	148368A	5	2	2	PA.A.4.2		
8	B	148472A	1	2	2	PA.GM.1.1		
8	B	148472A	2	1	2	PA.GM.1.1		
8	B	148472A	3	1	2	PA.GM.1.1		
8	B	148472A	4	2	2	PA.GM.1.2		
8	B	148472A	5	1	2	PA.GM.1.1		
8	B	148531A	1	2	2	PA.A.4.1		
8	B	148531A	2	1	2	PA.A.4.2		
8	B	148531A	3	1	2	PA.A.4.3		
8	B	148531A	4	2	2	PA.A.4.3		
8	B	148531A	5	1	2	PA.A.4.3		
8	B	150961A	1	1	2	PA.A.2.4		
8	B	150961A	2	1	2	PA.A.2.4		
8	B	150961A	3	2	2	PA.A.2.4		
8	B	150961A	4	2	2	PA.A.1.3		
8	B	150961A	5	2	2	PA.A.2.4		
8	B	151257A	1	1	2	PA.N.1.5		
8	B	151257A	2	1	2	PA.N.1.1		
8	B	151257A	3	1	2	PA.N.1.5		
8	B	151257A	4	1	2	PA.N.1.5		
8	B	151257A	5	1	2	PA.N.1.5		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	B	151271A	1	1	2	PA.N.1.5		
8	B	151271A	2	1	2	PA.N.1.5		
8	B	151271A	3	1	2	PA.N.1.5		
8	B	151271A	4	2	2	PA.N.1.5		
8	B	151271A	5	2	2	PA.N.1.5		
8	B	151302A	1	2	2	PA.GM.1.1		
8	B	151302A	2	1	2	PA.GM.1.1		
8	B	151302A	3	1	2	PA.GM.1.1		
8	B	151302A	4	2	2	PA.GM.1.2		
8	B	151302A	5	2	2	PA.GM.1.1		
8	B	151455A	1	1	2	PA.A.3.2		
8	B	151455A	2	1	2	PA.GM.2.1		
8	B	151455A	3	1	2	PA.GM.2.1		
8	B	151455A	4	2	2	PA.GM.2.1		
8	B	151455A	5	1	2	PA.GM.2.1		
8	B	151706A	1	2	2	PA.A.4.1		
8	B	151706A	2	1	2	PA.A.4.2		
8	B	151706A	3	1	2	PA.A.4.2		
8	B	151706A	4	1	2	PA.A.4.2		
8	B	151706A	5	1	2	PA.A.4.2		
8	B	152336A	1	1	2	PA.N.1.1		
8	B	152336A	2	1	2	PA.N.1.3		
8	B	152336A	3	1	2	PA.N.1.1		
8	B	152336A	4	1	2	PA.N.1.3		
8	B	152336A	5	1	2	PA.N.1.1		
8	B	152847A	1	1	2	PA.A.2.4		
8	B	152847A	2	1	2	PA.A.2.4		
8	B	152847A	3	2	2	PA.A.2.4		
8	B	152847A	4	2	2	PA.A.2.2		
8	B	152847A	5	2	2	PA.A.2.4		
8	B	152854A	1	1	2	PA.N.1.1		
8	B	152854A	2	1	2	PA.N.1.1		
8	B	152854A	3	1	2	PA.N.1.1		
8	B	152854A	4	1	2	PA.N.1.2		
8	B	152854A	5	1	2	PA.N.1.1		
8	B	152865A	1	2	2	PA.GM.1.1		
8	B	152865A	2	1	2	PA.GM.1.1		
8	B	152865A	3	2	2	PA.GM.1.1		
8	B	152865A	4	2	2	PA.GM.1.2		
8	B	152865A	5	1	2	PA.GM.1.1		
8	B	153161A	1	2	2	PA.A.2.1		
8	B	153161A	2	1	2	PA.A.2.1		
8	B	153161A	3	2	2	PA.A.2.1		
8	B	153161A	4	1	2	PA.A.2.1		
8	B	153161A	5	2	2	PA.A.2.1		
8	B	153283A	1	3	2	PA.GM.1.1		
8	B	153283A	2	1	2	PA.GM.1.1		
8	B	153283A	3	2	2	PA.GM.1.1		
8	B	153283A	4	2	2	PA.GM.1.2		
8	B	153283A	5	2	2	PA.GM.1.1		
8	B	153428A	1	1	2	PA.GM.1.1		
8	B	153428A	2	1	2	PA.GM.1.1		
8	B	153428A	3	1	2	PA.GM.1.1		
8	B	153428A	4	1	2	PA.GM.1.2		
8	B	153428A	5	1	2	PA.GM.1.1		
8	B	153448A	1	1	2	PA.A.4.3		
8	B	153448A	2	1	2	PA.A.4.3		
8	B	153448A	3	1	2	PA.A.4.3		
8	B	153448A	4	2	2	PA.A.4.1		
8	B	153448A	5	1	2	PA.A.4.3		
8	B	153516A	1	2	2	PA.A.3.1		
8	B	153516A	2	1	2	PA.A.4.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	B	153516A	3	1	2	PA.A.4.3		
8	B	153516A	4	1	2	PA.A.4.3		
8	B	153516A	5	1	2	PA.A.4.3		
8	B	153529A	1	1	2	PA.A.2.4		
8	B	153529A	2	1	2	PA.A.2.4		
8	B	153529A	3	2	2	PA.A.2.4		
8	B	153529A	4	2	2	PA.A.2.3		
8	B	153529A	5	2	2	PA.A.2.4		
8	B	154156A	1	2	2	PA.A.4.1		
8	B	154156A	2	1	2	PA.A.4.1		
8	B	154156A	3	1	2	PA.A.4.1		
8	B	154156A	4	2	2	PA.A.4.3		
8	B	154156A	5	2	2	PA.A.4.1		
8	B	154367A	1	1	2	PA.A.4.1		
8	B	154367A	2	2	2	PA.N.1.X		
8	B	154367A	3	2	1	PA.A.3.2		
8	B	154367A	4	2	2	PA.N.1.3		
8	B	154367A	5	2	2	PA.N.1.X		
8	B	181934A	1	1	2	PA.A.2.3		
8	B	181934A	2	2	2	PA.A.2.3		
8	B	181934A	3	1	2	PA.A.2.2		
8	B	181934A	4	2	2	PA.A.2.4		
8	B	181934A	5	1	2	PA.A.2.2		
8	B	181973A	1	1	1	PA.N.1.X		
8	B	181973A	2	1	2	PA.A.4.3		
8	B	181973A	3	1	2	PA.A.4.3		
8	B	181973A	4	2	2	PA.A.1.2		
8	B	181973A	5	1	2	PA.A.4.3		
8	B	183778A	1	2	2	PA.GM.2.1		
8	B	183778A	2	2	2	PA.A.4.1		
8	B	183778A	3	1	2	PA.A.4.1		
8	B	183778A	4	2	2	PA.A.3.1		
8	B	183778A	5	1	2	PA.A.4.1		
8	B	484755	1	2	2	PA.GM.1.1		
8	B	484755	2	2	2	PA.A.3.2		
8	B	484755	3	2	2	PA.A.3.2		
8	B	484755	4	1	2	PA.A.3.2		
8	B	484755	5	2	2	PA.A.3.2		
8	B	484770	1	1	2	PA.A.1.1		
8	B	484770	2	1	2	PA.A.1.1		
8	B	484770	3	1	2	PA.A.1.1		
8	B	484770	4	2	2	PA.D.2.3		
8	B	484770	5	1	2	PA.A.1.1		
8	B	484781	1	1	2	PA.A.1.3		
8	B	484781	2	1	2	PA.A.1.1		
8	B	484781	3	1	2	PA.A.1.3		
8	B	484781	4	1	2	PA.A.1.1		
8	B	484781	5	1	2	PA.A.1.3		
8	B	484819	1	1	2	PA.A.1.2		
8	B	484819	2	1	2	PA.A.1.2		
8	B	484819	3	1	2	PA.A.4.3		
8	B	484819	4	1	2	PA.A.1.2		
8	B	484819	5	1	2	PA.A.4.3		
8	B	484837	1	1	2	PA.A.1.3		
8	B	484837	2	1	1	PA.A.1.3		
8	B	484837	3	1	2	PA.A.1.3		
8	B	484837	4	2	2	PA.A.2.2		
8	B	484837	5	1	2	PA.A.1.3		
8	B	484843	1	1	2	PA.A.2.1		
8	B	484843	2	2	2	PA.A.2.1		
8	B	484843	3	1	2	PA.A.2.1		
8	B	484843	4	2	2	PA.A.2.5		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	B	484843	5	1	2	PA.A.2.1		
8	B	484849	1	1	2	PA.A.3.1		
8	B	484849	2	2	2	PA.A.3.1		
8	B	484849	3	1	2	PA.A.3.1		
8	B	484849	4	2	2	PA.A.3.1		
8	B	484849	5	2	2	PA.A.3.1		
8	B	484857	1	2	2	PA.GM.2.4		
8	B	484857	2	2	2	PA.GM.2.4		
8	B	484857	3	2	2	PA.GM.2.2		
8	B	484857	4	2	2	PA.GM.2.2		
8	B	484857	5	2	2	PA.GM.2.2		
8	B	484877	1	2	2	PA.D.2.1		
8	B	484877	2	1	2	PA.D.2.1		
8	B	484877	3	2	2	PA.A.4.1		
8	B	484877	4	2	2	PA.D.2.1		
8	B	484877	5	2	2	PA.A.4.1		
8	B	484883	1	1	2	PA.D.2.1		
8	B	484883	2	1	2	PA.D.2.1		
8	B	484883	3	2	2	PA.D.2.1		
8	B	484883	4	2	2	PA.D.2.1		
8	B	484883	5	2	2	PA.D.2.1		
8	B	484894	1	1	2	PA.D.2.2		
8	B	484894	2	1	2	PA.D.2.2		
8	B	484894	3	1	2	PA.D.2.2		
8	B	484894	4	2	2	PA.D.2.2		
8	B	484894	5	1	2	PA.D.2.2		
8	B	484979	1	1	2	PA.D.2.3		
8	B	484979	2	2	2	PA.D.2.1		
8	B	484979	3	2	2	PA.D.2.3		
8	B	484979	4	2	2	PA.D.2.1		
8	B	484979	5	2	2	PA.D.2.3		
8	B	490241	1	2	2	PA.GM.2.4		
8	B	490241	2	1	2	PA.GM.2.4		
8	B	490241	3	1	2	PA.GM.2.4		
8	B	490241	4	2	2	PA.GM.2.2		
8	B	490241	5	2	2	PA.GM.2.3		
8	B	492696	1	1	2	PA.N.1.4		
8	B	492696	2	2	2	PA.N.1.4		
8	B	492696	3	1	2	PA.N.1.4		
8	B	492696	4	1	2	PA.N.1.4		
8	B	492696	5	1	2	PA.N.1.4		
8	C	148272A	1	1	2	PA.A.4.3		
8	C	148272A	2	1	1	PA.A.4.3		
8	C	148272A	3	1	2	PA.A.4.3		
8	C	148272A	4	2	2	PA.A.4.3		
8	C	148272A	5	1	2	PA.A.4.3		
8	C	148273A	1	2	2	PA.A.4.2		
8	C	148273A	2	2	2	PA.A.4.2		
8	C	148273A	3	2	2	PA.A.4.2		
8	C	148273A	4	2	2	PA.A.4.2		
8	C	148273A	5	1	2	PA.A.4.2		
8	C	148680A	1	3	2	PA.N.1.3		
8	C	148680A	2	2	2	PA.N.1.3		
8	C	148680A	3	2	2	PA.N.1.3		
8	C	148680A	4	2	2	PA.N.1.3		
8	C	148680A	5	2	2	PA.N.1.3		
8	C	150218A	1	2	2	PA.A.4.1		
8	C	150218A	2	2	2	PA.A.4.2		
8	C	150218A	3	2	2	PA.A.4.2		
8	C	150218A	4	2	2	PA.A.4.3		
8	C	150218A	5	2	2	PA.A.4.2		
8	C	150256A	1	2	2	PA.GM.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	C	150256A	2	1	2	PA.GM.1.1		
8	C	150256A	3	2	2	PA.GM.1.1		
8	C	150256A	4	2	2	PA.GM.1.2		
8	C	150256A	5	2	2	PA.GM.1.1		
8	C	150947A	1	1	2	PA.A.2.4		
8	C	150947A	2	1	2	PA.A.2.3		
8	C	150947A	3	2	2	PA.A.2.4		
8	C	150947A	4	2	2	PA.A.2.3		
8	C	150947A	5	2	2	PA.A.2.4		
8	C	151260A	1	1	2	PA.N.1.5		
8	C	151260A	2	1	2	PA.N.1.5		
8	C	151260A	3	1	2	PA.N.1.5		
8	C	151260A	4	1	2	PA.N.1.5		
8	C	151260A	5	1	2	PA.N.1.5		
8	C	151314A	1	1	2	PA.N.1.5		
8	C	151314A	2	1	2	PA.N.1.5		
8	C	151314A	3	2	2	PA.N.1.5		
8	C	151314A	4	2	2	PA.N.1.5		
8	C	151314A	5	1	2	PA.N.1.5		
8	C	151317A	1	2	2	PA.GM.1.1		
8	C	151317A	2	1	2	PA.GM.1.1		
8	C	151317A	3	1	2	PA.GM.1.1		
8	C	151317A	4	2	2	PA.GM.1.2		
8	C	151317A	5	1	2	PA.GM.1.1		
8	C	151382A	1	2	2	PA.GM.1.1		
8	C	151382A	2	1	2	PA.GM.1.1		
8	C	151382A	3	1	2	PA.GM.1.1		
8	C	151382A	4	2	2	PA.GM.1.2		
8	C	151382A	5	1	2	PA.GM.1.1		
8	C	152213A	1	1	2	PA.A.1.2		
8	C	152213A	2	1	2	PA.A.2.1		
8	C	152213A	3	1	2	PA.A.2.1		
8	C	152213A	4	2	2	PA.A.2.2		
8	C	152213A	5	2	2	PA.A.2.1		
8	C	152909A	1	2	2	PA.GM.1.1		
8	C	152909A	2	1	2	PA.GM.1.1		
8	C	152909A	3	2	2	PA.GM.1.1		
8	C	152909A	4	2	2	PA.GM.1.1		
8	C	152909A	5	1	2	PA.GM.1.1		
8	C	152944A	1	2	2	PA.GM.2.1		
8	C	152944A	2	1	2	PA.GM.2.1		
8	C	152944A	3	1	2	PA.GM.2.1		
8	C	152944A	4	2	2	PA.GM.2.1		
8	C	152944A	5	2	2	PA.GM.2.1		
8	C	153249A	1	1	2	PA.A.4.3		
8	C	153249A	2	1	2	PA.A.4.3		
8	C	153249A	3	1	2	PA.A.4.3		
8	C	153249A	4	2	2	PA.A.4.2		
8	C	153249A	5	1	2	PA.A.4.2		
8	C	153437A	1	2	2	PA.GM.1.1		
8	C	153437A	2	1	2	PA.GM.1.1		
8	C	153437A	3	1	2	PA.GM.1.1		
8	C	153437A	4	2	2	PA.GM.1.2		
8	C	153437A	5	1	2	PA.GM.1.1		
8	C	153451A	1	2	2	PA.A.4.1		
8	C	153451A	2	1	2	PA.A.4.3		
8	C	153451A	3	1	2	PA.A.4.3		
8	C	153451A	4	2	2	PA.A.4.1		
8	C	153451A	5	1	2	PA.A.4.3		
8	C	153487A	1	2	2	PA.A.4.1		
8	C	153487A	2	2	2	PA.A.4.2		
8	C	153487A	3	2	2	PA.A.4.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	C	153487A	4	2	2	PA.A.4.3		
8	C	153487A	5	1	2	PA.A.4.2		
8	C	153599A	1	1	2	PA.A.2.4		
8	C	153599A	2	1	2	PA.A.2.4		
8	C	153599A	3	2	2	PA.A.2.4		
8	C	153599A	4	2	2	PA.A.2.4		
8	C	153599A	5	1	2	PA.A.2.4		
8	C	154134A	1	1	2	PA.A.4.1		
8	C	154134A	2	1	2	PA.A.2.1		
8	C	154134A	3	1	2	PA.A.2.1		
8	C	154134A	4	1	2	PA.A.2.3		
8	C	154134A	5	1	2	PA.A.2.1		
8	C	154152A	1	3	2	PA.GM.2.1		
8	C	154152A	2	2	2	PA.GM.2.1		
8	C	154152A	3	2	2	PA.GM.2.1		
8	C	154152A	4	2	2	PA.GM.2.1		
8	C	154152A	5	2	2	PA.GM.2.1		
8	C	154159A	1	1	2	PA.N.1.1		
8	C	154159A	2	1	2	PA.N.1.1		
8	C	154159A	3	1	2	PA.N.1.1		
8	C	154159A	4	1	2	PA.N.1.3		
8	C	154159A	5	1	2	PA.N.1.1		
8	C	154160A	1	2	2	PA.N.1.1		
8	C	154160A	2	1	2	PA.N.1.1		
8	C	154160A	3	2	2	PA.N.1.1		
8	C	154160A	4	2	2	PA.N.1.1		
8	C	154160A	5	1	2	PA.N.1.1		
8	C	181901A	1	1	2	PA.A.2.3		
8	C	181901A	2	1	2	PA.A.2.3		
8	C	181901A	3	1	2	PA.A.2.3		
8	C	181901A	4	2	2	PA.A.2.3		
8	C	181901A	5	1	2	PA.A.2.3		
8	C	181903A	1	1	2	PA.A.2.1		
8	C	181903A	2	1	2	PA.A.2.2		
8	C	181903A	3	1	2	PA.A.2.2		
8	C	181903A	4	1	2	PA.A.2.1		
8	C	181903A	5	1	2	PA.A.2.2		
8	C	183781A	1	2	2	PA.A.3.1		
8	C	183781A	2	1	2	PA.A.4.1		
8	C	183781A	3	2	2	PA.A.4.1		
8	C	183781A	4	2	2	PA.A.4.3		
8	C	183781A	5	2	2	PA.A.4.1		
8	C	484739	1	1	2	PA.N.1.4		
8	C	484739	2	1	2	PA.N.1.4		
8	C	484739	3	1	2	PA.N.1.4		
8	C	484739	4	1	2	PA.N.1.4		
8	C	484739	5	1	2	PA.N.1.4		
8	C	484757	1	1	2	PA.A.3.2		
8	C	484757	2	1	2	PA.A.3.2		
8	C	484757	3	2	2	PA.A.3.2		
8	C	484757	4	2	2	PA.A.3.2		
8	C	484757	5	1	2	PA.A.3.2		
8	C	484762	1	1	2	PA.D.1.3		
8	C	484762	2	1	2	PA.D.1.3		
8	C	484762	3	2	2	PA.D.1.3		
8	C	484762	4	2	2	PA.D.1.3		
8	C	484762	5	2	2	PA.D.1.3		
8	C	484768	1	1	2	PA.A.2.1		
8	C	484768	2	1	2	PA.A.1.1		
8	C	484768	3	1	2	PA.A.1.1		
8	C	484768	4	2	2	PA.A.1.1		
8	C	484768	5	1	2	PA.A.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
8	C	484783	1	1	2	PA.A.1.1		
8	C	484783	2	1	2	PA.A.1.1		
8	C	484783	3	1	2	PA.A.1.1		
8	C	484783	4	1	2	PA.A.1.1		
8	C	484783	5	1	2	PA.A.1.1		
8	C	484817	1	1	2	PA.A.1.2		
8	C	484817	2	1	2	PA.A.1.2		
8	C	484817	3	1	2	PA.A.2.1		
8	C	484817	4	2	2	PA.A.2.1		
8	C	484817	5	1	2	PA.A.2.1		
8	C	484826	1	1	2	PA.A.1.3		
8	C	484826	2	1	2	PA.A.1.3		
8	C	484826	3	1	2	PA.A.1.3		
8	C	484826	4	2	2	PA.A.1.3		
8	C	484826	5	1	2	PA.A.1.3		
8	C	484845	1	2	2	PA.A.2.3		
8	C	484845	2	2	2	PA.A.2.3		
8	C	484845	3	2	2	PA.A.2.1		
8	C	484845	4	2	2	PA.A.2.1		
8	C	484845	5	2	2	PA.A.2.1		
8	C	484851	1	2	2	PA.A.3.1		
8	C	484851	2	2	2	PA.A.3.1		
8	C	484851	3	1	2	PA.A.3.1		
8	C	484851	4	2	2	PA.A.3.1		
8	C	484851	5	1	2	PA.A.3.1		
8	C	484875	1	1	2	PA.D.2.1		
8	C	484875	2	1	2	PA.D.2.1		
8	C	484875	3	2	2	PA.D.2.1		
8	C	484875	4	2	2	PA.D.2.1		
8	C	484875	5	2	2	PA.D.2.1		
8	C	484889	1	2	2	PA.D.2.1		
8	C	484889	2	1	2	PA.D.2.1		
8	C	484889	3	1	2	PA.D.2.1		
8	C	484889	4	2	2	PA.D.2.1		
8	C	484889	5	2	2	PA.D.2.1		
8	C	484967	1	1	2	PA.D.2.2		
8	C	484967	2	1	2	PA.D.2.2		
8	C	484967	3	1	2	PA.D.2.2		
8	C	484967	4	2	2	PA.D.2.2		
8	C	484967	5	2	2	PA.D.2.2		
8	C	484977	1	1	2	PA.A.1.1		
8	C	484977	2	1	2	PA.D.2.3		
8	C	484977	3	1	2	PA.A.1.1		
8	C	484977	4	2	2	PA.D.2.1		
8	C	484977	5	2	2	PA.D.2.3		
8	C	490262	1	2	2	PA.GM.2.2		
8	C	490262	2	1	2	PA.GM.2.2		
8	C	490262	3	1	2	PA.GM.2.2		
8	C	490262	4	2	2	PA.GM.2.2		
8	C	490262	5	1	2	PA.GM.2.2		
8	C	490472	1	1	2	PA.N.1.2		
8	C	490472	2	1	2	PA.N.1.3		
8	C	490472	3	2	2	PA.N.1.3		
8	C	490472	4	2	2	PA.N.1.3		
8	C	490472	5	2	2	PA.N.1.3		
8	C	490595	1	2	1	PA.A.4.X		
8	C	490595	2	1	2	PA.A.4.X		
8	C	490595	3	2	2	PA.A.4.1		
8	C	490595	4	2	2	PA.A.4.1		
8	C	490595	5	2	2	PA.A.4.1		
10	A	141996A	1	2	2	A1.A.1.1		
10	A	141996A	2	2	2	A1.A.3.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	141996A	3	2	2	A1.A.3.1		
10	A	141996A	4	2	2	A1.F.3.1		
10	A	142002A	1	2	2	A1.A.4.3		
10	A	142002A	2	2	2	A1.A.4.3		
10	A	142002A	3	2	2	A1.A.4.3		
10	A	142002A	4	2	2	A1.A.4.3		
10	A	142018A	1	2	2	A1.N.1.2		
10	A	142018A	2	2	2	A1.N.1.2		
10	A	142018A	3	2	2	A1.N.1.2		
10	A	142018A	4	1	2	A1.N.1.2		
10	A	142022A	1	2	2	A1.A.3.3		
10	A	142022A	2	2	2	G.2D.1.4		
10	A	142022A	3	2	2	A1.A.3.3		
10	A	142022A	4	2	2	A1.A.3.3		
10	A	142043A	1	2	2	A1.A.2.1		
10	A	142043A	2	2	2	A1.A.2.1		
10	A	142043A	3	1	2	A1.A.2.1		
10	A	142043A	4	1	2	A1.A.2.1		
10	A	142055A	1	1	2	G.2D.1.5		
10	A	142055A	2	1	2	G.2D.1.5		
10	A	142055A	3	1	2	G.2D.1.5		
10	A	142055A	4	1	2	G.2D.1.5		
10	A	142062A	1	2	2	A1.F.1.1		
10	A	142062A	2	1	2	A1.F.1.1		
10	A	142062A	3	1	2	A1.F.1.1		
10	A	142062A	4	2	2	A1.F.1.1		
10	A	142216A	1	1	2	G.RL.1.1		
10	A	142216A	2	2	2	G.2D.1.8		
10	A	142216A	3	1	2	G.2D.1.8		
10	A	142216A	4	2	2	G.2D.1.8		
10	A	142440A	1	1	2	A1.F.2.1		
10	A	142440A	2	2	2	A1.F.2.1		
10	A	142440A	3	2	2	A1.F.1.1		
10	A	142440A	4	1	2	A1.F.2.1		
10	A	142456A	1	2	2	A1.A.3.1		
10	A	142456A	2	1	2	A1.A.3.1		
10	A	142456A	3	2	2	A1.A.3.1		
10	A	142456A	4	2	2	A1.A.3.1		
10	A	142742A	1	2	2	G.3D.1.1		
10	A	142742A	2	2	2	G.3D.1.1		
10	A	142742A	3	2	2	G.3D.1.2		
10	A	142742A	4	2	2	G.3D.1.1		
10	A	143118A	1	2	2	A1.A.4.4		
10	A	143118A	2	2	2	A1.A.4.4		
10	A	143118A	3	1	2	A1.F.1.3		
10	A	143118A	4	2	2	A1.A.4.4		
10	A	143621A	1	1	2	A1.F.1.2		
10	A	143621A	2	1	2	A1.F.1.1		
10	A	143621A	3	1	2	A1.F.1.1		
10	A	143621A	4	2	2	A1.F.1.1		
10	A	143634A	1	1	2	A1.A.3.2		
10	A	143634A	2	1	2	A1.A.3.2		
10	A	143634A	3	2	2	A1.A.3.2		
10	A	143634A	4	1	2	A1.A.3.2		
10	A	143934A	1	2	2	G.2D.1.4		
10	A	143934A	2	3	2	G.2D.1.4		
10	A	143934A	3	3	1	G.2D.1.4	G.RT.1.1	
10	A	143934A	4	2	1	G.2D.1.4	G.RT.1.1	
10	A	144122A	1	2	2	A1.F.3.3		
10	A	144122A	2	2	2	A1.F.3.3		
10	A	144122A	3	2	2	A1.F.3.3		
10	A	144122A	4	2	2	A1.F.3.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	148837A	1	2	2	G.2D.1.1		
10	A	148837A	2	2	2	G.2D.1.1		
10	A	148837A	3	1	2	G.2D.1.2		
10	A	148837A	4	1	2	G.2D.1.2		
10	A	150211A	1	2	2	A1.A.4.3		
10	A	150211A	2	2	2	A1.A.4.3		
10	A	150211A	3	1	2	G.2D.1.5		
10	A	150211A	4	2	2	A1.A.4.3		
10	A	152449A	1	2	2	A1.A.4.3		
10	A	152449A	2	2	2	A1.A.4.3		
10	A	152449A	3	2	2	A1.A.4.3		
10	A	152449A	4	2	2	A1.A.4.3		
10	A	155735A	1	2	0	PA.D.1.1		
10	A	155735A	2	2	0	A1.D.1.1		
10	A	155735A	3	2	1	PA.D.1.1	7.D.1.1	
10	A	155735A	4	3	2	A1.D.1.1		
10	A	155763A	1	2	2	A1.A.2.3		
10	A	155763A	2	2	2	A1.A.1.1		
10	A	155763A	3	2	2	A1.A.2.1		
10	A	155763A	4	2	2	A1.A.2.3		
10	A	161611A	1	2	2	A1.F.2.1		
10	A	161611A	2	2	2	A1.F.2.1		
10	A	161611A	3	1	2	A1.F.1.1		
10	A	161611A	4	2	2	A1.F.2.1		
10	A	164639A	1	2	2	A1.A.3.3		
10	A	164639A	2	2	2	A1.A.3.3		
10	A	164639A	3	2	2	A1.A.3.3		
10	A	164639A	4	1	2	A1.A.3.3		
10	A	164652A	1	2	2	A1.F.3.1		
10	A	164652A	2	2	1	A1.A.1.1		
10	A	164652A	3	2	1	A1.F.3.1		
10	A	164652A	4	2	2	A1.F.1.3		
10	A	164693A	1	2	2	A1.F.1.2		
10	A	164693A	2	2	2	A1.F.1.2		
10	A	164693A	3	2	2	A1.F.1.2		
10	A	164693A	4	3	2	A1.D.1.2		
10	A	164715A	1	2	2	A1.A.1.1		
10	A	164715A	2	1	2	A1.F.3.1		
10	A	164715A	3	2	2	A1.F.3.1		
10	A	164715A	4	2	2	A1.F.3.1		
10	A	165187A	1	3	2	G.2D.1.6		
10	A	165187A	2	3	2	A1.A.1.1		
10	A	165187A	3	3	2	G.2D.1.6		
10	A	165187A	4	2	2	G.2D.1.6		
10	A	165342A	1	2	2	A1.F.3.3		
10	A	165342A	2	2	2	A1.F.3.3		
10	A	165342A	3	2	2	A1.F.3.3		
10	A	165342A	4	2	2	A1.F.3.3		
10	A	165662A	1	3	2	A1.A.1.1		
10	A	165662A	2	2	1	A1.A.4.3	A1.A.4.1	
10	A	165662A	3	2	2	A1.F.3.1		
10	A	165662A	4	2	2	A1.A.1.1		
10	A	165761A	1	2	2	A1.A.2.1		
10	A	165761A	2	2	2	A1.A.2.1		
10	A	165761A	3	3	1	A1.A.2.1		
10	A	165761A	4	2	1	A1.A.2.1		
10	A	165825A	1	2	2	A1.D.1.2		
10	A	165825A	2	1	2	A1.D.1.2		
10	A	165825A	3	2	1	A1.D.1.2		
10	A	165825A	4	2	2	A1.D.1.2		
10	A	170065A	1	2	2	A1.A.1.2		
10	A	170065A	2	1	2	A1.F.2.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	170065A	3	1	2	A1.F.2.2		
10	A	170065A	4	1	2	A1.A.1.2		
10	A	170436A	1	3	2	A1.F.1.3		
10	A	170436A	2	2	1	A1.A.1.1		
10	A	170436A	3	2	2	A1.F.3.1		
10	A	170436A	4	2	2	A1.F.1.3		
10	A	170579A	1	2	2	A1.F.2.2		
10	A	170579A	2	2	2	A1.F.2.2		
10	A	170579A	3	1	2	A1.F.2.2		
10	A	170579A	4	2	2	A1.F.2.2		
10	A	171548A	1	3	2	A1.F.3.1		
10	A	171548A	2	2	2	A1.A.4.3		
10	A	171548A	3	3	2	A1.F.1.3		
10	A	171548A	4	2	2	A1.F.3.1		
10	A	172891A	1	3	2	A1.D.1.1		
10	A	172891A	2	2	0	A1.D.1.1		
10	A	172891A	3	3	2	A1.D.1.1		
10	A	172891A	4	3	2	A1.D.1.1		
10	A	173318A	1	2	2	A1.F.1.2		
10	A	173318A	2	2	2	A1.F.1.2		
10	A	173318A	3	2	2	A1.F.1.2		
10	A	173318A	4	2	2	A1.F.1.2		
10	A	173587A	1	3	2	A1.A.4.3		
10	A	173587A	2	2	1	A1.A.1.1		
10	A	173587A	3	3	2	A1.A.4.1		
10	A	173587A	4	2	2	A1.A.4.3		
10	A	173659A	1	2	2	A1.D.1.1		
10	A	173659A	2	2	1	A1.D.1.1		
10	A	173659A	3	2	1	PA.D.1.1	7.D.1.1	
10	A	173659A	4	3	2	A1.D.1.1		
10	A	173761A	1	3	2	A1.A.1.3		
10	A	173761A	2	3	2	A1.A.1.3		
10	A	173761A	3	3	2	A1.A.1.3		
10	A	173761A	4	2	2	A1.A.1.3		
10	A	173837A	1	2	2	A1.A.2.1		
10	A	173837A	2	2	2	A1.A.1.1		
10	A	173837A	3	2	2	A1.A.2.1		
10	A	173837A	4	1	2	A1.A.2.1		
10	A	173843A	1	2	2	A1.F.2.1		
10	A	173843A	2	2	2	A1.F.2.1		
10	A	173843A	3	1	2	A1.F.1.1		
10	A	173843A	4	1	2	A1.F.2.1		
10	A	173962A	1	2	2	A1.F.2.2		
10	A	173962A	2	1	2	A1.F.2.2		
10	A	173962A	3	2	2	A1.F.2.2		
10	A	173962A	4	1	2	A1.A.1.2		
10	A	173969A	1	2	2	A1.A.2.1		
10	A	173969A	2	2	2	A1.A.2.1		
10	A	173969A	3	2	2	A1.A.2.1		
10	A	173969A	4	2	2	A1.A.2.1		
10	A	173970A	1	1	2	A1.F.1.2		
10	A	173970A	2	2	2	A1.F.1.2		
10	A	173970A	3	1	2	A1.F.1.2		
10	A	173970A	4	1	2	A1.F.1.2		
10	A	176233A	1	2	2	A1.F.2.1		
10	A	176233A	2	2	2	A1.A.3.6		
10	A	176233A	3	1	2	A1.A.3.6		
10	A	176233A	4	2	2	A1.F.2.1		
10	A	179478A	1	2	2	A1.N.1.1		
10	A	179478A	2	2	2	A1.N.1.1		
10	A	179478A	3	2	2	A1.N.1.1		
10	A	179478A	4	1	2	A1.N.1.1		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	180171A	1	2	2	A2.F.2.1		
10	A	180171A	2	2	1	A1.F.3.3	A1.F.3.2	
10	A	180171A	3	2	2	A1.F.3.3		
10	A	180171A	4	2	2	A1.F.3.3		
10	A	180971A	1	3	2	A1.A.3.5		
10	A	180971A	2	3	2	A2.A.1.7		
10	A	180971A	3	2	2	A1.A.3.5		
10	A	180971A	4	2	2	A2.A.1.7		
10	A	181035A	1	3	2	A1.N.1.2		
10	A	181035A	2	2	2	A1.N.1.2		
10	A	181035A	3	2	2	A1.N.1.2		
10	A	181035A	4	2	2	A1.N.1.2		
10	A	184049A	1	2	0	A1.A.1.1		
10	A	184049A	2	2	1	G.2D.1.4		
10	A	184049A	3	1	1	G.2D.1.4		
10	A	184049A	4	2	0	G.2D.1.4		
10	A	480384	1	2	2	A1.D.2.4		
10	A	480384	2	2	2	A1.D.2.4		
10	A	480384	3	2	2	A1.D.2.4		
10	A	480384	4	2	2	A1.D.2.1		
10	A	480390	1	2	2	A1.D.2.3		
10	A	480390	2	2	2	A1.D.2.3		
10	A	480390	3	3	2	A1.D.2.3		
10	A	480390	4	3	2	A1.D.2.3		
10	A	480398	1	2	2	A1.D.2.4		
10	A	480398	2	2	1	A1.D.2.4		
10	A	480398	3	3	2	A1.D.2.4		
10	A	480398	4	2	2	A1.D.2.4		
10	A	480400	1	3	2	A1.F.1.3		
10	A	480400	2	2	2	A1.F.1.3		
10	A	480400	3	2	2	A1.F.3.1		
10	A	480400	4	2	2	A1.F.1.3		
10	A	480406	1	2	2	A1.F.3.2		
10	A	480406	2	2	2	A1.F.3.2		
10	A	480406	3	2	2	A1.F.3.2		
10	A	480406	4	1	2	A1.F.3.2		
10	A	480410	1	2	2	A1.N.1.1		
10	A	480410	2	1	2	A1.N.1.1		
10	A	480410	3	2	2	A1.N.1.1		
10	A	480410	4	1	2	A1.N.1.1		
10	A	480414	1	2	2	A1.N.1.1		
10	A	480414	2	2	2	A1.N.1.1		
10	A	480414	3	2	2	A1.N.1.1		
10	A	480414	4	1	2	A1.N.1.1		
10	A	480436	1	2	2	A1.N.1.2		
10	A	480436	2	3	2	A1.N.1.2		
10	A	480436	3	3	2	A1.N.1.2		
10	A	480436	4	2	2	A1.N.1.2		
10	A	480442	1	3	2	A1.N.1.2		
10	A	480442	2	2	1	G.2D.1.6		
10	A	480442	3	2	2	A1.N.1.2		
10	A	480442	4	2	2	A1.N.1.2		
10	A	493410	1	2	2	G.2D.1.3		
10	A	493410	2	3	2	G.2D.1.3		
10	A	493410	3	3	2	G.2D.1.3		
10	A	493410	4	2	2	G.2D.1.3		
10	A	496110	1	2	2	A1.F.3.3		
10	A	496110	2	2	2	A1.F.3.3		
10	A	496110	3	2	2	A1.F.3.3		
10	A	496110	4	2	2	A1.F.3.3		
10	A	496156	1	2	2	A1.A.2.3		
10	A	496156	2	3	2	A1.A.2.3		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	A	496156	3	2	2	A1.A.2.3		
10	A	496156	4	2	2	A1.A.2.3		
10	A	496213	1	2	2	A1.A.2.3		
10	A	496213	2	2	2	A1.A.2.3		
10	A	496213	3	2	2	A1.A.2.3		
10	A	496213	4	2	2	A1.A.2.3		
10	A	500416	1	3	2	A1.A.1.1		
10	A	500416	2	3	2	A1.A.1.1		
10	A	500416	3	3	2	A1.A.1.1		
10	A	500416	4	3	2	A1.A.1.1		
10	A	500575	1	2	2	A1.A.3.2		
10	A	500575	2	2	2	A1.A.3.2		
10	A	500575	3	3	2	A1.A.3.2		
10	A	500575	4	2	2	A1.A.3.2		
10	A	500579	1	2	2	A1.A.3.3		
10	A	500579	2	2	2	A1.A.3.3		
10	A	500579	3	2	2	A1.A.3.3		
10	A	500579	4	1	2	A1.A.3.3		
10	B	142004A	1	2	2	A1.A.4.2		
10	B	142004A	2	2	2	A1.A.4.2		
10	B	142004A	3	1	2	A1.A.4.2		
10	B	142004A	4	1	2	A1.A.4.2		
10	B	142007A	1	2	2	A1.A.4.3		
10	B	142007A	2	2	2	A1.A.4.3		
10	B	142007A	3	2	2	A1.A.4.3		
10	B	142007A	4	2	2	A1.A.4.3		
10	B	142046A	1	2	2	A1.A.4.1		
10	B	142046A	2	2	2	A1.A.4.3		
10	B	142046A	3	2	2	A1.F.3.1		
10	B	142046A	4	2	2	A1.A.4.1		
10	B	142047A	1	2	2	G.2D.1.9		
10	B	142047A	2	2	2	G.2D.1.9		
10	B	142047A	3	3	2	G.2D.1.9		
10	B	142047A	4	2	2	G.2D.1.9		
10	B	142089A	1	1	2	A1.A.3.4		
10	B	142089A	2	2	2	A1.A.3.2		
10	B	142089A	3	1	2	A1.A.3.4		
10	B	142089A	4	1	2	A1.A.3.4		
10	B	142092A	1	2	2	A1.A.2.3		
10	B	142092A	2	2	2	A1.A.1.3		
10	B	142092A	3	3	2	A1.A.1.3		
10	B	142092A	4	3	2	A1.A.1.3		
10	B	142210A	1	2	1	G.2D.1.6	G.2D.1.7	
10	B	142210A	2	2	2	G.2D.1.7	G.2D.1.6	
10	B	142210A	3	2	1	G.2D.1.6	G.2D.1.7	
10	B	142210A	4	1	1	G.2D.1.6	G.2D.1.7	
10	B	142344A	1	2	2	A1.A.1.3		
10	B	142344A	2	2	2	A1.A.1.3		
10	B	142344A	3	2	2	A1.A.1.3		
10	B	142344A	4	1	2	A1.A.1.3		
10	B	142371A	1	2	2	A1.A.4.1		
10	B	142371A	2	2	2	A1.A.4.1		
10	B	142371A	3	2	2	A1.A.4.1		
10	B	142371A	4	2	2	A1.A.4.1		
10	B	142431A	1	1	2	A1.F.1.2		
10	B	142431A	2	1	2	A1.F.1.2		
10	B	142431A	3	1	2	A1.F.1.2		
10	B	142431A	4	1	2	A1.F.1.2		
10	B	142541A	1	2	2	A1.D.1.1		
10	B	142541A	2	2	2	A1.A.1.2		
10	B	142541A	3	2	2	A1.D.1.2		
10	B	142541A	4	3	2	A1.D.1.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	B	142681A	1	1	2	A1.A.4.1		
10	B	142681A	2	1	2	A1.A.4.1		
10	B	142681A	3	2	2	A1.A.4.1		
10	B	142681A	4	1	2	A1.A.4.1		
10	B	142899A	1	2	2	A1.F.1.3		
10	B	142899A	2	2	2	A1.A.1.1		
10	B	142899A	3	2	2	A1.F.1.3		
10	B	142899A	4	2	2	A1.F.1.3		
10	B	142909A	1	2	2	A1.A.1.3		
10	B	142909A	2	2	2	A1.A.1.3		
10	B	142909A	3	2	2	A1.A.1.3		
10	B	142909A	4	1	2	A1.A.1.3		
10	B	143026A	1	2	2	A1.A.3.6		
10	B	143026A	2	3	2	A2.A.1.7		
10	B	143026A	3	2	2	A1.A.3.6		
10	B	143026A	4	2	2	A1.A.3.6		
10	B	143097A	1	2	2	A1.A.2.3		
10	B	143097A	2	2	2	A1.A.2.3		
10	B	143097A	3	1	2	A1.A.2.3		
10	B	143097A	4	1	2	A1.A.2.3		
10	B	157639A	1	2	2	G.2D.1.9		
10	B	157639A	2	2	2	G.2D.1.9		
10	B	157639A	3	3	2	G.2D.1.9		
10	B	157639A	4	2	2	G.2D.1.9		
10	B	164397A	1	2	2	A1.A.4.3		
10	B	164397A	2	2	2	A1.A.4.2		
10	B	164397A	3	3	2	A1.A.4.2		
10	B	164397A	4	2	2	A1.A.4.2		
10	B	164565A	1	2	2	A1.D.1.2		
10	B	164565A	2	2	2	A1.D.1.2		
10	B	164565A	3	2	2	A1.D.1.2		
10	B	164565A	4	3	2	A1.D.1.2		
10	B	164644A	1	2	2	A1.A.2.1		
10	B	164644A	2	3	2	A1.A.1.1		
10	B	164644A	3	3	2	A1.A.2.1		
10	B	164644A	4	2	2	A1.A.2.1		
10	B	164834A	1	2	2	A1.F.3.3		
10	B	164834A	2	3	2	A1.F.3.3		
10	B	164834A	3	2	2	A1.F.3.3		
10	B	164834A	4	2	2	A1.F.3.3		
10	B	165197A	1	1	2	A1.F.2.2		
10	B	165197A	2	1	2	A1.F.2.2		
10	B	165197A	3	1	2	A1.F.2.2		
10	B	165197A	4	1	2	A1.F.2.2		
10	B	170502A	1	1	2	A1.F.2.2		
10	B	170502A	2	2	2	A1.F.2.2		
10	B	170502A	3	1	2	A1.F.2.2		
10	B	170502A	4	1	2	A1.F.2.2		
10	B	170746A	1	2	2	A1.F.2.2		
10	B	170746A	2	2	2	A1.F.2.2		
10	B	170746A	3	1	2	A1.F.2.2		
10	B	170746A	4	1	2	A1.F.2.2		
10	B	170830A	1	2	2	A1.A.4.1		
10	B	170830A	2	2	2	A1.A.1.1		
10	B	170830A	3	2	2	A1.F.1.3		
10	B	170830A	4	2	2	A1.A.4.1		
10	B	171778A	1	1	2	A1.F.1.1		
10	B	171778A	2	1	2	A1.F.1.1		
10	B	171778A	3	1	2	A1.F.1.1		
10	B	171778A	4	1	2	A1.F.1.1		
10	B	172999A	1	2	2	A1.A.3.4		
10	B	172999A	2	2	2	A1.A.3.4		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	B	172999A	3	2	2	A1.A.3.4		
10	B	172999A	4	1	2	A1.A.3.4		
10	B	173300A	1	2	2	A1.F.3.2		
10	B	173300A	2	2	2	A1.F.1.2		
10	B	173300A	3	1	2	A1.F.1.2		
10	B	173300A	4	2	2	A1.F.3.2		
10	B	173868A	1	2	2	A1.F.1.1		
10	B	173868A	2	2	2	A1.F.1.1		
10	B	173868A	3	2	2	A1.F.1.1		
10	B	173868A	4	2	2	A1.F.1.1		
10	B	173938A	1	3	2	A1.A.2.3		
10	B	173938A	2	2	2	A1.A.1.3		
10	B	173938A	3	3	2	A1.A.2.3		
10	B	173938A	4	3	2	A1.A.2.3		
10	B	180260A	1	2	2	A1.F.2.1		
10	B	180260A	2	2	2	A1.A.3.6		
10	B	180260A	3	2	2	A1.A.3.6		
10	B	180260A	4	2	2	A1.F.2.1		
10	B	184044A	1	2	2	G.2D.1.7		
10	B	184044A	2	2	2	G.2D.1.7		
10	B	184044A	3	3	2	G.2D.1.7		
10	B	184044A	4	2	2	G.2D.1.7		
10	B	480386	1	2	2	A1.D.1.1		
10	B	480386	2	2	1	A1.D.2.3		
10	B	480386	3	3	2	A1.D.2.1		
10	B	480386	4	2	2	A1.D.2.1		
10	B	480392	1	1	2	A1.D.2.3		
10	B	480392	2	2	2	A1.D.2.3		
10	B	480392	3	2	2	A1.D.2.3		
10	B	480392	4	2	2	A1.D.2.3		
10	B	480402	1	3	2	A1.F.1.4		
10	B	480402	2	2	2	A1.F.1.4		
10	B	480402	3	2	2	A1.F.1.4		
10	B	480402	4	3	2	A1.F.1.4		
10	B	480408	1	2	2	A1.F.3.2		
10	B	480408	2	2	2	A1.F.1.3		
10	B	480408	3	3	2	A1.F.3.2		
10	B	480408	4	2	2	A1.F.3.2		
10	B	480412	1	2	2	A1.N.1.1		
10	B	480412	2	2	2	A1.N.1.1		
10	B	480412	3	2	2	A1.N.1.1		
10	B	480412	4	1	2	A1.N.1.1		
10	B	480418	1	2	2	G.3D.1.1		
10	B	480418	2	2	2	G.3D.1.1		
10	B	480418	3	2	2	G.3D.1.1		
10	B	480418	4	2	2	G.3D.1.1		
10	B	480438	1	1	2	A1.N.1.2		
10	B	480438	2	2	2	A1.A.3.2		
10	B	480438	3	2	2	A1.N.1.1		
10	B	480438	4	1	2	A1.N.1.2		
10	B	480444	1	2	2	A1.N.1.2		
10	B	480444	2	2	2	A1.A.3.2		
10	B	480444	3	2	2	A1.N.1.2		
10	B	480444	4	1	2	A1.N.1.2		
10	B	492698	1	2	2	A1.D.2.2		
10	B	492698	2	2	2	A1.D.2.2		
10	B	492698	3	3	2	A1.D.2.2		
10	B	492698	4	2	2	A1.D.2.2		
10	B	496119	1	2	2	A1.A.3.2		
10	B	496119	2	2	2	A1.F.3.3		
10	B	496119	3	2	2	A1.F.3.3		
10	B	496119	4	2	2	A1.A.3.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	B	496185	1	1	2	A1.A.2.3		
10	B	496185	2	2	2	A1.A.2.3		
10	B	496185	3	1	2	A1.A.2.1		
10	B	496185	4	1	2	A1.A.2.3		
10	B	496285	1	2	2	A1.A.2.3		
10	B	496285	2	2	2	A1.A.2.3		
10	B	496285	3	2	2	A1.A.2.1		
10	B	496285	4	2	2	A1.A.2.3		
10	B	500595	1	2	1	A1.F.3.1	A1.A.4.3	
10	B	500595	2	2	2	A1.F.1.3		
10	B	500595	3	2	2	A1.F.1.3		
10	B	500595	4	2	2	A1.F.3.1		
10	C	142012A	1	2	2	A1.A.1.3		
10	C	142012A	2	2	2	A1.A.1.3		
10	C	142012A	3	3	2	A1.A.1.3		
10	C	142012A	4	2	2	A1.A.1.3		
10	C	142347A	1	2	2	A1.A.4.3		
10	C	142347A	2	2	2	A1.A.4.1		
10	C	142347A	3	1	2	A1.A.4.3		
10	C	142347A	4	1	2	A1.A.4.3		
10	C	142418A	1	2	2	A1.A.4.1		
10	C	142418A	2	1	2	A1.A.4.1		
10	C	142418A	3	2	2	A1.A.4.1		
10	C	142418A	4	1	2	A1.A.4.1		
10	C	142792A	1	2	2	A1.A.4.2		
10	C	142792A	2	2	2	A1.A.4.2		
10	C	142792A	3	1	2	A1.A.4.2		
10	C	142792A	4	1	2	A1.A.4.2		
10	C	148477A	1	1	2	A1.A.4.4		
10	C	148477A	2	2	2	A1.A.1.1		
10	C	148477A	3	1	2	A1.A.4.4		
10	C	148477A	4	2	2	A1.A.4.4		
10	C	149745A	1	2	2	G.2D.1.2		
10	C	149745A	2	2	2	G.2D.1.1		
10	C	149745A	3	1	2	G.2D.1.1		
10	C	149745A	4	2	2	G.2D.1.1		
10	C	150860A	1	1	1	G.2D.1.3	G.2D.1.2	
10	C	150860A	2	2	2	G.2D.1.2		
10	C	150860A	3	1	2	G.2D.1.2		
10	C	150860A	4	1	2	G.2D.1.2		
10	C	150866A	1	1	2	G.2D.1.2		
10	C	150866A	2	2	1	G.2D.1.2	G.2D.1.1	
10	C	150866A	3	1	2	G.2D.1.1		
10	C	150866A	4	1	1	G.2D.1.2	G.2D.1.1	
10	C	152998A	1	2	2	G.2D.1.4		
10	C	152998A	2	2	2	G.2D.1.7		
10	C	152998A	3	2	2	G.2D.1.7		
10	C	152998A	4	2	2	G.2D.1.7		
10	C	155759A	1	2	2	A1.D.1.2		
10	C	155759A	2	2	2	A1.D.1.2		
10	C	155759A	3	2	2	A1.D.1.2		
10	C	155759A	4	2	2	A1.D.1.2		
10	C	155844A	1	3	2	A2.A.1.7		
10	C	155844A	2	3	2	A2.A.1.7		
10	C	155844A	3	3	2	A2.A.1.7		
10	C	155844A	4	2	2	A2.A.1.7		
10	C	156160A	1	2	2	A1.F.1.2		
10	C	156160A	2	2	2	A1.F.1.2		
10	C	156160A	3	2	2	A1.F.1.2		
10	C	156160A	4	2	2	A1.F.1.2		
10	C	156187A	1	2	2	A1.F.2.2		
10	C	156187A	2	1	2	A1.F.2.2		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	C	156187A	3	1	2	A1.F.2.2		
10	C	156187A	4	1	2	A1.F.2.2		
10	C	165015A	1	2		A2.A.1.7		
10	C	165015A	2	2	2	A2.A.1.7		
10	C	165015A	3	3	2	A2.A.1.7		
10	C	165015A	4	3	2	A2.A.1.7		
10	C	165789A	1	2	2	A1.A.1.3		
10	C	165789A	2	1	2	A1.A.1.3		
10	C	165789A	3	1	2	A1.A.1.3		
10	C	165789A	4	2	2	A1.A.1.3		
10	C	169976A	1	2	2	A1.A.2.1		
10	C	169976A	2	2	2	A1.A.2.1		
10	C	169976A	3	1	2	A1.A.2.1		
10	C	169976A	4	1	2	A1.A.2.1		
10	C	169985A	1	2	2	G.2D.1.6		
10	C	169985A	2	2	2	G.2D.1.4		
10	C	169985A	3	2	2	G.2D.1.6		
10	C	169985A	4	2	2	G.2D.1.6		
10	C	170499A	1	1	2	A1.F.1.1		
10	C	170499A	2	1	2	A1.F.1.1		
10	C	170499A	3	1	2	A1.F.1.1		
10	C	170499A	4	1	2	A1.F.1.1		
10	C	170528A	1	1	2	A1.F.2.1		
10	C	170528A	2	1	2	A1.F.2.1		
10	C	170528A	3	1	2	A1.F.2.1		
10	C	170528A	4	1	2	A1.F.2.1		
10	C	170551A	1	1	2	A1.F.1.3		
10	C	170551A	2	2	2	A1.A.4.1		
10	C	170551A	3	1	2	A1.A.4.3		
10	C	170551A	4	1	2	A1.A.4.3		
10	C	170563A	1	2	2	A1.F.2.2		
10	C	170563A	2	1	2	A1.F.2.2		
10	C	170563A	3	1	2	A1.F.2.2		
10	C	170563A	4	2	2	A1.F.2.2		
10	C	170755A	1	1	2	A1.A.4.1		
10	C	170755A	2	2	2	A1.A.1.1		
10	C	170755A	3	1	2	A1.A.4.3		
10	C	170755A	4	2	2	A1.A.4.3		
10	C	170780A	1	2	2	A1.A.2.1		
10	C	170780A	2	2	2	A1.A.2.1		
10	C	170780A	3	2	2	A1.A.2.1		
10	C	170780A	4	1	2	A1.A.2.1		
10	C	171427A	1	2	2	A1.A.3.2		
10	C	171427A	2	2	2	A1.A.3.2		
10	C	171427A	3	2	2	A1.A.3.2		
10	C	171427A	4	2	2	A1.A.3.2		
10	C	171913A	1	2	2	G.2D.1.6		
10	C	171913A	2	2	2	G.2D.1.6		
10	C	171913A	3	2	2	G.2D.1.6		
10	C	171913A	4	2	2	G.2D.1.6		
10	C	173288A	1	2	2	A1.F.2.1		
10	C	173288A	2	1	2	A1.F.2.1		
10	C	173288A	3	1	2	A1.F.2.1		
10	C	173288A	4	1	2	A1.F.2.1		
10	C	173296A	1	2	2	A1.F.1.1		
10	C	173296A	2	2	2	A1.F.1.1		
10	C	173296A	3	2	2	A1.F.1.1		
10	C	173296A	4	2	2	A1.F.1.1		
10	C	173355A	1	2	2	A1.A.3.5		
10	C	173355A	2	1	2	A1.A.3.5		
10	C	173355A	3	2	2	A1.A.3.5		
10	C	173355A	4	2	2	A1.A.3.5		

						Panelist Aligned		
Grade	Form Rated On	Item ID	Reviewer ID	DOK	Alignment Rating	Objective 1	Objective 2	Objective 3
10	C	173804A	1	2	2	A1.F.1.2		
10	C	173804A	2	2	2	A1.F.1.2		
10	C	173804A	3	1	2	A1.F.1.2		
10	C	173804A	4	1	2	A1.F.1.2		
10	C	179238A	1	2	2	A1.A.2.1		
10	C	179238A	2	2	2	A1.A.2.3		
10	C	179238A	3	2	2	A1.A.2.1		
10	C	179238A	4	2	2	A1.A.2.1		
10	C	180966A	1	2	2	A1.A.3.6		
10	C	180966A	2	2	1	A1.A.3.6		
10	C	180966A	3	2	2	A1.A.3.6		
10	C	180966A	4	2	2	A1.A.3.6		
10	C	181892A	1	2	2	A1.F.1.2		
10	C	181892A	2	1	2	A1.F.1.1		
10	C	181892A	3	1	2	A1.A.4.1		
10	C	181892A	4	1	2	A1.A.4.1		
10	C	183296A	1	2	2	G.2D.1.3		
10	C	183296A	2	2	2	G.2D.1.3		
10	C	183296A	3	2	2	G.2D.1.3		
10	C	183296A	4	2	2	G.2D.1.3		
10	C	183761A	1	2	2	A1.A.4.3		
10	C	183761A	2	3	2	A1.A.1.1		
10	C	183761A	3	2	2	A1.A.4.3		
10	C	183761A	4	1	2	A1.A.4.3		
10	C	480388	1	2	2	A1.D.2.2		
10	C	480388	2	2	2	A1.D.1.2		
10	C	480388	3	2	2	A1.D.2.2		
10	C	480388	4	2	2	A1.D.2.2		
10	C	480396	1	2	2	A1.D.2.3		
10	C	480396	2	2	2	A1.D.2.3		
10	C	480396	3	2	2	A1.D.2.3		
10	C	480396	4	2	2	A1.D.2.3		
10	C	480420	1	2	2	A1.N.1.2		
10	C	480420	2	2	2	A1.A.3.2		
10	C	480420	3	2	2	A1.N.1.2		
10	C	480420	4	1	2	A1.N.1.2		
10	C	480440	1	2	2	A1.N.1.2		
10	C	480440	2	2		A1.N.1.2		
10	C	480440	3	2	2	A1.N.1.1		
10	C	480440	4	1	2	A1.N.1.2		
10	C	495899	1	2	2	A1.A.4.3		
10	C	495899	2	1	2	A1.A.1.1		
10	C	495899	3	1	2	A1.A.4.3		
10	C	495899	4	1	2	A1.A.4.3		
10	C	496125	1	2	2	A1.F.3.3		
10	C	496125	2	2	2	A1.F.3.3		
10	C	496125	3	2	2	A1.F.3.3		
10	C	496125	4	2	2	A1.A.3.2		
10	C	496201	1	2	2	A1.A.2.3		
10	C	496201	2	2	2	A1.A.2.3		
10	C	496201	3	2	2	A1.A.2.1		
10	C	496201	4	2	2	A1.A.2.3		
10	C	500569	1	3	2	A1.A.1.3		
10	C	500569	2	2	2	A1.A.2.X		
10	C	500569	3	3	2	A1.A.1.3		
10	C	500569	4	3	2	A1.A.1.3		

Science Panelist Data

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
5	A	184387A	1	2	5-PS1-2			Y	Y	Y
5	A	184387A	2	1	5-PS1-3			Y	Y	Y
5	A	184387A	3	1	5-PS1-2			Y	Y	Y
5	A	184387A	4	1	5-PS1-2			Y	Y	Y
5	A	184387A	5	2	5-PS1-2			Y	Y	Y
5	A	184423A	1	3	5-PS1-2			Y	Y	Y
5	A	184423A	2	3	5-PS1-4			N	Y	Y
5	A	184423A	3	3	5-PS1-2			Y	Y	Y
5	A	184423A	4	3	5-PS1-2			Y	Y	Y
5	A	184423A	5	3	5-PS1-2			Y	Y	Y
5	A	185413A	1	4	5-PS1-2			Y	Y	Y
5	A	185413A	2	2	5-PS1-3			N	Y	Y
5	A	185413A	3	3	5-PS1-2			Y	Y	Y
5	A	185413A	4	2	5-PS1-2			Y	Y	Y
5	A	185413A	5	2	5-PS1-2			Y	Y	Y
5	A	186473A	1	2	5-PS1-4			Y	Y	Y
5	A	186473A	2	2	5-PS1-3			Y	Y	Y
5	A	186473A	3	2	5-PS1-4			Y	Y	Y
5	A	186473A	4	3	5-PS1-4			Y	Y	Y
5	A	186473A	5	3	5-PS1-4			Y	Y	Y
5	A	186475A	1	2	5-PS1-4			Y	Y	Y
5	A	186475A	2	2	5-PS1-4	5-PS1-3		Y	Y	Y
5	A	186475A	3	3	5-PS1-4			Y	Y	Y
5	A	186475A	4	3	5-PS1-4			Y	Y	Y
5	A	186475A	5	3	5-PS1-4			Y	Y	Y
5	A	186478A	1	3	5-PS1-4			Y	Y	Y
5	A	186478A	2	3	5-PS1-3			N	Y	N
5	A	186478A	3	3	5-PS1-4			Y	Y	Y
5	A	186478A	4	3	5-PS1-4			Y	Y	Y
5	A	186478A	5	3	5-PS1-4			Y	Y	Y
5	A	187286A	1	3	5-ESS1-1			Y	Y	Y
5	A	187286A	2	3	5-ESS1-1			Y	Y	Y
5	A	187286A	3	3	5-ESS1-1			Y	Y	Y
5	A	187286A	4	3	5-ESS1-1			Y	Y	Y
5	A	187286A	5	3	5-ESS1-1			Y	Y	Y
5	A	187288A	1	2	5-ESS1-1			Y	Y	Y
5	A	187288A	2	3	5-ESS1-1			Y	Y	Y
5	A	187288A	3	3	5-ESS1-1			Y	Y	Y
5	A	187288A	4	3	5-ESS1-1			Y	Y	Y
5	A	187288A	5	4	5-ESS1-1			Y	Y	Y
5	A	187289A	1	3	5-ESS1-1			Y	Y	Y
5	A	187289A	2	4	5-ESS1-1			Y	Y	Y
5	A	187289A	3	3	5-ESS1-1			Y	Y	Y
5	A	187289A	4	4	5-ESS1-1			Y	Y	Y
5	A	187289A	5	4	5-ESS1-1			Y	Y	Y
5	A	187487A	1	1	5-ESS2-1			Y	Y	Y
5	A	187487A	2	1	5-ESS2-1			Y	Y	Y
5	A	187487A	3	1	5-ESS2-1			Y	Y	Y
5	A	187487A	4	1	5-ESS2-1			Y	Y	Y
5	A	187487A	5	1	5-ESS2-1			Y	Y	Y
5	A	187491A	1	2	5-ESS2-1			Y	Y	Y
5	A	187491A	2	2	5-ESS2-1			Y	Y	Y
5	A	187491A	3	2	5-ESS2-1			Y	Y	Y
5	A	187491A	4	2	5-ESS2-1			Y	Y	Y
5	A	187491A	5	3	5-ESS2-1			Y	Y	Y
5	A	187497A	1	2	5-ESS2-1			Y	Y	Y
5	A	187497A	2	2	5-ESS2-1			N	Y	Y
5	A	187497A	3	3	5-ESS2-1			Y	Y	Y
5	A	187497A	4	1	5-ESS2-1			N	Y	Y
5	A	187497A	5	2	5-ESS2-1			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
5	A	187503A	1	2	5-LS2-1	5-PS3-1		Y	Y	Y
5	A	187503A	2	1	5-PS3-1	5-LS2-2		Y	Y	Y
5	A	187503A	3	2	5-PS3-1			Y	Y	Y
5	A	187503A	4	2	5-PS3-1			Y	Y	Y
5	A	187503A	5	2	5-PS3-1			Y	Y	Y
5	A	187505A	1	2	5-LS2-1	5-PS3-1		Y	Y	Y
5	A	187505A	2	2	5-PS3-1	5-LS1-1		Y	Y	Y
5	A	187505A	3	1	5-LS2-1			Y	Y	Y
5	A	187505A	4	1	5-LS2-1			Y	Y	Y
5	A	187505A	5	2	5-LS2-1			Y	Y	Y
5	A	187510A	1	2	5-LS2-1	5-PS3-1		Y	Y	Y
5	A	187510A	2	2	5-LS2-1			Y	Y	Y
5	A	187510A	3	2	5-LS2-1			Y	Y	Y
5	A	187510A	4	1	5-LS2-1			Y	Y	Y
5	A	187510A	5	2	5-LS2-1			Y	Y	Y
5	A	188304A	1	1	5-LS2-1			Y	Y	Y
5	A	188304A	2	2	5-LS2-1	5-LS2-2		Y	Y	Y
5	A	188304A	3	2	5-LS2-1			N	Y	Y
5	A	188304A	4	2	5-LS2-1			Y	Y	Y
5	A	188304A	5	2	5-LS2-1			Y	Y	Y
5	A	188318A	1	2	5-LS2-1	5-PS3-1		Y	Y	Y
5	A	188318A	2	3	5-PS3-1	5-LS2-2		Y	Y	Y
5	A	188318A	3	1	5-LS2-1			Y	Y	Y
5	A	188318A	4	1	5-LS2-1			Y	Y	Y
5	A	188318A	5	2	5-LS2-1			Y	Y	Y
5	A	188323A	1	2	5-LS2-1			Y	Y	Y
5	A	188323A	2	3	5-LS2-1			Y	Y	Y
5	A	188323A	3	3	5-LS2-1			Y	Y	Y
5	A	188323A	4	4	5-LS2-1			Y	Y	Y
5	A	188323A	5	3	5-LS2-1			Y	Y	Y
5	A	188334A	1	2	5-PS1-1			Y	Y	Y
5	A	188334A	2	2	5-PS1-1	5-PS1-3		Y	Y	Y
5	A	188334A	3	2	5-PS1-2			N	Y	Y
5	A	188334A	4	2	5-PS1-1			Y	Y	Y
5	A	188334A	5	2	5-PS1-1			Y	Y	Y
5	A	188338A	1	2	5-PS1-1			Y	Y	Y
5	A	188338A	2	2	5-PS1-2			N	Y	Y
5	A	188338A	3	2	5-PS1-2			N	Y	Y
5	A	188338A	4	2	5-PS1-1			Y	Y	Y
5	A	188338A	5	3	5-PS1-1			Y	Y	Y
5	A	188340A	1	3	5-PS1-1			Y	Y	Y
5	A	188340A	2	2	5-PS1-4	5-PS1-3		Y	Y	Y
5	A	188340A	3	2	5-PS1-2			N	Y	Y
5	A	188340A	4	2	5-PS1-1			Y	Y	Y
5	A	188340A	5	3	5-PS1-1			Y	Y	Y
5	A	188377A	1	3	5-ESS1-1			Y	Y	Y
5	A	188377A	2	3	5-ESS1-1			Y	Y	Y
5	A	188377A	3	2	5-ESS1-1			N	Y	Y
5	A	188377A	4	2	5-ESS1-1			Y	Y	Y
5	A	188377A	5	4	5-ESS1-1			Y	Y	Y
5	A	188378A	1	3	5-ESS1-1			Y	Y	Y
5	A	188378A	2	3	5-ESS1-1			Y	Y	Y
5	A	188378A	3	3	5-ESS1-1			Y	Y	Y
5	A	188378A	4	4	5-ESS1-1			Y	Y	Y
5	A	188378A	5	3	5-ESS1-1			Y	Y	Y
5	A	188380A	1	2	5-ESS1-1			Y	Y	Y
5	A	188380A	2	3	5-ESS1-1			Y	Y	Y
5	A	188380A	3	2	5-ESS1-1			Y	Y	N
5	A	188380A	4	3	5-ESS1-1			Y	Y	Y
5	A	188380A	5	4	5-ESS1-1			Y	Y	Y
5	A	188432A	1	2	5-PS1-3			Y	Y	Y
5	A	188432A	2	1	5-PS1-3			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
5	A	188432A	3	3	5-PS1-3			Y	Y	Y
5	A	188432A	4	3	5-PS1-3			Y	Y	Y
5	A	188432A	5	3	5-PS1-3			Y	Y	Y
5	A	188433A	1	1	5-PS1-3			Y	Y	Y
5	A	188433A	2	2	5-PS1-3			Y	Y	Y
5	A	188433A	3	2	5-PS1-3			Y	Y	Y
5	A	188433A	4	3	5-PS1-3			Y	Y	Y
5	A	188433A	5	2	5-PS1-3			Y	Y	Y
5	A	188439A	1	2	5-PS1-3			Y	Y	Y
5	A	188439A	2	2	5-PS1-3			Y	Y	Y
5	A	188439A	3	2	5-PS1-3			Y	Y	Y
5	A	188439A	4	2	5-PS1-3			Y	Y	Y
5	A	188439A	5	3	5-PS1-3			Y	Y	Y
5	A	188452A	1	2	5-ESS2-2			Y	Y	Y
5	A	188452A	2	2	5-ESS2-2			Y	Y	Y
5	A	188452A	3	2	5-ESS2-2			Y	Y	Y
5	A	188452A	4	2	5-ESS2-2			Y	Y	Y
5	A	188452A	5	2	5-ESS2-2			Y	Y	Y
5	A	188453A	1	1	5-ESS2-2			Y	Y	Y
5	A	188453A	2	2	5-ESS2-2			Y	Y	Y
5	A	188453A	3	2	5-ESS2-2			Y	Y	Y
5	A	188453A	4	1	5-ESS2-2			Y	Y	Y
5	A	188453A	5	1	5-ESS2-2			Y	Y	Y
5	A	188456A	1	2	5-ESS2-2			Y	Y	Y
5	A	188456A	2	2	5-ESS2-2			Y	Y	Y
5	A	188456A	3	1	5-ESS2-2			Y	Y	Y
5	A	188456A	4	1	5-ESS2-2			Y	Y	Y
5	A	188456A	5	2	5-ESS2-2			Y	Y	Y
5	A	188717A	1	2	5-PS2-1			Y	Y	Y
5	A	188717A	2	2	5-PS2-1			Y	Y	Y
5	A	188717A	3	3	5-PS2-1			Y	Y	Y
5	A	188717A	4	2	5-PS2-1			Y	Y	Y
5	A	188717A	5	2	5-PS2-1			Y	Y	Y
5	A	188718A	1	2	5-PS2-1			Y	Y	Y
5	A	188718A	2	2	5-PS2-1			Y	Y	Y
5	A	188718A	3	2	5-PS2-1			Y	Y	Y
5	A	188718A	4	1	5-PS2-1			Y	Y	Y
5	A	188718A	5	2	5-PS2-1			Y	Y	Y
5	A	188720A	1	3	5-PS2-1			Y	Y	Y
5	A	188720A	2	3	5-PS2-1			Y	Y	Y
5	A	188720A	3	3	5-PS2-1			Y	Y	Y
5	A	188720A	4	3	5-PS2-1			Y	Y	Y
5	A	188720A	5	2	5-PS2-1			Y	Y	Y
5	A	189235A	1	2	5-ESS1-2			Y	Y	Y
5	A	189235A	2	2	5-ESS1-2			Y	Y	Y
5	A	189235A	3	3	5-ESS1-2			Y	Y	Y
5	A	189235A	4	3	5-ESS1-2			Y	Y	Y
5	A	189235A	5	2	5-ESS1-2			Y	Y	Y
5	A	189237A	1	3	5-ESS1-2			Y	Y	Y
5	A	189237A	2	3	5-ESS1-2			Y	Y	Y
5	A	189237A	3	3	5-ESS1-2			Y	Y	Y
5	A	189237A	4	2	5-ESS1-2			Y	Y	Y
5	A	189237A	5	3	5-ESS1-2			Y	Y	Y
5	A	189238A	1	3	5-ESS1-2			Y	Y	Y
5	A	189238A	2	2	5-ESS1-2			Y	Y	Y
5	A	189238A	3	3	5-ESS1-2			Y	Y	Y
5	A	189238A	4	2	5-ESS1-2			Y	Y	Y
5	A	189238A	5	2	5-ESS1-2			Y	Y	Y
5	A	189340A	1	2	5-LS2-2			Y	Y	Y
5	A	189340A	2	2	5-LS2-2			Y	Y	Y
5	A	189340A	3	2	5-LS2-1			N	Y	Y
5	A	189340A	4	2	5-LS2-1			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
5	A	189340A	5	2	5-LS2-2	5-LS2-1		Y	Y	Y
5	A	189341A	1	2	5-LS2-2			Y	Y	Y
5	A	189341A	2	3	5-LS2-2			Y	Y	Y
5	A	189341A	3	3	5-LS2-1			Y	Y	Y
5	A	189341A	4	2	5-LS2-2			Y	Y	Y
5	A	189341A	5	3	5-LS2-2			Y	Y	Y
5	A	189345A	1	3	5-LS2-2			Y	Y	Y
5	A	189345A	2	2	5-LS2-2			Y	Y	Y
5	A	189345A	3	4	5-LS2-1			N	Y	Y
5	A	189345A	4	2	5-LS2-2			Y	Y	Y
5	A	189345A	5	3	5-LS2-2			Y	Y	Y
5	A	189348A	1	2	5-LS2-1			Y	Y	Y
5	A	189348A	2	2	5-PS3-1	5-LS2-2		Y	Y	Y
5	A	189348A	3	1	5-LS2-1			Y	Y	Y
5	A	189348A	4	1	5-LS2-1			Y	Y	Y
5	A	189348A	5	2	5-LS2-1	5-PS3-1		Y	Y	Y
5	A	189349A	1	2	5-LS2-1			Y	Y	Y
5	A	189349A	2	2	5-LS2-1	5-PS3-1		Y	Y	Y
5	A	189349A	3	2	5-LS2-1			Y	Y	Y
5	A	189349A	4	2	5-LS2-1			Y	Y	Y
5	A	189349A	5	2	5-LS2-1			Y	Y	Y
5	A	189352A	1	2	5-LS2-1			Y	Y	Y
5	A	189352A	2	2	5-PS3-1			Y	Y	Y
5	A	189352A	3	2	5-LS2-1			N	Y	Y
5	A	189352A	4	2	5-LS2-1			Y	Y	Y
5	A	189352A	5	3	5-LS2-1			Y	Y	Y
5	A	189356A	1	3	5-LS1-1			Y	Y	Y
5	A	189356A	2	3	5-LS1-1			Y	Y	Y
5	A	189356A	3	2	5-LS1-1			Y	Y	Y
5	A	189356A	4	3	5-LS1-1			Y	Y	Y
5	A	189356A	5	3	5-LS1-1			Y	Y	Y
5	A	189358A	1	4	5-LS1-1			Y	Y	Y
5	A	189358A	2	3	5-LS1-1			Y	Y	Y
5	A	189358A	3	3	5-LS1-1			Y	Y	Y
5	A	189358A	4	3	5-LS1-1			Y	Y	Y
5	A	189358A	5	3	5-LS1-1			Y	Y	Y
5	A	189361A	1	4	5-LS1-1			Y	Y	Y
5	A	189361A	2	3	5-LS1-1			Y	Y	Y
5	A	189361A	3	3	5-LS1-1			Y	Y	Y
5	A	189361A	4	3	5-LS1-1			Y	Y	Y
5	A	189361A	5	3	5-LS1-1			Y	Y	Y
5	BR	184525A	1	2	5-ESS1-2			Y	Y	Y
5	BR	184525A	2	2	5-ESS1-2			Y	Y	Y
5	BR	184525A	3	2	5-ESS1-2			Y	Y	Y
5	BR	184525A	4	2	5-ESS1-2			Y	Y	Y
5	BR	184525A	5	2	5-ESS1-2			Y	Y	Y
5	BR	184530A	1	3	5-ESS1-2			Y	Y	Y
5	BR	184530A	2	2	5-ESS1-2			Y	Y	Y
5	BR	184530A	3	3	5-ESS1-2			Y	Y	Y
5	BR	184530A	4	3	5-ESS1-2			Y	Y	Y
5	BR	184530A	5	2	5-ESS1-2			Y	Y	Y
5	BR	184534A	1	3	5-ESS1-2			Y	Y	Y
5	BR	184534A	2	2	5-ESS1-2			Y	Y	Y
5	BR	184534A	3	2	5-ESS1-2			Y	Y	Y
5	BR	184534A	4	2	5-ESS1-2			Y	Y	Y
5	BR	184534A	5	2	5-ESS1-2			Y	Y	Y
5	BR	186452A	1	2	5-PS1-2			Y	Y	Y
5	BR	186452A	2	2	5-PS1-2			Y	Y	Y
5	BR	186452A	3	2	5-PS1-2			Y	Y	Y
5	BR	186452A	4	2	5-PS1-2			Y	Y	Y
5	BR	186452A	5	2	5-PS1-2			Y	Y	Y
5	BR	186458A	1	3	5-PS1-2			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
5	BR	186458A	2	2	5-PS1-3	5-PS1-2		Y	Y	Y
5	BR	186458A	3	2	5-PS1-2			Y	Y	Y
5	BR	186458A	4	3	5-PS1-2			Y	Y	N
5	BR	186458A	5	2	5-PS1-2			Y	Y	Y
5	BR	186464A	1	3	5-PS1-2			Y	Y	Y
5	BR	186464A	2	2	5-PS1-2			Y	Y	Y
5	BR	186464A	3	3	5-PS1-2			Y	Y	Y
5	BR	186464A	4	2	5-PS1-2			Y	Y	Y
5	BR	186464A	5	3	5-PS1-2			Y	Y	Y
5	BR	186483A	1	2	5-PS1-4			Y	Y	Y
5	BR	186483A	2	2	5-PS1-4			Y	Y	Y
5	BR	186483A	3	1	5-PS1-4			Y	Y	Y
5	BR	186483A	4	3	5-PS1-4			Y	Y	Y
5	BR	186483A	5	3	5-PS1-4			Y	Y	Y
5	BR	186489A	1	3	5-PS1-4			Y	Y	Y
5	BR	186489A	2	3	5-PS1-4			Y	Y	Y
5	BR	186489A	3	3	5-PS1-4			Y	Y	Y
5	BR	186489A	4	3	5-PS1-4			Y	Y	N
5	BR	186489A	5	2	5-PS1-4			Y	Y	Y
5	BR	186490A	1	3	5-PS1-4			Y	Y	Y
5	BR	186490A	2	3	5-PS1-3			Y	Y	Y
5	BR	186490A	3	2	5-PS1-4			Y	Y	Y
5	BR	186490A	4	2	5-PS1-4			Y	Y	Y
5	BR	186490A	5	3	5-PS1-4			Y	Y	Y
5	BR	186506A	1	3	5-PS1-1			Y	Y	Y
5	BR	186506A	2	2	5-PS1-1			Y	Y	Y
5	BR	186506A	3	2	5-PS1-3			Y	Y	Y
5	BR	186506A	4	3	5-PS1-1			Y	Y	Y
5	BR	186506A	5	2	5-PS1-1			Y	Y	Y
5	BR	186508A	1	2	5-PS1-1			Y	Y	Y
5	BR	186508A	2	2	5-PS1-1			Y	Y	Y
5	BR	186508A	3	2	5-PS1-3			Y	Y	Y
5	BR	186508A	4	3	5-PS1-1			Y	Y	Y
5	BR	186508A	5	3	5-PS1-1			Y	Y	Y
5	BR	186510A	1	2	5-PS1-1			Y	Y	Y
5	BR	186510A	2	3	5-PS1-1	5-PS1-2		Y	Y	Y
5	BR	186510A	3	2	5-PS1-1			Y	Y	Y
5	BR	186510A	4	3	5-PS1-1			Y	Y	Y
5	BR	186510A	5	3	5-PS1-1			Y	Y	Y
5	BR	188387A	1	2	5-PS1-4			Y	Y	Y
5	BR	188387A	2	2	5-PS1-4	5-PS1-3		Y	Y	Y
5	BR	188387A	3	1	5-PS1-4			Y	Y	Y
5	BR	188387A	4	2	5-PS1-4			Y	Y	Y
5	BR	188387A	5	3	5-PS1-4			Y	Y	Y
5	BR	188389A	1	3	5-PS1-4			Y	Y	Y
5	BR	188389A	2	3	5-PS1-4			Y	Y	Y
5	BR	188389A	3	3	5-PS1-4			Y	Y	Y
5	BR	188389A	4	2	5-PS1-4			Y	Y	Y
5	BR	188389A	5	4	5-PS1-4			Y	Y	Y
5	BR	188390A	1	3	5-PS1-4			Y	Y	Y
5	BR	188390A	2	3	5-PS1-1			Y	Y	Y
5	BR	188390A	3	3	5-PS1-4			Y	Y	Y
5	BR	188390A	4	4	5-PS1-4			Y	Y	Y
5	BR	188390A	5	2	5-PS1-4			Y	Y	Y
5	BR	188728A	1	1	5-PS2-1			Y	Y	Y
5	BR	188728A	2	2	5-PS2-1			Y	Y	Y
5	BR	188728A	3	2	5-PS2-1			Y	Y	Y
5	BR	188728A	4	2	5-PS2-1			Y	Y	Y
5	BR	188728A	5	1	5-PS2-1			Y	Y	Y
5	BR	188729A	1	2	5-PS2-1			Y	Y	Y
5	BR	188729A	2	3	5-PS2-1			Y	Y	Y
5	BR	188729A	3	2	5-PS2-1			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
5	BR	188729A	4	3	5-PS2-1			Y	Y	Y
5	BR	188729A	5	2	5-PS2-1			Y	Y	Y
5	BR	188731A	1	3	5-PS2-1			Y	Y	Y
5	BR	188731A	2	2	5-PS2-1			Y	Y	Y
5	BR	188731A	3	2	5-PS2-1					
5	BR	188731A	4	3	5-PS2-1			Y	Y	Y
5	BR	188731A	5	2	5-PS2-1			Y	Y	Y
5	BR	188904A	1	3	5-LS1-1			Y	Y	Y
5	BR	188904A	2	2	5-LS1-1			Y	Y	Y
5	BR	188904A	3	3	5-LS1-1			Y	Y	Y
5	BR	188904A	4	2	5-LS1-1			Y	Y	Y
5	BR	188904A	5	3	5-LS1-1			Y	Y	Y
5	BR	188907A	1	2	5-LS1-1			Y	Y	Y
5	BR	188907A	2	2	5-LS1-1			Y	Y	Y
5	BR	188907A	3	2	5-LS1-1			Y	Y	Y
5	BR	188907A	4	2	5-LS1-1			Y	Y	Y
5	BR	188907A	5	3	5-LS1-1			Y	Y	Y
5	BR	188908A	1	3	5-LS1-1			Y	Y	Y
5	BR	188908A	2	3	5-LS1-1			Y	Y	Y
5	BR	188908A	3	3	5-LS1-1			Y	Y	Y
5	BR	188908A	4	3	5-LS1-1			Y	Y	Y
5	BR	188908A	5	3	5-LS1-1			Y	Y	Y
8	A	185793A	1	1	MS-PS2-2			Y	Y	Y
8	A	185793A	2	2	MS-PS2-1			Y	Y	Y
8	A	185793A	3	2	MS-PS2-2			Y	N	Y
8	A	185793A	4	2	MS-PS2-2			Y		
8	A	185805A	1	2	MS-PS2-2			Y	Y	Y
8	A	185805A	2	2	MS-PS2-1			Y		Y
8	A	185805A	3	3	MS-PS2-2			Y	Y	Y
8	A	185805A	4	2	MS-PS2-2					Y
8	A	185826A	1	2	MS-PS2-2			Y	Y	Y
8	A	185826A	2	2	MS-PS2-1			Y	Y	
8	A	185826A	3	2	MS-PS2-2			Y	Y	Y
8	A	185826A	4	1	MS-PS2-2			Y		Y
8	A	185899A	1	1	MS-ESS3-1			Y	Y	Y
8	A	185899A	2	1	MS-ESS2-3			Y	Y	Y
8	A	185899A	3	2	MS-ESS2-2			Y	Y	Y
8	A	185899A	4	3	MS-ESS3-1				Y	Y
8	A	185901A	1	1	MS-ESS3-1			N	N	Y
8	A	185901A	2	3	MS-ESS2-3			Y		Y
8	A	185901A	3	1	MS-ESS2-2			N	Y	N
8	A	185901A	4	1	MS-ESS3-1				Y	Y
8	A	185916A	1	2	MS-ESS3-1			Y	Y	Y
8	A	185916A	2	2	MS-ESS3-1			Y	Y	Y
8	A	185916A	3	2	MS-ESS2-2			Y	Y	N
8	A	185916A	4	2	MS-ESS3-1				Y	Y
8	A	186154A	1	3	MS-LS4-1			Y	Y	Y
8	A	186154A	2	2	MS-ESS3-2			Y		Y
8	A	186154A	3	1	MS-LS4-1			Y	Y	Y
8	A	186154A	4	1	MS-ESS1-4				Y	Y
8	A	186293A	1	2	MS-LS4-1			Y	Y	Y
8	A	186293A	2	1	MS-ESS3-2			Y		Y
8	A	186293A	3	1	MS-LS4-1			Y	Y	Y
8	A	186293A	4	1	MS-ESS1-4				Y	Y
8	A	186309A	1	2	MS-LS4-1			Y	Y	Y
8	A	186309A	2	2	MS-ESS3-2			Y		Y
8	A	186309A	3	2	MS-LS4-1			Y	Y	Y
8	A	186309A	4	1	MS-ESS1-4				Y	Y
8	A	187032A	1	2	MS-ESS2-2			N	Y	Y
8	A	187032A	2	2	MS-ESS2-3			Y		Y
8	A	187032A	3	1	MS-ESS2-1			Y	Y	Y
8	A	187032A	4	1	MS-ESS2-2					

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
8	A	187038A	1	2	MS-ESS2-2			Y	Y	Y
8	A	187038A	2	3	MS-ESS2-2			Y	Y	Y
8	A	187038A	3	3	MS-ESS2-1			Y	Y	Y
8	A	187038A	4	3	MS-ESS2-2			Y	Y	Y
8	A	187047A	1	3	MS-ESS2-2			Y	Y	Y
8	A	187047A	2	2	MS-ESS2-3			Y		Y
8	A	187047A	3	1	MS-ESS2-1			N	Y	Y
8	A	187047A	4	2	MS-ESS2-2					
8	A	187676A	1	1	MS-ESS3-2			Y	Y	Y
8	A	187676A	2	1	MS-ESS2-3			Y		
8	A	187676A	3	2	MS-ESS3-2			Y	Y	Y
8	A	187676A	4	1	MS-ESS3-2			Y	Y	Y
8	A	187681A	1	2	MS-ESS3-2			Y	Y	N
8	A	187681A	2	1	MS-ESS2-3			Y		
8	A	187681A	3	1	MS-ESS3-2			Y	Y	Y
8	A	187681A	4	1	MS-ESS3-2			Y	Y	Y
8	A	187688A	1	1	MS-ESS3-2			Y	Y	N
8	A	187688A	2	1	MS-ESS2-3			Y		
8	A	187688A	3	1	MS-ESS3-2			Y	Y	Y
8	A	187688A	4	1	MS-ESS3-2			Y	Y	
8	A	188149A	1	2	MS-ESS2-3			Y	Y	Y
8	A	188149A	2	3	MS-ESS2-3			Y		Y
8	A	188149A	3	1	MS-ESS2-3			Y	Y	Y
8	A	188149A	4	1	MS-ESS2-3			Y	Y	Y
8	A	188150A	1	2	MS-ESS2-3			Y	Y	Y
8	A	188150A	2	1	MS-ESS2-3			Y		Y
8	A	188150A	3	1	MS-ESS2-3			N	Y	Y
8	A	188150A	4	1	MS-ESS2-3			Y	Y	Y
8	A	188153A	1	1	MS-ESS2-3			Y	Y	Y
8	A	188153A	2	1	MS-ESS2-3			Y		Y
8	A	188153A	3	1	MS-ESS2-3			Y	Y	Y
8	A	188153A	4	2	MS-ESS2-3			Y	Y	Y
8	A	188158A	1	2	MS-PS1-6			Y	Y	Y
8	A	188158A	2	1	MS-PS1-5			Y		Y
8	A	188158A	3	1	MS-PS1-6			Y	Y	Y
8	A	188158A	4	1	MS-PS1-6				Y	Y
8	A	188160A	1	2	MS-PS1-6			Y	Y	Y
8	A	188160A	2	2	MS-PS1-6			Y		Y
8	A	188160A	3	3	MS-PS1-6			Y	Y	Y
8	A	188160A	4	1	MS-PS1-6				Y	Y
8	A	188176A	1	3	MS-PS1-6			Y	Y	Y
8	A	188176A	2	2	MS-PS1-5			Y		
8	A	188176A	3	3	MS-PS1-6			Y	Y	Y
8	A	188176A	4	1	MS-PS1-6				Y	Y
8	A	188317A	1	2	MS-LS4-1			Y	Y	Y
8	A	188317A	2	1	MS-ESS1-4			Y		Y
8	A	188317A	3	2	MS-ESS2-3			Y	Y	Y
8	A	188317A	4	1	MS-LS4-1			Y	Y	
8	A	188320A	1	2	MS-LS4-1			Y	Y	Y
8	A	188320A	2	2	MS-ESS1-4			Y		Y
8	A	188320A	3	2	MS-ESS2-3			Y	Y	Y
8	A	188320A	4	1	MS-LS4-1			Y	Y	Y
8	A	188328A	1	1	MS-ESS1-4			Y	Y	Y
8	A	188328A	2	1	MS-ESS1-4			Y		
8	A	188328A	3	2	MS-ESS1-4			Y	Y	Y
8	A	188328A	4	1	MS-ESS2-3			Y	Y	Y
8	A	188332A	1	2	MS-ESS1-4			N	N	Y
8	A	188332A	2	1	MS-ESS1-4			Y		Y
8	A	188332A	3	2	MS-ESS1-4			Y	Y	Y
8	A	188332A	4	1	MS-ESS2-3			Y	Y	
8	A	188846A	1	3	MS-PS4-2			Y	Y	Y
8	A	188846A	2	1	MS-PS4-2			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
8	A	188846A	3	1	MS-PS4-2			Y	Y	Y
8	A	188846A	4	2	MS-PS4-2			Y	Y	Y
8	A	188847A	1	2	MS-PS4-2			Y	Y	Y
8	A	188847A	2	1	MS-PS4-2			Y	Y	Y
8	A	188847A	3	2	MS-PS4-2			Y	Y	Y
8	A	188847A	4	1	MS-PS4-2			Y	Y	Y
8	A	188849A	1	2	MS-PS4-2			Y	Y	Y
8	A	188849A	2	1	MS-PS4-2			Y	Y	Y
8	A	188849A	3	2	MS-PS4-2			Y	Y	Y
8	A	188849A	4	2	MS-PS4-2			Y	Y	Y
8	A	188863A	1	3	MS-LS1-7			Y	Y	Y
8	A	188863A	2	2	MS-LS1-7			Y	Y	Y
8	A	188863A	3	2	MS-LS1-7			Y	Y	Y
8	A	188863A	4	1	MS-LS1-7			Y	Y	Y
8	A	188866A	1	3	MS-LS1-7			Y	Y	Y
8	A	188866A	2	2	MS-LS1-7			Y	Y	Y
8	A	188866A	3	2	MS-LS1-7			Y	Y	Y
8	A	188866A	4	2	MS-LS1-7			Y	Y	Y
8	A	188868A	1	1	MS-LS1-7			Y	Y	Y
8	A	188868A	2	2	MS-LS1-7			Y		
8	A	188868A	3	3	MS-LS1-7			Y	Y	Y
8	A	188868A	4	2	MS-LS1-7				Y	Y
8	A	189061A	1	3	MS-PS4-1			Y	Y	Y
8	A	189061A	2	1	MS-PS4-2			Y		Y
8	A	189061A	3	2	MS-PS4-1			Y	Y	Y
8	A	189061A	4	1	MS-PS4-1			Y	Y	
8	A	189076A	1	2	MS-PS4-1			Y	Y	Y
8	A	189076A	2	1	MS-PS4-1			Y	Y	Y
8	A	189076A	3	1	MS-PS4-1			Y	Y	Y
8	A	189076A	4	2	MS-PS4-1			Y	Y	Y
8	A	189080A	1	2	MS-PS4-1			Y	Y	Y
8	A	189080A	2	1	MS-PS4-3			Y		Y
8	A	189080A	3	3	MS-PS4-1			Y	Y	Y
8	A	189080A	4	2	MS-PS4-1			Y	Y	Y
8	A	189087A	1	1	MS-PS1-5			Y	Y	Y
8	A	189087A	2	3	MS-PS1-X			Y		Y
8	A	189087A	3	1	MS-PS1-5			Y	Y	Y
8	A	189087A	4	1	MS-PS1-5				Y	
8	A	189090A	1	1	MS-PS1-5			Y	Y	Y
8	A	189090A	2	2	MS-PS1-X			Y		Y
8	A	189090A	3	1	MS-PS1-5			Y	Y	Y
8	A	189090A	4	2	MS-PS1-5				Y	
8	A	300070A	1	3	MS-ESS3-4			Y	Y	Y
8	A	300070A	2	3	MS-ESS3-4			Y		
8	A	300070A	3	2	MS-ESS3-4			Y	Y	Y
8	A	300070A	4	1	MS-ESS3-4			Y	Y	Y
8	A	300072A	1	3	MS-ESS3-4			Y	Y	Y
8	A	300072A	2	1	MS-ESS3-1			Y		
8	A	300072A	3	2	MS-ESS3-4			Y	Y	Y
8	A	300072A	4	1	MS-ESS3-4			Y	Y	Y
8	A	300074A	1	2	MS-ESS3-4			Y	Y	Y
8	A	300074A	2	1	MS-LS4-1			Y		
8	A	300074A	3	3	MS-ESS3-4			Y	Y	Y
8	A	300074A	4	2	MS-ESS3-4			Y	Y	Y
8	A	300078A	1	2	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	300078A	2	2	MS-LS4-1			Y		
8	A	300078A	3	3	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	300078A	4	2	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	300080A	1	1	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	300080A	2	2	MS-LS4-1			Y		
8	A	300080A	3	2	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	300080A	4	1	MS-LS4-2	MS-LS4-1		Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
8	A	300081A	1	3	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	300081A	2	1	MS-LS4-1			Y		
8	A	300081A	3	3	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	300081A	4	2	MS-LS4-2	MS-LS4-1		Y	Y	Y
8	A	494074	1	1	MS-ESS1-4			N	N	Y
8	A	494074	2	1	MS-ESS1-4			Y		
8	A	494074	3	2	MS-ESS1-4			Y	Y	Y
8	A	494074	4	3	MS-ESS2-3			Y	Y	
8	A	494236	1	3	MS-PS1-5			Y	Y	Y
8	A	494236	2	3	MS-PS1-X			Y		Y
8	A	494236	3	2	MS-PS1-5			Y	Y	Y
8	A	494236	4	3	MS-PS1-5			Y	Y	Y
8	A	494991	1	2	MS-LS4-1			Y	Y	Y
8	A	494991	2	2	MS-ESS1-4			Y		Y
8	A	494991	3	3	MS-ESS2-3			Y	Y	Y
8	A	494991	4	2	MS-LS4-1			Y	Y	Y
8	BR	186997A	1	1	MS-PS4-1			Y	Y	Y
8	BR	186997A	2	1	MS-PS4-1			Y	Y	Y
8	BR	186997A	3	3	MS-PS4-1			Y	Y	Y
8	BR	186997A	4	1	MS-PS4-1			Y	Y	Y
8	BR	186999A	1	2	MS-PS4-1			Y	Y	Y
8	BR	186999A	2	2	MS-PS4-1			Y	Y	Y
8	BR	186999A	3	2	MS-PS4-1			Y	Y	Y
8	BR	186999A	4	2	MS-PS4-1			Y	Y	Y
8	BR	187000A	1	2	MS-PS4-1			N	Y	Y
8	BR	187000A	2	3	MS-PS4-1			Y	Y	Y
8	BR	187000A	3	1	MS-PS4-1			Y	Y	Y
8	BR	187000A	4	1	MS-PS4-1			Y	Y	Y
8	BR	188250A	1	2	MS-ESS2-3			Y	Y	Y
8	BR	188250A	2	3	MS-ESS2-3			Y		Y
8	BR	188250A	3	1	MS-ESS2-3			Y	Y	Y
8	BR	188250A	4	2	MS-ESS2-3			Y	Y	Y
8	BR	188251A	1	3	MS-ESS2-3			Y	Y	Y
8	BR	188251A	2	3	MS-ESS2-3			Y		Y
8	BR	188251A	3	3	MS-ESS2-3			Y	Y	Y
8	BR	188251A	4	2	MS-ESS2-3			Y	Y	Y
8	BR	188253A	1	2	MS-ESS2-3			Y	Y	Y
8	BR	188253A	2	2	MS-ESS2-3			Y		Y
8	BR	188253A	3	1	MS-ESS2-3			Y	Y	Y
8	BR	188253A	4	2	MS-ESS2-3			Y	Y	Y
8	BR	188838A	1	1	MS-PS2-2			Y	Y	Y
8	BR	188838A	2	2	MS-PS2-1			Y	Y	Y
8	BR	188838A	3	2	MS-PS2-1			Y	Y	Y
8	BR	188838A	4	2	MS-PS2-2	MS-PS2-1		Y		Y
8	BR	188841A	1	2	MS-PS2-2			Y	Y	Y
8	BR	188841A	2	3	MS-PS2-1			Y	Y	Y
8	BR	188841A	3	2	MS-PS2-1			Y	Y	Y
8	BR	188841A	4	1	MS-PS2-2	MS-PS2-1		Y		Y
8	BR	188843A	1	3	MS-PS2-2			Y	Y	Y
8	BR	188843A	2	3	MS-PS2-1			Y	Y	Y
8	BR	188843A	3	3	MS-PS2-1			Y	Y	Y
8	BR	188843A	4	3	MS-PS2-2	MS-PS2-1		Y		Y
8	BR	189095A	1	1	MS-ESS2-3			Y	Y	Y
8	BR	189095A	2	1	MS-ESS2-1			Y		Y
8	BR	189095A	3	2	MS-ESS3-2			Y	Y	Y
8	BR	189095A	4	2	MS-ESS2-3					Y
8	BR	189099A	1	2	MS-ESS2-3			Y	Y	Y
8	BR	189099A	2	3	MS-ESS2-3			Y		Y
8	BR	189099A	3	2	MS-ESS3-2			Y	Y	Y
8	BR	189099A	4	2	MS-ESS2-3					Y
8	BR	189100A	1	2	MS-ESS2-3			Y	Y	Y
8	BR	189100A	2	1	MS-ESS2-3			Y		Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
8	BR	189100A	3	3	MS-ESS3-2			Y	Y	Y
8	BR	189100A	4	1	MS-ESS2-3					Y
8	BR	189438A	1	1	MS-LS4-2			Y	Y	Y
8	BR	189438A	2	1	MS-LS4-1			Y	Y	Y
8	BR	189438A	3	2	MS-LS4-2			Y	N	Y
8	BR	189438A	4	2	MS-LS4-2				Y	Y
8	BR	189440A	1	1	MS-LS4-2			Y	Y	Y
8	BR	189440A	2	1	MS-LS4-1			Y	Y	Y
8	BR	189440A	3	1	MS-LS4-2			Y	Y	Y
8	BR	189440A	4	1	MS-LS4-2				Y	Y
8	BR	189442A	1	1	MS-LS4-2			Y	Y	Y
8	BR	189442A	2	1	MS-LS4-1			Y	Y	Y
8	BR	189442A	3	2	MS-LS4-2			Y	Y	Y
8	BR	189442A	4	2	MS-LS4-2				Y	Y
8	BR	300093A	1	1	MS-ESS2-1			Y	Y	Y
8	BR	300093A	2	2	MS-ESS2-2			Y		Y
8	BR	300093A	3	1	MS-ESS1-4			Y	Y	Y
8	BR	300093A	4	1	MS-ESS2-3					
8	BR	300095A	1	2	MS-ESS2-1			Y	Y	Y
8	BR	300095A	2	3	MS-ESS2-2			Y		Y
8	BR	300095A	3	1	MS-ESS1-4			Y	Y	Y
8	BR	300095A	4	2	MS-ESS2-3				Y	
8	BR	300097A	1	3	MS-ESS2-1			Y	Y	Y
8	BR	300097A	2	2	MS-ESS2-2			Y		Y
8	BR	300097A	3	2	MS-ESS1-4			Y	Y	Y
8	BR	300097A	4	3	MS-ESS2-3					
8	BR	300109A	1	2	MS-ESS3-1			Y	Y	Y
8	BR	300109A	2	2	MS-ESS3-1			Y		Y
8	BR	300109A	3	2	MS-ESS3-1			Y	Y	Y
8	BR	300109A	4	2	MS-ESS2-1			Y	Y	Y
8	BR	300111A	1	2	MS-ESS3-1			Y	Y	Y
8	BR	300111A	2	2	MS-ESS3-1			Y		
8	BR	300111A	3	2	MS-ESS3-1			Y	Y	Y
8	BR	300111A	4	2	MS-ESS2-1			Y	Y	Y
8	BR	300114A	1	3	MS-ESS3-1			Y	Y	Y
8	BR	300114A	2	1	MS-ESS3-1			Y		
8	BR	300114A	3	3	MS-ESS3-1			Y	Y	Y
8	BR	300114A	4	1	MS-ESS2-1			Y	Y	Y
10	A	186821A	1	3	HS-LS2-4			Y	Y	Y
10	A	186821A	2	2	HS-LS2-4			Y	Y	Y
10	A	186821A	3	2	HS-LS2-4			Y	Y	Y
10	A	186821A	4	2	HS-LS2-4	HS-LS2-6		Y	Y	Y
10	A	186828A	1	2	HS-LS2-4			Y	Y	Y
10	A	186828A	2	2	HS-LS2-4			Y	Y	Y
10	A	186828A	3	1	HS-LS2-4			Y	Y	Y
10	A	186828A	4	2	HS-LS2-4			Y	Y	Y
10	A	186834A	1	2	HS-LS2-4			Y	Y	Y
10	A	186834A	2	2	HS-LS2-4			Y	Y	Y
10	A	186834A	3	2	HS-LS2-4			Y	Y	Y
10	A	186834A	4	2	HS-LS2-4			Y	Y	Y
10	A	186972A	1	2	HS-LS1-7			Y	Y	Y
10	A	186972A	2	2	HS-LS1-7			Y	Y	Y
10	A	186972A	3	2	HS-LS1-7			Y	Y	Y
10	A	186972A	4	1	HS-LS1-7			Y	Y	Y
10	A	186989A	1	2	HS-LS1-7			Y	Y	Y
10	A	186989A	2	2	HS-LS1-7			Y	Y	Y
10	A	186989A	3	2	HS-LS1-7			Y	Y	Y
10	A	186989A	4	2	HS-LS1-7			Y	Y	Y
10	A	186992A	1	3	HS-LS1-7			Y	Y	Y
10	A	186992A	2	2	HS-LS1-7			Y	Y	Y
10	A	186992A	3	2	HS-LS1-7			Y	Y	Y
10	A	186992A	4	3	HS-LS1-7			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
10	A	187525A	1	2	HS-LS1-3	HS-LS4-1		Y	Y	Y
10	A	187525A	2	2	HS-LS4-1	HS-LS1-3		Y	Y	Y
10	A	187525A	3	2	HS-LS1-3	HS-LS1-1		Y	Y	Y
10	A	187525A	4	1	HS-LS1-3			Y	Y	Y
10	A	187526A	1	2	HS-LS1-3			Y	Y	Y
10	A	187526A	2	2	HS-LS1-3			Y	Y	Y
10	A	187526A	3	3	HS-LS1-3			Y	Y	Y
10	A	187526A	4	3	HS-LS1-3			Y	Y	Y
10	A	187996A	1	1	HS-LS1-5			Y	Y	Y
10	A	187996A	2	2	HS-LS1-5			Y	Y	Y
10	A	187996A	3	1	HS-LS1-5	HS-LS2-5		Y	Y	Y
10	A	187996A	4	1	HS-LS1-5			Y	Y	Y
10	A	187999A	1	3	HS-LS1-5	HS-LS2-5		Y	Y	Y
10	A	187999A	2	3	HS-LS1-5			Y	Y	Y
10	A	187999A	3	3	HS-LS2-5	HS-LS1-5		Y	Y	Y
10	A	187999A	4	3	HS-LS1-5			Y	Y	Y
10	A	188011A	1	2	HS-LS1-5	HS-LS2-5		Y	Y	Y
10	A	188011A	2	2	HS-LS1-5			Y	Y	Y
10	A	188011A	3	2	HS-LS1-5	HS-LS2-5		Y	Y	Y
10	A	188011A	4	2	HS-LS1-5			Y	Y	Y
10	A	188474A	1	1	HS-LS1-2			Y	Y	Y
10	A	188474A	2	1	HS-LS1-2			Y	Y	Y
10	A	188474A	3	1	HS-LS1-2			Y	Y	Y
10	A	188474A	4	1	HS-LS1-2			Y	Y	Y
10	A	188475A	1	1	HS-LS1-2			Y	Y	Y
10	A	188475A	2	1	HS-LS1-2			Y	Y	Y
10	A	188475A	3	2	HS-LS1-2			Y	Y	Y
10	A	188475A	4	1	HS-LS1-2			Y	Y	Y
10	A	188478A	1	2	HS-LS1-2			Y	Y	Y
10	A	188478A	2	2	HS-LS1-2			Y	Y	Y
10	A	188478A	3	2	HS-LS1-2			Y	Y	Y
10	A	188478A	4	2	HS-LS1-2			Y	Y	Y
10	A	188500A	1	2	HS-LS2-3			Y	Y	Y
10	A	188500A	2	3	HS-LS2-3			Y	Y	Y
10	A	188500A	3	3	HS-LS1-7	HS-LS1-6		Y	Y	Y
10	A	188500A	4	3	HS-LS2-3	HS-LS1-7		Y	Y	Y
10	A	188502A	1	2	HS-LS2-3			Y	Y	Y
10	A	188502A	2	3	HS-LS2-3			Y	Y	Y
10	A	188502A	3	2	HS-LS1-7	HS-LS2-3		Y	Y	Y
10	A	188502A	4	2	HS-LS1-7			N	Y	Y
10	A	188503A	1	2	HS-LS2-3			Y	Y	Y
10	A	188503A	2	3	HS-LS2-3			Y	Y	Y
10	A	188503A	3	2	HS-LS1-7	HS-LS2-3		Y	Y	Y
10	A	188503A	4	3	HS-LS2-3			Y	Y	Y
10	A	188544A	1	2	HS-LS3-2			Y	Y	Y
10	A	188544A	2	3	HS-LS4-5			Y	Y	Y
10	A	188544A	3	2	HS-LS4-5	HS-LS3-2		Y	Y	Y
10	A	188544A	4	2	HS-LS4-3	HS-LS4-5		Y	Y	Y
10	A	188545A	1	2	HS-LS4-4			Y	Y	Y
10	A	188545A	2	3	HS-LS4-5			Y	Y	Y
10	A	188545A	3	2	HS-LS4-5	HS-LS3-3		Y	Y	Y
10	A	188545A	4	3	HS-LS4-4	HS-LS4-2		Y	Y	Y
10	A	188546A	1	3	HS-LS4-5			Y	Y	Y
10	A	188546A	2	3	HS-LS4-5			Y	Y	Y
10	A	188546A	3	2	HS-LS4-5	HS-LS3-3	HS-LS3-2	Y	Y	Y
10	A	188546A	4	3	HS-LS4-4			Y	Y	Y
10	A	188647A	1	3	HS-LS3-2	HS-LS4-5		Y	Y	Y
10	A	188647A	2	3	HS-LS3-2			Y	Y	Y
10	A	188647A	3	2	HS-LS3-2			Y	Y	Y
10	A	188647A	4	3	HS-LS3-2			Y	Y	Y
10	A	188649A	1	3	HS-LS3-2	HS-LS4-5		Y	Y	Y
10	A	188649A	2	3	HS-LS3-2			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
10	A	188649A	3	3	HS-LS3-2			Y	Y	Y
10	A	188649A	4	2	HS-LS4-5			Y	Y	Y
10	A	188653A	1	2	HS-LS3-2	HS-LS4-5		Y	Y	Y
10	A	188653A	2	3	HS-LS3-2			Y	Y	Y
10	A	188653A	3	2	HS-LS3-2	HS-LS3-1		Y	Y	Y
10	A	188653A	4	2	HS-LS4-2			Y	Y	Y
10	A	188657A	1	2	HS-LS2-6			N	Y	Y
10	A	188657A	2	2	HS-LS4-5			Y	Y	Y
10	A	188657A	3	3	HS-LS4-2	HS-LS2-1	HS-LS4-5	Y	Y	Y
10	A	188657A	4	2	HS-LS2-2	HS-LS2-1		Y	Y	Y
10	A	188658A	1	2	HS-LS2-6			Y	Y	Y
10	A	188658A	2	2	HS-LS4-5			Y	Y	Y
10	A	188658A	3	2	HS-LS4-2	HS-LS4-5		Y	Y	Y
10	A	188658A	4	3	HS-LS2-1			Y	Y	Y
10	A	188659A	1	3	HS-LS2-6			Y	Y	Y
10	A	188659A	2	3	HS-LS4-5			Y	Y	Y
10	A	188659A	3	3	HS-LS4-2	HS-LS4-5		Y	Y	Y
10	A	188659A	4	3	HS-LS2-2	HS-LS2-6		Y	Y	Y
10	A	188833A	1	2	HS-LS3-3			N	Y	Y
10	A	188833A	2	2	HS-LS3-3			Y	Y	Y
10	A	188833A	3	3	HS-LS4-2	HS-LS2-2		Y	Y	Y
10	A	188833A	4	3	HS-LS4-3			Y	Y	Y
10	A	188834A	1	2	HS-LS3-2	HS-LS4-2		Y	Y	Y
10	A	188834A	2	2	HS-LS3-2			Y	Y	Y
10	A	188834A	3	2	HS-LS4-2			Y	Y	Y
10	A	188834A	4	2	HS-LS4-5			Y	Y	Y
10	A	188835A	1	2	HS-LS3-2	HS-LS4-5		Y	Y	Y
10	A	188835A	2	2	HS-LS3-2			Y	Y	Y
10	A	188835A	3	2	HS-LS4-2			Y	Y	Y
10	A	188835A	4	3	HS-LS4-5	HS-LS4-4		Y	Y	Y
10	A	188964A	1	2	HS-LS2-1			Y	Y	Y
10	A	188964A	2	2	HS-LS2-1			Y	Y	Y
10	A	188964A	3	2	HS-LS2-1			Y	Y	Y
10	A	188964A	4	2	HS-LS2-1			N	Y	Y
10	A	188965A	1	3	HS-LS2-6			Y	Y	Y
10	A	188965A	2	3	HS-LS2-6			Y	Y	Y
10	A	188965A	3	3	HS-LS2-6			Y	Y	Y
10	A	188965A	4	3	HS-LS2-6			Y	Y	Y
10	A	188970A	1	2	HS-LS2-1			Y	Y	Y
10	A	188970A	2	2	HS-LS2-1			Y	Y	Y
10	A	188970A	3	2	HS-LS2-1			Y	Y	Y
10	A	188970A	4	2	HS-LS2-1			N	Y	Y
10	A	189393A	1	2	HS-LS2-2			Y	Y	Y
10	A	189393A	2	2	HS-LS2-6			Y	Y	Y
10	A	189393A	3	2	HS-LS2-6	HS-LS2-1	HS-LS4-2	Y	Y	Y
10	A	189393A	4	3	HS-LS2-2	HS-LS2-6		Y	Y	Y
10	A	189394A	1	2	HS-LS2-2	HS-LS2-6		Y	Y	Y
10	A	189394A	2	2	HS-LS2-6			Y	Y	Y
10	A	189394A	3	2	HS-LS2-6	HS-LS4-2		Y	Y	Y
10	A	189394A	4	2	HS-LS2-2			Y	Y	Y
10	A	189414A	1	3	HS-LS4-5			Y	Y	Y
10	A	189414A	2	3	HS-LS4-5			Y	Y	Y
10	A	189414A	3	2	HS-LS4-4	HS-LS4-5	HS-LS4-2	Y	Y	Y
10	A	189414A	4	3	HS-LS4-2	HS-LS2-2		Y	Y	Y
10	A	189415A	1	3	HS-LS4-4			Y	Y	Y
10	A	189415A	2	2	HS-LS4-5			Y	Y	Y
10	A	189415A	3	3	HS-LS4-4	HS-LS4-5	HS-LS4-2	Y	Y	Y
10	A	189415A	4	3	HS-LS2-6	HS-LS2-2		Y	Y	Y
10	A	189421A	1	4	HS-LS3-1			Y	Y	Y
10	A	189421A	2	3	HS-LS3-3			Y	Y	Y
10	A	189421A	3	2	HS-LS3-1	HS-LS3-3		Y	Y	Y
10	A	189421A	4	4	HS-LS3-1			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
10	A	189423A	1	3	HS-LS3-2			Y	Y	Y
10	A	189423A	2	3	HS-LS3-3			Y	Y	Y
10	A	189423A	3	3	HS-LS3-1	HS-LS3-3		Y	Y	Y
10	A	189423A	4	2	HS-LS3-1			Y	Y	Y
10	A	189425A	1	2	HS-LS3-3			N	N	Y
10	A	189425A	2	3	HS-LS3-3			Y	Y	Y
10	A	189425A	3	2	HS-LS3-1	HS-LS3-2		Y	Y	Y
10	A	189425A	4	3	HS-LS3-1			Y	Y	Y
10	A	189597A	1	1	HS-LS1-1			Y	N	Y
10	A	189597A	2	1	HS-LS1-1			Y	Y	Y
10	A	189597A	3	2	HS-LS1-1	HS-LS1-2		Y	Y	Y
10	A	189597A	4	1	HS-LS1-1			Y	Y	Y
10	A	300014A	1	2	HS-LS1-1			Y	Y	Y
10	A	300014A	2	2	HS-LS1-1			N	Y	N
10	A	300014A	3	2	HS-LS1-1			Y	Y	Y
10	A	300014A	4	3	HS-LS1-1			Y	Y	Y
10	A	300028A	1	1	HS-LS1-1			Y	Y	N
10	A	300028A	2	1	HS-LS1-1			N	Y	N
10	A	300028A	3	2	HS-LS1-1			Y	Y	Y
10	A	300028A	4	2	HS-LS1-1			Y	Y	Y
10	A	493046	1	3	HS-LS4-5	HS-LS1-3		N	Y	Y
10	A	493046	2	3	HS-LS4-5			Y	Y	Y
10	A	493046	3	4	HS-LS1-3			Y	Y	Y
10	A	493046	4	3	HS-LS1-3			Y	Y	Y
10	A	493306	1	3	HS-LS2-2			Y	Y	Y
10	A	493306	2	3	HS-LS2-6			Y	Y	Y
10	A	493306	3	3	HS-LS2-6	HS-LS4-2		Y	Y	Y
10	A	493306	4	2	HS-LS2-2	HS-LS2-6		N	Y	Y
10	A	493561	1	4	HS-LS4-4	HS-LS4-5		Y	Y	Y
10	A	493561	2	3	HS-LS4-5			Y	Y	Y
10	A	493561	3	4	HS-LS4-4	HS-LS4-5		Y	Y	Y
10	A	493561	4	2	HS-LS4-2	HS-LS2-6		Y	Y	Y
10	BR	187933A	1	2	HS-LS1-3			Y	Y	Y
10	BR	187933A	2	2	HS-LS1-3			Y	Y	Y
10	BR	187933A	3	2	HS-LS2-3			Y	Y	Y
10	BR	187933A	4	3	HS-LS1-3			Y	Y	Y
10	BR	187934A	1	2	HS-LS1-3			Y	Y	Y
10	BR	187934A	2	2	HS-LS1-3			Y	Y	Y
10	BR	187934A	3	2	HS-LS2-3			Y	Y	Y
10	BR	187934A	4	3	HS-LS1-3			Y	Y	Y
10	BR	187938A	1	2	HS-LS1-3			Y	Y	Y
10	BR	187938A	2	2	HS-LS1-3			Y	Y	Y
10	BR	187938A	3	3	HS-LS2-3			Y	N	Y
10	BR	187938A	4	2	HS-LS1-3			Y	N	N
10	BR	187974A	1	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	187974A	2	3	HS-LS4-5			Y	Y	Y
10	BR	187974A	3	3	HS-LS4-2	HS-LS4-4		Y	Y	Y
10	BR	187974A	4	3	HS-LS4-4			Y	Y	Y
10	BR	187978A	1	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	187978A	2	3	HS-LS4-4			Y	Y	Y
10	BR	187978A	3	2	HS-LS4-1	HS-LS4-2		Y	Y	Y
10	BR	187978A	4	2	HS-LS4-3			Y	Y	Y
10	BR	187985A	1	2	HS-LS4-4	HS-LS4-5		Y	Y	Y
10	BR	187985A	2	3	HS-LS4-4			Y	Y	Y
10	BR	187985A	3	3	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	187985A	4	3	HS-LS4-4	HS-LS4-3		Y	Y	Y
10	BR	188070A	1	1	HS-LS1-4			Y	Y	Y
10	BR	188070A	2	2	HS-LS1-4			Y	Y	Y
10	BR	188070A	3	1	HS-LS1-4			Y	Y	Y
10	BR	188070A	4	2	HS-LS1-4			Y	Y	Y
10	BR	188072A	1	1	HS-LS1-4			Y	Y	Y
10	BR	188072A	2	2	HS-LS1-4			Y	Y	Y

					Panelist Aligned			Dimension Link		
Grade	Form Rated On	Item ID	Reviewer	DOK	PE1	PE2	PE3	D1	D2	D3
10	BR	188072A	3	2	HS-LS1-4			Y	Y	Y
10	BR	188072A	4	3	HS-LS1-4			Y	Y	Y
10	BR	188075A	1	2	HS-LS1-4			Y	Y	Y
10	BR	188075A	2	2	HS-LS1-4			Y	Y	Y
10	BR	188075A	3	3	HS-LS1-4			Y	Y	Y
10	BR	188075A	4	3	HS-LS1-4			Y	Y	Y
10	BR	189104A	1	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	189104A	2	3	HS-LS3-2			Y	Y	Y
10	BR	189104A	3	2	HS-LS4-4	HS-LS4-2		Y	Y	Y
10	BR	189104A	4	1	HS-LS4-3			Y	Y	Y
10	BR	189105A	1	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	189105A	2	3	HS-LS3-2			Y	Y	Y
10	BR	189105A	3	3	HS-LS4-4	HS-LS4-3		Y	Y	Y
10	BR	189105A	4	2	HS-LS2-1			Y	Y	Y
10	BR	189106A	1	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	189106A	2	2	HS-LS3-2			Y	Y	Y
10	BR	189106A	3	2	HS-LS4-4			Y	Y	Y
10	BR	189106A	4	3	HS-LS2-6			Y	Y	Y
10	BR	189220A	1	2	HS-LS4-1			Y	Y	Y
10	BR	189220A	2	3	HS-LS4-1			Y	Y	Y
10	BR	189220A	3	2	HS-LS4-1	HS-LS4-4		Y	Y	Y
10	BR	189220A	4	3	HS-LS4-1			Y	Y	Y
10	BR	189223A	1	2	HS-LS3-2	HS-LS4-1		Y	Y	Y
10	BR	189223A	2	3	HS-LS4-2			Y	Y	Y
10	BR	189223A	3	3	HS-LS4-1	HS-LS4-4		Y	Y	Y
10	BR	189223A	4	3	HS-LS4-1			Y	Y	Y
10	BR	189224A	1	3	HS-LS4-1			Y	Y	Y
10	BR	189224A	2	3	HS-LS4-1			Y	Y	Y
10	BR	189224A	3	2	HS-LS4-1	HS-LS4-4		Y	Y	N
10	BR	189224A	4	2	HS-LS4-1			Y	Y	Y
10	BR	189383A	1	1	HS-LS2-5			Y	Y	Y
10	BR	189383A	2	3	HS-LS2-5			Y	Y	Y
10	BR	189383A	3	1	HS-LS2-5	HS-LS1-5		Y	Y	Y
10	BR	189383A	4	2	HS-LS2-5			Y	Y	Y
10	BR	189384A	1	3	HS-LS2-5			Y	Y	Y
10	BR	189384A	2	3	HS-LS2-5			Y	Y	Y
10	BR	189384A	3	3	HS-LS2-5			Y	Y	Y
10	BR	189384A	4	3	HS-LS2-5			Y	Y	Y
10	BR	189387A	1	3	HS-LS2-5			Y	Y	Y
10	BR	189387A	2	3	HS-LS2-5			Y	Y	Y
10	BR	189387A	3	2	HS-LS2-5			Y	Y	Y
10	BR	189387A	4	3	HS-LS2-5			Y	Y	Y
10	BR	189403A	1	2	HS-LS4-3	HS-LS4-4		Y	Y	Y
10	BR	189403A	2	3	HS-LS4-4			Y	Y	Y
10	BR	189403A	3	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	189403A	4	3	HS-LS4-4			Y	Y	Y
10	BR	189407A	1	1	HS-LS4-2			Y	Y	Y
10	BR	189407A	2	3	HS-LS4-4			Y	Y	Y
10	BR	189407A	3	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	189407A	4	2	HS-LS4-4			Y	Y	Y
10	BR	189408A	1	1	HS-LS4-3			Y	Y	Y
10	BR	189408A	2	3	HS-LS4-4			Y	Y	Y
10	BR	189408A	3	2	HS-LS4-2	HS-LS4-3		Y	Y	Y
10	BR	189408A	4	4	HS-LS4-5			Y	Y	Y

Appendix E.

Alignment Workshop Materials

The documents included in this appendix were used by panelists during the alignment workshop.

Panelist Instructions ELA and Math

OSDE ELA and Math Alignment Study
Panelist Instructions

	Rating Task	Documents Needed	File Format
1	Standards Objectives Consensus	(1) OSDE Standards Objectives	Print copy
		(2) OSDE Panelist Instructions	Print copy
		(3) OSDE PEs_DOKConsensus_panelgroup	Excel (Group lead)
		(4) OSDE Objectives DOK rating form	Print copy
2	OSDE Item Rating - Independent	(1) OSDE Standards Objectives	Print copy
		(2) OSDE Panelist Instructions	Print copy
		(3) OSDE_itemRating_panelgroup	Excel
		(4) OSDE Items	Paper
3	OSDE Debrief/Evaluation	(1) OSDE Debriefing/Evaluation Form	Print copy

Prior to alignment steps:

1. Introductions
2. Review all of the materials:
   a. Laptops for recording ratings in Excel
   b. Panelist Instructions
   c. OSDE Standards Objectives
   d. OSDE Objectives DOK rating form
3. Additional documents will be handed out as needed
   a. OSDE items on paper
   b. OSDE Debriefing and Evaluation form

Task 1 OSDE Standard Objectives DOK Rating (Consensus)

Task preparation:

1. Facilitator will introduce the task of assigning DOK ratings to testable standards' objective.
2. Documents needed are:
   a. OSDE Standard Objectives
   b. OSDE Panelist Instructions
   c. Any notes from the general training
   d. OSDE Objectives DOK rating form
   e. Review the DOK ratings: Look at the DOK definitions starting on page 3, for math or ELA/Writing and Webb/Bloom DOK comparison matrix, page 5, which will be the basis for the discussion with the facilitator.

Conduct Task:

1. The facilitator will ask for a volunteer from your group to help them move the group through the task and enter the group's consensus rating for each standard objective.
2. Using the DOK definitions, everyone will rate the first few objectives individually, record their ratings on the paper rating form, then discuss them as a group. The rules are:
   a. **If the your group doesn't fully agree, then majority rules.**
   b. **If there is an exact split between your group members, then the higher level prevails.**
3. Continue until all objectives for all grades have been completed

2 Rate OSDE Items

Train Preparation:

1. The facilitator will explain the process for this task and have everyone open the rating form on their laptop.
   a. Locate the file, provided by the facilitator, on the desktop, double click to open.
   b. "Save As" file name by first adding **undersoore and your 3 initials** to the file name (e.g., OSDE_itemRating_panelgroup_vmn).
2. Form review:
   a. The number of tabs at bottom correspond to the number of grades you will review.
   b. The facilitator will talk discuss each column.
      i. Columns A & B include the item sequence and item number.
      ii. Column C, enter DOK level that best represents the cognitive demand of the item.
      iii. Column D, enter the objective that best matches what the item measures. Use the OSDE Standards Objective document.
      iv. Column E, determine the level of quality content match between the item and the objective. We anticipate a "0" would be very rare. If you are unable to find a primary objective, determine if the item can link at the standard level and talk with your facilitator. In column I, document what content the item measures that isn't in an any objective.
      v. Column F, enter a second objective, if you feel it matches nearly as well as the primary objective, this will be fairly uncommon. You must provide an explanation. Column G, describing the content that the item measures which is not part of the primary objective selected. We expect it to be extremely rare that you would have 3 objectives. Column H, and that requires a full explanation. Column I, how one item measures 3 objectives equally well.

Conduct Task:

1. You will first rate an item independently for DOK and Objective – primary then the group will discuss.
2. After the first few items, you will work independently until the task has been completed for all test items for all grades.

3 OSDE Debrief

Conduct Task:

1. The facilitator will hand out the OSDE Debriefing Form.
2. Complete the form front and back and insert it into the envelope provided by the facilitator.

Support Materials

DOK Definitions (applied to Math)

Level 1 (recall): Level 1 includes the recall of information such as a fact, definition, term, or a simple procedure, as well as performing a simple algorithm or applying a formula. That is, in mathematics a one-step, well-defined, and straight algorithmic procedure should be included at this lowest level.

With regard to items, students may be asked to calculate or solve by a simple formula. A student answering a Level 1 item either knows the answer or does not: that is, the answer does not need to be "figured out" or "solved."

Standards objectives or items at this level may include words such as *recall, recognize, use, measure, and identify*.

Examples: Solve a one-step problem, represent math relationships in words, pictures, or symbols, or locate points on a grid or number line.

Level 2 (skill/concept): Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response. The content knowledge or process involved is more complex than in level 1. Students are required to make some decisions as to how to approach the question or problem. These actions imply more than one step. Caution is warranted in interpreting Level 2 as ONLY skills and exclude cognitive processing such as visualization and using probability.

With regard to items, involves students to make some decisions as to how to approach the problem or activity, interpreting information from a simple graph, or classifying/organizing data.

Standards objectives or items at this level may include words such as *estimate, make observations, display, classify, organize*, and *collect, display*, or *compare data*.

Examples: determine the first step needed to solve this problem or organize or display data in tables, graphs, and charts.

Level 3 (strategic thinking): Level 3 requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. The cognitive demands at Level 3 are complex and abstract. The complexity does not result only from possible multiple answers, but because a multi-step task requires more demanding reasoning.

With regard to items, requiring students to explain their thinking is at Level 3 such as an activity that has more than one possible answer and requires students to justify the response they give.

Standards objectives or items at this level may include words such as *interpret, analyze, verify, justify*, and *cite evidence*.

Examples: solve non-routine problems, determine which data should be used from this graph to solve problem, describe what the data in the graph indicate.

Level 4 (extended thinking): Level 4 requires complex reasoning, experimental design and planning, and could require an extended period of time for carrying out the multiple steps of an assessment item. The cognitive demand is high and complex by making several connections.

Standards objectives or items at this level may include words such as *analyze, synthesize*, and *evaluate*.

Examples: analyze and apply multisource information to explain the results of the data displayed, critique how similar problems were solved using different approaches, design a mathematical model to inform and solve a practical or abstract situation.

DOK Definitions (applied to ELA and Writing)

Level 1 (recall and reproduction): Level 1 requires students to receive, recite or write facts or to use simple skills or abilities. Oral reading that does not include analysis of the text as well as basic comprehension of a text is included. The students are engaged in listing ideas or words prior to written composition and are expected to use appropriate grammar, punctuation, capitalization, and spelling.

With regard to items, identify or write only a shallow understanding of text presented and often consist of verbatim recall from text or simple understanding of a single word or phrase.

Standards objectives or items at this level may include words such as *recall, recognize, locate, and identify*.

Examples: use a dictionary to find the meaning of words, identify figurative language in a reading passage, identify details explicitly stated in the passage, use punctuation marks correctly.

Level 2 (skill/concept): Level 2 includes the engagement of some mental processing beyond recalling, reproducing, or writing a response; it requires both comprehension and subsequent processing of text or portions of text. Inter-sentence analysis of inference is required. Students are beginning to connect ideas using a simple organizational structure. Some important concepts are covered but not in a complex way. Literal main ideas are stressed.

With regard to items, may require students to apply some of the skills and concepts that are covered in Level 1; however, items require closer understanding of text, possibly through the item's paraphrasing of both the question and the answer.

Standards objectives or items at this level may include words such as *summarize, interpret, infer, classify, organize, collect, display, compare*, and *determine fact or opinion*.

Examples: use context cues to identify the meaning of unfamiliar words, predict a logical outcome based on information in a reading selection, identify and summarize the major events in a narrative, construct compound sentences, use simple organizational strategies to structure written work, write summaries that contain the main idea and pertinent details.

Level 3 (strategic thinking): Deep knowledge becomes more of a focus at Level 3. Students are encouraged to go beyond the text; however, they are still required to show understanding of the ideas in the text. Student are developing compositions that include multiple paragraphs. Students may be encouraged to write, explain, generalize, or connect ideas. Students must be able to support their thinking. They will address chronological order in a narrative or support facts and details in informational writing.

With regard to items, they involve reasoning and planning and abstract theme identification, inference across an entire passage, or students' application of prior knowledge. edit and revise compositions.

Standards objectives or items at this level may include words such as *interpret, analyze, verify, justify*, and *cite evidence*.

Examples: determine the author's purpose and describe how it affect the interpretation of a reading selection, summarize information from multiple sources to address a specific topic, analyze and describe the characteristics of various types of literature, support ideas with details and examples, use voice appropriate to the purpose and audience.

Level 4 (extended thinking): Higher order thinking is central and knowledge is deep at Level 4. The standard at this level may describe an extended activity, with extended time provided to apply significant conceptual understanding and higher-order thinking, multi-paragraph composition demonstrating syntheses and analysis.

With regard to items, they may involve taking information from at least one passage and are asked to apply this information to a new task, develop hypotheses and perform complex analyses of the connections among texts, stimulate the reader to consider new perspectives.

Standards objectives or items at this level may include words such as *analyze, synthesize*, and *evaluate*.

Examples: analyze and synthesize information from multiple sources, examine and explain alternative perspectives across a variety of sources, describe and illustrate how common themes are found across texts from different cultures, write an analysis of two selections and identify the common theme and generating a purpose that is appropriate for both.

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Hess' Cognitive Rigor Matrix & Curricular Examples: Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions – *M-Sci*

Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts	Webb's DOK Level 3 Strategic Thinking/ Reasoning	Webb's DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	○ Recall, observe, & recognize facts, principles, properties ○ Recall/ identify conversions among representations or numbers (e.g., customary and metric measures)			
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion (such as from examples given), predict, compare/contrast, match like ideas, explain, construct models	○ Evaluate an expression ○ Locate points on a grid or number on number line ○ Solve a one-step problem ○ Represent math relationships in words, pictures, or symbols ○ Read, write, compare decimals in scientific notation	○ Specify and explain relationships (e.g., non-examples/examples; cause-effect) ○ Make and record observations ○ Explain steps followed ○ Summarize results or concepts ○ Make basic inferences or logical predictions from data/observations ○ Use models /diagrams to represent or explain mathematical concepts ○ Make and explain estimates	○ Use concepts to solve non-routine problems ○ Explain, generalize, or connect ideas using supporting evidence ○ Make and justify conjectures ○ Explain thinking when more than one response is possible ○ Explain phenomena in terms of concepts	○ Relate mathematical or scientific concepts to other content areas, other domains, or other concepts ○ Develop generalizations of the results obtained and the strategies used (from investigation or readings) and apply them to new problem situations
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task	○ Follow simple procedures (recipe-type directions) ○ Calculate, measure, apply a rule (e.g., rounding) ○ Apply algorithm or formula (e.g., area, perimeter) ○ Solve linear equations ○ Make conversions among representations or numbers, or within and between customary and metric measures	○ Select a procedure according to criteria and perform it ○ Solve routine problem applying multiple concepts or decision points ○ Retrieve information from a table, graph, or figure and use it solve a problem requiring multiple steps ○ Translate between tables, graphs, words, and symbolic notations (e.g., graph data from a table) ○ Construct models given criteria	○ Design investigation for a specific purpose or research question ○ Conduct a designed investigation ○ Use concepts to solve non-routine problems ○ Use & show reasoning, planning, and evidence ○ Translate between problem & symbolic notation when not a direct translation	○ Select or devise approach among many alternatives to solve a problem ○ Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results
Analyze Break into constituent parts, determine how parts relate; differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct	○ Retrieve information from a table or graph to answer a question ○ Identify whether specific information is contained in graphic representations (e.g., table, graph, T-chart, diagram) ○ Identify a pattern/trend	○ Categorize, classify materials, data, figures based on characteristics ○ Organize or order data ○ Compare/ contrast figures or data ○ Select appropriate graph and organize & display data ○ Interpret data from a simple graph ○ Extend a pattern	○ Compare information within or across data sets or texts ○ Analyze and draw conclusions from data, citing evidence ○ Generalize a pattern ○ Interpret data from complex graph ○ Analyze similarities/differences between procedures or solutions	○ Analyze multiple sources of evidence ○ Analyze complex/abstract themes ○ Gather, analyze, and evaluate information
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique			○ Cite evidence and develop a logical argument for concepts or solutions ○ Describe, compare, and contrast solution methods ○ Verify reasonableness of results	○ Gather, analyze, & evaluate information to draw conclusions ○ Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns/structures; generate, hypothesize, design, plan, construct, produce	○ Brainstorm ideas, concepts, or perspectives related to a topic	○ Generate conjectures or hypotheses based on observations or prior knowledge and experience	○ Synthesize information within one data set, source, or text ○ Formulate an original problem given a situation ○ Develop a scientific/mathematical model for a complex situation	○ Synthesize information across multiple sources or texts ○ Design a mathematical model to inform and solve a practical or abstract situation

Panelist Instructions Science

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OSDE Science Alignment Study
Panelist Instructions

	Rating Task	Documents Needed	File Format
1	Standards-Performance Expectations (PEs) Consensus	(1) OSDE Standards-Performance Expectations (PEs)	Print copy
		(2) OSDE Panelist Instructions	Print copy
		(3) OSDE PEs_DOKConsensus_panelgroup	Excel (Group lead)
		(4) OSDE Performance Expectations DOK rating form	Print copy
2	OSDE Item Rating - Independent	(1) OSDE Standards-Performance Expectations (PEs)	Print copy
		(2) OSDE Panelist Instructions	Print copy
		(3) OSDE_ItemRating_panelgroup	Excel
		(4) OSDE Items	Paper
3	OSDE Debrief/Evaluation	(1) OSDE Debriefing/Evaluation Form	Print copy

Prior to alignment steps:

1. Introductions
2. Review all of the materials:
   a. Laptops for recording ratings in Excel
   b. Panelist Instructions
   c. OSDE Standards-Performance Expectations (PEs)
   d. OSDE Performance Expectations DOK rating form
3. Additional documents will be handed out as needed
   a. OSDE items on paper
   b. OSDE Debriefing and Evaluation form

Task 1 OSDE Performance Expectations (PEs) DOK Rating (Consensus)

Task preparation:

1. Facilitator will introduce the task of assigning DOK ratings to testable standards' performance expectations.
2. Documents needed are:
   a. OSDE Standards-Performance Expectations (PEs)
   b. OSDE Panelist Instructions
   c. Any notes from the general training
   d. OSDE Performance Expectations DOK rating form
   e. Review the DOK ratings. Look at the DOK definitions provided on page 3, this will be the basis for the discussion with the facilitator.

Conduct Task:

1. The facilitator will ask for a volunteer from your group to help them move the group through the task and enter the group's consensus rating for each standard performance expectation.
2. Using the DOK definitions on page 3, everyone will rate the first few performance expectations individually, record their ratings on the paper rating form, then discuss them as a group. The rules are:
   a. **If the your group doesn't fully agree, then majority rules.**
   b. **If there is an exact split between your group members, then the higher level prevails.**
3. Continue until all performance expectations for all grades have been completed

2 Rate OSDE Items

Train Preparation:

1. The facilitator will explain the process for this task and have everyone open the rating form on their laptop.
   a. Locate the file, provided by the facilitator, on the desktop, double click to open.
   b. "Save As" file name by first adding **underscore and your 3 initials** to the file name (e.g., OSDE_ItemRating_panelgroup_ymq).
2. Form review:
   a. The number of tabs at bottom correspond to the number of grades you will review.
   b. The facilitator will talk discuss each column.
      i. Columns A & B include the item sequence and item number.
      ii. Column C, enter DOK level that best represents the cognitive demand of the item.
      iii. Column D, enter the performance expectation (PE) that best matches what the item measures. Use the OSDE Standards-Performance Expectations (PEs) document.
      iv. Columns E, F, and G are for listing a second or third PE. If you list 3, then explain your reasoning how one item measures 3 expectations equally well in Column G.
   c. Columns H, I, and J (PE Dimensions), type "y" under one or more of the Performance Expectation dimensions. Refer to page 4 and 5.

Conduct Task:

1. You will first rate an item independently for DOK, PE – primary, and PE Dimensions then the group will discuss.
2. After the first few items, you will work independently until the task has been completed for all test items for all grades.

3 OSDE Debrief

Conduct Task:

1. The facilitator will hand out the OSDE Debriefing Form.
2. Complete the form front and back and insert it into the envelope provided by the facilitator.

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Support Materials

DOK Definitions (applied to Science)

Level 1 (recall and reproduction): Level 1 is the recall of information such as a fact, definition, term, or a simple procedure, as well as performing a simple science process or procedure. Level 1 only requires students to demonstrate a rote response, use a well-known formula, follow a set procedure (like a recipe), or perform a clearly defined series of steps. A "simple" procedure is well-defined and typically involves only one-step.

With regard to items, simple word problems that can be directly translated into and solved by a formula are considered Level 1. A student answering a Level 1 item either knows the answer or does not: that is, the answer does not need to be "figured out" or "solved."

Standards-Performance Expectations (PEs) or items at this level may include words such as *recall*, recognize, *locate*, *use*, *calculate*, *measure*, *and identify*.

Examples: recognize or recall a fact or property, represent a scientific concept or relationship through words or diagram, provide or recognize a simple phenomenon, perform a routine procedure.

Level 2 (skill/concept): Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response. The content knowledge or process involved is more complex than in level 1. Students are required to make some decisions as to how to approach the question or problem. These actions imply more than one step. For example, to compare data requires first identifying characteristics of the objects or phenomenon and then grouping or ordering the objects.

With regard to items, interpretation from a complex graph, such as making decisions regarding features of the graph that need to be considered and how information from the graph can be aggregated, is at Level 3.

Standards-Performance Expectations (PEs) or items at this level may include words such as *estimate, make observations, display, classify*, *organize*, and *collect*, *display*, or *compare data*.

Examples: specify and explain facts or properties, describe and explain examples and non-examples of science concepts, select a procedure according to specified criteria, formulate a routine problem given data and conditions or organize and interpret data.

Level 3 (strategic thinking): Level 3 requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. The cognitive demands at Level 3 are complex and abstract. The complexity does not result only from possible multiple answers, but because a multi-step task requires more demanding reasoning.

With regard to items, requiring students to explain their thinking is at Level 3 such as an activity that has more than one possible answer and requires students to justify the response they give. Experimental designs in Level 3 typically involve more than one dependent variable.

Standards-Performance Expectations (PEs) or items at this level may include words such as *interpret*, *analyze*, *verify*, *justify*, and *cite evidence*.

Examples: identify research questions and design investigations for a scientific problem, solve non-routine problems, develop a scientific model for a complex situation, or form conclusions from experimental data.

Level 4 (extended thinking): Level 4 requires complex reasoning, experimental design and planning, and likely could require an extended period of time either for the science investigation required by an objective, or for carrying out the multiple steps of an assessment item. The cognitive demand is high and complex by making several connections. For example, a Level 4 standard might be, "Develop generalizations of the results obtained and the strategies used and apply them to new problem situations."

Standards-Performance Expectations (PEs) or items at this level may include words such as *analyze*, *synthesize*, and *evaluate*.

Examples: analyze and apply multisource information to explain results of an experiment or explain alternative perspectives of competing scientific theories.

NOTE: The Hess cognitive Rigor Matrix is the same as ELA and math

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Hess' Cognitive Rigor Matrix & Curricular Examples: Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions – *M-Sci*

Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts	Webb's DOK Level 3 Strategic Thinking, Reasoning	Webb's DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	• Recall, observe, & recognize facts, principles, properties • Recall/ identify conversions among representations or numbers (e.g., customary and metric measures)			
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion (such as from examples given), predict, compare/contrast, match like ideas, explain, construct models	• Evaluate an expression • Locate points on a grid or number on number line • Solve a one-step problem • Represent math relationships in words, pictures, or symbols • Read, write, compare decimals in scientific notation	• Specify and explain relationships (e.g., non-examples/examples; cause-effect) • Make and record observations • Explain steps followed • Summarize results or concepts • Make basic inferences or logical predictions from data/observations • Use models /diagrams to represent or explain mathematical concepts • Make and explain estimates	• Use concepts to solve non-routine problems • Explain, generalize, or connect ideas using supporting evidence • Make and justify conjectures • Explain thinking when more than one response is possible • Explain phenomena in terms of concepts	• Relate mathematical or scientific concepts to other content areas, other domains, or other concepts • Develop generalizations of the results obtained and the strategies used (from investigation or readings) and apply them to new problem situations
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task	• Follow simple procedures (recipe-type directions) • Calculate, measure, apply a rule (e.g., rounding) • Apply algorithm or formula (e.g., area, perimeter) • Solve linear equations • Make conversions among representations or numbers, or within and between customary and metric measures	• Select a procedure according to criteria and perform it • Solve routine problem applying multiple concepts or decision points • Retrieve information from a table, graph, or figure and use it solve a problem requiring multiple steps • Translate between tables, graphs, words, and symbolic notations (e.g., graph data from a table) • Construct models given criteria	• Design investigation for a specific purpose or research question • Conduct a detailed investigation • Use concepts to solve non-routine problems • Use & show reasoning, planning, and evidence • Translate between problem & symbolic notation when not a direct translation	• Select or devise approach among many alternatives to solve a problem • Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results
Analyze Break into constituent parts, determine how parts relate, determine/ relevant/irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct	• Retrieve information from a table or graph to answer a question • Identify whether specific information is contained in graphic representations (e.g., table, graph, T-chart, diagram) • Identify a pattern/trend	• Categorize, classify materials, data, figures based on characteristics • Organize or order data • Compare/ contrast figures or data • Select appropriate graph and organize & display data • Interpret data from a simple graph • Extend a pattern	• Compare information within or across data sets or texts • Analyze and draw conclusions from data, citing evidence • Generalize a pattern • Interpret data from complex graph • Analyze similarities/differences between procedures or solutions	• Analyze multiple sources of evidence • analyze complex/abstract themes • Gather, analyze, and evaluate information
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique			• Cite evidence and develop a logical argument for concepts or solutions • Describe, compare, and contrast solution methods • Verify reasonableness of results	• Gather, analyze, & evaluate information to draw conclusions • Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce	• Brainstorm ideas, concepts, or perspectives related to a topic	• Generate conjectures or hypotheses based on observations or prior knowledge and experience	• Synthesize information within one data set, source, or text • Formulate an original problem given a situation • Develop a scientific/mathematical model for a complex situation	• Synthesize information across multiple sources or texts • Design a mathematical model to inform and solve a practical or abstract situation

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Science Major Dimensions

Science performance expectations are built around the following three major dimensions.

Science and Engineering Practices...describe the major practices scientists employ as they investigate and build models and theories about the world and what engineers use as they design and build systems.

They include:

1. Ask questions and define problems
2. Develop and use models
3. Plan and conduct investigations
4. Analyze and interpret data
5. Use mathematical and computational thinking
6. Construct explanations and design solutions
7. Engage in scientific argument from evidence
8. Obtain, evaluate, and communicate information

Disciplinary Core Ideas...represent a set of science and engineering ideas for K-12 science education that have broad importance across multiple sciences or engineering disciplines; provide a key tool for understanding or investigating more complex ideas and solving problems; relate to the interests and life experiences of students; be teachable and learnable over multiple grades at increasing levels of sophistication.

They include:

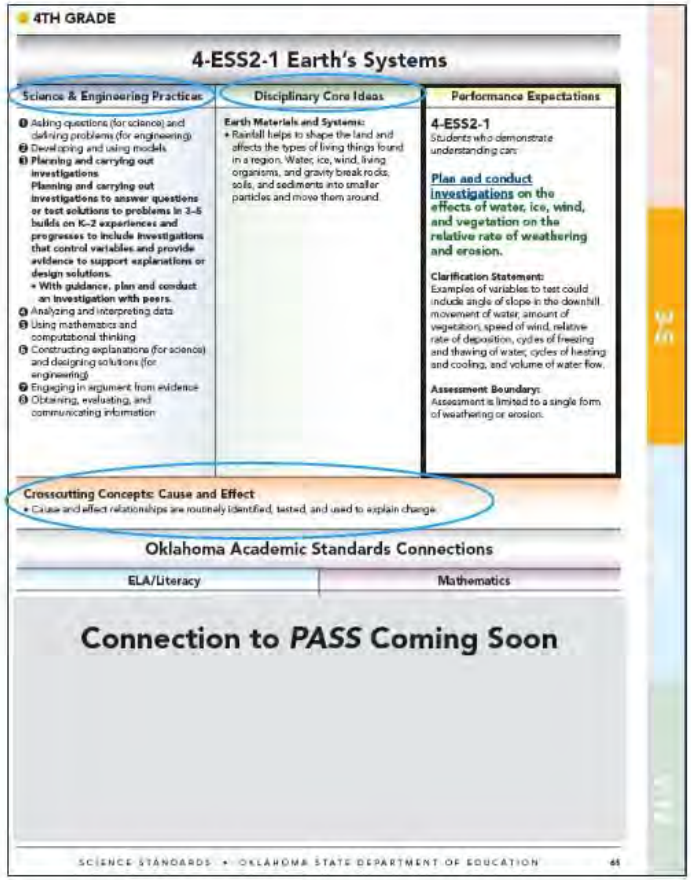
1. Physical Science
2. Life Science
3. Earth and Space Science

Crosscutting Concepts...represent common threads or themes that span across science disciplines (biology, chemistry, physics, environmental science, Earth/space science) and have value to both scientists and engineers because they identify universal properties and processes found in all disciplines.

They include:

1. Patterns
2. Cause and Effect: Mechanism and Explanations
3. Scale, Proportion, and Quantity
4. Systems and System Models
5. Energy and Matter: Flows, cycles, and conservation
6. Structure and Function
7. Stability and Change

See sample Performance Expectation for grade 5 next page



4TH GRADE

4-ESS2-1 Earth's Systems

Science & Engineering Practices	Disciplinary Core Ideas	Performance Expectations
❶ Asking questions (for science) and defining problems (for engineering) ❷ Developing and using models ❸ **Planning and carrying out investigations** **Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.** **• With guidance, plan and conduct an investigation with peers.** ❹ Analyzing and interpreting data ❺ Using mathematics and computational thinking ❻ Constructing explanations (for science) and designing solutions (for engineering) ❼ Engaging in argument from evidence ❽ Obtaining, evaluating, and communicating information	**Earth Materials and Systems:** • Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.	**4-ESS2-1** Students who demonstrate understanding can: **Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.** **Clarification Statement:** Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow. **Assessment Boundary:** Assessment is limited to a single form of weathering or erosion.

Crosscutting Concepts: Cause and Effect
• Cause and effect relationships are routinely identified, tested, and used to explain change.

Oklahoma Academic Standards Connections

ELA/Literacy	Mathematics

Connection to *PASS* Coming Soon

SCIENCE STANDARDS • OKLAHOMA STATE DEPARTMENT OF EDUCATION 65

Workshop Agendas

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Agenda
Oklahoma Alignment Study
ELA/Math Grades 3-5 & 6-8, Science Grades 5 & 8
November 15-17 2016
Sheraton Oklahoma City Downtown

Day 1 Tuesday, November 15		
8:00	9:00	Breakfast (20th Century room)
9:00	10:00	Welcome, Introductions, Logistics, and Alignment Overview Training (20th Century room)
10:00	10:15	Break (move to breakout rooms)
10:15	10:45	Introductions & train OK standards depth of knowledge (DOK) task
10:45	12:00	Begin OK standards DOK task (Consensus)
12:00	12:45	Lunch break (20th Century room)
12:45	3:15	Finish OK standards DOK task (Consensus)
3:15	3:30	Break
3:30	5:30	Train, calibrate, and begin item review task (Individual)
Day 2 Wednesday, November 16		
8:00	9:00	Breakfast (20th Century room)
9:00	10:15	Calibrate and continue item review task (Individual)
10:15	10:30	Break
10:30	12:00	Continue item review task (Individual)
12:00	12:45	Lunch break 30-40 minutes (20th Century room)
12:45	3:15	Continue item review task (Individual)
3:15	3:30	Break
3:30	5:30	Continue item review task (Individual)
Day 3 Wednesday, November 17		
8:00	9:00	Breakfast (20th Century room)
9:00	10:15	Calibrate and continue item review task (Individual)
10:15	10:30	Break
10:30	12:00	Continue item review task (Individual)
12:00	12:45	Lunch break 30-40 minutes (20th Century room)
12:45	3:15	Continue item review task (Individual)
3:15	3:30	Break
3:30	5:10	Finish item review task (Individual)
5:10	5:30	Debrief, process evaluation, adjourn

(NOTE: Breakout out rooms are same as on the High School Agenda)

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Agenda
Oklahoma Alignment Study
High School ELA, Math, and Science
November 15-16 2016
Sheraton Oklahoma City Downtown

Day 1 Tuesday, November 15		
8:00	9:00	Breakfast (20th Century room)
9:00	10:00	Welcome, Introductions, Logistics, and Alignment Overview Training
10:00	10:15	Break (move to breakout rooms)
10:15	10:40	Introductions & train OK standards depth of knowledge (DOK) task
10:40	12:00	Begin OK standards DOK task (Consensus)
12:00	12:45	Lunch break (20th Century room)
12:45	3:15	Finish OK standards DOK task (Consensus)
3:15	3:30	Break
3:30	5:30	Train, calibrate, and begin item review task (Individual)
Day 2 Wednesday, November 16		
8:00	9:00	Breakfast (20th Century room)
9:00	10:15	Calibrate and continue item review task (Individual)
10:15	10:30	Break
10:30	12:00	Continue item review task (Individual)
12:00	12:45	Lunch break 30-40 minutes (20th Century room)
1:00	3:15	Continue item review task (Individual)
3:15	3:30	Break
3:30	5:10	Continue item review task (Individual)
5:10	5:30	Debrief, process evaluation, adjourn

Breakout Rooms

Green Country - ELA grades 3-5 & 6-8

Plaza South - Math grades 3-5 & 6-8

Great Plains - Science Grades 5 & 8

Plaza North - ELA/Math/Science HS

20th Century - Breakfast; General Opening Session; Lunch; Breaks

Panelist Objective Rating Form Sample (Consensus)

Panelists used a paper version of this excel file to record their individual ratings of the standards (objectives or performance expectations). The panelists would then discuss reasons for their ratings to come to a group consensus rating. A panelist volunteer recorded the group consensus rating into the excel file.

Math Grade 6			
Standard Code	DOK	Standard Code	DOK
6.N.1.1		6.A.2.1	
6.N.1.2		6.A.3.1	
6.N.1.3		6.A.3.2	
6.N.1.4		6.GM.1.1	
6.N.1.5		6.GM.1.2	
6.N.1.6		6.GM.1.3	
6.N.2.1		6.GM.2.1	
6.N.2.2		6.GM.2.2	
6.N.2.3		6.GM.3.1	
6.N.3.1		6.GM.3.2	
6.N.3.2		6.GM.4.1	
6.N.3.3		6.GM.4.2	
6.N.3.4		6.GM.4.3	
6.N.4.1		6.GM.4.4	
6.N.4.2		6.D.1.1	
6.N.4.3		6.D.1.2	
6.N.4.4		6.D.1.3	
6.A.1.1		6.D.2.1	
6.A.1.2		6.D.2.2	
6.A.1.3		6.D.2.3	

Panelist Math and ELA Test Item Rating Form Sample (Individual)

Panelists used this excel file to enter their individual ratings for each of the following dimensions.

1. DOK – key the DOK rating number into the cell for each item.
2. OK Standard – key the content objective or performance expectation that best links to what the items measures
3. Quality of Match – key rating number. If the content the items measures is part of the standard (content objective or performance expectation) selected, then it is fully matched. If the item also measures content contain in a secondary standard, then indicate the item is partially matched.
4. If partially or no matched is used, provide the secondary standard number in the next column and state in the explanation column exactly what the additional content is that the item also measures.
5. If the content the item measures isn't fully covered by the two standards selected, provide a third standard and state exactly what the content is that the item also measures.

		Oklahoma Alignment Worksheet: ELA Grade 7						
Item Number	Item ID	Enter Depth of Knowledge (DOK) Rating	Enter Oklahoma Standard	Quality of Content Match	Secondary Standard	Explanation	Additional Standard	Explanation
		1 - Recall 2 - Skill/Concept 3 - Strategic Thinking 4 - Extended Thinking	Select the Oklahoma standard that best matches the content the item measures	0 - No match 1 - Partially matched 2 - Fully matched	If the match is 0 or 1, provide a secondary standard, if appropriate.	If you list a secondary standard, state specifically what content the item measures that is NOT part of the Standard listed.	If the match is 0 or 1, provide an additional standard, if appropriate.	If you list an additional standard, state specifically what content the item measures that is NOT part of the Standard listed.
Form A								
1	158845A							
2	158810A							
3	158826A							
4	485447							
5	158849A							
6	160475A							
7	160498A							
8	160508A							

Panelist Math and ELA Test Item Rating Form Sample (Individual)

Panelists used this excel file to enter their individual ratings for each of the following dimensions.

1. DOK – key the DOK rating number into the cell for each item.
2. OK Standard – key the performance expectation that best links to what the items measures. Should the item measure additional content than the primary performance expectation (PE), provide the other PE number and state what additional content is measured by the item.
3. Key a "y" under the PE Dimension that best indicates what the item is asking the student to do. For example, does the item strictly deal with a content question, then select core idea. Should the item as for the student to do an engineering practice (e.g., use models, interpret data) or procedure that goes across concepts (e.g., pattern, cause and effect) then selection the appropriate dimension. Panelists were advised they could select more than one dimension, if appropriate.

Oklahoma Alignment Item Review: Science Grade 10									
							Performance Expectation Dimensions		
Item	Item Number	Enter Depth of Knowledge (DOK) Rating	Performance Expectation Primary	Performance Expectation Two	Performance Expectation Three	Explanation	Science and Engineering Practices	Crosscutting Concepts	Disciplinary Core Ideas
		1 - Recall 2 - Skill/Concept 3 - Strategic Thinking 4 - Extended Thinking	Select the Performance Expectation that best matches the content the item measures.	Provide a second Performance Expectation, if appropriate.	Provide a third Performance Expectation, if appropriate.	If you listed three Performance Expectations, explain how the item measures three different Performance Expectations equally well.	Enter 'y' if the item targets this specific dimension of the performance expectations.	Enter 'y' if the item targets this specific dimension of the performance expectations.	Enter 'y' if the item targets this specific dimension of the performance expectations.
1	188965A								
2	188970A								
3	188964A								
4	188474A								
5	188475A								
6	188478A								
7	189597A								
8	300014A								
9	300028A								
10	188834A								
11	188833A								

Panelist Alignment Familiarization Training Presentation

Looking Ahead for Today and Beyond…

Agenda

- Roles and the alignment schedule
- OSDE Assessment overview
- Subject and grade spans
- Standards terminology & levels
- Alignment basics and process
- DOK vs. Difficulty
- Rating sheet examples
- Secure web browser
- Debrief and logistics
- Questions

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Looking Ahead for Today and Beyond…

- Roles:
  - HumRRO staff…provide alignment expertise, facilitation, and final research report
  - You, the essential expert panelists…provide the data used to analyze and report alignment findings for OSDE
  - Measured Progress…the assessment contractor for OSDE
- Alignment workshop begins today, November 15 -17:
  - Day 1:
    - Alignment training in large group then into panel groups (10am)
    - Training and conduct DOK ratings and item reviews
  - Day 2:
    - Continue item reviews, HS group finishes this afternoon and provides debrief/evaluation
  - Day 3:
    - Continue item review for Math and ELA
    - Debrief and process evaluation

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OSDE Standards/Assessment - Overview

- General information
  - Grades 3-5 math and ELA, science grade 5 are paper-based
  - All other grades and content areas are computer-delivered (not adaptive)
  - Panelists will review pdfs of five operational test items
  - Each grade or HS content area has 3 test forms
- Panel groups
  - ELA (1 writing prompt, Grades 5, 8, 10)
    - Grade 3-5, per grade standards- 167, items-420
    - Grade 6-8, per grade standards- 159, items-420
  - Math
    - Grade 3-5, per grade standards- 101, items-420
    - Grade 6-8, per grade standards- 104, items-420
  - Science
    - Grade 5, standards- 14, items-60
    - Grade 8, standards- 18, items-60
  - Grade 10 (High School)
    - ELA, standards- 49, items-162
    - Math, standards- 90, items-170
    - Science, standards- 22, items-60

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Standards Terminology and Levels

- Standards implemented for 2016-2017 school year
- Assessment items are aligned to the most specific level of the content standards

	ELA & Math	Math	Science
Broadest	Course	Course	Course
	Standard	Strand	Domain
	Strand or Concept	Standard	Standard
Most Specific	Objective	Objective	Performance Expectation

Alignment Basics and Process

- Define concept of alignment
- Explain why alignment is important
- Understand how alignment is measured
- Understand alignment-related concepts
- Training in panel groups
- Perform alignment task

Alignment Basics

What is Alignment?

"***The degree to which expectations and assessments are in agreement*** and serve in conjunction with one another to guide the system toward students learning what is expected."

-Webb, 2005

Alignment Basics

Why is Alignment Important?

- Fairness for all students…
  - Consistency in general curriculum
  - Accurate assessment of what students can do and are expected to know from State content standards and the curriculum
  - Improves teacher instruction and student learning
- Federal statutes require alignment

Alignment Basics

- Depth of Knowledge/Cognitive Complexity
  - The type of processing required to evaluate material.
- Cognitive Difficulty
  - The level of demand required by material.

Webb DOK Level	Definition
Recall	Requires only a shallow understanding of the text and often consist of verbatim recall
Skill/Concept	Demands both comprehension and subsequent processing or synthesizing
Strategic Thinking	Requires students to reason and engage in complex thinking
Extended Thinking	Requires investigation or research

- Cognitive complexity and cognitive difficulty are correlated buy not equal

11

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Materials and Guidance

- Agenda and training slides
- Additional materials provided in panel groups
  - Instructions
  - Standards
  - Test items
  - Resource materials
- Each panel group will have a HumRRO facilitator to answer questions and guide the alignment process
- Each task will begin with a more detailed review/training in each panel group
- Notes or comments on individual items are allowed
  - Capturing comments may be a secondary goal to alignment – the purpose is NOT to re-write items – item review sessions have already taken place
- Periodic reviews of non-adjacent ratings and calibrations will be conducted in each panel group

14

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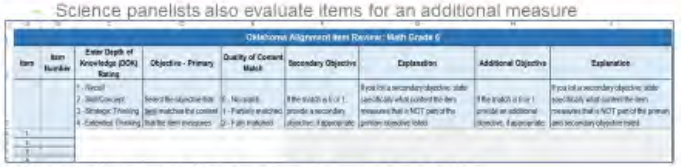
Alignment Process

- OSDE Standards DOK rating (grade level, consensus)
  - Use the OSDE Standards document
  - Individual DOK rating form
  - Rate individually, discuss and come to consensus or majority
- OSDE item rating (grade level, individual)
  - Review paper copies (pdfs) of test items
  - Use OSDE Standards document
  - Provide DOK ratings, link items, and indicate quality of link to standards using Excel
  - Science panelists also evaluate items for an additional measure



- Debriefing and Evaluation form completion.

13

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HUMAN RESOURCES RESEARCH ORGANIZATION

Appendix F.

Reduced Objectives by Content Standard

OSDE provided HumRRO a list of content objectives for each standard that are not currently assessed by multiple choice items on the Oklahoma State Testing Program (OSTP). The standards and objectives noted with a single asterisk indicates, "The content standard is best measured by constructed response items. At this time, there are no items assessing this content standard on the Oklahoma State Testing Program" and the content standard and objectives noted with a double asterisk indicates, "The objective is assessed through the rubric of the writing assessment" (C. Walker, personal communication, 28 February 2017).

Standard	Strand or Concept	Standard Objective
Grade 3		
Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.*	Reading	3.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules.* 3.1.R.2 Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding.* 3.1.R.3 Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly in pairs, diverse groups, and whole class settings.*
	Writing	3.1.W.1 Students will report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences at an appropriate pace.* 3.1.W.2 Students will work respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.*
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.*	Phonological Awareness	NOTE: Students will continue to review and apply earlier grade level expectations for this standard. If phonological awareness skills are not mastered, students will address skills from previous grades.
	Print Concepts	3.2.PC Students will correctly form letters in print and cursive and use appropriate spacing for letters, words, and sentences.*
	Phonics and Word Study	3.2.PWS.1 Students will decode multisyllabic words using their knowledge of: ● "r" controlled vowels (e.g ., ar, er, ir or, ur) ● vowel diphthongs (vowel combinations having two vowel sounds e.g., oi as in boil, oy as in boy]*

Standard	Strand or Concept	Standard Objective
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.*	Phonics and Word Study	3.2.PWS.2 Students will decode multisyllabic words by applying knowledge of structural analysis: ● all major syllable patterns ● contractions ● abbreviations ● common roots and related prefixes and suffixes* 3.2.PWS.3 Students will use decoding skills and semantics in context when reading new words in a text, including multisyllabic words.*
	Fluency	3.2.F.1 Students will read high frequency and/or irregularly spelled grade-level words with automaticity in text.*
		3.2.F.2 Students will orally read grade-level text at an appropriate rate, smoothly and accurately, with expression that connotes comprehension.*
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Reading	3.2.R.1 Students will locate the main idea and key supporting details of a text or section of text. 3.2.R.2 Students will compare and contrast details (e.g., plots or events, settings, and characters) to discriminate genres.
		3.2.R.3 Students will summarize events or plots (i.e., beginning, middle, end, and conflict) of a story or text .
	Writing*	3.2.W.1 Students will develop drafts by categorizing ideas and organizing them into paragraphs using correct paragraph indentations.* 3.2.W.2 Students will edit drafts and revise for clarity and organization.* 3.2.W.3 Students will correctly spell grade-appropriate words while editing.* 3.2.W.4 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, print and electronic dictionaries).*
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	3.3.R.1 Students determine the author's stated and implied purpose (i.e., entertain, inform, persuade).
	Reading	3.3.R.2 Students will infer whether a story is narrated in first or third person point of view in grade-level literary and/or informational text.

Standard	Strand or Concept	Standard Objective
		3.3.R.3 Students will find textual evidence when provided with examples of literary elements and organization: ● setting (i.e., time, place) ● plot ● characters ● characterization ● theme 3.3.R.4 Students will find examples of literary devices: ● simile ● metaphor ● personification ● onomatopoeia ● hyperbole 3.3.R.5 Students will distinguish fact from opinion in a text.
		3.3 R.6 Students will describe the structure of a text (e.g., description, compare/contrast, sequential, problem/solution, cause/effect) with guidance and support. 3.3.R.7 Students will ask and answer inferential questions using the text to support answers with guidance and support.
	Writing*	NARRATIVE - Grade Level Focus 3.3.W.1 Students will write narratives incorporating characters, plot, setting, point of view, and conflict (i.e., solution and resolution).*
		INFORMATIVE3.3.W.2 Students will write facts about a subject, including a main idea with supporting details, and use transitional and signal words.*
		OPINION 3.3.W.3 Students will express an opinion about a topic and provide reasons as support.*
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	3. 4.R.1 Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. 3. 4.R.2 Students will use word parts (e.g., affixes, roots, stems) to define and determine the meaning of new words.

Standard	Strand or Concept	Standard Objective
		3. 4.R.3 Students will use context clues to determine the meaning of words or distinguish among multiple-meaning words. 3. 4.R.4 Students will infer relationships among words, including synonyms, antonyms, homographs, and homonyms. 3. 4.R.5 Students will use a dictionary or glossary (print and/or electronic) to determine or clarify the meanings, syllabication, and pronunciation of words.
	Writing*	3.4.W.1 Students will use domain-appropriate vocabulary to communicate ideas in writing.* 3.4.W.2 Students will select appropriate language according to purpose in writing.*
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	3.5.R.1 Students will recognize pronouns and possessive nouns. 3.5.R.2 Students will recognize irregular and past participle verbs and verb tense to identify settings, times, and sequences in text. 3.5.R.3 Students will recognize adjectives, articles as adjectives, and adverbs. 3.5.R.4 Students will recognize prepositions and conjunctions. 3.5.R.5 Students will recognize the subject and verb agreement.
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Writing	3.5.W.1 Students will capitalize and appropriately punctuate: ● titles of respect ● appropriate words in titles ● geographical names 3.5.W.2 Students will use complex contractions (e.g., should've, won't). 3.5.W.3 Students will compose and expand grammatically correct sentences and questions with appropriate commas, apostrophes, quotation marks, and end marks as needed for dialogue. 3.5.W.4 Students will compose simple, compound and complex declarative, interrogative, imperative, and exclamatory sentences.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	3.6.R.1 Students will use their own questions to find information on their topic. 3.6.R.2 Students will use graphic features including photos, illustrations, captions, titles, labels, headings, subheadings, italics, sidebars, charts, graphs, and legends to define a text. 3.6.R.3 Students will locate information in visual and text reference sources, electronic resources, and/or interviews.

Standard	Strand or Concept	Standard Objective
		3.6.R.4 Students will determine the relevance and reliability of the information for their specific topic of interest with guidance and support.
	Writing*	3.6.W.1 Students will generate a list of topics of interest and individual questions about one specific topic of interest.* 3.6.W.2 Students will organize information found during group or individual research, using graphic organizers or other aids.* 3.6.W.3 Students will summarize and present information in a report.*
Multimodal Literacies- Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.*	Reading	3.7.R.1 Students will locate, organize, and use information from a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal questions.*
	Reading	3.7.R.2 Students will compare how ideas and topics are depicted in a variety of media and formats*
	Writing	3.7.W.1 Students will create multimodal content that communicates an idea using technology or appropriate media.* 3.7.W.2 Students will create presentations using video, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.*
Independent Reading and Writing- Students will read and write for a variety of purposes including, but not limited to, academic and personal.*	Reading	3.8.R Students will select appropriate texts for specific purposes and read independently for extended periods of time.*
	Writing	3.8.W Students will write independently over extended periods of time (e.g., time for reflection and revision) and for shorter timeframes (e.g., a single sitting or a day or two) to communicate with different audiences for a variety of purposes.*
Grade 4		
Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.*	Reading	4.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules.* 4.1.R.2 Students will ask and answer questions to seek help, get information, or clarify information presented orally through text or other media to confirm understanding.* 4.1.R.3 Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.*

Standard	Strand or Concept	Standard Objective
	Writing	4.1.W.1 Students will report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences at an appropriate pace.* 4.1.W.2 Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.*
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.*	Phonological Awareness	Students will continue to review and apply earlier grade level expectations for this standard. If phonological awareness skills are not mastered, students will address skills from previous grades.
	Print Concepts	4.2.PC Students will correctly form letters in print and cursive and use appropriate spacing for letters, words, and sentences.*
	Phonics and Word Study	4.2.PWS.1 Students will use their combined knowledge of letter-sound correspondences, syllable patterns, morphology and semantics to accurately read unfamiliar words, including multisyllabic words.*
	Fluency	4.2.F.1 Students will read high frequency and irregularly spelled grade-level words with automaticity in text.*
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.*	Fluency	4.2.F.2 Students will orally read grade-level text at an appropriate rate, smoothly and accurately, with expression that connotes comprehension.*
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Reading	4.2.R.1 Students will distinguish how key details support the main idea of a passage. 4.2.R.2 Students will compare and contrast details in literary and nonfiction/informational texts to discriminate various genres. 4.2.R.3 Students will summarize events or plots (i.e., beginning, middle, end, conflict, and climax) of a story or text. 4.2.R.4 Students will begin to paraphrase main ideas with supporting details in a text.
	Writing*	4.2.W.1 Students will develop drafts by categorizing ideas and organizing them into paragraphs.* 4.2.W.2 Students will edit drafts and revise for clarity and organization.* 4.2.W.3 Students will correctly spell grade-appropriate words while editing.*

Standard	Strand or Concept	Standard Objective
		4.2.W.4 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	4.3.R.1 Students will determine the author's purpose (i.e., entertain, inform, persuade) and infer the difference between the stated and implied purpose. 4.3.R.2 Students will infer whether a story is narrated in first or third person point of view in grade-level literary and/or informational text.
	Reading	4.3.R.3 Students will describe key literaryelements:● setting● plot● characters (i.e., protagonist,antagonist)● characterization● theme 4.3.R.4 Students will find examples of literary devices: ● simile ● metaphor ● personification ● onomatopoeia ● hyperbole ● imagery ● symbolism* ● tone* *Students will find textual evidence when provided with examples. 4.3.R.5 Students will distinguish fact from opinion in a text and investigate facts for accuracy. 4.3.R.6 Students will describe the structure of a text (e.g., description, compare/contrast, sequential, problem/solution, cause/effect). 4.3.R.7 Students will ask and answer inferential questions using the text to support answers.
	Writing*	NARRATIVE 4.3.W.1 Students will write narratives incorporating characters, plot, setting, point of view, conflict (i.e., solution and resolution), and dialogue*

Standard	Strand or Concept	Standard Objective
		INFORMATIVE - Grade Level Focus 4.3.W.2 Students will write facts about a subject, including a clear main idea with supporting details, and use transitional and signal words.* OPINION 4.3.W.3 Students will express an opinion about a topic and provide fact-based reasons as support.*
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	4. 4.R.1 Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. 4. 4.R.2 Students will use word parts (e.g., affixes, Greek and Latin roots, stems) to define and determine the meaning of new words.
		4. 4.R.3 Students will use context clues to determine the meaning of words or distinguish among multiple-meaning words. 4. 4.R.4 Students will infer relationships among words with multiple meanings, including synonyms, antonyms, and more complex homographs and homonyms. 4. 4.R.5 Students will use a dictionary or glossary (print and/or electronic) to determine or clarify the meanings, syllabication, and pronunciation of words.
	Writing*	4.4.W.1 Students will use domain-appropriate vocabulary to communicate ideas in writing.* 4.4.W.2 Students will select appropriate language to create a specific effect according to purpose in writing.*
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	4.5.R.1 Students will recognize pronouns and irregular possessive nouns. 4.5.R.2 Students will recognize present perfect verbs and verb tense to identify settings, times, sequences, and conditions in text. 4.5.R.3 Students will recognize comparative and superlative adjectives and adverbs.
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	4.5.R.4 Students will recognize prepositional phrases and conjunctions. 4.5.R.5 Students will recognize the subject and verb agreement.
	Writing	4.5.W.1 Students will capitalize ● familial relations ● proper adjectives ● conventions of letter writing

Standard	Strand or Concept	Standard Objective
		4.5.W.2 Students will compose and expand grammatically correct sentences and questions with appropriate commas, end marks, apostrophes, and quotation marks as needed for dialogue. 4.5.W.3 Students will compose simple, compound, and complex sentences and questions, create sentences with an understood subject, and correct fragments and run-on sentences. 4.5.W.4 Students will compose declarative, interrogative, imperative, and exclamatory sentences.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	4.6.R.1 Students will use their own viable research questions to find information about a specific topic. 4.6.R.2 Students will use graphic features including photos, illustrations, captions, titles, labels, headings, subheadings, italics, sidebars, charts, graphs, and legends to interpret a text. 4.6.R.3 Students will determine the relevance and reliability of the information gathered.
	Writing*	4.6.W.1 Students will generate a viable research question about a specific topic.* 4.6.W.2 Students will organize information found during research, following a modified citation style (e.g., author, title, publication date) with guidance and support.*
		4.6.W.3 Students will summarize and present information in a report.*
Multimodal Literacies- Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.*	Reading	4.7.R.1 Students will locate, organize, and analyze information from a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal and interpretive questions to create new understandings.* 4.7.R.2 Students will compare and contrast how ideas and topics are depicted in a variety of media and formats.*
	Writing	4.7.W.1 Students will create multimodal content that effectively communicates an idea using technology or appropriate media.* 4.7.W.2 Students will create presentations using videos, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.*
Independent Reading and Writing- Students will read and write for a variety of purposes including, but not limited to, academic and personal.*	Reading	4.8.R Students will select appropriate texts for specific purposes and read independently for extended periods of time.*
	Writing	4.8.W Students will write independently over extended periods of time (e.g., time for reflection and revision) and for shorter timeframes (e.g., a single sitting or a day or two) to communicate with different audiences for a variety of purposes.*
Grade 5		

Standard	Strand or Concept	Standard Objective
Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.*	Reading	5.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules with awareness of verbal and nonverbal cues.* 5.1.R.2 Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding.* 5.1.R.3 Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.*
	Writing	5.1.W.1 Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content for audience.* 5.1.W.2 Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.*
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.	Fluency	Students will continue to review and apply earlier grade level expectations for this standard. If these fluency skills are not mastered, students will address skills from previous grades.
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Reading	5.2.R.1 Students will create an objective summary, including main idea and supporting details, while maintaining meaning and a logical sequence of events. 5.2.R.2 Students will compare and contrast details in literary and nonfiction/informational texts to distinguish genres.
		5.2.R.3 Students will begin to paraphrase main ideas with supporting details in a text.
	Writing	5.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.** 5.2.W.2 Students will plan (e.g., outline) and prewrite a first draft as necessary.* 5.2.W.3 Students will develop drafts by choosing an organizational structure (e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.) and building on ideas in multi-paragraph essays.** 5.2.W.4 Students will edit and revise multiple drafts for intended purpose (e.g., staying on topic), organization, and coherence.** 5.2.W.5 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*
	Reading	5.3.R.1 Students will determine an author's stated or implied purpose and draw conclusions to evaluate how well the author's purpose was achieved.

Standard	Strand or Concept	Standard Objective
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.		5.3.R.2 Students will determine the point of view and describe how it affects grade-level literary and/or informational text.
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	5.3.R.3 Students will describe and find textual evidence of key literary elements: ● setting ● plot ● characters (i.e., protagonist, antagonist) ● characterization ● theme 5.3.R.4 Students will evaluate literary devices to support interpretations of literary texts: ● simile ● metaphor ● personification ● onomatopoeia ● hyperbole ● imagery ● symbolism* ● tone* *Students will find textual evidence when provided with examples. 5.3.R.5 Students will distinguish fact from opinion in non-fiction text and investigate facts for accuracy.
		5.3.R.6 Students will distinguish the structures of texts (e.g., description,compare/contrast, sequential, problem/solution, cause/effect) and content by making inferences about texts and use textual evidence to support understanding.
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	5.3.R.7 Students will compare and contrast texts and ideas within and between texts.
	Writing	NARRATIVE 5.3.W.1 Students will write narratives incorporating characters, plot, setting, point of view, conflict (i.e., internal, external), and dialogue.*

Standard	Strand or Concept	Standard Objective
		INFORMATIVE - Grade Level Focus 5.3.W.2 Students will introduce and develop a topic, incorporating evidence (e.g., specific facts, examples, details) and maintaining an organized structure.** OPINION 5.3.W.3 Students will clearly state an opinion supported with facts and details.* 5.3.W.4 Students will show relationships among facts, opinions, and supporting details.*
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	5. 4.R.1 Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. 5. 4.R.2 Students will use word parts (e.g., affixes, Greek and Latin roots, stems) to define new words and determine the meaning of new words. 5. 4.R.3 Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. 5. 4.R.4 Students will infer the relationships among words with multiple meanings, including synonyms, antonyms, analogies, and more complex homographs and homonyms.
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.		5. 4.R.5 Students will use a dictionary, glossary, or a thesaurus (print and/or electronic) to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.
	Writing	5.4.W.1 Students will use domain-appropriate vocabulary to communicate ideas in writing clearly.** 5.4.W.2 Students will select appropriate language to create a specific effect according to purpose in writing.**
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	5.5.R.1 Students will recognize conjunctions, prepositions, and interjections and explain their effect in particular sentences. 5.5.R.2 Students will recognize verb tense to signify various times, sequences, states, and conditions in text. 5.5.R.3 Students will recognize the subject and verb agreement.
	Writing	5.5.W.1 Students will write using correct mechanics with a focus on commas, apostrophes, and quotation marks as needed for dialogue and quoted material.
		5.5.W.2 Students will compose simple, compound, and complex sentences and questions, create sentences with an understood subject, and correct fragments and run-on sentences. 5.5.W.3 Students will form and use the present and past verb tenses.

Standard	Strand or Concept	Standard Objective
		5.5.W.4 Students will form and use verb tense to convey various times, sequences, states, and conditions. 5.5.W.5 Students will recognize and correct inappropriate shifts in verb tense.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	5.6.R.1 Students will use their own viable research questions to find information about a specific topic.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	5.6.R.2 Students will record and organize information from various print and/or digital sources. 5.6.R.3 Students will determine the relevance and reliability of the information gathered.
	Writing*	5.6.W.1 Students will write research papers and/or texts independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two)* 5.6.W.2 Students will formulate a viable research question from findings.* 5.6.W.3 Students will organize information found during research, following a modified citation style (e.g., author, title, publication date) with guidance and support.* 5.6.W.4 Students will summarize and present information in a report.*
Multimodal Literacies- Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.*	Reading	5.7.R.1 Students will analyze the characteristics and effectiveness of a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal and interpretive questions to create new understandings.* 5.7.R.2 Students will compare and contrast how ideas and topics are depicted in a variety of media and formats.*
	Writing	5.7.W.1 Students will create multimodal content that effectively communicates an idea using technology and appropriate media.* 5.7.W.2 Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.*
Independent Reading and Writing- Students will read and write for a variety of purposes including, but not limited to, academic and personal.*	Reading	5.8.R Students will select appropriate texts for specific purposes and read independently for extended periods of time.*
	Writing	5.8.W Students will write independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two) to communicate with different audiences for a variety of purposes.*
Grade 6		

Standard	Strand or Concept	Standard Objective
Speaking and Listening* - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.*	Reading	6.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules with awareness of verbal and nonverbal cues.*
		6.1.R.2 Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective.* 6.1.R.3 Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.*
	Writing	6.1.W.1 Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content and purpose for audience.* 6.1.W.2 Students will work effectively and respectfully within diverse groups, share responsibility for collaborative work, and value individual contributions made by each group member.*
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.	Fluency	Students will continue to review and apply earlier grade level expectations for this standard. If these fluency skills are not mastered, students will address skills from previous grades.
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Reading	6.2.R.1 Students will create an objective summary, including main idea and supporting details, while maintaining meaning and a logical sequence of events. 6.2.R.2 Students will analyze details in literary and nonfiction/informational texts to distinguish genres. 6.2.R.3 Students will paraphrase main ideas with supporting details in a text.
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Writing*	6.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.* 6.2.W.2 Students will plan (e.g., outline) and prewrite a first draft as necessary.* 6.2.W.3 Students will develop drafts by choosing an organizational structure (e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.) and building on ideas in multi-paragraph essays.* 6.2.W.4 Students will edit and revise multiple drafts for intended purpose (e.g., staying on topic), organization, coherence, using a consistent point of view.* 6.2.W.5 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*
	Reading	6.3.R.1 Students will compare and contrast stated or implied purposes of authors writing on the same topic in grade-level literary and/or informational texts.

Standard	Strand or Concept	Standard Objective
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.		6.3.R.2 Students will evaluate how the point of view and perspective affect grade-level literary and/or informational text.
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	6.3.R.3 Students will analyze how key literary elements contribute to themeaning of the literary work:● setting● plot● characters (i.e., protagonist,antagonist)● characterization● theme● conflict (i.e., internal and external) 6.3.R.4 Students will evaluate literary devices to support interpretations of literary texts: ● simile ● metaphor ● personification ● onomatopoeia ● hyperbole ● imagery ● symbolism* ● tone* *Students will find textual evidence when provided with examples. 6.3.R.5 Students will categorize facts included in an argument as for or against an issue. 6.3.R.6 Students will analyze the structures of texts (e.g., description, compare/contrast, sequential, problem/solution, cause/effect) and content by making inferences about texts and use textual evidence to support understanding. 6.3.R.7 Students will analyze texts and ideas within and between texts and provide textual evidence to support their inferences.
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Writing*	NARRATIVE 6.3.W.1 Students will write narratives incorporating characters, plot, setting, point of view, conflict (i.e., internal, external), and dialogue.*

Standard	Strand or Concept	Standard Objective
		INFORMATIVE 6.3.W.2 Students will compose essays and reports about topics, incorporating evidence (e.g., specific facts, examples, details) and maintaining an organized structure.*
		OPINION - Grade Level Focus 6.3.W.3 Students will clearly state an opinion supported with facts and details.* 6.3.W.4 Students will show relationships among facts, opinions, and supporting details.*
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	6. 4.R.1 Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text.
		6. 4.R.2 Students will use word parts (e.g., affixes, Greek and Latin roots, stems) to define and determine the meaning of increasingly complex words. 6. 4.R.3 Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. 6. 4.R.4 Students will infer the relationships among words with multiple meanings, including synonyms, antonyms, analogies, and more complex homographs and homonyms. 6. 4.R.5 Students will use a dictionary, glossary, or a thesaurus (print and/or electronic) to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Writing*	6.4.W.1 Students will use domain-appropriate vocabulary to communicate ideas in writing clearly.* 6.4.W.2 Students will select appropriate language to create a specific effect according to purpose in writing.*
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	6.5.R.1 Students will recognize simple and compound sentences to signal differing relationships among ideas. 6.5.R.2 Students will recognize verb tense to signify various times, sequences, states, and conditions in text. 6.5.R.3 Students will recognize the subject and verb agreement.
	Writing	6.5.W.1 Students will write using correct mechanics with a focus on commas, apostrophes, quotation marks, colons, and semi-colons. 6.5.W.2 Students will compose simple, compound, and complex sentences and questions to signal differing relationships among ideas. 6.5.W.3 Students will use intensive and reflexive pronouns.

Standard	Strand or Concept	Standard Objective
		6.5.W.4 Students will recognize and correct inappropriate shifts in pronoun number and person.
		6.5.W.5 Students will recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	6.6.R.1 Students will use their own viable research questions to find information about a specific topic. 6.6.R.2 Students will record and organize information from various primary and secondary sources (e.g., print and digital). 6.6.R.3 Students will determine the relevance, reliability, and validity of the information gathered.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Writing*	6.6.W.1 Students will write research papers and/or texts independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two).*
		6.6.W.2 Students will refine and formulate a viable research question and/or topic from initial findings.* 6.6.W.3 Students will organize information found during research, following a citation style (e.g., MLA, APA, etc.) with guidance and support.* 6.6.W.4 Students will summarize and present information in a report.*
Multimodal Literacies- Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.*	Reading	6.7.R.1 Students will compare and contrast the effectiveness of a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal, interpretive, and applied questions to create new understandings.* 6.7.R.2 Students will analyze the impact of selected media and formats on meaning.*
	Writing	6.7.W.1 Students will create multimodal content that effectively communicates ideas using technologies and appropriate media.* 6.7.W.2 Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.*
Independent Reading and Writing- Students will read and write for a variety of purposes including, but not limited to, academic and personal.*	Reading	6.8.R Students will select appropriate texts for specific purposes and read independently for extended periods of time.*
	Writing	6.8.W Students will write independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two) , vary their modes of expression to suit audience and task, and explain how concepts relate to one another.*

Standard	Strand or Concept	Standard Objective
Grade 7		
Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.*	Reading	7.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules with awareness and control of verbal and nonverbal cues.* 7.1.R.2 Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective.* 7.1.R.3 Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.*
	Writing	7.1.W.1 Students will give formal and informal presentations in a group or individually, providing evidence to support a main idea.* 7.1.W.2 Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.*
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.	Fluency	Students will continue to review and apply earlier grade level expectations for this standard. If these fluency skills are not mastered, students will address skills from previous grades.
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Reading	7.2.R.1 Students will create an objective summary, including main idea and supporting details, while maintaining meaning and a logical sequence of events. 7.2.R.2 Students will analyze details in literary and nonfiction/informational texts to distinguish genres. 7.2.R.3 Students will paraphrase main ideas with supporting details in a text.
	Writing*	7.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.*
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Writing*	7.2.W.2 Students will plan (e.g., outline)and prewrite a first draft as necessary.* 7.2.W.3 Students will develop drafts by choosing an organizational structure (e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.) and building on ideas in multi-paragraph essays.* 7.2.W.4 Students will edit and revise multiple drafts for organization, transitions to improve coherence and meaning, using a consistent point of view.* 7.2.W.5 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*

Standard	Strand or Concept	Standard Objective
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	7.3.R.1 Students will compare and contrast stated or implied purposes of authors writing on the same topic in grade-level literary and/or informational texts.
		7.3.R.2 Students will evaluate how the point of view and perspective affect grade-level literary and/or informational text. 7.3.R.3 Students will analyze how key literary elements contribute to the meaning of the literary work: ● setting ● plot ● characters (i.e., protagonist, antagonist) ● characterization ● theme ● conflict (i.e., internal and external)
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	7.3.R.4 Students will evaluate literary devices to support interpretations of literary texts:● simile● metaphor● personification● onomatopoeia● hyperbole● imagery● symbolism● tone● irony**Students will find textual evidence when provided with examples. 7.3.R.5 Students will distinguish factual claims from opinions. 7.3.R.6 Students will analyze the structures of texts (e.g., compare/contrast, problem/solution, cause/effect, claims/evidence) and content by making inferences about texts and use textual evidence to draw simple logical conclusions. 7.3.R.7 Students will make connections (e.g., thematic links) between and across multiple texts and provide textual evidence to support their inferences.

Standard	Strand or Concept	Standard Objective
	Writing*	NARRATIVE 7.3.W.1 Students will write narratives incorporating characters, plot, setting, point of view, conflict , dialogue, and sensory details to convey experiences and events.* INFORMATIVE 7.3.W.2 Students will compose essays and reports about topics, incorporating evidence (e.g., specific facts, examples, details) and maintaining an organized structure and a formal style.*
		ARGUMENT - Grade Level Focus 7.3.W.3 Students will introduce a claim and organize reasons and evidence, using credible sources.*
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Writing*	7.3.W.4 Students will show relationships among the claim, reasons, and evidence.*
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	7. 4.R.1 Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. 7. 4.R.2 Students will use word parts (e.g., affixes, Greek and Latin roots, stems) to define and determine the meaning of increasingly complex words. 7. 4.R.3 Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. 7. 4.R.4 Students will infer the relationships among words with multiple meanings and recognize the connotation and denotation of words.
		7. 4.R.5 Students will use a dictionary, glossary, or a thesaurus (print and/or electronic) to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.
	Writing*	7.4.W.1 Students will use domain-appropriate vocabulary to communicate ideas in writing clearly.* 7.4.W.2 Students will select appropriate language to create a specific effect according to purpose in writing.*
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	7.5.R.1 Students will recognize the correct use of prepositional phrases and dependent clauses. 7.5.R.2 Students will recognize simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas. 7.5.R.3 Students will recognize the subject and verb agreement.

Standard	Strand or Concept	Standard Objective
		7.5.R.4 Students will recognize and correct misplaced and dangling modifiers.
	Writing*	7.5.W.1 Students will write using correct mechanics with a focus on commas, apostrophes, quotation marks, colons, and semi-colons.* 7.5.W.2 Students will compose simple, compound, complex, and compound-complex sentences and questions to signal differing relationships among ideas.*
		7.5.W.3 Students will use prepositional phrases and clauses (e.g., dependent and independent) in writing.*
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	7.6.R.1 Students will use their own viable research questions and thesis statements to find information about a specific topic. 7.6.R.2 Students will follow ethical and legal guidelines for finding and recording information from a variety of primary and secondary sources (e.g., print and digital). 7.6.R.3 Students will determine the relevance, reliability, and validity of the information gathered.
	Writing*	7.6.W.1 Students will write research papers and/or texts independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two).* 7.6.W.2 Students will refine and formulate a viable research question and report findings clearly and concisely, using a thesis statement.* 7.6.W.3 Students will quote, paraphrase, and summarize findings following an appropriate citation style (e.g., MLA, APA, etc.) and avoiding plagiarism.* 7.6.W.4 Students will summarize and present information in a report.*
Multimodal Literacies- Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.*	Reading	7.7.R.1 Students will compare and contrast the effectiveness of techniques used in a variety of written, oral, visual, digital, non-verbal, and interactive texts to generate and answer literal, interpretive, and applied questions to create new understandings.*
		7.7.R.2 Students will analyze the impact of selected media and formats on meaning.*
	Writing	7.7.W.1 Students will select, organize, or create multimodal content to complement and extend meaning for a selected topic.* 7.7.W.2 Stu*dents will utilize multimedia to clarify information and strengthen claims or evidence.
Independent Reading and Writing- Students will read and write for a variety of purposes	Reading	7.8.R Students will select appropriate texts for specific purposes and read independently for extended periods of time.*

Standard	Strand or Concept	Standard Objective
including, but not limited to, academic and personal.*	Writing	7.8.W Students will write independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two), vary their modes of expression to suit audience and task, and discover different perspectives.*
Grade 8		
Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.*	Reading	8.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules with control of verbal and nonverbal cues.* 8.1.R.2 Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective.* 8.1.R.3 Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.*
	Writing	8.1.W.1 Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea.* 8.1.W.2 Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.*
Reading Foundations - Students will develop foundational skills for future reading success by working with sounds, letters, and text.	Fluency	Students will continue to review and apply earlier grade level expectations for this standard. If these fluency skills are not mastered, students will address skills from previous grades.
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Reading	8.2.R.1 Students will summarize and paraphrase ideas, while maintaining meaning and a logical sequence of events, within and between texts. 8.2.R.2 Students will analyze details in literary and nonfiction/informational texts to evaluate patterns of genres. 8.2.R.3 Students will generalize main ideas with supporting details in a text.
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Writing	8.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.** 8.2.W.2 Students will plan (e.g., outline) and prewrite a first draft as necessary.*
		8.2.W.3 Students will develop drafts by choosing an organizational structure (e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.) and building on ideas in multi-paragraph essays.**

Standard	Strand or Concept	Standard Objective
		8.2.W.4 Students will edit and revise multiple drafts for organization, transitions to improve coherence and meaning, sentence variety, and use of consistent point of view.** 8.2.W.5 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	8.3.R.1 Students will analyze works written on the same topic and compare the methods the authors use to achieve similar or different purposes and include support using textual evidence. 8.3.R.2 Students will evaluate points of view and perspectives and describe how this affects grade-level literary and/or informational text. 8.3.R.3 Students will analyze how authors use key literary elements to contribute to the meaning of a text: ● setting ● plot ● characters (i.e., protagonist, antagonist) ● characterization ● theme ● conflict (i.e., internal and external)
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	8.3.R.4 Students will evaluate literary devices to support interpretations of literary texts: ● simile ● metaphor ● personification ● onomatopoeia ● hyperbole ● imagery ● tone ● symbolism ● irony 8.3.R.5 Students will evaluate textual evidence to determine whether a claim is substantiated or unsubstantiated. 8.3.R.6 Students will analyze the structures of texts (e.g., compare/contrast, problem/solution, cause/effect, claims/evidence) and content by making complex inferences about texts to draw logical conclusions from textual evidence.

Standard	Strand or Concept	Standard Objective
		8.3.R.7 Students will make connections (e.g., thematic links, literary analysis) between and across multiple texts and provide textual evidence to support their inferences.
	Writing	NARRATIVE8.3.W.1 Students will write narratives incorporating characters, plot (i.e., flashback and foreshadowing) , setting, point of view, conflict , dialogue, and sensory details.**
		INFORMATIVE 8.3.W.2 Students will compose essays and reports about topics, incorporating evidence (e.g., specific facts, examples, details) and maintaining an organized structure and a formal style.** ARGUMENT - Grade Level Focus 8.3.W.3 Students will introduce a claim, recognize at least one claim from an opposing viewpoint, and organize reasons and evidences, using credible sources.**
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Writing	8.3.W.4 Students will show relationships among the claim, reasons, and evidence and include a conclusion that follows logically from the information presented.**
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	8. 4.R.1 Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text. 8. 4.R.2 Students will use word parts (e.g., affixes, Greek and Latin roots, stems) to define and determine the meaning of increasingly complex words. 8. 4.R.3 Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words. 8. 4.R.4 Students will infer the relationships among words with multiple meanings and recognize the connotation and denotation of words. 8. 4.R.5 Students will use a dictionary, glossary, or a thesaurus (print and/or electronic) to determine or clarify the meanings, syllabication, pronunciation, synonyms, and parts of speech of words.
	Writing	8.4.W.1 Students will use domain-appropriate vocabulary to communicate ideas in writing clearly.** 8.4.W.2 Students will select appropriate language to create a specific effect according to purpose in writing.**
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	8.5.R.1 Students will recognize the use of verbals (e.g., gerunds, participles, infinitives) and clauses. 8.5.R.2 Students will recognize the use of active and passive voice.

Standard	Strand or Concept	Standard Objective
		8.5.R.3 Students will recognize and correct inappropriate shifts in verb tense.
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	8.5.R.4 Students will recognize the subject and verb agreement, and correct as necessary.
	Writing	8.5.W.1 Students will write using correct mechanics with a focus on commas, apostrophes, quotation marks, colons, and semi-colons. 8.5.W.2 Students will compose simple, compound, complex, and compound-complex sentences and questions to signal differing relationships among ideas. 8.5.W.3 Students will use verbals (e.g., gerunds, participles, infinitives) in writing.
		8.5.W.4 Students will form and use verbs in the active and passive voice. 8.5.W.5 Students will form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	8.6.R.1 Students will use their own viable research questions and well-developed thesis statements to find information about a specific topic. 8.6.R.2 Students will follow ethical and legal guidelines for finding and recording information from a variety of primary and secondary sources (e.g., print and digital). 8.6.R.3 Students will determine the relevance, reliability, and validity of the information gathered.
	Writing*	8.6.W.1 Students will write research papers and/or texts independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two).* 8.6.W.2 Students will refine and formulate a viable research question and report findings clearly and concisely, using a well-developed thesis statement.* 8.6.W.3 Students will quote, paraphrase, and summarize findings following an appropriate citation style (e.g., MLA, APA, etc.) and avoiding plagiarism.* 8.6.W.4 Students will summarize and present information in a report.*
Multimodal Literacies- Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.*	Reading	8.7.R.1 Students will determine the intended purposes of techniques used for rhetorical effects in written, oral, visual, digital, non-verbal, and interactive texts to generate and answer interpretive and applied questions to create new understandings.* 8.7.R.2 Students will analyze the impact of selected media and formats on meaning.*
	Writing	8.7.W.1 Students will select, organize, or create multimodal content that encompasses different points of view.* 8.7.W.2 Students will utilize multimedia to clarify information and emphasize salient points.*

Standard	Strand or Concept	Standard Objective
Independent Reading and Writing- Students will read and write for a variety of purposes including, but not limited to, academic and personal.*	Reading	8.8.R Students will select appropriate texts for specific purposes and read independently for extended periods of time.*
	Writing	8.8.W Students will write independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two), vary their modes of expression to suit audience and task, and analyze different perspectives.*
Grade 10		
Speaking and Listening - Students will speak and listen effectively in a variety of situations including, but not limited to, responses to reading and writing.*	Reading	10.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules with control of verbal and nonverbal cues.* 10.1.R.2 Students will actively listen and evaluate, analyze, and synthesize a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective.*
		10.1.R.3 Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.*
	Writing	10.1.W.1 Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea.* 10.1.W.2 Students will work effectively and respectfully within diverse groups, show willingness to make necessary compromises to accomplish a goal, share responsibility for collaborative work, and value individual contributions made by each group member.*
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Reading	10.2.R.1 Students will summarize, paraphrase, and synthesize ideas, while maintaining meaning and a logical sequence of events, within and between texts. 10.2.R.2 Students will analyze details in literary and nonfiction/informational texts to connect how genre supports the author's purpose.
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Writing	10.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.** 10.2.W.2 Students will plan (e.g., outline) and prewrite a first draft as necessary.*
Reading and Writing Process - Students will use a variety of recursive reading and writing processes.	Writing	10.2.W.3 Students will develop drafts by choosing an organizational structure (e.g., description, compare/contrast, sequential, problem/solution, cause/effect, etc.) and building on ideas in multi-paragraph essays.** 10.2.W.4 Students will edit and revise multiple drafts for organization, enhanced transitions and coherence, sentence variety, and consistency in tone and point of view to establish meaningful texts.**

Standard	Strand or Concept	Standard Objective
		10.2.W.5 Students will use resources to find correct spellings of words (e.g., word wall, vocabulary notebook, print and electronic dictionaries, and spell-check).*
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	10.3.R.1 Students will evaluate the extent to which historical, cultural, and/or global perspectives affect authors' stylistic and organizational choices in grade-level literary and informational genres. 10.3.R.2 Students will evaluate points of view and perspectives in more than one grade-level literary and/or informational text and explain how multiple points of view contribute to the meaning of a work.
		10.3.R.3 Students will analyze how authors use key literary elements to contribute to meaning and interpret how themes are connected across texts: ● character development ● theme ● conflict (i.e., internal and external) ● archetypes
		10.3.R.4 Students will evaluate literary devices to support interpretations of texts, including comparisons across texts:● figurative language● imagery● tone● symbolism● irony 10.3.R.5 Students will distinguish among different kinds of evidence (e.g., logical, empirical, anecdotal) used to support conclusions and arguments in texts.
Critical Reading and Writing - Students will apply critical thinking skills to reading and writing.	Reading	10.3.R.6 Students will comparatively analyze the structures of texts (e.g., compare/contrast, problem/solution, cause/effect, claims/counterclaims/evidence) and content by inferring connections among multiple texts and providing textual evidence to support their inferences. 10.3.R.7 Students will make connections (e.g., thematic links, literary analysis) between and across multiple texts and provide textual evidence to support their inferences.
	Writing	NARRATIVE 10.3.W.1 Students will write narratives embedded in other modes as appropriate.**

Standard	Strand or Concept	Standard Objective
		INFORMATIVE - Grade Level Focus 10.3.W.2 Students will compose essays and reports to objectively introduce and develop topics, incorporating evidence (e.g., specific facts, examples, details, data) and maintaining an organized structure and a formal style.** 10.3.W.3 Students will elaborate on ideas by using logical reasoning and illustrative examples to connect evidences to claim(s).** ARGUMENT - Grade Level Focus 10.3.W.4 Students will introduce precise claims and distinguish them from counterclaims and provide sufficient evidences to develop balanced arguments, using credible sources.**
		10.3.W.5 Students will use words, phrases, and clauses to connect claims, counterclaims, evidence, and commentary to create a cohesive argument and include a conclusion that follows logically from the information presented and supports the argument.** 10.3.W.6 Students will blend multiple modes of writing to produce effective argumentative essays.*
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	10. 4.R.1 Students will increase knowledge of academic, domain-appropriate, grade-level vocabulary to infer meaning of grade-level text.
Vocabulary- Students will expand their working vocabularies to effectively communicate and understand texts.	Reading	10. 4.R.2 Students will use word parts (e.g., affixes, Greek and Latin roots, stems) to define and determine the meaning of increasingly complex words. 10. 4.R.3 Students will use context clues to determine or clarify the meaning of words or distinguish among multiple-meaning words.
		10. 4.R.4 Students will analyze the relationships among words with multiple meanings and recognize the connotation and denotation of words. 10. 4.R.5 Students will use a dictionary, glossary, or a thesaurus (print and/or electronic) to determine or clarify the meanings, syllabication, pronunciation, synonyms, parts of speech, and etymology of words or phrases.
	Writing	10.4.W.1 Students will use domain-appropriate vocabulary to communicate complex ideas in writing clearly.** 10.4.W.2 Students will select appropriate language to create a specific effect according to purpose in writing.**
Language- Students will apply knowledge of grammar and rhetorical style to reading and writing.	Reading	10.5.R Students will examine the function of parallel structures, various types of phrases, clauses, and active and passive voice to convey specific meanings and/or reflect specific rhetorical styles.

Standard	Strand or Concept	Standard Objective
	Writing	10.5.W.1 Students will write using correct mechanics. 10.5.W.2 Students will compose simple, compound, complex, and compound-complex sentences and questions, to signal differing relationships among ideas. 10.5.W.3 Students will practice their use of Standard American English, grammar, mechanics, and usage through writing, presentations, and/or other modes of communication to convey specific meanings and interests.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	10.6.R.1 Students will use their own viable research questions and well-developed thesis statements to find information about a specific topic.
Research- Students will engage in inquiry to acquire, refine, and share knowledge.	Reading	10.6.R.2 Students will synthesize the most relevant information from a variety of primary and secondary sources (e.g., print and digital), following ethical and legal citation guidelines. 10.6.R.3 Students will evaluate the relevance, reliability, and validity of the information gathered.
	Writing	10.6.W.1 Students will write research papers and/or texts independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two).* 10.6.W.2 Students will refine and formulate a viable research question, integrate findings from sources, and clearly use a well-developed thesis statement.* 10.6.W.3 Students will integrate into their own writing quotes, paraphrases, and summaries of findings following an appropriate citation style (e.g., MLA, APA, etc.) and avoiding plagiarism. 10.6.W.4 Students will synthesize and present information in a report.*
Multimodal Literacies- Students will acquire, refine, and share knowledge through a variety of written, oral, visual, digital, non-verbal, and interactive texts.*	Reading	10.7.R.1 Students will analyze techniques used to achieve the intended rhetorical purposes in written, oral, visual, digital, non-verbal, and interactive texts to generate and answer interpretive and applied questions to create new understandings.* 10.7.R.2 Students will analyze the impact of selected media and formats on meaning.*
	Writing	10.7.W.1 Students will critique the sources of multimodal content.* 10.7.W.2 Students will create visual and/or multimedia presentations using a variety of media forms to enhance understanding of findings, reasoning, and evidence for diverse audiences.*
Independent Reading and Writing- Students will read and write for a variety of purposes	Reading	10.8.R Students will select appropriate texts for specific purposes and read independently for extended periods of time.*

Standard	Strand or Concept	Standard Objective
including, but not limited to, academic and personal.*	Writing	10.8.W Students will write independently over extended periods of time (e.g., time for research, reflection, and revision) and for shorter timeframes (e.g., a single sitting or a day or two) , vary their modes of expression to suit audience and task, and draw and justify appropriate conclusions.*

* This content standard is best measured by constructed response items. At this time, there are no items assessing this content standard on the Oklahoma State Testing Program.

**These objectives are assessed through the rubric of the writing assessment.

APPENDIX F— LINKING FRAMEWORK REPORT

Linking the Oklahoma OSTP ELA Assessments™ with The Lexile® Framework for Reading

November 2017

Prepared by MetaMetrics for:

Oklahoma State Department of Education
N. Lincoln Boulevard
Oklahoma City, OK 73105

MetaMetrics. *Linking Assessment with Instruction*

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Linking the
Oklahoma OSTP ELA Assessments
with
The Lexile® Framework for Reading

Technical Report

Prepared by MetaMetrics for Oklahoma State Department of Education
(Contract dated August 23, 2017).

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November 2017

Table of Contents

List of Tables

List of Figures

Introduction

Often it is desirable to convey more information about test performance than can be incorporated into a single primary score scale. Two examples arise in large-scale assessment. In one situation, one test can provide a unique type of information (such as national or international comparisons) but is not administered very often. At the same time another test is administered more often, but is not able to provide the same breadth of information (such as a school-level assessment). An auxiliary score scale for a test can be established to provide this additional information through assessment scale linkages. Once linkages are established between the two assessments, then the results of the more-frequently-administered assessment can be translated in terms of the scale for the other assessment.

In another situation, the linkage between two score scales can be used to provide a context for understanding the results of one of the assessments. For example, sometimes it is hard to explain what a student can read based on the results of a reading comprehension test. Parents typically ask the questions If my child is in the fourth grade and scores a 317 on the Oklahoma School Testing Program English language arts assessment, what does this mean?" or "Based on my child's test results, what can he or she read and how well?" or "Is my child well prepared to meet the reading demands of grade level materials?" Once a linkage is established with an assessment that is related to specific book or text titles, then the results of the assessment can be explained and interpreted in the context of the specific titles that a student can read.

Auxiliary score scales can be used to "convey additional normative information, test-content information, and information that is jointly normative and content based. For many test uses, an auxiliary scale conveys information that is as meaningful as the information conveyed by the primary score scale. In such instances, the auxiliary score is the one that is focused on, and the primary scale can be viewed more as a vehicle for maintaining interpretability over time" (Petersen, Kolen, and Hoover, 1989, p. 222). One such auxiliary scale is The Lexile® Framework for Reading, which was developed to appropriately match students with text at a level that provides challenge but not frustration.

Linking assessment results with the Lexile Framework provides a mechanism for matching each student's reading ability with text on a common scale. It serves as an anchor to which texts and assessments can be connected, allowing students and educators to communicate more easily regarding test results. In addition, the Lexile Framework provides a common way to monitor if students are "on track" for the reading demands of various postsecondary endeavors. By using the Lexile Framework, the same metric is applied to the books students read, the tests they take, and the results that are reported. People often ask questions such as the following:

- How can I help my child become a better reader?
- How do I challenge my child to read so that she is ready for various college and career options?

Questions like these can be challenging for parents and educators. By linking the Oklahoma School Testing Program English Language Arts (OSTP ELA) assessment with The Lexile

Framework for Reading, educators and students will be able to answer these questions and will be better able to use the results from the test to improve instruction and to develop each student's level of reading comprehension.

The prior assessment used with the OSTP, the Oklahoma Core Curriculum Tests (OCCT), was linked with the Quantile Framework in 2007 and updated in 2009 (MetaMetrics). This current research study was designed to determine a mechanism to provide reading levels that can be matched to text based on scale scores from the new assessment, the OSTP ELA. The study was conducted by MetaMetrics in collaboration with the Oklahoma State Department of Education (OSDE) in collaboration with Measured Progress (Contract dated August 23, 2017). The primary purposes of this study were to:

- present a solution for matching students with text,
- provide the Oklahoma State Department of Education (OSDE) with Lexile measures on the OSTP ELA assessments,
- develop tables for converting OSTP ELA scale scores to Lexile measures, and
- produce a report that describes the linking analysis procedures.

The Lexile Framework for Reading

A reader's comprehension of text is dependent on many factors – the purpose for reading, the ability of the reader, and the text that is being read. The reader can be asked to read a text for many purposes including entertainment (literary experience), to gain information, or to perform a task. Each reader brings to the reading experience a variety of important factors: reading ability, prior knowledge, interest level, and developmental readiness. For any text, there are three factors associated with the readability of the text: complexity, support, and quality. All of these reader and text factors are important considerations when evaluating the appropriateness of a text for a reader. The Lexile Framework focuses primarily on two features: reader ability and text complexity.

Lexile text measures for texts and readers typically range from above 200L to below 1600L but measures can be below 0L for beginning reader materials (e.g., BR150L) to above 2000L for advanced materials. Within any single classroom, there will be a range of reading materials to reflect the student range of reading ability and interest in different topics and types of text.

Text Complexity

All symbol systems share two features: a semantic component and a syntactic component. In language, the semantic units are words. Words are organized according to rules of syntax into thought units and sentences (Carver, 1974). In all cases, the semantic units vary in familiarity and the syntactic structures vary in complexity. The comprehensibility or difficulty of a text is dominated by the familiarity of the semantic units and by the complexity of the syntactic structures used in constructing the text. The Lexile Framework utilizes these two dominant features of language in measuring text complexity by examining the characteristics of word frequency and sentence length. In addition to these features, when measuring early reader texts, the Lexile Framework utilizes characteristics found to be important to the complexity of early reader text such as word decodabilty and patterning and repetition.

Variables that Affect the Text Complexity of Upper Level Text

Semantic Component. Most operationalizations of the semantic component are proxies for the probability that an individual will encounter a word in a familiar context and thus be able to infer its meaning (Bormuth, 1966). This is the basis of exposure theory, which explains the way receptive or hearing vocabulary develops (Miller and Gildea, 1987; Stenner, Smith, and Burdick, 1983). Klare (1963) hypothesized that the semantic component varied along a familiarity-to-rarity continuum. This concept was further developed by Carroll, Davies, and Richman (1971), whose word-frequency study examined the reoccurrence of words in a five-million-word corpus of running text. Knowing the frequency of words as they are used in written and oral communication provided the best means of inferring the likelihood that a word would be encountered by a reader and thus become a part of that individual's receptive vocabulary.

Variables such as the average number of letters or syllables per word have been observed to be proxies for word frequency. There is a strong negative correlation between the length of words and the frequency of word usage. Polysyllabic words are used less frequently than monosyllabic words, making word length a good proxy for the likelihood that an individual will be exposed to a word.

In a study examining receptive vocabulary, Stenner, Smith, and Burdick (1983) analyzed more than 50 semantic variables in order to identify those elements that contributed to the difficulty of the 350 vocabulary items on Forms L and M of the *Peabody Picture Vocabulary Test*—Revised (Dunn and Dunn, 1981). Variables included part of speech, number of letters, number of syllables, the modal grade at which the word appeared in school materials, content classification of the word, the frequency of the word from two different word counts, and various algebraic transformations of these measures.

The first word frequency measure used was the raw count of how often a given word appeared in a corpus of 5,088,721 words sampled from a broad range of school materials (Carroll, Davies, and Richman, 1971). For example, the word "accident" appears 176 times in the 5,088,721-word corpus. The second word frequency measure used was the frequency of the "word family." A word family included: (1) the stimulus word; (2) all plurals (adding "-s" or "-es" or changing "-y" to "-ies"); (3) adverbial forms; (4) comparatives and superlatives; (5) verb forms ("-s," "-d," "-ed," and "-ing"); (6) past participles; and (7) adjective forms. For example, the word family for "accident" would include "accidental," "accidentally," "accidentals," and "accidents," and they would all have the same word frequency of 334. The frequency of a word family was based on the sum of the individual word frequencies from each of the types listed.

Correlations were computed between algebraic transformations of these means (mean frequency of the words in the test item and mean frequency of the word families in the test item) and the rank order of the test items. Since the items were ordered according to increasing difficulty, the rank order was used as the observed item difficulty. The log of the mean word frequency provided the strongest correlation with item rank order (r = -0.779) for the items on the combined form.

The Lexile Framework currently employs a 1.4 billion-word corpus when examining the semantic component of text. This corpus was assembled from the more than 90,000 texts that were measured by MetaMetrics for publishers from 1998 through 2012.

Syntactic Component. Klare (1963) provides a possible interpretation for how sentence length works in predicting passage difficulty. He speculated that the syntactic component varied with the load placed on short-term memory. Crain and Shankweiler (1988), Shankweiler and Crain (1986), and Liberman, Mann, Shankweiler, and Westelman (1982) have also supported this explanation. The work of these individuals has provided evidence that sentence length is a good proxy for the demand that structural complexity places upon verbal short-term memory.

While sentence length has been shown to be a powerful proxy for the syntactic complexity of a passage, an important caveat is that sentence length is not the underlying causal influence (Chall, 1988). Researchers sometimes incorrectly assume that manipulation of sentence length will have

a predictable effect on passage difficulty. Davidson and Kantor (1982), for example, illustrated rather clearly that sentence length can be reduced and difficulty increased and vice versa.

Based on previous research, it was decided to use sentence length as a proxy for the syntactic component of reading difficulty in the Lexile Framework.

Variables that Affect the Text Complexity of Early Reader Texts

Texts designed for early readers are distinct from texts designed for more accomplished readers because they are usually designed specifically to facilitate early readers' progress. For all readers, making meaning of the texts is always the focus, but for early readers, developing an understanding of how to "crack the code" requires specific attention. Early readers must develop the ability to hear sounds in words, develop sight words, and acquire word recognition strategies (Fitzgerald and Shanahan, 2000) as they develop the comprehension and fluency characteristic of more advanced readers. A number of studies support the finding that the presence of specific text features support the development of skills associated with code cracking. For example, word repetition reinforces sight-word learning and development of the sounds associated with spelling patterns (e.g., Vadasy, Sanders, & Peyton, 2005). Repeated phrases also reinforce scaffolding development of a variety of word recognition strategies (e.g., Ehri & McCormick, 1998). The use of words familiar in oral language enhances readers' ability to make meaning from words and permits more attention to word recognition (e.g., Muter, Hulme, Snowling, & Stevenson, 2004). Inclusion of several types of text-characteristic support may further support students' growth as readers. Research suggests that to appropriately describe early reader text complexity it is necessary to consider several text characteristics at multiple linguistic levels (Graesser & McNamara, 2011; Graesser, McNamara, & Kulikowich, 2011; Kintsch, 1998; and Snow, 2002). In general, levels of text characteristics include word level (e.g., word structure, word frequency), within-sentence level (e.g., syntax), and across-sentence/discourse level (e.g., referential cohesion). The research base supporting the importance of multiple levels of text characteristics for early phases of learning to read is extensive (Mesmer, Cunningham, & Hiebert, 2012) and has identified the importance of considering the impact of interaction between the features (Merlini Barbaresi, 2003; and Biber, 1988).

In order to determine which text characteristics had the greatest impact on text complexity for early readers, MetaMetrics identified twenty-two unique text characteristics at four linguistic levels: sounds-in-words, words (structure and meaning), within-sentence syntax, and across-sentence/discourse.

- *Sounds-in-Words*: number of phonemes in words, phonemic Levenshtein Distance, and mean internal phonemic predictability
- *Word Structure*: decoding demand, orthographic Levenshtein Distance, number of syllables in words, and mean internal orthographic predictability
- *Word Meaning*: age of acquisition, abstractness, and word rareness
- *Within-Sentence Syntax*: sentence length and grammar
- *Across-Sentence/Discourse*: linear edit distance, linear word overlap, cohesion triggers, type-token ratio, longest common string, edit distance, Cartesian word overlap, information load, and compression ratio

From these characteristics, 238 operationalizations were developed to capture the varied ways in which the characteristics could be quantified in terms of their presence in the text. Three hundred and fifty early reader texts designed for readers in Kindergarten through Grade 2 were selected to represent the range of text types early readers are likely to encounter. These included decodable books, phonics readers, leveled books, high-frequency readers, and various trade books. Two separate sub-studies were conducted to determine the relative challenge of the texts. One study collected primary-grade educators' ratings of the complexity of the 350 texts and the other gathered Grade 1 and 2 students' responses to a subset of 89 texts from the full set of 350 study texts. From these studies a text-complexity logit scale was created so that each text could be assigned a measure (Fitzgerald, Elmore, Koons, Hiebert, Bowen, Sanford-Moore & Stenner, 2014).

Calibration of Text Difficulty of Upper Level Texts

The research study on semantic units (Stenner, Smith, and Burdick, 1983) was extended to examine the relationship of word frequency and sentence length to reading comprehension. In 1987(a), Stenner, Smith, Horabin, and Smith performed exploratory regression analyses to test the explanatory power of these variables. This analysis involved calculating the mean word frequency and the log of the mean sentence length for each of the 66 reading comprehension passages on the *Peabody Individual Achievement Test* (Dunn and Markwardt, 1970). The observed difficulty of each passage was the mean difficulty of the items associated with the passage (provided by the publisher) converted to the logit scale. A regression analysis based on the word-frequency and sentence-length measures produced a regression equation that explained most of the variance found in the set of reading comprehension tasks. The resulting correlation between the observed logit difficulties and the theoretical calibrations was 0.97 after correction for range restriction and measurement error. The regression equation was further refined based on its use in predicting the observed difficulty of the reading comprehension passages on 8 other standardized tests. The resulting correlation between the observed logit difficulties and the theoretical calibrations across the 9 tests was 0.93 after correction for range restriction and measurement error.

Once a regression equation is established linking the syntactic and semantic features of text to the difficulty of text, the equation can be used to calibrate test items and text. The result of the research was a regression equation linking the syntactic and semantic features of text to the difficulty of text. This equation can now be used to calibrate test items and text within the Lexile Framework.

The Lexile Scale

In developing the Lexile Scale, the Rasch model (Wright and Stone, 1979) was used to estimate the difficulties of the items and the abilities of the persons on the logit scale.

The calibrations of the items from the Rasch model are objective in the sense that the relative difficulties of the items will remain the same across different samples of persons (specific objectivity). When two items are administered to the same group it can be determined which item is harder and which one is easier. This ordering should hold when the same two items are administered to a second group. If two different items are administered to the second group, there is no way to know which set of items is harder and which set is easier. The problem is that the location of the scale is not known. General objectivity requires that scores obtained from different test administrations be tied to a common zero—absolute location must be sample independent (Stenner, 1990). To achieve general objectivity, the theoretical logit difficulties must be transformed to a scale where the ambiguity regarding the location of zero is resolved.

The first step in developing a scale with a fixed zero was to identify two anchor points for the scale. The following criteria were used to select the two anchor points: they should be intuitive, easily reproduced, and widely recognized. For example, with most thermometers the anchor points are the freezing and boiling points of water. For the Lexile Scale, the anchor points are text from seven basal primers for the low end and text from *The Electronic Encyclopedia* (Grolier, Inc., 1986) for the high end. These points correspond to the middle of first grade text and the midpoint of workplace text.

The next step was to determine the unit size for the scale. For the Celsius thermometer, the unit size (a degree) is $1/100^{th}$ of the difference between freezing (0 degrees) and boiling (100 degrees) water. For the Lexile Scale the unit size (a Lexile) was defined as $1/1000^{th}$ of the difference between the mean difficulty of the primer material and the mean difficulty of the encyclopedia samples. Therefore, a Lexile by definition equals $1/1000^{th}$ of the difference between the difficulty of the primers and the difficulty of the encyclopedia.

The third step was to assign a value to the lower anchor point. The low-end anchor on the Lexile Scale was assigned a value of 200.

Finally, a linear equation of the form

$$[(\text{Logit} + \text{constant}) \times \text{CF}] + 200 = \text{Lexile text measure} \qquad \text{Equation (1)}$$

was developed to convert logit difficulties to Lexile calibrations. The values of the conversion factor (CF) and the constant were determined by substituting in the low-end anchor point and then solving the system of equations.

The Lexile Scale ranges from below 200L to above 1600L. There is not an explicit bottom or top to the scale, but rather two anchor points on the scale (described above) that describe different levels of reading comprehension. The Lexile Map, a graphic representation of the Lexile Scale

from 200L to 1500L+, provides a context for understanding reading comprehension (see the Appendix).

Calibration of Text Difficulty of Early Reader Texts

To bring the observed difficulties (logit scores) of early reader texts from the two studies previously described onto the Lexile scale, a theory-based linking procedure was conducted. First, Lexile text measures were calculated based only on the syntactic and semantic features of the text as done with upper level texts. Next, for approximately 10% of the texts the discrepancy between the observed difficulty and the theoretical Lexile measure was large and the texts were flagged and not used in subsequent analyses. Finally, using the remaining 90% of the texts in the study, a linear linking function (SD line) was calculated. In linear linking, a transformation is chosen such that scores on two sets of data are considered to be linked if they correspond to the same number of standard deviations above (or below) the mean in some group of data elements (Angoff, 1984, cited in Petersen, Kolen, and Hoover, 1989; Kolen and Brennan, 2014). The result of the linear linking function was that the early reader observed difficulties were transformed to Lexile measures while still maintaining the relative ordering of the difficulty of the texts derived from the educator judgments and student performances.

Once observed Lexile measures were calculated, random forest regression technique was employed to evaluate the importance of the 238 operationalizations of characteristics that research suggests affects text complexity of early reader texts. This process was conducted in several stages and is described in detail by Fitzgerald and Elmore and their colleagues (2014). The first step in the analysis was to set baseline performance. Eighty percent of the texts were selected for this training process and twenty percent were held as a validation sample. Three separate random forest regressions were conducted, one each for: (1) the 80% of the 350 texts that the teachers ordered (n = 279); (2) the 80% of the texts that the students were presented (n = 71), and (3) the two sets of texts combined (N = 350). Each random forest regression produced importance values for each of the 238 variables in relation to the text-complexity logit scale. The next step in the analysis involved an iterative variable-selection procedure in which the variables with the smallest importance values were systematically removed and the effect on the model calculated. This process determined whether fewer variables could predict text complexity as well or nearly as well as the 238-variable model. The result was a set of nine variables:

- word level: monosyllable decoding, syllable count, age of acquisition, and word rareness, and abstractness;
- within-sentence and across-sentence/discourse level: intersentential complexity, phrase diversity, non-compressibility, and text density.

Finally, a final set of three random forest regression models was trained using the nine variables with the teacher text set, the student text set, and the two text sets combined. The resulting correlations for the teacher, student, and combined models were 0.89, 0.71, and 0.88, respectively. The validation samples, 20% of the teacher texts (n = 71) and 20% of the student texts (n = 19), were combined and a final random forest regression was run with the nine selected

variables as predictors. The model was validated with a correlation of 0.85 and RMSE of 9.68. The final model is now used to calibrate texts intended for early-readers.

The nine variables have been grouped into four early-reading indicators based on the linguist level addressed:

- Decoding Demand includes syllable count and monosyllable decoding demand;
- Semantic Demand includes abstractness, word rareness, and age of acquisition;
- Syntactic Demand includes intersentential complexity; and
- Structure Demand includes non-compressibility, phrase diversity, and text density.

The Enhanced Lexile Analyzer®

When text is analyzed by MetaMetrics, all electronic files are initially edited according to established guidelines used with the enhanced Lexile Analyzer software. These guidelines include the removal of all incomplete sentences, chapter titles, and paragraph headings; running of a spell check. The text is then submitted to the enhanced Lexile Analyzer that examines the lengths of the sentences and the frequencies of the words for upper-level texts and the nine early-reader variables for lower-level texts. The enhanced Lexile Analyzer first looks at the text features of a piece of text and attempts to determine if the text is written for early readers (early reader texts) or for more advanced readers (upper level texts). Based on the results of the examination, the enhanced Lexile Analyzer applies the most appropriate word and sentence/discourse variables to the measurement process. The enhanced Lexile Analyzer then reports a Lexile measure for the text. If the Lexile measure of the text is 650L or below, then the four early-reading indicators are also reported.

Validity of The Lexile Framework for Reading

The 2014 *Standards for Educational and Psychological Testing* (America Educational Research Association, American Psychological Association, and National Council on Measurement in Education) states that "validity refers to the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (p. 11). In applying this definition to The Lexile Framework for Reading, the question that should be asked is "What evidence supports the use of the Lexile Framework to describe text complexity and reader ability?" Because the Lexile Framework addresses reading comprehension, an important aspect of validity evidence that should be brought to bear is evidence showing that the construct being addressed is indeed reading comprehension. This type of validity evidence has traditionally been called construct validity. One source of construct validity evidence for The Lexile Framework for Reading can be evaluated by examining how well Lexile measures relate to other measures of reading ability and reading comprehension.

Lexile Framework and other Measures of Reading Comprehension. The Lexile Framework has been linked to numerous standardized tests of reading comprehension. When assessment scales are linked, a common frame of reference can be used to interpret the test results. This frame of

reference can be "used to convey additional normative information, test-content information, and information that is jointly normative and content-based. For many test uses, … [this frame of reference] conveys information that is more crucial than the information conveyed by the primary score scale" (Petersen, Kolen, and Hoover, 1989, p. 222). Linking the Lexile Framework to other measures of reading comprehension produces a common frame of reference: the Lexile measure.

Table 1 presents the results from a number of linking studies conducted with the Lexile Framework. In these studies, students were administered a Lexile assessment and another assessment of reading comprehension. There is a strong relationship between reading comprehension ability as measured by the Lexile Framework and reading comprehension ability as measured by other assessments. For each of the tests listed, student reading comprehension scores can also be reported as Lexile measures. This dual reporting provides a rich, criterion-related frame of reference for interpreting the standardized test scores. When a student takes one of the standardized tests, in addition to receiving his norm-referenced test information, the student can receive a reading list consisting of texts (books and articles) targeted to his specific reading level.

Table 1. Results from linking studies conducted with The Lexile Framework for Reading.

Standardized Test	Grades in Study	N	Correlation Between Test Score and Lexile Measure
Gates-MacGinitie Reading Test	2, 4, 6, 8, 10	4,644	0.90
Metropolitan Achievement Test (8th ed.)	2, 4, 6, 8, 10	2,382	0.93
Texas Assessment of Knowledge and Skills (TAKS)	3, 5, 8	1,960	0.60 to 0.73*
The Iowa Tests (Iowa Tests of Basic Skills and Iowa Tests of Educational Development)	3, 5, 7, 9, and 11	4,666	0.88
Stanford Achievement Test (Tenth Edition)	2, 4, 6, 8, and 10	3,064	0.93
Oregon Reading/Literature Knowledge and Skills Test	3, 5, 8, and 10	3,180	0.89
Mississippi Curriculum Test	2, 4, 6, and 8	7,045	0.90
Georgia Criterion Referenced Competency Test (CRCT and GHSGT)	1 – 8, and 11	16,363	0.72 to 0.88*
Wyoming Performance Assessment for Wyoming Students (PAWS)	3, 5, 7, and 11	3,871	0.91
Arizona Instrument to Measure Progress (AIMS)	3, 5, 7, and 10	7,735	0.89
South Carolina Palmetto Achievement Challenge Tests (PACT)	3 – 8	15,559	0.87 to 0.88*
Comprehensive Testing Program (CPT 4 – ERB)	2, 4, 6, and 8	924	0.83 to 0.88
Oklahoma Core Competency Tests (OCCT)	3 – 8	10,691	0.71 to 0.75*
TOEFL iBT	NA	2,906	0.63 to 0.67
TOEIC	NA	2,799	0.73 to 0.74
Kentucky Performance Rating for Educational Progress (K-PREP)	3 – 8	6,480	0.71 to 0.79*
North Carolina ACT	11	3,472	0.84
North Carolina READY End-of-Grades/End-of-Course Tests (NC READY EOG/EOC)	3, 5, 7, 8, and E2	12,356	0.88 to 0.89

Notes: Results are based on final samples used with each linking study.
*Not vertically linked; separate linking equations were derived for each grade.

Lexile Framework and the Difficulty of Basal Readers. Lexile measures are organized in a sequential manner, so a lower Lexile measure for a text indicates that the text is less complex than text with a higher Lexile measure. Validity evidence for the internal structure (the sequential structure) of the Lexile Framework was obtained through a study that examined the relationship of basal reader sequencing to Lexile measures. In a study conducted by Stenner, Smith, Horabin, and Smith (1987b) Lexile calibrations were obtained for units in 11 basal series. It was presumed that each basal series was sequenced by difficulty. So, for example, the latter portion of a third-grade reader is presumably more difficult than the first portion of the same book. Likewise, a fourth-grade reader is presumed to be more difficult than a third-grade reader. Observed difficulties for each unit in a basal series were estimated by the rank order of the unit in the series. Thus, the first unit in the first book of the first grade was assigned a rank order of one and the last unit of the eighth-grade reader was assigned the highest rank order number.

Correlations were computed between the rank order and the Lexile calibration of each unit in each series. After correction for range restriction and measurement error, the average disattenuated correlation between the Lexile calibration of text comprehensibility and the rank order of the basal units was 0.995 (see *Table 2*).

Table 2. Correlations between theory-based calibrations produced by the Lexile equation and rank order of unit in basal readers.

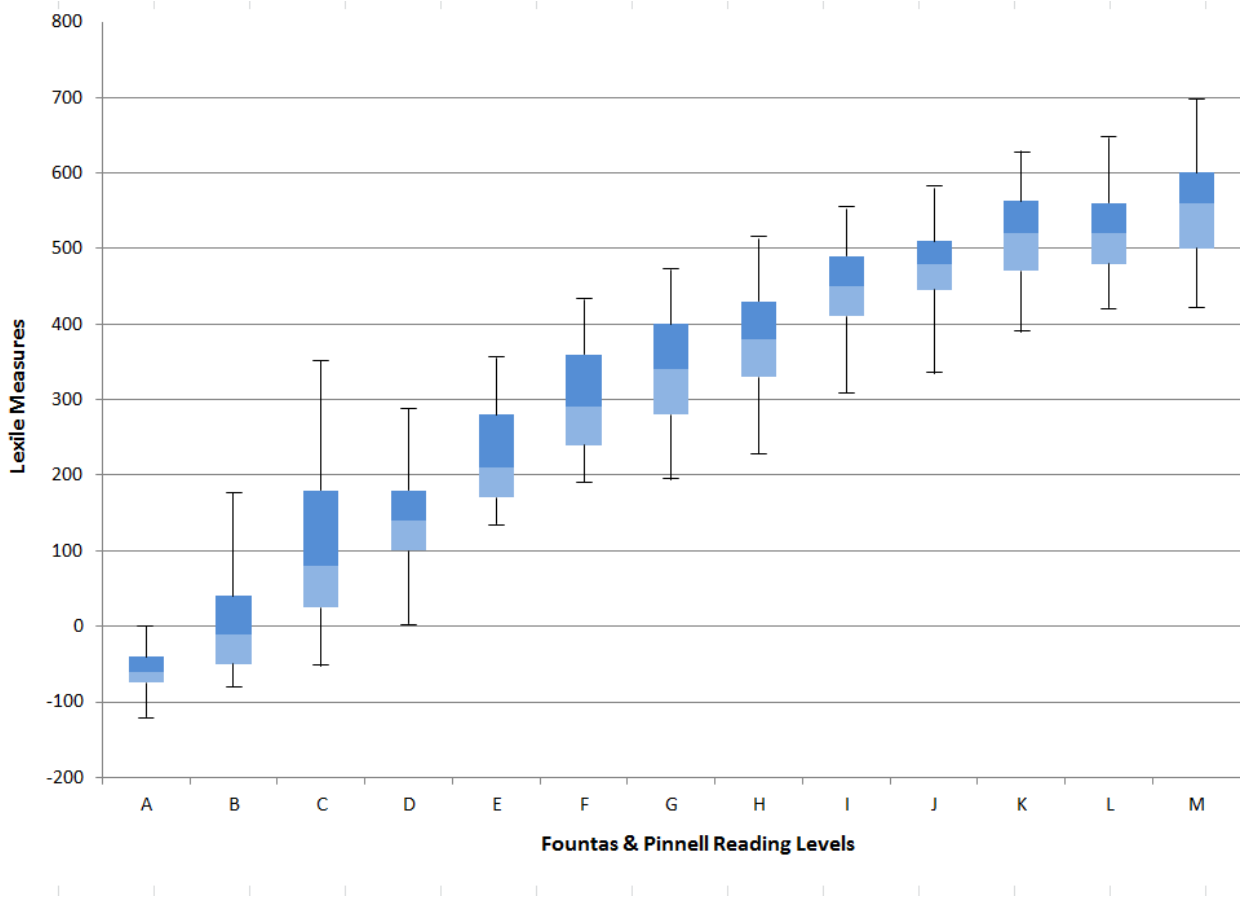
Basal Series	Number of Units	r_{OT}	R_{OT}	R'_{OT}
Ginn Rainbow Series (1985)	53	.93	.98	1.00
HBJ Eagle Series (1983)	70	.93	.98	1.00
Scott Foresman Focus Series (1985)	92	.84	.99	1.00
Riverside Reading Series (1986)	67	.87	.97	1.00
Houghton-Mifflin Reading Series (1983)	33	.88	.96	.99
Economy Reading Series (1986)	67	.86	.96	.99
Scott Foresman American Tradition (1987)	88	.85	.97	.99
HBJ Odyssey Series (1986)	38	.79	.97	.99
Holt Basic Reading Series (1986)	54	.87	.96	.98
Houghton-Mifflin Reading Series (1986)	46	.81	.95	.98
Open Court Headway Program (1985)	52	.54	.94	.97
Total/Means*	660	.839	.965	.995

r_{OT} = raw correlation between observed difficulties (O) and theory-based calibrations (*T*).
R_{OT} = correlation between observed difficulties (O) and theory-based calibrations (*T*) corrected for range restriction.
R'_{OT} = correlation between observed difficulties (O) and theory-based calibrations (*T*) corrected for range restriction and measurement error.
*****Mean correlations are the weighted averages of the respective correlations.

Based on the consistency of the results in *Table 2*, the Lexile theory was able to account for the unit rank ordering of the 11 basal series even with numerous differences in the series—prose selections, developmental range addressed, types of prose introduced (i.e., narrative versus expository), and purported skills and objectives emphasized.

Lexile Framework and Fountas & Pinnell Reading Levels. Koons, Elmore, Sanford-Moore, and Stenner (2017) explored the relationship between Fountas & Pinnell reading levels for a set of texts A through M (i.e. Kindergarten through Grade 2) and the their corresponding Lexile measures to obtain construct validity evidence for the measurement of early reader texts. The Spearman correlation coefficient between the two text sets was $r_s = 0.84$, indicating a strong positive relationship. Because Fountas & Pinnell reading levels are "larger grained" than the Lexile measures, some variation of Lexile measures within each Fountas & Pinnell reading level was expected. *Figure 1* shows a series of box-and-whisker plots of the results. The box in each box-and-whisker plot depicts the IQR with the bottom of the box at the 25th percentile of the distribution of Lexile measures, the line between the shaded portions at the median (50th percentile), and the top of the box at the 75th percentile. The bottom whisker depicts the text measure at the 5th percentile of the distribution and the top whisker depicts the text measure at the 95th percentile. *Figure 1* shows steadily increasing Lexile text measures across Fountas & Pinnell reading levels for each represented percentile except the 95th percentile of Level C (351L), which has a greater value than the 95th percentile of the two following levels (D: 288L; and E: 350L).

Figure 1. Progression of Lexile text measures and Fountas & Pinnell reading levels, Levels A through M.



Lexile Framework and the Difficulty of Reading Test Items. Additional construct validity evidence was obtained by exploring the relationship between Lexile calibrations of item difficulties and actual item difficulties of reading comprehension tests. In a study conducted by Stenner, Smith, Horabin, and Smith (1987a), 1,780 reading comprehension test items appearing on nine nationally-normed tests were analyzed. The study correlated empirical item difficulties provided by the publishers with the Lexile calibrations specified by the computer analysis of the text of each item. The empirical difficulties were obtained in one of three ways. Three of the tests included observed logit difficulties from either a Rasch or three-parameter analysis (e.g., NAEP). For four of the tests, logit difficulties were estimated from item p-values and raw score means and standard deviations (Poznanski, 1990; Wright, and Linacre, 1994). Two of the tests provided no item parameters, but in each case items were ordered on the test in terms of difficulty (e.g., PIAT). For these two tests, the empirical difficulties were approximated by the difficulty rank order of the items. In those cases where multiple questions were asked about a single passage, empirical item difficulties were averaged to yield a single observed difficulty for the passage.

Once theory-specified calibrations and empirical item difficulties were computed, the two arrays were correlated and plotted separately for each test. The plots were checked for unusual residual distributions and curvature, and it was discovered that the Lexile equation did not fit poetry items or noncontinuous prose items (e.g., recipes, menus, or shopping lists). This indicated that the universe to which the Lexile equation could be generalized was limited to continuous prose. The poetry and noncontinuous prose items were removed and correlations were recalculated. *Table 3* contains the results of this analysis.

Table 3. Correlations between theory-based calibrations produced by the Lexile equation and empirical item difficulties.

Test	Number of Questions	Number of Passages	Mean	SD	Range	Min	Max	r_{OT}	R_{OT}	R'_{OT}
SRA	235	46	644	353	1303	33	1336	.95	.97	1.00
CAT-E	418	74	789	258	1339	212	1551	.91	.95	.98
Lexile	262	262	771	463	1910	−304	1606	.93	.95	.97
PIAT	66	66	939	451	1515	242	1757	.93	.94	.97
CAT-C	253	43	744	238	810	314	1124	.83	.93	.96
CTBS	246	50	703	271	1133	173	1306	.74	.92	.95
NAEP	189	70	833	263	1162	169	1331	.65	.92	.94
Battery	26	26	491	560	2186	−702	1484	.88	.84	.87
Mastery	85	85	593	488	2135	−586	1549	.74	.75	.77
Total/ Mean	1780	722	767	343	1441	50	1491	.84	.91	.93

r_{OT} = raw correlation between observed difficulties (O) and theory-based calibrations (*T*).
R_{OT} = correlation between observed difficulties (O) and theory-based calibrations (*T*) corrected for range restriction.
R'_{OT} = correlation between observed difficulties (O) and theory-based calibrations (*T*) corrected for range restriction and measurement error.
*Means are computed on Fisher ~~Z~~ transformed correlations.

The last three columns in *Table 3* show the raw correlation between observed (O) item difficulties and theoretical (T) item calibrations, with the correlations corrected for restriction in range and measurement error. The Fisher Ƶ mean of the raw correlations (r_{OT}) is 0.84. When corrections are made for range restriction and measurement error, the Fisher Ƶ mean disattenuated correlation between theory-based calibration and empirical difficulty in an unrestricted group of reading comprehension items (R'_{OT}) is 0.93. These results show that most attempts to measure reading comprehension, no matter what the item form, type of skill or objectives assessed, or item type used, measure a common comprehension factor specified by the Lexile theory.

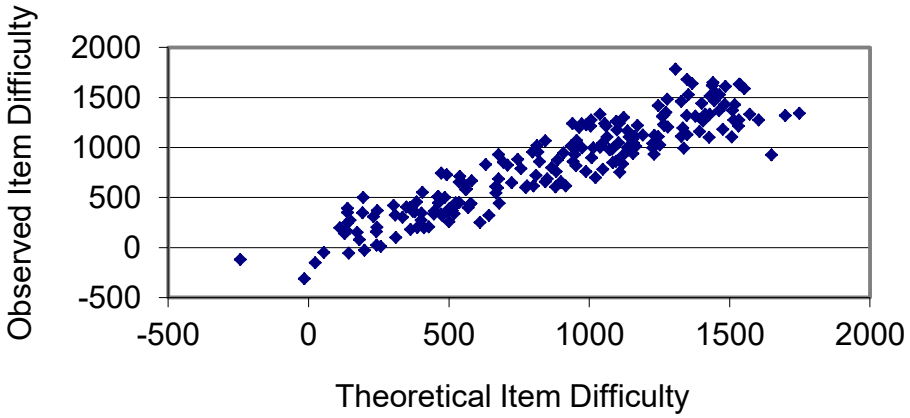
Text Measure Error Associated with the Lexile Framework

To determine a Lexile measure for a text, the standard procedure is to process the entire text. All pages in the work are concatenated into an electronic file that is processed by a software package called the Lexile Analyzer (developed by MetaMetrics, Inc.). The analyzer "slices" the text file into as many 125-word passages as possible, analyzes the set of slices, and then calibrates each slice in terms of the logit metric. That set of calibrations is then processed to determine the Lexile measure corresponding to a 75% comprehension rate. The analyzer uses the slice calibrations as test item calibrations and then solves for the measure corresponding to a raw score of 75% (e.g., 30 out of 40 correct, as if the slices were test items). The Lexile Analyzer automates this process, but what "certainty" can be attached to each text measure?

Using a bootstrap procedure to examine error due to the text samples, the above analysis could be repeated (Efron, 1981; Sitter, 1992). The result would be an identical text measure to the first because there is no sampling error when a complete text is calibrated.

There is, however, another source of error that increases the uncertainty about where a text is located on the Lexile Map. The Lexile theory is imperfect in its calibration of the difficulty of individual text slices. To examine this source of error, 200 items that had been previously calibrated and shown to fit the model were administered to 3,026 students in Grades 2 through 12 in a large urban school district. For each item the observed item difficulty calibrated from the Rasch model was compared with the theoretical item difficulty calibrated from the regression equation used to calibrate texts. A scatter plot of the data is presented in *Figure 2*.

Figure 2. Scatter plot between observed item difficulty and theoretical item difficulty.



The correlation between the observed and the theoretical calibrations for the 200 items was 0.92 and the root mean square error was 178L. Therefore, for an individual slice of text the measurement error is 178L.

The standard error of measurement associated with a text is a function of the error associated with one slice of text (178L) and the number of slices that are calibrated from a text. Very short books have larger uncertainties than longer books. A book with only four slices would have an uncertainty of 89L whereas a longer book such as *War and Peace* (4,082 slices of text) would only have an uncertainty of 3L (*Table 4*).

Table 4. Standard errors for selected values of the length of the text.

Title	Number of Slices	Text Measure	Standard Error of Text
The Stories Julian Tells	46	520L	26
Bunnicula	102	710L	18
The Pizza Mystery	137	620L	15
Meditations of First Philosophy	206	1720L	12
Metaphysics of Morals	209	1620L	12
Adventures of Pinocchio	294	780L	10
Red Badge of Courage	348	900L	10
Scarlet Letter	597	1420L	7
Pride and Prejudice	904	1100L	6
Decameron	2431	1510L	4
War and Peace	4082	1200L	3

A typical Grade 3 reading test has approximately 2,000 words in the passages. To calibrate this text, it would be sliced into 16 125-word passages. The error associated with this text measure would be 45L. A typical Grade 7 reading test has approximately 3,000 words in the passages and

the error associated with the text measure would be 36L. A typical Grade 10 reading test has approximately 4,000 words in the passages and the error associated with the text measure would be 30L.

The Find A Book (fab.lexile.com) contains information about each book analyzed: author, Lexile measure and Lexile Code, awards, ISBN, and developmental level as determined by the publisher. Information concerning the length of a book and the extent of illustrations—factors that affect a reader's perception of the difficultly of a book—can be obtained from MetaMetrics.

Lexile Item Bank

The Lexile Item Bank contains over 10,000 items that have been developed since 1986 for research purposes with the Lexile Framework.

Passage Selection. Passages selected for use are selected from "real world" reading materials that students may encounter both in and out of the classroom. Sources include textbooks, literature, and periodicals from a variety of interest areas and material written by authors of different backgrounds. The following criteria are used to select passages:

- the passage must develop one main idea or contain one complete piece of information;
- understanding of the passage is independent of the information that comes before or after the passage in the source text; and
- understanding of the passage is independent of prior knowledge not contained in the passage.

With the aid of a computer program, item writers develop native-Lexile items by examining blocks of text (minimum of three sentences) that are calibrated to be within 100L of the source text. From these blocks of text item writers are asked to select four to five that could be developed as items. If it is necessary to shorten or lengthen the passage in order to meet the criteria for passage selection, the item writer can immediately recalibrate the text to ensure that it is still targeted within 100L of the complete text (source targeting).

Item Format. The native-Lexile item format is an embedded completion task. The embedded completion format is similar to the fill-in-the-blank format. When properly written, this format directly assesses the reader's ability to draw inferences and establish logical connections between the ideas in the passage (Haladyna, 1994). The reader is presented with a passage of approximately 30 to 150 words in length. The passages are shorter for beginning readers and longer for more advanced readers. The passage is then response illustrated (a statement is added at the end of the passage with a missing word or phrase followed by four options). From the four presented options, the reader is asked to select the "best" option that completes the statement. With this format, all options are semantically and syntactically appropriate completions of the sentence, but one option is unambiguously the "best" option when considered in the context of the passage.

The statement portion of the embedded completion item can assess a variety of skills related to reading comprehension: paraphrase information in the passage, draw a logical conclusion based on the information in the passage, make an inference, identify a supporting detail, or make a generalization based on the information in the passage. The statement is written to ensure that by reading and comprehending the passage the reader is able to select the correct option. When the embedded completion statement is read by itself, each of the four options is plausible.

Item Writer Training. Item writers are classroom teachers and other educators who have had experience with the everyday reading ability of students at various levels. The use of individuals with these types of experiences helps to ensure that the items are valid measures of reading comprehension. Item writers are provided with training materials concerning the embedded completion item format and guidelines for selecting passages, developing statements, and selecting options. The item writing materials also contain incorrect items that illustrate the criteria used to evaluate items and corrections based on those criteria. The final phase of item writer training is a short practice session with three items. Item writers are provided vocabulary lists to use during statement and option development. The vocabulary lists were compiled from spelling books one grade level below the level where the item would typically be used. The rationale was that these words should be part of a reader's "working" vocabulary since they had been learned the previous year.

Item writers are also given extensive training related to "sensitivity" issues. Part of the item writing materials address these issues and identify areas to avoid when selecting passages and developing items. The following areas are covered: violence and crime, depressing situations/death, offensive language, drugs/alcohol/tobacco, sex/attraction, race/ethnicity, class, gender, religion, supernatural/magic, parent/family, politics, animals/environment, and brand names/junk food. These materials were developed based on material published by McGraw-Hill (*Guidelines for Bias-Free Publishing,* 1983). This publication discusses the equal treatment of the sexes, fair representation of minority groups, and the fair representation of disabled individuals.

Item Review. All items are subjected to a two-stage review process. First, items are reviewed and edited by an editor according to the 19 criteria identified in the item writing materials and for sensitivity issues. Approximately 25% of the items developed are deleted for various reasons. Where possible items are edited and maintained in the item bank.

Items are then reviewed and edited by a group of specialists that represent various perspectives—test developers, editors, and curriculum specialists. These individuals examine each item for sensitivity issues and for the quality of the response options. During the second stage of the item review process, items are either "approved as presented," "approved with edits," or "deleted." Approximately 10% of the items written are "approved with edits" or "deleted" at this stage. When necessary, item writers receive additional on-going feedback and training.

Item Analyses. As part of the linking studies and research studies conducted by MetaMetrics, items in the Lexile Item Bank are evaluated in terms of difficulty (relationship between logit [observed Lexile measure] and theoretical Lexile measure), internal consistency (point-biserial

correlation), and bias (ethnicity and gender where possible). Where necessary, items are deleted from the item bank or revised and recalibrated.

During the spring of 1999, 8 levels of a Lexile assessment were administered in a large urban school district to students in Grades 1 through 12. The 8 test levels were administered in Grades 1, 2, 3, 4, 5, 6, 7-8, and 9-12 and ranged from 40 to 70 items depending on the grade level. A total of 427 items were administered across the 8 test levels. Each item was answered by at least 9,000 students (the number of students per level ranged from 9,286 in grade 2 to 19,056 in grades 9-12). The item responses were submitted to a Winsteps Rasch analysis. The resulting item difficulties (in logits) were assigned Lexile measures by multiplying by 180 and anchoring each set of items to the mean theoretical difficulty of the items on the form.

The OSTP ELA Assessment – Lexile Framework Linking Process

Description of the Assessments

Oklahoma School Testing Program English Language Arts Assessment. The Oklahoma School Testing Program (OSTP) assesses students' levels of proficiency in Mathematics, English Language Arts, Science, Social Studies, and Writing. The OSTP assessments measure students' level of mastery of the content described in the Oklahoma Academic Standards adopted by the Oklahoma State Department of Education (OSDE) in 2016 (Oklahoma State Department of Education, 2016b). The OSTP assessments fulfill federal and state mandates for testing and are used for federal accountability as outlined in state law, 70 O.S. §1210.505 (OSDE, 2016a).

The OSTP ELA assessment is administered annually to students in Grades 3 through 8 and 10 (OSDE, 2016b). Each assessment consists of items written to reflect the depth of knowledge associated with specific content standards. The grade-level content standards are organized into eight standards common across all grades:

- Standard 1: Speaking and Listening
- Standard 2: Reading Foundations/Reading Process and Writing Process
- Standard 3: Critical Reading and Writing
- Standard 4: Vocabulary
- Standard 5: Language
- Standard 6: Research
- Standard 7: Multimodal Literacies
- Standard 8: Independent Reading and Writing

The OSTP ELA assessments for Grades 3 through 8 and 10 consist of 50 operational items and 10 field-test items (OSDE, 2016c). The 60 items are divided into two test sections. In Grades 5, 8, and 10, an additional written response section is administered. The first two sections consist of multiple-choice items with four-response options. In addition to multiple-choice items, Grade 10 also includes evidence-based selected response (EBSR) items. Each EBSR item consists of two parts that together serve as one item. Each part is a selected response question with a minimum of four options. The second part of the item asks the student to demonstrate that he/she can connect details or provide evidence from the text explaining or justifying the answer to the first part.

Because the Oklahoma Academic Standards for English Language Arts include eight distinct standards, the test items reflect a distinct distribution across each standard. *Table 5* distinguishes these allocations for Grades 3 through 8 and 10 assessments, respectively. In Grades 5, 8, and 10, the multiple-choice and EBSR items constitute between 85% and 90% of a students' overall score with the remainder of the points allocated to the written response section. The written response section assesses state Standards 2, 3, 4, 5, 6, and 8 (OSDE, 2016c)

Table 5. Percentage of multiple-choice and EBSR items on the OSTP ELA assessment blueprints, by standard for grades 3 through 8 and 10.

Standard	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
Standard 1: Speaking and Listening	0	0	0	0	0	0	0
Standard 2: Reading Foundations/ Reading Process and Writing Process	40	32	32	36	36	28	32
Standard 3: Critical Reading and Writing	12	20	24	20	20	28	20
Standard 4: Vocabulary	24	24	20	20	16	16	24
Standard 5: Language	12	12	12	12	12	14	12
Standard 6: Research	12	12	12	12	16	14	12
Standard 7: Multimodal Literacies	0	0	0	0	0	0	0
Standard 8: Independent Reading and Writing	0	0	0	0	0	0	0

For the Spring 2017 administration, the Grades 3 through 5 assessment forms were paper/pencil based, while the Grades 6 through 8 and 10 were administered online. The tests were not timed and typical time was estimated to be between 55 minutes and 75 minutes for each section. Students were given additional time if needed.

The OSTP ELA multiple-choice and EBSR items are scored as correct or incorrect (i.e. no partial credit scoring). Student responses are scaled using the three-parameter logistic item response theory model (3-PL IRT). Scale scores range from 200 to 399 for each grade.

The Lexile Framework for Reading. The Lexile Framework is a tool that can help teachers, parents, and students locate challenging reading materials. Text complexity (difficulty) and reader ability are measured in the same unit—the Lexile. Text complexity is determined by examining a number of text characteristics at the word and sentence/discourse levels. Items and text are calibrated using the Rasch model. The typical range of the Lexile Scale is from 200L to 1600L, although actual Lexile measures can range from below zero (e.g., BR150L) to above 1600L.

The Lexile Framework measures reading ability by focusing on skills readers use when studying written materials sampled from various content areas. Each test item consists of a passage that is response-illustrated (a statement is added at the end of the passage with a missing word or phrase followed by four options, or distractors). The skills measured by these items include referring to details in the passage, drawing conclusions, and making comparisons and generalizations. Lexile

items do not require prior knowledge of ideas outside of the passage, vocabulary taken out of context, or formal logic.

At each grade, reading items from the Lexile Framework Item Bank were selected for inclusion in the set of Lexile linking items used in the Lexile linking study. For each grade level assessed, MetaMetrics provided a set of 18 Lexile linking items organized into six blocks of four items with some overlapping items across blocks. Additionally, each grade level set had at least 5 common items and at most 12 common items with an adjacent grade level set. Each 18-item set spanned a range of difficulties typical for the grade level. All of the Lexile linking items have established theoretical difficulty values (Lexile measures) validated by data from previous test administrations. Lexile linking items were administered in blocks embedded as part of the OSTP ELA assessment administration.

Characteristics of the Lexile linking item sets were as similar as possible to the OSTP ELA assessment levels, including the difficulty of the items. For each grade, the mean Lexile measure of the grade level linking item set was established through analysis of the difficulties of the passages on the target test and normative grade-level means. The following mean targets were set: Grade 3, 559L; Grade 4, 755L; Grade 5, 864L; Grade 6, 946L; Grade 7, 992L; Grade 8, 1050L; and Grade 10, 1140L.

Evaluation of Lexile linking item pool for OSTP ELA. After administration, the Lexile linking item sets were reviewed for use in the OSTP ELA linking analysis. Descriptive statistics for the Lexile linking item sets are presented in *Table 13*. A total of 339,636 student records were provided to MetaMetrics from Measured Progress. During the evaluation, student records were flagged for removal of an off-grade designation, no responses, or exhibited misfit to the Rasch model. A total of 331,853 items were included in the evaluation of the MetaMetrics items. Each item was reviewed and evaluated for use in the linking study based on item difficulty or potential alternate answer choices being more attractive than the correct answer choice (i.e. low point-measure correlation). The number of students responding to each item ranged from 6,991 students to 25,863 students. No items were flagged for removal, and all remained in the linking analysis.

Table 6. Descriptive statistics from the administration of the Lexile linking items (N = 331,853).

Grade	*N* Persons* (Range)	*N* Items	Percent Correct Mean (Range)	Point Measure Range
3	8,488 – 25,863	18	.76 (.46 - .94)	.22 - .56
4	8,223 – 25,102	18	.71 (.42 - .95)	.23 - .49
5	7,822 – 23,720	18	.70 (.40 - .95)	.29 - .50
6	7,561 – 23,474	18	.75 (.49 - .97)	.18 - .59
7	7,844 – 24,153	18	.75 (.57 - .97)	.17 - .50
8	7,510 – 23,046	18	.74 (.44 - .94)	.26 - .54
10	6,991 – 21,570	18	.74 (.52 - .94)	.35 - .54

*7,783 students were removed due to off-grade testing or misfit to the Rasch model.

Study Design

A single-group design was chosen for this study (Kolen and Brennen, 2014). This design is most useful when (1) administering two sets of items to examinees is operationally possible, and (2) differential order effects are not expected to occur (pp. 16–17). The Lexile linking item pool was embedded in the OSTP ELA assessment administrations. The OSTP ELA assessment was administered between April 3, 2017 and April 28, 2017.

Description of the Sample

OSTP ELA sample. The OSTP ELA scale scores and item responses were provided to MetaMetrics by the OSDE and their testing contractor (Measured Progress) and included 339,636 students. This number represents all students from the statewide OSTP ELA assessment administration.

Three steps were performed prior to the linking analysis. First, a concurrent calibration of all OSTP ELA assessment items and Lexile linking items was conducted to evaluate the appropriateness of scaling both Lexile and OSTP ELA items on the same scale. Second, a concurrent calibration of the OSTP ELA items with the Lexile linking items anchored to their theoretical Lexile values was conducted to place the OSTP ELA items on the Lexile scale. Finally, a scoring run using only the OSTP ELA assessment items on the Lexile scale was conducted to express student results from the OSTP ELA assessments in the Lexile metric. These three steps were performed separately across grades because the OSTP ELA scale is unique for each grade level.

During the initial concurrent calibration for each grade, all students were submitted to a Winsteps analysis using a logit convergence criterion of 0.0001. Students were removed from further analysis if they did not fit the Rasch model, indicated by an infit statistic greater than 1.5 and outfit statistic greater than 2.0 (Linacre, 2011). A total of 331,183 students, or 97.51%, of the

initial sample remained in the final sample for the OSTP ELA link. *Table 7* presents the number of students in the initial and final samples and reasons for removal at each grade.

Table 7. Number of OSTP ELA students in the initial and final samples and reasons for removal.

Initial Sample		***N* removed by reason**				**Final Sample**	
Grade	***N***	**No Item Response**	**Off-Grade Test**	**Accommodations**	**Misfit to the Rasch Model**	***N***	**Percent of the Initial Sample**
3	52,080	0	6	0	560	51,514	98.91
4	50,518	0	6	0	540	49,972	98.92
5	48,452	3	2	0	1,103	47,344	97.71
6	46,525	0	5	88	157	46,275	99.46
7	48,076	0	5	105	139	47,827	99.48
8	47,936	22	4	293	2,026	45,591	95.11
10	46,049	59	383	184	2,763	42,660	92.64
Total	339,636	84	411	670	7,288	331,183	97.51

Table 8 presents the demographic characteristics of all students in the OSTP ELA assessment initial sample and final sample. Across the demographic characteristics, the final sample compares similarly to the initial sample.

Table 8. Percentage of students in the OSTP ELA linking study initial and final samples for selected demographic characteristics.

Student Characteristic	Category	Initial Sample *N* = 339,636	Final Sample *N* = 331,183
Grade	3	15.17	15.55
	4	14.71	15.09
	5	13.94	14.30
	6	13.62	13.97
	7	14.08	14.44
	8	13.42	13.77
	10	12.56	12.88
	Not Available	2.49	0.00
Gender	Female	47.89	49.11
	Male	49.48	50.74
	Not Available	2.63	0.14
Ethnicity	Asian	2.06	2.06
	Black/African American	9.85	9.82
	Native American	15.47	15.49
	Pacific Islander	0.46	0.46
	White/Caucasian	71.94	71.96
	Not Available	0.22	0.20
Hispanic/Latino	Yes	16.61	17.03
	No	80.90	82.97
	Not Available	2.49	0.00
ELL	Yes	5.71	5.85
	No	91.80	94.15
	Not Available	2.49	0.00
IEP	Yes	15.80	16.21
	No	81.71	83.79
	Not Available	2.49	0.00
Economically Disadvantaged	Yes	59.54	61.06
	No	37.97	38.94
	Not Available	2.49	0.00

Relationship between OSTP ELA scale scores and the OSTP ELA Lexile measures. Table 9 presents descriptive statistics for the OSTP ELA scale scores for the final sample as well as their calibrated Lexile measures. The OSTP ELA scales were developed on a grade-by-grade basis. An indication that the OSTP ELA scale is not a vertical scale is seen in the mean scale score for each grade being very similar. The OSTP ELA calibrated Lexile measures are on a vertical scale as evidenced by the increasing mean calibrated Lexile measure as the grade level increases. The correlation between OSTP ELA scale scores and their calibrated Lexile measures was 0.99, indicating that the scaling methods yielded consistent results.

Table 9. Descriptive statistics for the OSTP ELA scale scores and their calibrated Lexile measures, final sample (N = 331,183).

Grade	*N*	OSTP ELA Scale Score Mean (SD)	OSTP ELA Calibrated Lexile Measure Mean (SD)	*r*
3	51,514	291 (28.8)	646L (190.7)	0.99
4	49,972	290 (29.4)	795L (183.5)	0.99
5	47,344	291 (29.0)	875L (194.2)	0.99
6	46,275	293 (29.3)	999L (191.2)	0.99
7	47,827	287 (30.5)	1046L (173.5)	0.99
8	45,591	288 (29.0)	1136L (177.4)	0.99
10	42,660	287 (29.6)	1217L (158.4)	0.99

Figures 3 through *9* show the relationship between the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for the final sample. The scatter plots indicate that the relationship between the two scales is not linear, with the departure from linearity being most pronounced near the lower end of the distributions, at approximately 220 on the OSTP ELA scale, but also at the upper end of the distributions. At the lower level, the OSTP calibrated Lexile measures decrease at a much higher rate than at other points in the distributions of scores.

Figure 3. Scatter plot of the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for Grade 3, final sample (N = 51,514).

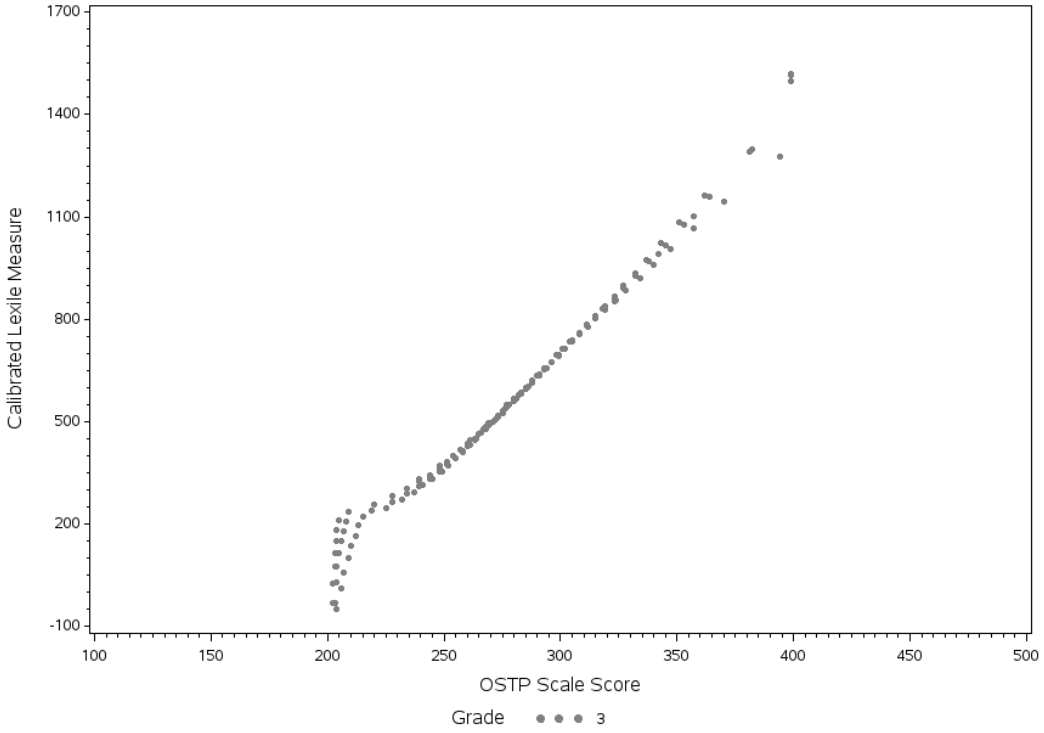


Figure 4. Scatter plot of the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for Grade 4, final sample (N = 49,972).

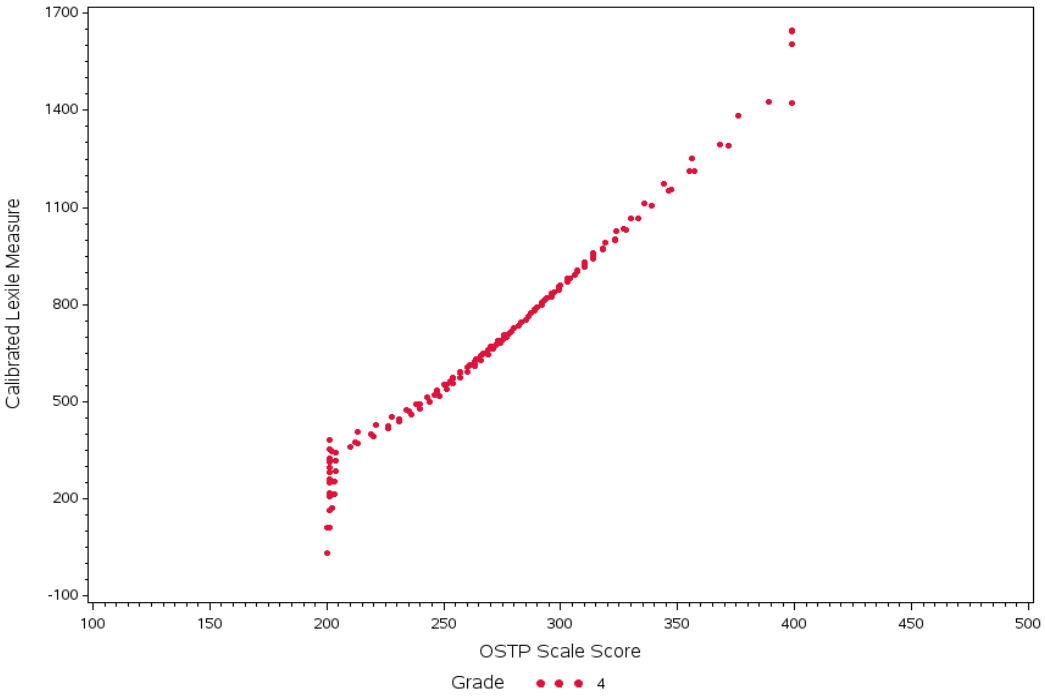


Figure 5. Scatter plot of the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for Grade 5, final sample (N = 47,344).

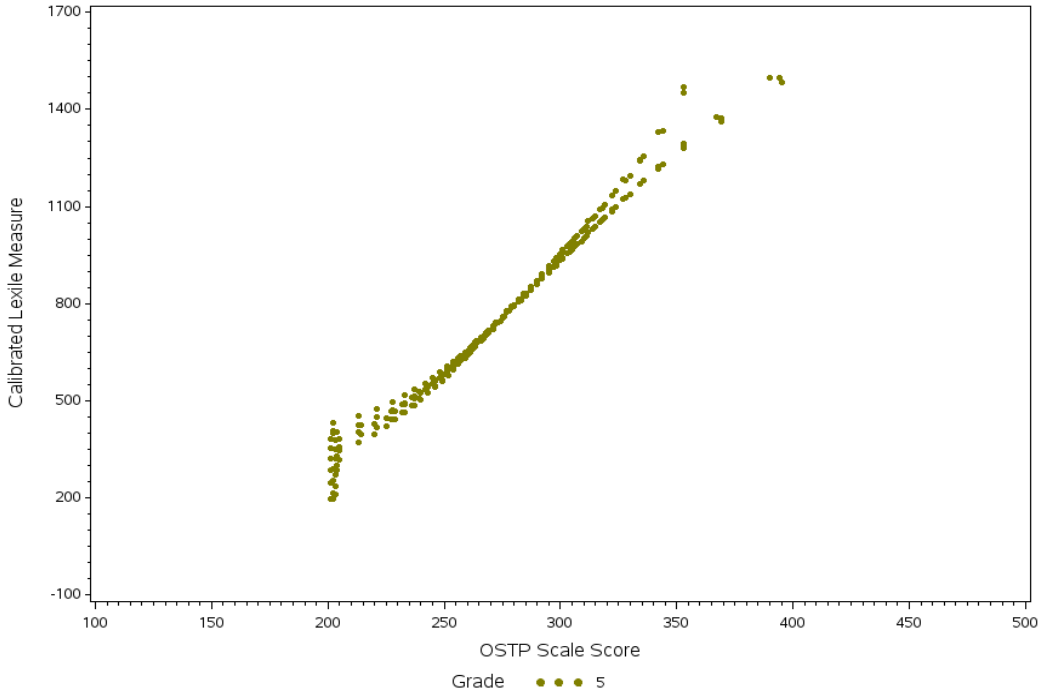


Figure 6. Scatter plot of the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for Grade 6, final sample (N = 46,275).

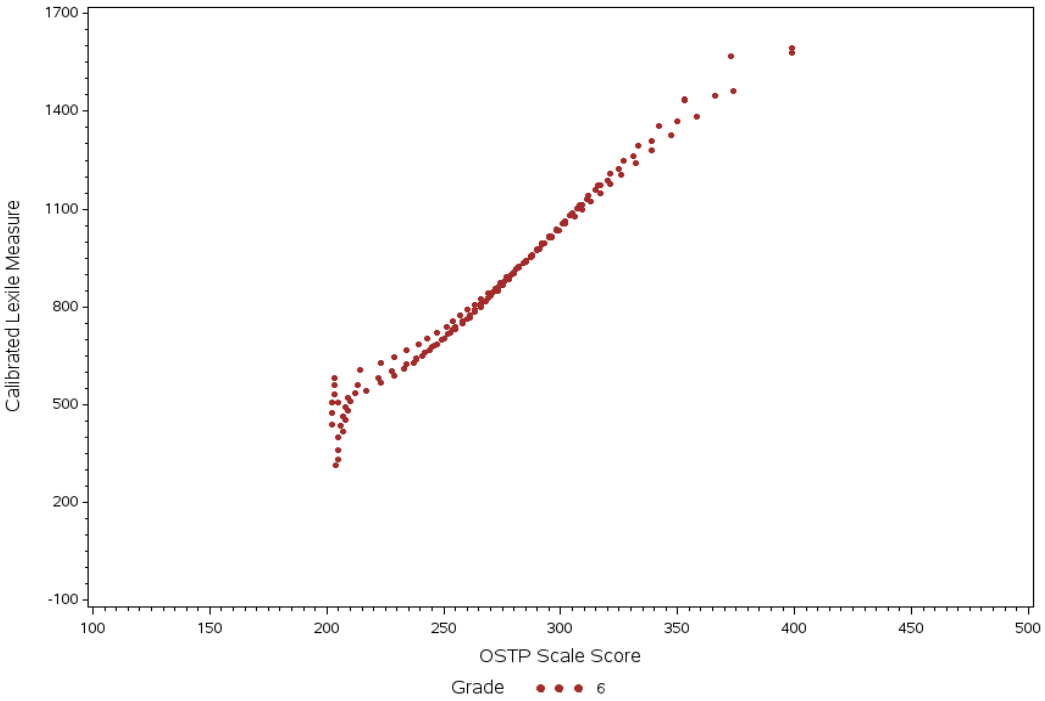


Figure 7. Scatter plot of the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for Grade 7, final sample (N = 47,827).

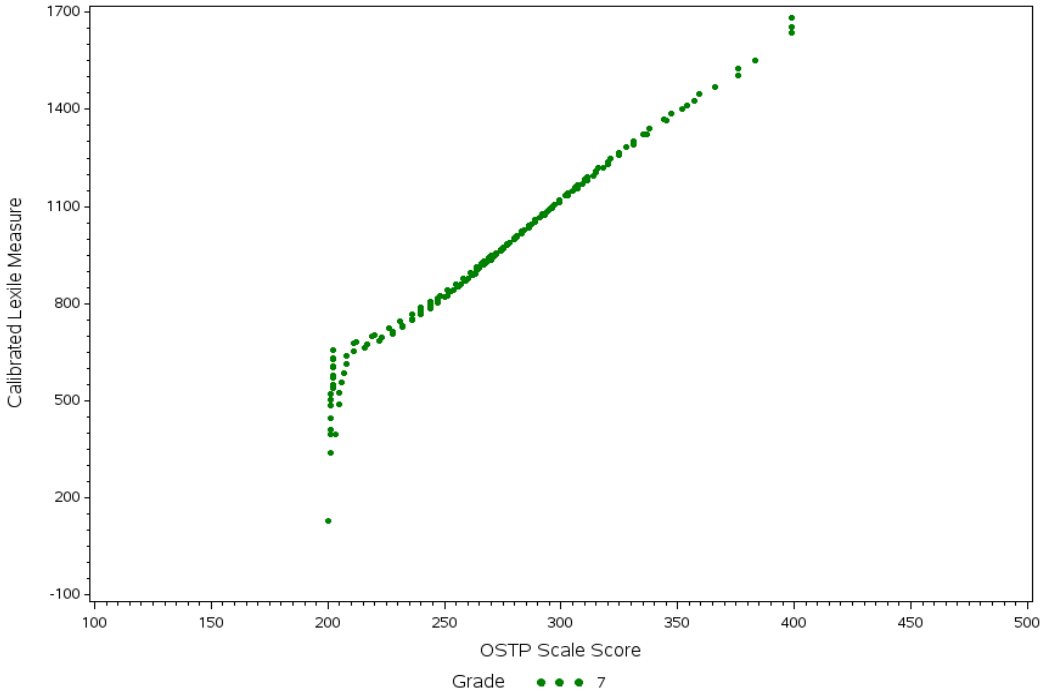


Figure 8. Scatter plot of the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for Grade 8, final sample (N = 45,591).

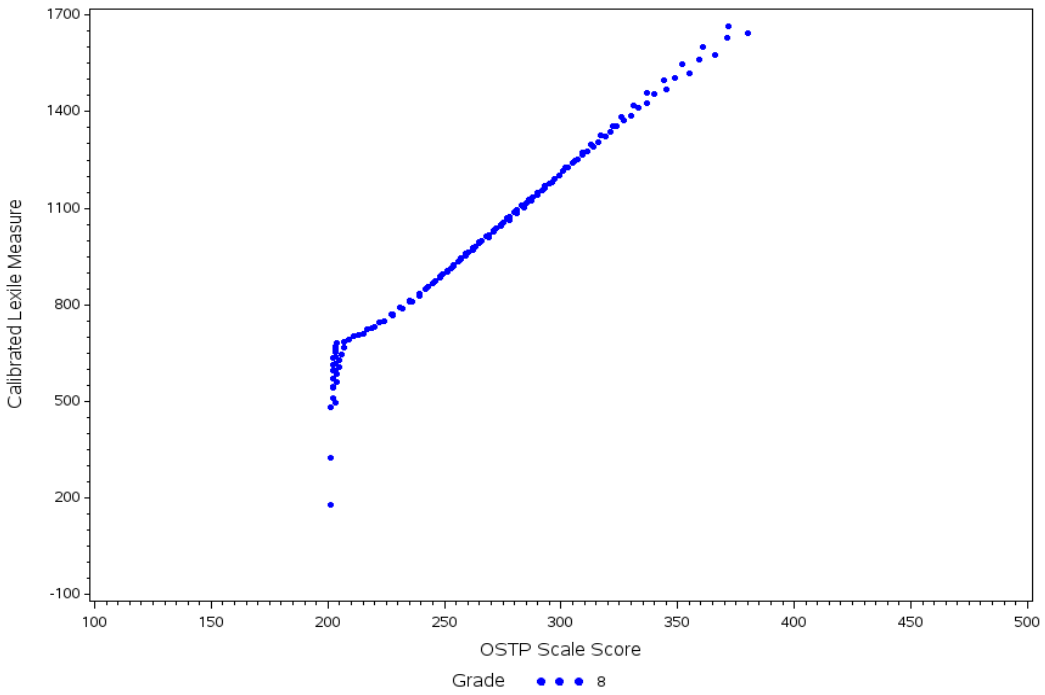
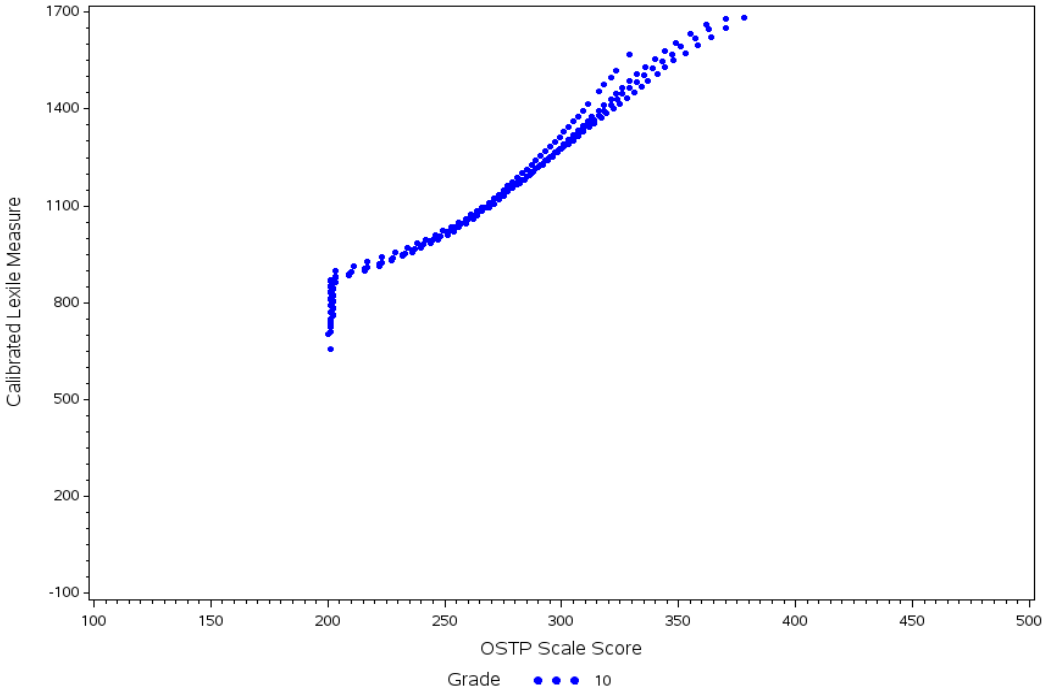


Figure 9. Scatter plot of the OSTP ELA scale scores and the OSTP ELA calibrated Lexile measures for Grade 10, final sample (N = 42,660).



Linking the OSTP ELA Scales with the Lexile Scale

Linking in general means "putting the scores from two or more tests on the same scale" (National Research Council, 1999, p.15). MetaMetrics and the Oklahoma State Department of Education conducted this linking study for the purpose of matching students with books and texts—to predict the books and texts a student should be matched with for successful reading experiences, given their performance on the OSTP ELA assessment.

Linking Analyses. In scale alignment, which uses the same methods as linear equating (Dorans, Moses, and Eignor, 2010), the equating relationship requires that the transformations between to scales be symmetric (Lord 1980). This requires that the function used to transform Form *X* to Form *Y* can be inversely applied. When the distributions of scores from two assessments are not linear, as illustrated in *Figures 3* through *9*, equipercentile linking methods can be used to symmetrically link two scales. In this procedure, a curve is used to describe scale-to-scale differences and is appropriate for linking two scales when test forms have different distributions of item difficulties (Kolen and Brennan, 2014). The equipercentile method has several advantages over the linear method:

- equipercentile equivalents are within the range of possible score points, which avoids the out-of-range problem that can occur with the mean, linear, and parallel-linear methods;
- for the equipercentile the relationship between scales is not assumed to be linear;
- the cumulative distribution function of transformed scores is approximated by the cumulative distribution function of Test *Y;* and

- the moments for transformed scores (e.g., mean, variance, skewness, and kurtosis) are approximately the same as those for Test *Y* (p. 504).

In equipercentile equating, differences in difficulty between tests are described by a non-linear transformation (Kolen and Brennan, 2014). Given scores *x* and *y* on tests *X* and *Y*, the non-linear relationship is

$$e_Y(x) = G^{-1}[F(x)] \qquad \text{Equation (2)}$$

where *F* is the cumulative distribution function of *X*, *G* is the cumulative distribution function of *Y*, and G^{-1} is the inverse of the cumulative distribution function of *Y*. Using percentile rank functions *P* and *Q* (for *X* and *Y*, respectively), the equipercentile equivalent of score *x* on the *Y* scale for the population is

$$\begin{aligned} e_Y(x) &= Q^{-1}[P(x)], && 0 \le P(x) < 100, \\ &= Y_j + 0.5, && P(x) = 100 \end{aligned} \qquad \text{Equation (3)}$$

where Q^{-1} is the inverse of the percentile rank function for *Y*, and Y_j represents the highest score for *Y*.

Equipercentile links often create uneven or jagged distributions. Post smoothing is typically employed to obtain equivalents with an unfluctuating or smooth shape.

An adapted version of a SAS software program used for calculating equivalent scores using equipercentile methods was employed to conduct an equipercentile linking of the OSTP ELA assessment for Grades 3 through 8 and 10 unrounded scale scores and the OSTP ELA calibrated Lexile measures (Price, Lurie, and Wilkins, 2001). This program generates unsmoothed functions. Polynomial smoothing splines methods were conducted for post smoothing (De Boor, 1978; Kolen and Brennan, 2014) using the SAS transformation regression procedure (SAS Institute, 2015). The program preserves the symmetry of the conversion by averaging target-to-reference and reference-to-target conversions. Thus, the OSTP ELA scale scores can be converted to Lexile measures and, symmetrically, scores on the Lexile scale can be converted to OSTP ELA scale scores resulting in the conversion tables, or linking functions.

Using the final sample data described in *Table 9*, the equipercentile linking functions relating the OSTP ELA scale scores and OSTP ELA calibrated Lexile measures for all examinees in the sample, by grade level, were constructed.

Conversion tables were developed for all grade levels in order to express the OSTP ELA scale scores in the Lexile metric and were delivered to the OSDE and their testing contractor (Measured Progress) in electronic format.

Recommendations about reporting Lexile measures. Lexile measures are reported as a number followed by a capital "L" for "Lexile." There is no space between the measure and the "L," and measures of 1,000 or greater are reported without a comma (e.g., 1050L). All Lexile measures

should be rounded to the nearest 5L to avoid over interpretation of the measures. As with any test score, uncertainty in the form of measurement error is present.

Lexile measures that are reported for an individual student should reflect the purpose for which they will be used. If the purpose is research (e.g., to measure growth at the student, grade, school, district, or state level), then actual measures should be used at all score points, rounded to the nearest integer. A computed Lexile measure of 772.5L would be reported as 773L. If the purpose is instructional, then the Lexile measures should be capped at the upper bound of measurement error (e.g., at the 95th percentile of the national Lexile norms) to ensure developmental appropriateness of the material. MetaMetrics expresses these as "Reported Lexile Measures" and recommends that these measures be reported on individual score reports. The grade level caps used for reporting Lexile measures are shown in *Table 10.*

In instructional environments where the purpose of the Lexile measure is to appropriately match readers with texts, all scores below 0L should be reported as "BRxxxL." No student should receive a negative Lexile measure on a score report. The lowest reported value below 0L is BR400L.

Table 10. Maximum reported Lexile measures, by test level.

Test Level	Lexile Caps
3	1200L
4	1300L
5	1400L
6	1500L
7	1600L
8	1700L
10	1750L

Some assessments report a Lexile range for each student, which is 50L above and 100L below the student's actual Lexile measure. This range represents the boundaries between the easiest kind of reading material for the student to be reading and still lead to growth in reading ability and the level at which the student will be more challenged, yet should still be able to read successfully.

Validity of the OSTP ELA–Lexile Links

Table 11 presents the descriptive statistics for the OSTP ELA calibrated Lexile measures as well as the OSTP ELA equipercentile Lexile measures from the final sample. The two scoring

methods yield highly similar Lexile measures; the differences between mean Lexile measures are within 4 Lexiles and the correlations between the calibrated and equipercentile Lexile measures are all 0.99 (see *Table 11*).

Table 11. Descriptive statistics for the OSTP ELA calibrated Lexile measures and the equipercentile linking Lexile measures, final sample (N = 331,183).

Grade	*N*	OSTP ELA Calibrated Lexile Measure Mean (SD)	OSTP ELA Equipercentile Lexile Measure Mean (SD)	*r*
3	51,514	646L (190.7)	644L (186.1)	0.99
4	49,972	795L (183.5)	797L (185.9)	0.99
5	47,344	875L (194.2)	877L (195.4)	0.99
6	46,275	999L (191.2)	1000L (192.7)	0.99
7	47,827	1046L (173.5)	1043L (165.9)	0.99
8	45,591	1136L (177.4)	1137L (177.2)	0.99
10	42,660	1217L (158.4)	1218L (158.8)	0.99

Percentile Rank Distributions. To support the generalization of the reported scores from the equipercentile links, the similarity between the percentile ranks of the OSTP ELA calibrated and equipercentile Lexile measures are compared in *Table 12.* The criterion of a half standard deviation (100L) on the Lexile scale was used to evaluate the size of the difference. In examining the values, the calibrated and equipercentile Lexile measures are very similar across all selected percentiles, with the largest difference being 37L at the 99th percentile in Grade 5.

Table 12. Comparison of the Lexile measures for selected percentile ranks from the OSTP ELA calibrated Lexile measures and the equipercentile Lexile measures, final sample by grade (N = 331,183).

Grade 3		
Percentile Rank	**OSTP Calibrated Lexile Measure**	**OSTP Equipercentile Lexile Measure**
1	234L	217L
5	333L	346L
10	391L	401L
25	514L	516L
50	654L	650L
75	778L	774L
90	886L	883L
95	960L	951L
99	1083L	1057L

Grade 4		
Percentile Rank	**OSTP Calibrated Lexile Measure**	**OSTP Equipercentile Lexile Measure**
1	382L	381L
5	480L	494L
10	554L	550L
25	669L	667L
50	800L	804L
75	916L	927L
90	1026L	1022L
95	1068L	1082L
99	1213L	1233L

Grade 5		
Percentile Rank	**OSTP Calibrated Lexile Measure**	**OSTP Equipercentile Lexile Measure**
1	427L	415L
5	546L	556L
10	622L	621L
25	746L	751L
50	878L	877L
75	1003L	1003L
90	1124L	1122L
95	1180L	1184L
99	1362L	1399L

Grade 6		
Percentile Rank	**OSTP Calibrated Lexile Measure**	**OSTP Equipercentile Lexile Measure**
1	567L	560L
5	680L	674L
10	750L	743L
25	873L	870L
50	996L	998L
75	1123L	1127L
90	1241L	1235L
95	1311L	1312L
99	1449L	1470L

Table 12 (continued). Comparison of the Lexile measures for selected percentile ranks from the OSTP ELA calibrated Lexile measures and the equipercentile Lexile measures, final sample by grade (N = 331,183).

Grade 7		
Percentile Rank	**OSTP Calibrated Lexile Measure**	**OSTP Equipercentile Lexile Measure**
1	639L	632L
5	747L	744L
10	806L	821L
25	931L	935L
50	1056L	1051L
75	1159L	1151L
90	1259L	1250L
95	1323L	1305L
99	1427L	1421L

Grade 8		
Percentile Rank	**OSTP Calibrated Lexile Measure**	**OSTP Equipercentile Lexile Measure**
1	703L	694L
5	813L	818L
10	895L	892L
25	1027L	1028L
50	1141L	1150L
75	1251L	1256L
90	1354L	1348L
95	1411L	1401L
99	1547L	1538L

Grade 10		
Percentile Rank	**OSTP Calibrated Lexile Measure**	**OSTP Equipercentile Lexile Measure**
1	881L	885L
5	957L	958L
10	1008L	1004L
25	1107L	1103L
50	1219L	1221L
75	1329L	1328L
90	1418L	1421L
95	1470L	1475L
99	1578L	1575L

OSTP ELA Performance Levels. Performance level descriptors describe the knowledge and skills students are expected to demonstrate at each level. Four performance levels have been established for the OSTP ELA scale scores: Advanced, Proficient, Limited and Unsatisfactory (OSDE, 2017a):

- *Advanced*: Students demonstrate superior performance on challenging subject matter.
- *Proficient*: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.
- *Limited Knowledge*: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.
- *Unsatisfactory*: Students have not performed at least at the Limited Knowledge level. Students scoring at the **Unsatisfactory** level should be given comprehensive reading instruction.

In *Table 13,* the OSTP ELA performance level descriptor scale scores and their associated Lexile measures are provided for each performance level and grade. The performance levels reported as Lexile measures can provide insight with respect to aligning appropriate instructional materials with student ability.

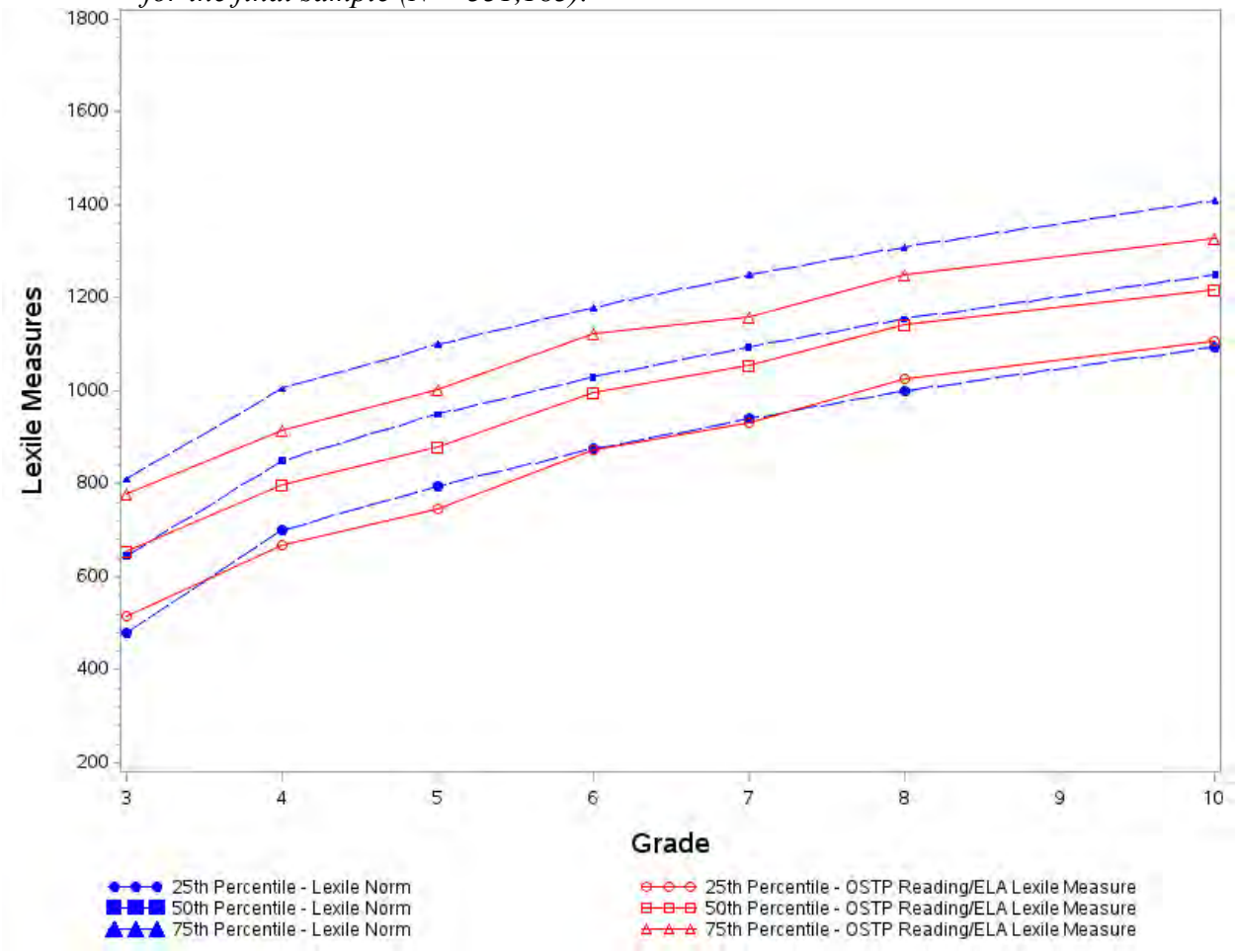
Table 13. OSTP ELA performance levels and associated Lexile measures.

Grade	Unsatisfactory	Lexile Measure	Limited Knowledge	Lexile Measure	Proficient	Lexile Measure	Advanced	Lexile Measure
3	200-276	40L–535L	277-299	540L–695L	300-328	700L–890L	329-399	895L–1200L
4	200-274	235L–690L	275-299	695L–855L	300-330	860L–1065L	331-399	1070L–1075L
5	200-270	265L–725L	271-299	730L–930L	300-322	935L–1090L	323-399	1095L–1400L
6	200-268	395L–825L	269-299	830L–1045L	300-329	1050L–1250L	330-399	1255L–1500L
7	200-272	550L–955L	273-299	960L–1105L	300-322	1110L–1235L	323-399	1240L–1600L
8	200-268	595L–1010L	269-299	1015L–1210L	300-321	1215L–1345L	322-399	1350L–1700L
10	200-262	750L–1070L	263-299	1075L–1280L	300-322	1285L–1420L	323-399	1425L–1750L

Lexile Framework Norms. Figure 10 shows the Lexile measures for the OSTP ELA assessment levels compared to the Lexile norms that have been developed for use with The Lexile Framework for Reading. The normative information for The Lexile Framework for Reading is based on linking studies conducted with the Lexile Framework and the results of assessments that report directly in the Lexile metric (N = 3,535,123 students). The sample included students in Grades 1 through 12 from 51 states, districts, or territories and who were tested from 2010 to 2016. Of the students with gender information (45%), 51.6% of the students were male and 48.4% of the students were female. Of the students with race or ethnicity information (39%), the majority of the students in the norming sample were White (46.2%), with 4.8% African-American, 1.6% American Indian/Alaskan Native, 12.3% Hispanic, 12.5% Asian, and 4.4% Other. Of the students with data, 5.7 percent of the students were classified as "limited English proficient"; and 8.9 percent of the students were classified as "Needing Special Education Services." Approximately 45 percent of the students were eligible for the free or reduced-price lunch program. The 2017 Lexile norms have been validated in relation to a longitudinal sample of students across Grades 3 through 11 (N = 101,610).

In *Figure 10,* the OSTP ELA Lexile measures are closely aligned with the Lexile norms. In Grade 3, OSTP ELA Lexile measures for the 25th and 50th percentile are slightly higher than their respective Lexile values from the Lexile Framework norming sample, while the OSTP ELA 75th percentile is slightly lower than the Lexile norms. For Grades 4 through 7, the OSTP ELA Lexile measure selected percentiles are all slightly lower than their respective Lexile norming sample percentiles. The Grades 8 and 10 OSTP ELA 25th percentile Lexile measure is slightly higher than the Lexile norming sample, while the 50th and 75th percentile Lexile measures are slightly lower than their respective Lexile norming sample.

Figure 10. Selected percentiles (25th, 50th, and 75th) plotted for the OSTP ELA Lexile measures for the final sample (N = 331,183).



Grade-Level Progressions. The following box-and-whisker plots (*Figures 11* through *13*) show the progression of OSTP ELA scale scores and Lexile measures (the *y*-axis) from grade to grade (the *x*-axis). For each grade, the box refers to the interquartile range. The line within the box indicates the median. The end of each whisker represents the 5th and 95th percentile of the score distribution (the *y*-axis).

Figures 11 through *13* demonstrate the horizontal scaling for the OSTP ELA scale and the vertical nature of the Lexile scale. In *Figure 11*, no increase is observed from one grade to the next in terms of the OSTP ELA scale scores that are not reported on a vertical scale. The vertical nature of the Lexile scale can be observed in *Figures 12* and *13* highlighting the benefit of having OSTP ELA scores on a vertical scale. As the grade increases so do the overall Lexile measures, indicating increasing reading ability across the grades and providing a method to examine growth across grades.

Figure 11. Box-and-whisker plot of the OSTP ELA scale scores by grade, final sample (N = 331,183).

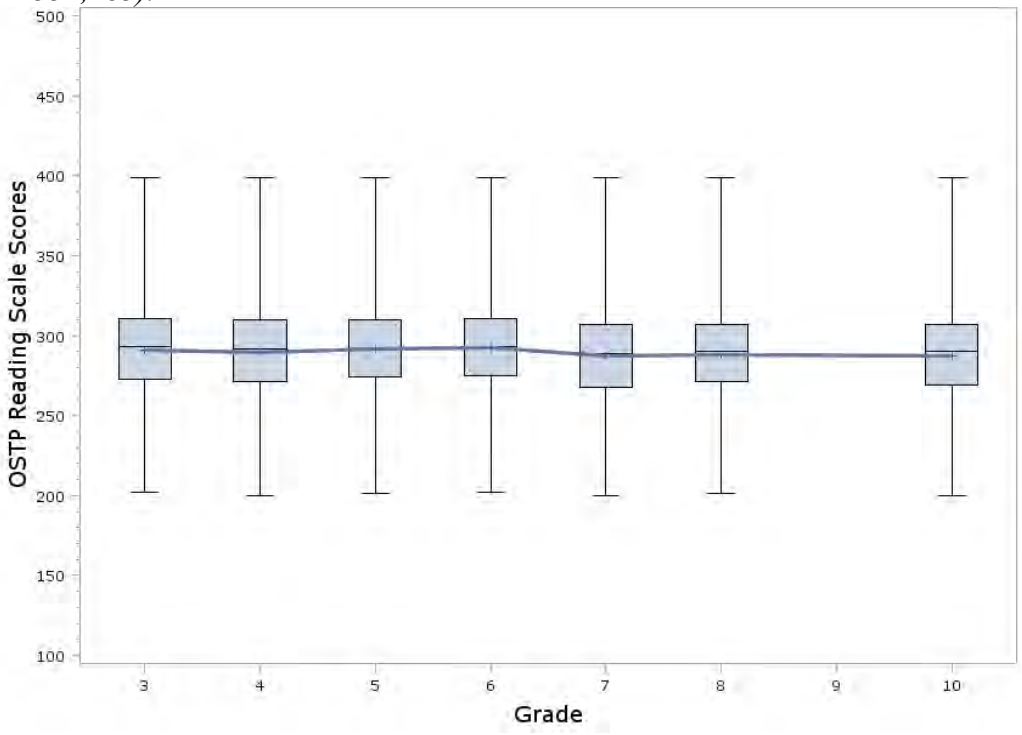


Figure 12. Box-and-whisker plot of the OSTP ELA calibrated Lexile measures, final sample (N = 331,183).

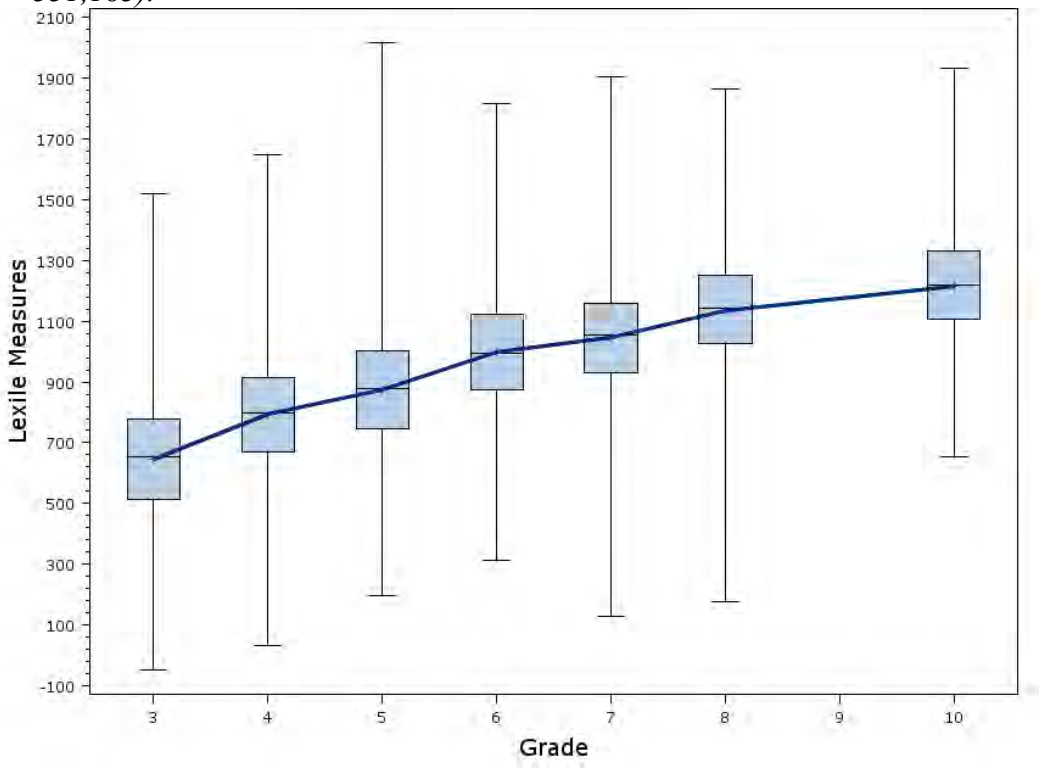
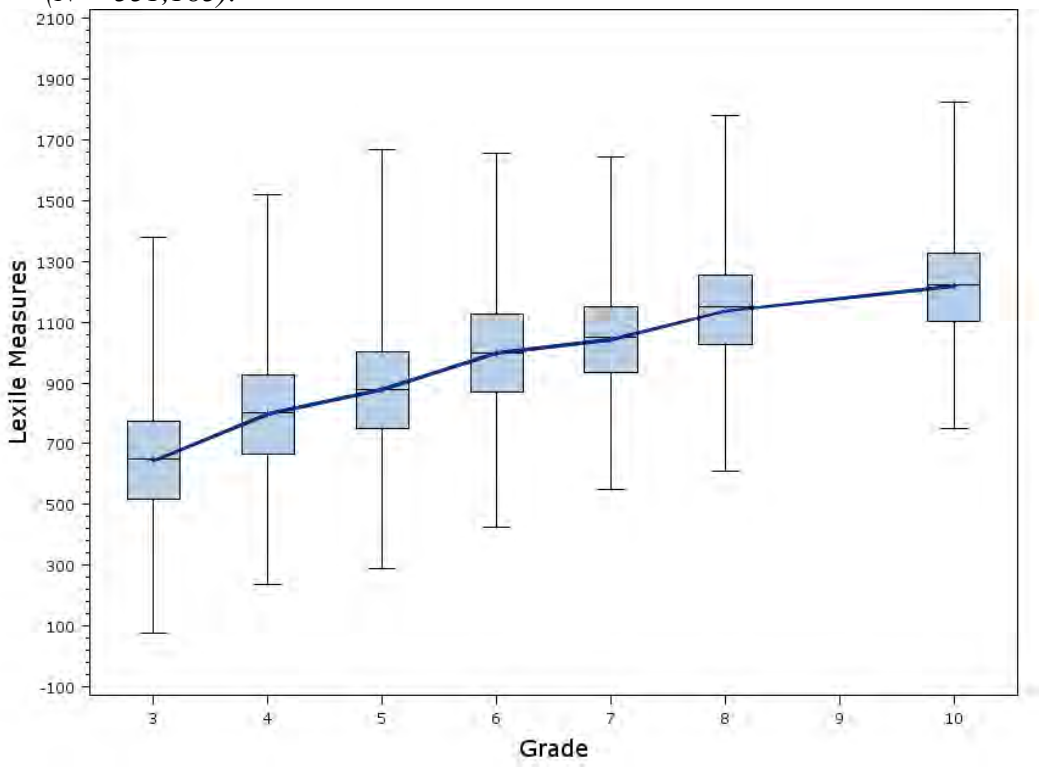


Figure 13. Box-and-whisker plot of the OSTP ELA equipercentile Lexile measures, final sample (N = 331,183).



The Lexile Framework and Forecasted Comprehension Rates

A student with a measure of 600L who is given a text measured at 600L is expected to have a 75-percent comprehension rate. This 75-percent comprehension rate is the basis for selecting text that is targeted to the individual's reading ability, but what exactly does it mean? And what would the comprehension rate be if this same student were given a text measured at 350L or one at 850L?

The 75-percent comprehension rate for a student-text pairing can be given an operational meaning by imagining the text is carved into item-sized slices of approximately 125-140 words with a question embedded in each slice. An individual who answers three-fourths of the questions correctly has a 75-percent comprehension rate.

Suppose instead that the text and the student measures are not the same. It is the difference in Lexile measures between the student and text that governs comprehension. If the text measure is less than the student measure, the comprehension rate will exceed 75 percent. If not, it will be less. The question is "By how much?" What is the expected comprehension rate when a 600L individual reads a 350L text?

If all the item-sized slices in the 350L text had the same calibration, the 250L difference between the 600L student and the 350L text could be determined using the Rasch model equation. This equation describes the relationship between the measure of a student's level of reading comprehension and the calibration of the items. Unfortunately, comprehension rates calculated by this procedure would be biased because the calibrations of the slices in ordinary prose are not all the same. The average difficulty level of the slices *and* their variability both affect the comprehension rate.

Although the exact relationship between comprehension rate and the pattern of slice calibrations is complicated, Equation 4 is an unbiased approximation:

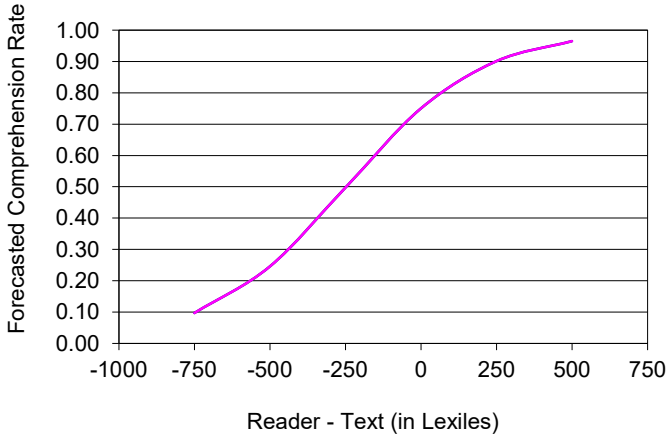
$$Rate = \frac{e^{ELD+1.1}}{1+e^{ELD+1.1}} \qquad \text{Equation (4)}$$

where ELD is the "effective logit difference" given by

$$\text{ELD} = (\text{Student Lexile measure} - \text{Text Lexile measure}) \div 225. \qquad \text{Equation (5)}$$

Figure 14 shows the general relationship between student-text discrepancy and forecasted comprehension rate. When the student measure and the text calibration are the same (difference of 0L) then the forecasted comprehension rate is 75 percent. In the example in the preceding paragraph, the difference between the student measure of 600L and the text calibration of 350L is 250L. Referring to *Figure 14* and using +250L (student minus text), the forecasted comprehension rate for this student-text combination would be 90 percent.

Figure 14. Relationship between student-text discrepancy and forecasted comprehension rate.



Tables 14 and *15* show comprehension rates calculated for various combinations of student measures and text calibrations.

Table 14. Comprehension rates for the same individual with materials of varying comprehension difficulty.

Student Measure	Text Measure	Sample Titles	Forecast Comprehension
1000L	500L	*Rapunzel's Revenge* (Hale)	96%
1000L	750L	*The Yearling* (Rawlings)	90%
1000L	1000L	*Reader's Digest*	75%
1000L	1250L	*The Lost World* (Doyle)	50%
1000L	1500L	*Don Quixote* (Cervantes Saavedra)	25%

Table 15. Comprehension rates of different student abilities with the same material.

Student Measure	Calibration for a Grade 10 Biology Textbook	Forecasted Comprehension Rate
500L	1000L	25%
750L	1000L	50%
1000L	1000L	75%
1250L	1000L	90%
1500L	1000L	96%

The subjective experience of 50-percent, 75-percent, and 90-percent comprehension as reported by students varies greatly. A 1000L student reading 1000L text (75-percent comprehension) reports confidence and competence. Individuals listening to such a student report that the student can sustain the meaning thread of the text and can read with motivation and appropriate emotion and emphasis. In short, such students appear to comprehend what they are reading. A 1000L student reading 1250L text (50-percent comprehension) encounters so much unfamiliar vocabulary and difficult syntactic structures that the meaning thread is frequently lost. Such students report frustration and seldom choose to read independently at this level of comprehension. Finally, a 1000L student reading 750L text (90-percent comprehension) reports total control of the text, reads with speed, and experiences automaticity during the reading process.

The primary utility of the Lexile Framework is its ability to forecast what happens when students confront text. With every application by teacher, student, or librarian there is a test of the Lexile Framework's accuracy. The Lexile Framework makes a point prediction every time a text is chosen for an individual. Anecdotal evidence suggests that the Lexile Framework predicts as intended. That is not to say that there is an absence of error in forecasted comprehension. There is error in text measures, student measures, and their difference modeled as forecasted comprehension. However, the error is sufficiently small that the judgments about students, texts, and comprehension rates are useful.

Relationship between Linking Error and Forecasted Comprehension Rate. Using Equation 5 with different combinations of student measure and text difficulty, the effect of linking error on forecasted comprehension rate can be examined. *Table 16* shows the changes in the forecasted comprehension rate for different combinations of student and text interactions. When the linking error is small, 5–10L, then the effect on forecasted comprehension rate is a minimal difference (1 to 2 percent increase or decrease) in comprehension.

Table 16. Effect of student-text discrepancy on forecasted comprehension rate.

Student Lexile Measure	Text Lexile Measure	Difference	Forecasted Comprehension Rate
1000L	970L	30L	77.4%
1000L	975L	25L	77.0%
1000L	980L	20L	76.7%
1000L	985L	15L	76.3%
1000L	990L	10L	75.8%
1000L	995L	5L	75.4%
1000L	1000L	0L	75.0%
1000L	1005L	¯5L	74.6%
1000L	1010L	¯10L	74.2%
1000L	1015L	¯15L	73.8%
1000L	1020L	¯20L	73.3%
1000L	1025L	¯25L	72.9%
1000L	1030L	¯30L	72.4%

Conclusions, Caveats, and Recommendations

Forging a link between scales is a way to add value to one scale without having to administer an additional test. Value can be in the form of any or all of the following:

- increased *interpretability* (e.g., "Based on this test score, what can my child actually read?"), or
- increased *instructional use* (e.g., "Based on these test scores, I need to modify my instruction to include these skills.").

The link that has been established between the OSTP ELA scale and the Lexile scale provides a way to match readers with books and texts that provide an appropriate level of challenge while avoiding frustration. The result of this purposeful match may be that students will read more, and, thereby read better. The real power of the Lexile Framework is in examining the growth of readers—wherever the reader may be in the development of his or her reading skills. Readers can be matched with texts that they are forecasted to read with 75-percent comprehension. As a reader grows, he or she can be matched with more demanding texts. And, as the texts become more demanding, then the reader grows.

The concordance provides a link between the two scales. All linking functions are statistical estimates based on data collected from specific samples. These linking results may be somewhat different with a different sample. Other factors may affect the students' performance during the test administrations such as health conditions, surrounding environment, or motivation.

Recommendations about reporting Lexile measures for readers. Lexile measures are reported as a number followed by a capital "L" for "Lexile." There is no space between the measure and the "L," and measures of 1,000 or greater are reported without a comma (e.g., 1050L). All Lexile measures should be rounded to the nearest 5L to avoid over interpretation of the measures. As with any test score, uncertainty in the form of measurement error is present.

Lexile measures that are reported for an individual student should reflect the purpose for which they will be used. If the purpose is research (e.g., to measure growth at the student, grade, school, district, or state level), then actual measures should be used at all score points, rounded to the nearest integer. A computed Lexile measure of 772.51 would be reflected as 773L. If the purpose is instructional, then the Lexile measures should be capped at the upper bound of measurement error (e.g., at the 95^{th} percentile of the national Lexile norms) to ensure developmental appropriateness of the material. MetaMetrics expresses these as "Reported Lexile Measures" and recommends that these measures be reflected on individual score reports. In instructional environments where the purpose of the Lexile measure is to appropriately match readers with texts, all scores below 0L should be reported as "BRxxxL." No student should receive a negative Lexile measure on a score report. The lowest reported value below 0L is BR400L.

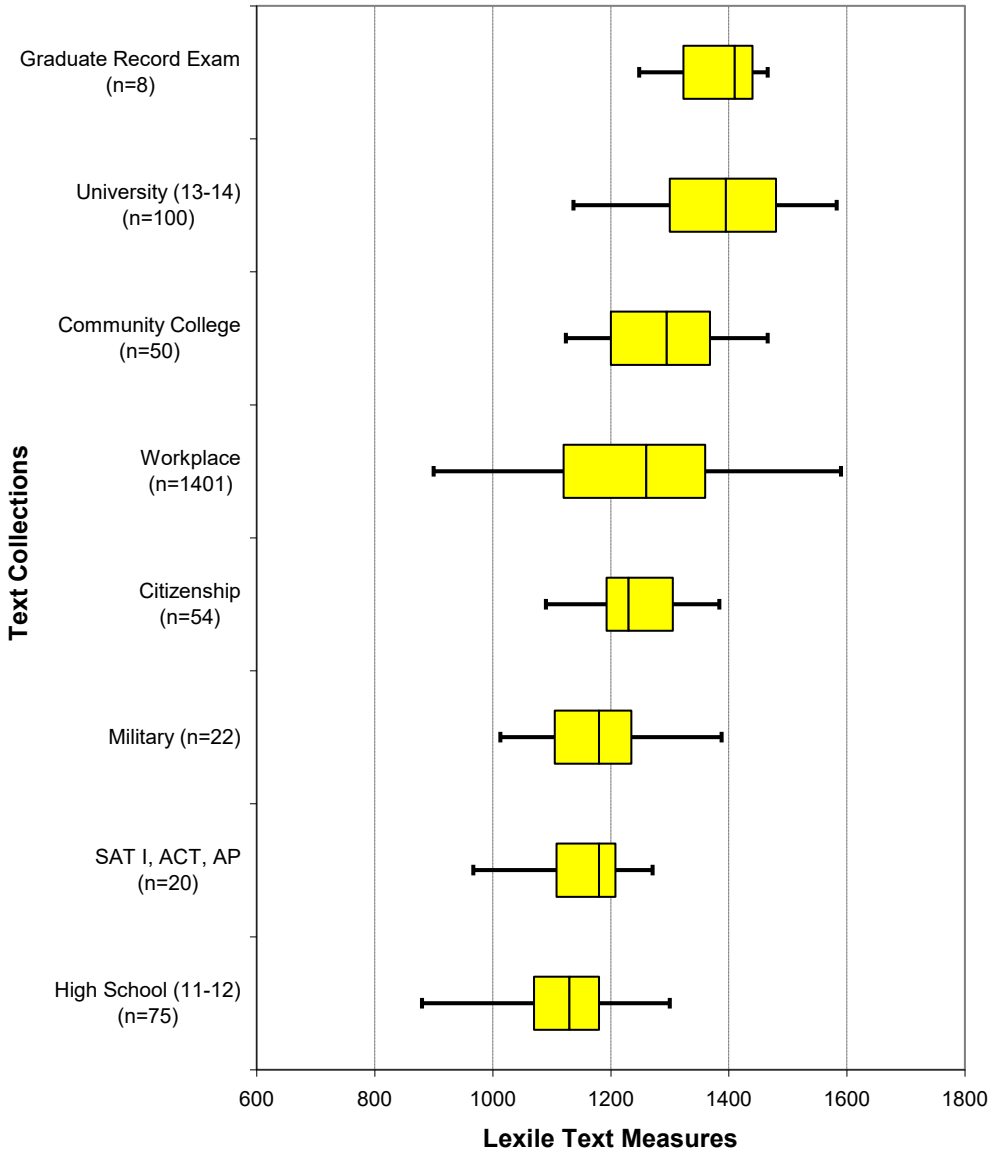
Some assessments report a Lexile range for each student, which is 50L above and 100L below the student's actual Lexile measure. This range represents the boundaries between the easiest kind of reading material for the student to be reading and still lead to growth in reading ability

and the level at which the student will be more challenged, yet should still be able to read successfully. A reader with a Lexile measure of 1000L would have a Lexile range of 900L–1050L. This range represents the recommended guideline to select reading materials for instructional purposes. Understanding the impact of selecting reading materials on a student's comprehension is important for student success. It should be noted that material above or below the reader's Lexile range may be used for specific instructional purposes. As in any academic setting, the teachers and parents know the student best. The Lexile range is best viewed as a tractable guideline where teachers or parents selecting reading materials outside of the Lexile range may seem more appropriate.

Text Complexity. There is increasing recognition of the importance of bridging the gap that exists between K-12 and higher education and other postsecondary endeavors. Many state and policy leaders have formed task forces and policy committees such as P-20 councils.

In the *Journal of Advanced Academics* (Summer 2008), Williamson investigated the gap between high school textbooks and various reading materials across several postsecondary domains. The resources Williamson used were organized into four domains that correspond to the three major postsecondary endeavors that students can choose—further education, the workplace, or the military—and the broad area of citizenship, which cuts across all postsecondary endeavors. *Figure 15* shows the Lexile ranges of reading materials in the domains investigated by Williamson. Williamson discovered a substantial increase in reading expectations and text complexity from high school to postsecondary domains—a gap large enough to help account for high remediation rates and disheartening graduation statistics (Smith, 2011).

Figure 15. A continuum of text difficulty for the transition from high school to postsecondary experiences (box plot percentiles: 5th, 25th, 50th, 75th, and 95th).[1]



In Texas, two studies examined the reading demands in various postsecondary options – technical college, community college, and 4-year university programs. Under Commissioner Raymond Paredes, THECB conducted a research study in 2007 (and extended in 2008) which addressed the focal question of "how well does a student need to read to be successful in community colleges, technical colleges, and universities in Texas?" THECB staff collected a sample of books that first year students in Texas would be required to read in each setting. The text complexity of these books was measured using The Lexile Framework for Reading. Since

[1] Reprinted from Williamson, G. L. (2008). A text readability continuum for postsecondary readiness. *Journal of* ***Advanced Academics, 19*****(4), 602-632.**

the TAKS had already been linked with Lexile measures for several years, the THECB study was able to overlay the TAKS cut scores onto the post high school reading requirements. (For a complete description of this report, visit www.thecb.state.tx.us/index.cfm?objectid=31BFFF6B-BB41-8A43-C76A99EDA0F38B7D.)

Since the THECB study was completed, other states have followed the Texas example and used the same approach in examining the gap from high school to the postsecondary world. In 2009, a similar study was conducted for the Georgia Department of Education; and in 2010, a study was conducted for the Tennessee Department of Education. In terms of mean text demand, the results across the three states produced similar estimates of the reading ability needed in higher-education institutions: Texas, 1230L; Georgia, 1220L; and Tennessee, 1260L. When these results are incorporated with the reading demands of other postsecondary endeavors (military, citizenship, workplace, and adult reading materials [national and international newspapers] and Wikipedia articles) used by Stenner, Koons, and Swartz (2010), the college and career readiness standard for reading is 1293L. These results are based on more than 105,000,000 words from approximately 3,100 sources from the adult text space.

Expanding on Williamson's work, Stenner, Sanford-Moore, and Williamson (2012) aggregated the readability information across the various postsecondary options available to a high school graduate to arrive at a standard of reading needed by individuals to be considered "college and career ready." In their study, they included additional citizenship materials beyond those examined by Williamson (e.g., national and international newspapers and other adult reading materials such as Wikipedia articles). Using a weighted mean of the medians for each of the postsecondary options (education, military, work place, and citizenship), a measure of 1300L was defined as the general reading demand for postsecondary options and could be used to judge a student's "college and career readiness."

The question for educators becomes how to determine if a student is "on track" for college and career as previously defined in the Common Core State Standards and described above. "As state departments of education, and the districts and schools within those respective states, transition from *adopting* the new Common Core State Standards to the more difficult task of *implementing* them, the challenge now becomes how to translate these higher standards into tangible, practical and cost-effective curricula" (Smith, 2012). Implementing the college and career readiness standards will require districts and schools to develop new instructional strategies and complementary resources that are not only aligned with these college- and career-readiness standards, but also utilize and incorporate proven and cost-effective tools that are universally accessible to all stakeholders.

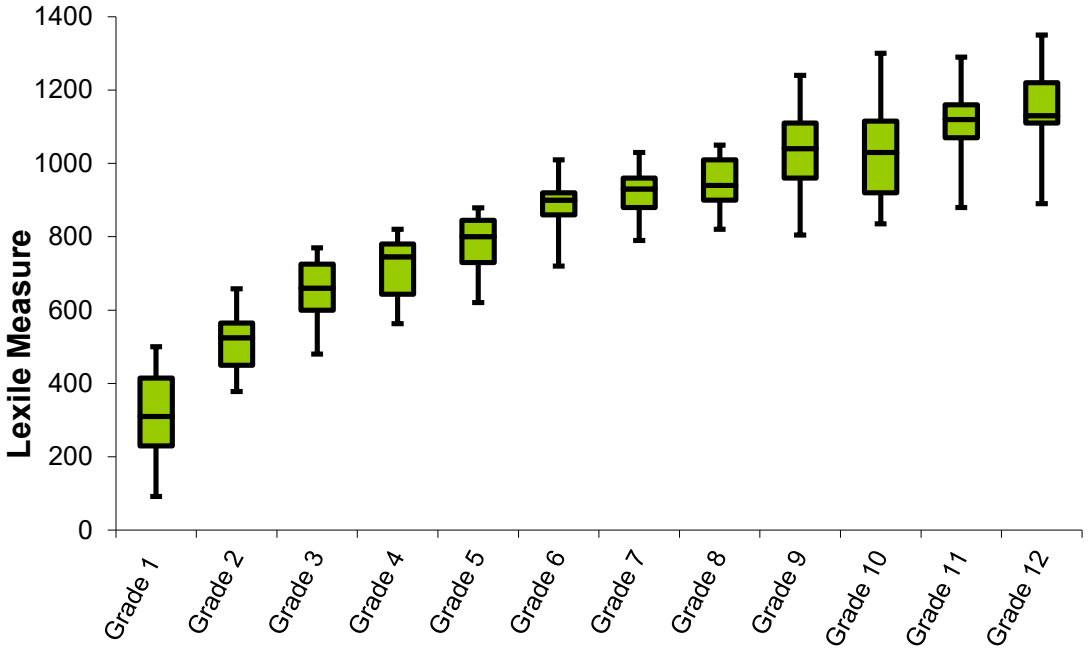
The Standards for English Language Arts focus on the importance of text complexity. As stated in Standard 10, students must be able to "read and comprehend complex literary and informational texts independently and proficiently" (Common Core State Standards for English Language Arts, College and Career Readiness Anchor Standards for Reading, NGA Center and CCSSO, 2010, p.10).

The Common Core State Standards recommends a three-part model for evaluating the complexity of a text that takes into account its qualitative dimensions, quantitative measure, and

reader and task considerations. It describes text complexity as "the inherent difficulty of reading and comprehending a text combined with consideration of reader and task variables…a three-part assessment of text [complexity] that pairs qualitative and quantitative measures with reader-task considerations" (NGA Center and CCSSO, 2010, p. 43). In simpler terms, *text complexity is a transaction between text, reader, and task*. The quantitative aspect of defining text complexity consists of a stair-step progression of increasingly difficult text by grade levels (see Figure 1) (Common Core State Standards for English Language Arts, Appendix A, NGA Center and CCSSO, 2010, p. 8).

Between 2004 and 2008, MetaMetrics (Williamson, Koons, Sandvik, and Sanford-Moore, 2012) conducted research to describe the typical reading demands and develop a text continuum of reading materials across Grades 1-12. The grade-by-grade text distributions are presented in *Figure 16*.

Figure 16. Text complexity distributions, in Lexile units, by grade (whiskers represent 5th and 95th percentiles).



This continuum can be "stretched" to describe the reading demands expected of students in Grades 1-12 who are "on track" for college and career (Sanford-Moore and Williamson, 2012). This information can provide a basis for defining at what level students need to be able to read to be ready for various postsecondary endeavors such as further education beyond high school and entering the work force.

Table 17. Lexile ranges aligned to college- and career-readiness reading expectations, by grade.

Grade	2012 "Stretch" Text Measure
1	190L to 530L
2	420L to 650L
3	520L to 820L
4	740L to 940L
5	830L to 1010L
6	925L to 1070L
7	970L to 1120L
8	1010L to 1185L
9	1050L to 1260L
10	1080L to 1335L
11-12	1185L to 1385L

MetaMetrics' research on the typical reading demands of college and careers contributed to the Common Core State Standards as a whole and, more specifically, to the Lexile-based grade ranges in *Figure 17*. *Figure 17* shows the relationship between the Proficient performance for the OSTP ELA (gray dotted line) and the "stretch" reading demands based on the Common Core State Standards (blue box). At each grade, the lowest score in the Proficient performance level is within the grade-level stretch band, with the exception of Grade 8 which is higher than the stretch band.

Figure 17. Comparison of the OSTP ELA Lexile measures for the Proficient performance levels and the college and career reading levels described in the CCSS.

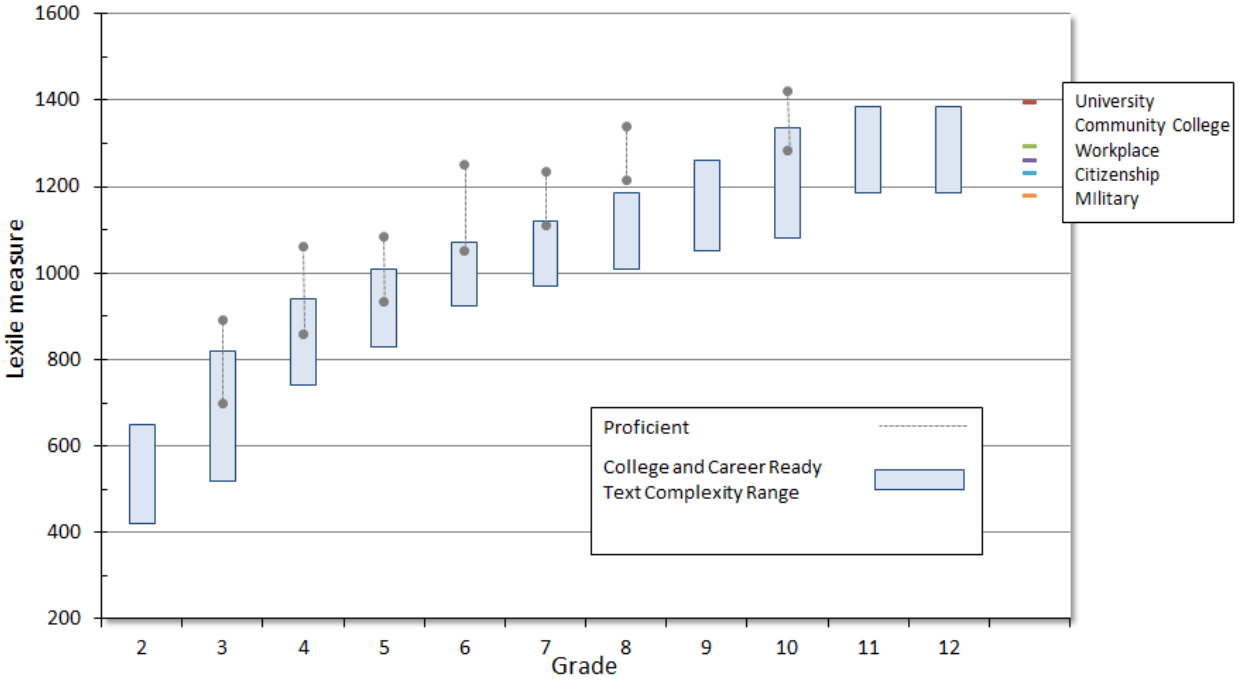
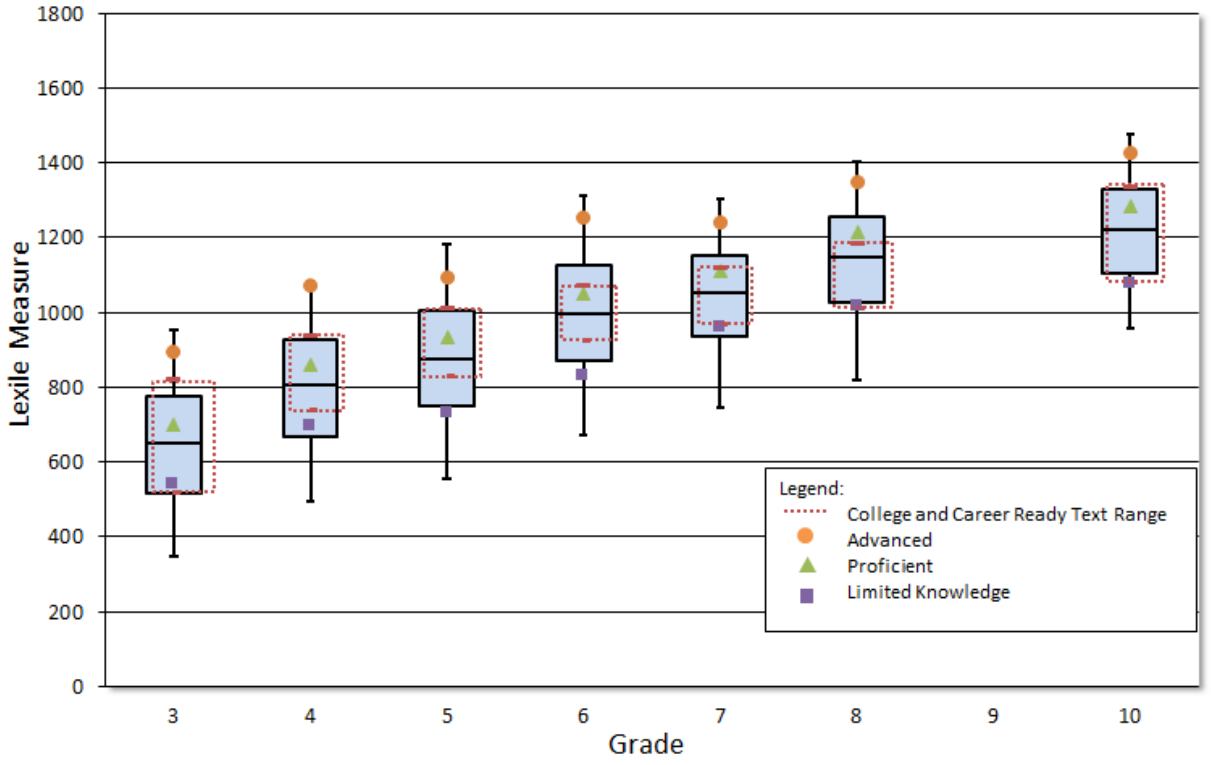


Figure 18 shows the OSTP ELA linking study sample student performance expressed as Lexile measures at each performance level cut point. For the OSTP ELA assessment levels, the box refers to the interquartile range of student scores. The line within the box indicates the median. The end of each whisker represents the 5th percentile at the low end of the distribution and the 95th percentile at the high end of the distribution of scores. The boxes indicated by dashed lines represent the recommended "stretch" text range at each grade level. Combining student results with criterion referenced indicators provides information to reference when matching students with reading materials that are at or above the recommendations in Appendix A of the CCSS for ELA for each grade level.

Figure 18. OSTP ELA student performance expressed as Lexile measures and the "stretch" text range for Grades 3 through 8 and 10, final sample (N = 331,183).



Next Steps. To utilize the results from this study, Lexile measures need to be incorporated into the OSTP ELA reported results processing and interpretation frameworks. When that occurs, the measures and the educators can use the tools available through The Lexile Framework for Reading to link the assessment results with subsequent instruction.

Within the *instructional area*, suggested book lists can be developed for ranges of readers. Care must be taken to ensure that the books on the lists are also developmentally appropriate for the readers. The Lexile measure is one factor related to comprehension and is a good starting point in the selection process of a book for a specific reader. Other factors such as student developmental level, motivation, and interest; amount of background knowledge possessed by

the reader; and characteristics of the text such as illustrations and formatting also need to be considered when matching a book with a reader.

The Lexile Framework reporting scale is not bounded by grade level, although typical Lexile measure ranges have been identified for students in specific grades. Because the Lexile Framework reporting scale is not bounded by grade level, it makes provisions for students who read below or beyond their grade level. See the Lexile Framework Map for literary and informational titles, leveled reading samples, and approximate grade ranges (Appendix A).

In this era of student-level accountability and high-stakes assessment, differentiated instruction—the attempt "on the part of classroom teachers to meet students where they are in the learning process and move them along as quickly and as far as possible in the context of a mixed-ability classroom" (Tomlinson, 1999)—is a means for all educators to help students succeed. Differentiated instruction promotes high-level and powerful curriculum for all students, but varies the level of teacher support, task complexity, pacing, and avenues to learning based on student readiness, interest, and learning profile. One strategy for managing a differentiated classroom suggested by Tomlinson is the use of multiple texts and supplementary materials.

The Lexile Framework is an objective tool that can be used to determine a student's readiness for a reading experience; the Lexile Framework "targets" text (books, newspapers, periodicals) for readers at a 75 percent comprehension level—a level that is challenging, but not frustrating (Schnick and Knickelbine, 2000).

Suggestions for Using The Lexile Framework for Reading

Use the Lexile Framework to Select Books. Teachers, parents, and students can use the tools provided by the Lexile Framework to select materials to plan instruction. When teachers provide parents and students with lists of titles that match the students' Lexile measures, they can then work together to choose appropriate titles that also match the students' interests and background knowledge. *The Lexile Framework does not prescribe a reading program, but it gives educators more knowledge of the variables involved when they design reading instruction.* The Lexile Framework facilitates multiple opportunities for use in a variety of instructional activities. After becoming familiar with the Lexile Framework, teachers are likely to think of a variety of additional creative ways to use this tool to match students with books that students find challenging, but not frustrating.

Many factors affect the relationship between a reader and a book. These factors include text content, age of the reader, interests of the reader, suitability of the text, and text difficulty. The Lexile measure of a text, a measure of text complexity, is a good starting point in the selection process, but other factors also must be considered. The Lexile measure should never be the only piece of information used when selecting a text for a reader.

Help Students Set Appropriate Learning Goals. Students' Lexile measures can be used to identify reading materials that students are likely to comprehend with 75% accuracy. Students can set goals of improving their reading comprehension and plan clear strategies for reaching those

goals using literature from the appropriate Lexile ranges. Progress tests throughout the year can help to monitor students' progress toward their goals.

Monitor Reading Program Goals. As a student's Lexile measure increases, the set of reading materials he can likely comprehend at 75% accuracy changes. Schools often write grant applications in which they are required to state how they will monitor progress of the intervention or program funded by the grant. Schools that receive funds targeted to assist students improve their reading skills can use the Lexile Framework for evaluation purposes. Schools can use student-level and school-level Lexile information to monitor and evaluate interventions designed to improve reading skills.

Measurable goals can be clearly stated in terms of Lexile measures. Examples of measurable goals and clearly related strategies for reading intervention programs might include.

Goal: At least half of the students will improve reading comprehension abilities by 100L after one year of use of an intervention.
Goal: *S*tudents' attitudes about reading will improve after reading 10 books at their 75% comprehension level.

These examples of goals emphasize the fact that the Lexile Framework is not an intervention, but a tool to help educators plan instruction and measure the success of the reading program.

Communicate With Parents Meaningfully to Include Them in the Educational Process. Teachers can make statements to parents such as, "Your child should be ready to read with at least 75% comprehension these kinds of materials which are at the next grade level." Or, "Your child will need to increase his/her Lexile measure by 400L-500L in the next few years to be prepared for college reading demands. Here is a list of appropriate titles your child can choose from for reading this summer."

Improve Students' Reading Fluency. Fluency is highly correlated to comprehension (Fuchs, Fuchs, Hops, & Jenkins, 2001; Rasinski, 2009). Educational researchers have found that students who spend a minimum of three hours a week reading at their own level for their own purposes develop reading fluency that leads to improved mastery. Not surprisingly, researchers have found that students who read age-appropriate materials with a high level of comprehension also learn to enjoy reading.

Teach Learning Strategies by Controlling Comprehension Match. The Lexile Framework permits the teacher to target readers with challenging text and to systematically adjust text targeting when the teacher wants fluency and automaticity (i.e. reader measure is well above text measure) or wants to teach strategies for attacking "hard" text (i.e. reader measure is well below text measure). For example, metacognitive ability has been well documented to play an important role in reading comprehension performance. Once teachers know the kinds of texts that would likely be challenging for a group of readers, they can systematically plan instruction that will allow students to encounter difficult text in a controlled fashion and make use of instructional scaffolding to build student success and confidence with more challenging text. The teacher can model appropriate learning strategies for students, such as rereading or rephrasing

text in one's own words, so that students can then learn what to do when comprehension breaks down. Students can then practice these metacognitive strategies on selected text while the teacher monitors their progress.

Teachers can use Lexile measures to guide a struggling student toward texts at the lower end of the student's Lexile range (100L above to 50L below his or her Lexile measure). Similarly, advanced students can be adequately challenged by reading texts at the midpoint of their Lexile range, or slightly above. Challenging new topics or genres may be approached in the same way. Differentiating instruction for the reading experience also involves the student's motivation and purpose. If a student is highly motivated for a particular reading task (e.g., self-selected free reading), the teacher may suggest books higher in the student's Lexile range. If the student is less motivated or intimidated by a reading task, material at the lower end of his or her Lexile range can provide the basic comprehension support to keep the student from feeling overwhelmed.

Targeting Instruction to Students' Abilities. To encourage optimal progress with the use of any reading materials, teachers need to be aware of the complexity level of the text relative to a student's reading level. A text that is too difficult may serve to undermine a student's confidence and diminish learning. Frequent use of text that is too easy may foster poor work habits and unrealistic expectations that will undermine the later success of the best students.

When students confront new kinds of texts and texts containing new content, the introduction can be softened and made less intimidating by guiding the student to easier reading. On the other hand, students who are comfortable with a particular genre or format or the content of such texts can be challenged with more difficult reading levels, which will reduce boredom and promote the greatest rate of development of vocabulary and comprehension skills.

To become better readers, students need to be challenged continually—they need to be exposed to less frequent and more difficult vocabulary in meaningful contexts. A 75% comprehension level provides an appropriate level of challenge, but is not too challenging.

Apply Lexile measures Across the Curriculum. Over 450 publishers provide Lexile measures for their trade books and textbooks, enabling educators to make connections among all of the different components of the curriculum to plan instruction more effectively. With a student's Lexile measure, teachers can connect him or her to hundreds of thousands of books. Using periodical databases, teachers and students can also find appropriately challenging newspaper and magazine articles that have Lexile measures.

Using the Lexile Framework in the Classroom

- Develop individualized reading lists that are tailored to provide appropriately challenging reading while still reflecting student interest and motivations.
- Build text sets that include texts at varying levels to enhance thematic teaching. These texts might not only support the theme, but also provide a way for all students to successfully learn about and participate in discussions about the theme, building knowledge of common content for the class while building the reading skills of

individual students. Such discussions can provide important collaborative brainstorming opportunities to fuel student writing and synthesize the curriculum.

- Sequence materials in a reading program to encourage growth in reading ability. For example, an educator might choose one article a week for use as a read-aloud. In addition to considering the topic, the educator could increase the complexity of the articles throughout the course. This approach is also useful when utilizing a core program or textbook that is set up in anthology format. (The order in which the readings in anthologies are presented to the students may need to be rearranged to best meet student needs.)
- Develop a reading folder that goes home with students and comes back for weekly review. The folder can contain a reading list of texts within the student's Lexile range, reports of recent assessments, and a form to record reading that occurs at home. This is an important opportunity to encourage individualized goal setting and engage families in monitoring the progress of students in reaching those goals.
- Choose texts lower in the student's Lexile range when factors make the reading situation more challenging or unfamiliar. Select texts at or above the student's range to stimulate growth when a topic is of extreme interest to a student, or when adding additional support such as background teaching or discussion.
- Use to provide all students with exposure to differentiated, challenging text at least once every two to three weeks as suggested by the lead authors of the Common Core State Standards.
- Use the free Find a Book website (at fab.lexile.com) to support book selection and create booklists within a student's Lexile range to help the student make more informed choices when selecting texts.
- Use database resources to infuse research into the curricula while tailoring reading selections to specific Lexile levels. In this way, students can explore new content at an appropriate reading level and then demonstrate their assimilation of that content through writing and/or presentations. A list of the database service providers that have their collections measured can be found at https://metametricsinc.com/products/library-products/.

Using the Lexile Framework in the Library

- Make the Lexile measures of books available to students to better enable them to find books of interest at their appropriate reading level.
- Compare student Lexile levels with the Lexile levels of the books and periodicals in the library to analyze and develop the collection to more fully meet the needs of all students.
- Use the database resources to search for articles at specific Lexile levels to support classroom instruction and independent student research. A list of the database service providers that have had their collections measured can be found at https://metametricsinc.com/products/library-products/)
- Use the free Find a Book website (at fab.lexile.com) to support book selection and help students make informed choices when selecting texts.

Lexile Measures and Grade Levels. Lexile measures do not translate specifically to grade levels. Within any grade, there will be a range of readers and a range of materials to be read. In a fifth-grade classroom there will be some readers who are far ahead of the others and there will be some readers who are behind the others in terms of reading ability. To say that some books are "just right" for fifth graders assumes that all fifth graders are reading at the same level. The Lexile Framework can be used to match readers with texts at whatever level the reader is reading.

Simply because a student is an excellent reader, it should not be assumed that the student would necessarily comprehend a text typically found at a higher grade level. Without adequate background knowledge, the words may not have sufficient meaning to the student. A high Lexile measure for a grade indicates that the student can read grade-appropriate materials at a higher comprehension level (90%, for example).

The real power of the Lexile Framework is in examining the growth of readers—wherever the reader may be in the development of his or her reading skills. Readers can be matched with texts that they are forecasted to read with 75% comprehension. As a reader grows, he or she can be matched with more demanding texts. And, as the texts become more demanding, the reader grows.

Communicating with Lexile measures. Lexile measures can be used to communicate with students, parents, teachers, educators, and the community by providing a common language to use to talk about reading growth and development. By aligning all areas of the educational system, parents can be included in the instructional process. With a variety of data related to a student's reading level a more complete picture can be formed and more informed decisions can be made concerning reading-group placement, amount of extra instruction needed, and promotion/retention decisions.

It is much easier to understand what a national percentile rank of 50 means when it is tied to the reading demands of book titles that are familiar to adults. Parents are encouraged to help their children achieve high standards by expecting their children to succeed at school, communicating with their children's teachers and the school, and helping their children keep pace and do homework.

Through the customized reading lists and electronic database of titles, parents can assist their children in the selection of reading materials that are at the appropriate level of challenge and monitor the reading process at home. A link can be provided to the "Find a Book with Lexiles" website. This site provides a quick, free resource to battle "summer slide" – the learning losses that students often experience during the summer months when they are not in school. Lexiles make it easy to help students read and learn all summer long and during the school year. This website can help build a reading list of books at a young person's reading level that are about subjects that interest him or her. This website can be viewed at fab.lexile.com.

In one large school district, the end-of-year testing results are sent home to parents in a folder. The folder consists of a Lexile Map on one side and a letter from the superintendent on the other side. The school district considers this type of material as "refrigerator-friendly." They

encourage parents to put the Lexile Map on the refrigerator and use it to monitor and track the reading progress of their child throughout the school year.

The community-at-large (business leaders, citizens, politicians, and visitors) sees the educational system as a reflection of the community. Through the reporting of assessment results (after all, that is what the community is most interested in—results), people can understand what the community values and see the return for its investment in the schools and its children.

One way to involve the community is to work with the public libraries and local bookstores when developing reading lists. The organizations should be contacted early enough so that they can be sure that the books will be available. Often books can be displayed with their Lexile measures for easy access.

Many school districts make presentations to civic groups to educate the community as to their reading initiatives and how the Lexile Framework is being utilized in the school. Conversely, many civic groups are looking for an activity to sponsor, and it could be as simple as "donate-a-book" or "sponsor-a-reader" campaigns.

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Appendix

The Lexile® Framework for Reading Map

THE LEXILE® FRAMEWORK FOR READING MAP

Matching Readers with Text

Imagine getting students excited about reading while also improving their reading abilities. With the Lexile® Map, students have a chance to match books with their reading levels, and celebrate as they are able to read increasingly complex texts!

Let your students find books that fit them! Build custom book lists for your students by accessing our "Find a Book" tool at fab.lexile.com.

HOW IT WORKS

The Lexile Map provides examples of popular books and sample texts that are matched to various points on the Lexile® scale, from 200L for early reader text to 1600L for more advanced texts. The examples on the map help to define text complexity and help readers identify books of various levels of text complexity. Both literature and informational texts are presented on the Lexile Map.

HOW TO USE IT

Lexile reader and text measures can be used together to forecast how well a reader will likely comprehend a text at a specific Lexile level. A Lexile reader measure is usually obtained by having the reader take a reading comprehension test. Numerous tests report Lexile reader measures including many state end-of-year assessments, national norm-referenced assessments and reading program assessments.

A Lexile reader measure places students on the same Lexile scale as the texts. This scale ranges from below 200L to above 1600L. The Lexile website also provides a way to estimate a reader measure by using information about the reader's grade level and self-reported reading ability.

Individuals reading within their Lexile ranges (100L below to 50L above their Lexile reader measures) are likely to comprehend approximately 75 percent of the text when reading independently. This "targeted reading" rate is the point at which a reader will comprehend enough to understand the text but will also face some reading challenge. The result is growth in reading ability and a rewarding reading experience.

For more guidance concerning targeting readers with books, visit fab.lexile.com to access the "Find a Book" tool. "Find a Book" enables users to search from over 275,000 books to build custom reading lists based on Lexile range and personal interests and to check the availability of books at the local library.

1500L+

1630L ***Descartes: Philosophical Essays*** LAFLEUR

But neither should we fall into the error of those who occupy their minds only with deep and serious matters, of which, after much effort, they acquire only a confused knowledge, while they hoped for a profound one. It is therefore in these easier matters that we should first exercise our minds, but methodically, so that we become accustomed to penetrate each time, by open and recognized paths and almost as in a game, to the inner truth of things. In this way, soon afterward, and in less time than one could hope, we will find ourselves able to deduce with equal ease and from self-evident principles, many propositions which appear very difficult and intricate. But perhaps some will be astonished that in this study, where we are inquiring how we can be made more competent to deduce some truths from others, we omit all the rules by which the logicians think they regulate human reason. These prescribe certain forms of argument which involve such necessary implications that the mind which relies upon this method, even though it neglects to give clear and attentive consideration to the reasoning, can nevertheless reach certain conclusions on the strength of the form of the argument alone.

SAMPLE TITLES

LITERATURE
- 1640L **The Plot Against America** (ROTH)
- 1530L **The Good Earth** (BUCK)
- 1520L **A Fable** (FAULKNER)

INFORMATIONAL
- 1650L **Twenty Years at Hull-House** (ADDAMS)
- 1600L **The U.S. Constitution and Other Key American Writings** (ASSORTED)
- 1600L **Sustaining Life: How Human Health Depends on Biodiversity** (CHIVIAN)
- 1590L **Captain John Smith: A Select Edition of His Writings** (SMITH)
- 1520L **Collapse: How Societies Choose to Fail or Succeed** (DIAMOND)
- 1510L **Original Meanings: Politics and Ideas in the Making of the Constitution** (RAKOVE)

1400L–1495L

1440L ***Fordlandia*** GRANDIN

As Ford biographer Robert Lacey put it, the "Five Dollar Day raised the pain threshold of capitalism." But beyond an incentive to make workers stay put, it also became a model for how to respond to another crisis that plagued industrialism. The mechanized factory production that took flight during America's Gilded Age had promised equality and human progress but in reality delivered deepening polarization and misery, particularly in sprawling industrial cities like Detroit. Ford, advised by farsighted company executives such as James Couzens and John Lee, understood that high wages and decent benefits would do more than create a dependable and thus more productive workforce; they would also stabilize and stimulate demand for industrial products by turning workers into consumers.

SAMPLE TITLES

LITERATURE
- 1460L **The Legend of Sleepy Hollow** (IRVING)
- 1450L **Billy Budd** (MELVILLE)
- 1420L **The Life All Around Me by Ellen Foster** (GIBBONS)
- 1420L **The Fall of the House of Usher** (POE)
- 1410L **Death in Venice** (MANN)

INFORMATIONAL
- 1490L **Rousseau's Political Writings** (ROUSSEAU)
- 1430L **America's Constitution: A Biography** (AMAR)
- 1410L **Profiles in Courage** (KENNEDY)
- 1400L **The Mysteries of Beethoven's Hair** (MARTIN & NIBLEY)
- 1400L **Life and Times of Frederick Douglass: His Early Life as a Slave, His Escape From Bondage, and His Complete History to the Present Time** (DOUGLASS)

1300L–1395L

1340L ***Silent Spring*** CARSON

The basic element, carbon, is one whose atoms have an almost infinite capacity for uniting with each other in chains and rings and various other configurations, and for becoming linked with atoms of other substances. Indeed, the incredible diversity of living creatures from bacteria to the great blue whale is largely due to this capacity of carbon. The complex protein molecule has the carbon atom as its basis, as have molecules of fat, carbohydrates, enzymes, and vitamins. So, too, have enormous numbers of nonliving things, for carbon is not necessarily a symbol of life.

SAMPLE TITLES

LITERATURE
- 1390L **The Yellow Wallpaper** (GILMAN)
- 1350L **The Secret Sharer** (CONRAD)
- 1330L **The Jungle** (SINCLAIR)
- 1330L **Silas Marner** (ELIOT)
- 1300L **Gulliver's Travels** (SWIFT)

INFORMATIONAL
- 1390L **In Defense of Food: An Eater's Manifesto** (POLLAN)
- 1360L **Anne Frank: The Book, the Life, the Afterlife** (PROSE)
- 1340L **Walden and Civil Disobedience** (THOREAU)
- 1330L **The Professor and the Madman: A Tale of Murder, Insanity, and the Making of the Oxford English Dictionary** (WINCHESTER)
- 1300L **Arctic Dreams: Imagination and Desire in a Northern Landscape** (LOPEZ)

1200L–1295L

1210L ***The Tortilla Curtain*** BOYLE

He didn't wake America, not yet. He made four trips up to the ledge and back, with the tools, the sacks of vegetables—they could use the empty sacks as blankets, he'd already thought of that—and as many wooden pallets as he could carry. He'd found the pallets stacked up on the far side of the shed, and though he knew the maintenance man would be sure to miss them, it could be weeks before he noticed and then what could he do? As soon as Qindido had laid eyes on those pallets an architecture had invaded his brain and he knew he had to have them. If the fates were going to deny him his apartment, well then, he would have a house, a house with a view.

SAMPLE TITLES

LITERATURE
- **1290L** An Old-Fashioned Girl (ALCOTT)
- **1280L** The House of the Spirits (ALLENDE)
- **1280L** The Castle (KAFKA)
- **1220L** The Silent Cry (ŌE)
- **1210L** Chronicle of a Death Foretold (GARCÍA MÁRQUEZ)

INFORMATIONAL
- **1290L** A Brief History of Time: From the Big Bang to Black Holes (HAWKING)
- **1280L** Black, Blue, and Gray: African Americans in the Civil War (HASKINS)
- **1230L** Stiff: The Curious Lives of Human Cadavers (ROACH)
- **1230L** Knowing Mandela: A Personal Portrait (CARLIN)
- **1200L** The Dark Game: True Spy Stories (JANECZKO)

1100L–1195L

1150L ***A Room of One's Own*** WOOLF

The reason perhaps why we know so little of Shakespeare—compared with Donne or Ben Jonson or Milton—is that his grudges and spites and antipathies are hidden from us. We are not held up by some "revelation" which reminds us of the writer. All desire to protest, to preach, to proclaim an injury, to pay off a score, to make the world the witness of some hardship or grievance was fired out of him and consumed. Therefore his poetry flows from him free and unimpeded. If ever a human being got his work expressed completely, it was Shakespeare. If ever a mind was incandescent, unimpeded, I thought, turning again to the bookcase, it was Shakespeare's mind.

SAMPLE TITLES

LITERATURE
- **1180L** Sense and Sensibility (AUSTEN)
- **1170L** The Amazing Adventure of Kavalier & Clay (CHABON)
- **1150L** Great Expectations (DICKENS)
- **1140L** Cold Mountain (FRAZIER)
- **1130L** Democracy (DIDION)

INFORMATIONAL
- **1160L** The Longitude Prize (DASH)
- **1160L** In Search of Our Mothers' Gardens (WALKER)
- **1150L** The Human Microbiome: The Germs That Keep You Healthy (HIRSCH)
- **1150L** In My Place (HUNTER-GAULT)
- **1100L** Something to Declare (ALVAREZ)

1000L–1095L

1070L ***Geeks: How Two Lost Boys Rode the Internet out of Idaho*** KATZ

Geeks were the first to grasp just how much information was available on the Web, since they wrote the programs that put much of it there—movie times and reviews, bus and train schedules, news and opinions, catalogues, appliance instructions, plus, of course, software and its upgrades. And of course, music, the liberation of which is considered a seminal geek accomplishment.

Virtually everything in a newspaper—and in many magazines—is now available online. In fact, some things, like the latest weather and breaking news, appear online hours before they hit print.

Yet while Jesse had gone through literally thousands of downloaded software applications, he'd never paid for any of them. He didn't even quite get the concept. The single cultural exception was books. Perhaps as a legacy of his childhood, Jesse remained an obsessive reader. He liked digging through the bins of used bookstores to buy sci-fi and classic literature; he liked books, holding them and turning their pages.

SAMPLE TITLES

LITERATURE
- **1080L** I Heard the Owl Call My Name (CRAVEN)
- **1070L** Savvy (LAW)
- **1070L** Around the World in 80 Days (VERNE)
- **1010L** The Pearl (STEINBECK)
- **1000L** The Hobbit or There and Back Again (TOLKIEN)

INFORMATIONAL
- **1030L** Phineas Gage: A Gruesome but True Story About Brain Science (FLEISCHMAN)
- **1020L** This Land Was Made for You and Me: The Life and Songs of Woody Guthrie (PARTRIDGE)
- **1010L** Travels With Charley: In Search of America (STEINBECK)
- **1000L** Harriet Tubman: Conductor on the Underground Railroad (PETRY)
- **1000L** Claudette Colvin: Twice Toward Justice (HOOSE)

900L–995L

900L ***We Are the Ship: The Story of Negro League Baseball*** NELSON

Rube ran his ball club like it was a major league team. Most Negro teams back then weren't very well organized. Didn't always have enough equipment or even matching uniforms. Most times they went from game to game scattered among different cars, or sometimes they'd even have to "hobo"—which means hitch a ride on the back of someone's truck to get to the next town for a game. But not Rube's team. They were always well equipped, with clean, new uniforms, bats, and balls. They rode to the games in fancy Pullman cars Rube rented and hitched to the back of the train. It was something to see that group of Negroes stepping out of the train, dressed in suits and hats. They were big-leaguers.

SAMPLE TITLES

LITERATURE

- 980L **Dovey Coe** (DOWELL)
- 950L **Bud, Not Buddy** (CURTIS)
- 940L **Harry Potter and the Chamber of Secrets** (ROWLING)
- 940L **Heat** (LUPICA)
- 900L **City of Fire** (YEP)

INFORMATIONAL

- 990L **Seabiscuit: An American Legend** (HILLENBRAND)
- 980L **The Kid's Guide to Money: Earning It, Saving It, Spending It, Growing It, Sharing It** (OTFINOSKI)
- 950L **Jim Thorpe, Original All-American** (BRUCHAC)
- 930L **Colin Powell** (FINLAYSON)
- 920L **Talking With Artists** (CUMMINGS)

800L–895L

800L ***Moon Over Manifest*** VANDERPOOL

We tiptoed down the hall to the second classroom on the right. The heavy wooden door opened easily and we stepped in. There is an eerie, expectant feeling to a schoolroom in the summer. The normal classroom items were there: desks, chalkboards, a set of encyclopedias. The American flag with accompanying pictures of Presidents Washington and Lincoln. But without students occupying those desks and their homework tacked on the wall, that empty summer classroom seemed laden with the memory of past students and past learning that took place within those walls. I strained to listen, as if I might hear the whisperings and stirrings of the past. Maybe Ruthanne was right. Maybe there was more here than met the eye.

SAMPLE TITLES

LITERATURE

- GN840L* **The Odyssey** (HINDS)
- 830L **Baseball in April and Other Stories** (SOTO)
- 820L **Maniac Magee** (SPINELLI)
- 810L **Where the Mountain Meets the Moon** (LIN)
- 800L **Homeless Bird** (WHELAN)

INFORMATIONAL

- 880L **Volcanoes** (SIMON)
- 880L **The Circuit: Stories From the Life of a Migrant Child** (JIMÉNEZ)
- IG860L* **Animals Nobody Loves** (SIMON)
- 860L **Through My Eyes: Ruby Bridges** (BRIDGES)
- 830L **Quest for the Tree Kangaroo** (MONTGOMERY)

700L–795L

700L ***The Miraculous Journey of Edward Tulane*** DICAMILLO

Edward Tulane waited.

He repeated the old doll's words over and over until they wore a smooth groove of hope in his brain: *Someone will come; someone will come for you.*

And the old doll was right.

Someone did come.

It was springtime. It was raining. There were dogwood blossoms on the floor of Lucius Clarke's shop.

She was a small girl, maybe five years old, and while her mother struggled to close a blue umbrella, the little girl walked around the store, stopping and staring solemnly at each doll and then moving on.

When she came to Edward, she stood in front of him for what seemed like a long time. She looked at him and he looked back at her.

SAMPLE TITLES

LITERATURE

- 770L **Walk Two Moons** (CREECH)
- 760L **Hoot** (HIAASEN)
- 750L **Esperanza Rising** (RYAN)
- 720L **Nancy's Mysterious Letter** (KEENE)
- GN720L* **Sherlock Holmes and the Adventure at the Copper Beeches** (DOYLE)

INFORMATIONAL

- 790L **Be Water, My Friend: The Early Years of Bruce Lee** (MIOCHIZUKI)
- 760L **Stay: The True Story of Ten Dogs** (MUNTEAN)
- IG760L* **Mapping Shipwrecks With Coordinate Planes** (WALL)
- 720L **Pretty in Print: Questioning Magazines** (BOTZAKIS)
- 720L **Spiders in the Hairdo: Modern Urban Legends** (HOLT & MOONEY)

THE LEXILE® FRAMEWORK FOR READING

400L–695L LEXILE RANGE

600L–695L

620L ***The Year of Billy Miller*** HENKES

His heart was pounding.

Once again, he forgot every word of his poem, including the title—but this time he didn't have a copy of it to read from.

He saw Ms. Silver in the fringes of his vision. She was smiling and nodding, urging him on with her wide eyes.

Should he walk over to her to get a copy of his poem? She seemed about a mile away. And he didn't think he could make his legs move.

What should he do?

The air felt weird all of a sudden. As if it had sprouted wings and was brushing against him. The air was fluttering against his arm.

How could that be?

He turned around and Mama was there with a copy of his poem, tapping it lightly against his elbow. "Here," she whispered. "You can do it."

SAMPLE TITLES

LITERATURE

690L **Firefly Hollow** (MCGHEE)
680L **Charlotte's Web** (WHITE)
670L **A Year Down Yonder** (PECK)
660L **Holes** (SACHAR)
610L **Mountain Bike Mania** (CHRISTOPHER)

INFORMATIONAL

690L **Sadako and the Thousand Paper Cranes** (COERR)
680L **An Eye for Color: The Story of Josef Albers** (WING)
680L **The Moon** (LANDAU)
660L **Remember: The Journey to School Integration** (MORRISON)
620L **Crittercam** (EINSPRUCH)

500L–595L

500L ***The Curse of the Cheese Pyramid*** STILTON

Trap winked at me and announced, "Grandfather has hired me to be his personal cook!"

This was ridiculous! I was getting hotter than a bag of cheese popcorn in a microwave. Who would help me run the paper?

At that moment, I felt a tug on the sleeve of my jacket. It was my young nephew Benjamin. "Uncle Geronimo, guess what?" he beamed. "Great-grandfather William has hired me to be his personal assistant!"

Grandfather stroked Ben's tiny ears.

"Ah, the family, there's nothing like the family! The Stilton Family, that is..." I snorted. I could see I was the workmouse of the family. It looked like I would be the only one doing any work!

SAMPLE TITLES

LITERATURE

590L **The Great Kapok Tree** (CHERRY)
580L **Tops and Bottoms** (STEVENS)
570L **Grace for President** (DIPUCCHIO)
540L **Ron's Big Mission** (BLUE & NADEN)
500L **Poppleton in Spring** (RYLANT)

INFORMATIONAL

IG590L* **Claude Monet** (CONNOLLY)
580L **What Magnets Can Do** (FOWLER & BARKAN)
560L **Molly the Pony** (KASTER)
550L **Martin Luther King, Jr. and the March on Washington** (RUFFIN)
510L **A Picture for Marc** (KIMMEL)

400L–495L

470L ***Frog and Toad Are Friends*** LOBEL

Toad said, "Frog, you are looking quite green."
"But I always look green," said Frog. "I am a frog."
"Today you look very green even for a frog," said Toad. "Get into my bed and rest."
Toad made Frog a cup of hot tea.
Frog drank the tea, and then he said, "Tell me a story while I am resting."
"All right," said Toad.

SAMPLE TITLES

LITERATURE

480L **A Birthday for Frances** (HOBAN)
470L **Tales of a Fourth Grade Nothing** (BLUME)
450L **Amelia Bedelia** (PARISH)
440L **Fox on the Job** (MARSHALL)
420L **Hey, New Kid!** (DUFFEY)

INFORMATIONAL

480L **Rally for Recycling** (BULLARD)
480L **Grand Canyon** (GILBERT)
470L **Life in China** (CHUNG)
460L **Half You Heard of Fractions?** (ADAMSON & ADAMSON)
440L **Abraham Lincoln** (HANSEN)

THE LEXILE® FRAMEWORK FOR READING

200L–395L+ LEXILE RANGE

300L–395L

330L ***Seals*** ARNOLD

Earless seals live in oceans.
Thick blubber keeps seals warm.
A seal's back flippers help it swim fast.
A seal on land is slow.
Its claws dig into rocks and ice.
Many seals have dark brown or gray fur.
Some have spots.
Seals molt every year.

SAMPLE TITLES

LITERATURE	370L	Little Bear Book (MINARIK)
	350L	To the Rescue! (MAYER)
	340L	Snow (SHULEVITZ)
	GN320L*	Spotlight Soccer (SANCHEZ)
	310L	I Spy Fly Guy! (ARNOLD)
INFORMATIONAL	370L	Starfish (HURD)
	IG340L*	We Can Be Friends (JORDAN)
	340L	Fernando Exercises!: Tell and Write Time (KAY)
	340L	Simple Machines (RISSMAN)
	310L	Visiting the Beach in Summer (FELIX)

200L–295L

220L ***Put Me in the Zoo*** LOPSHIRE

Look at this, now! One! Two! Three!
I can put them on a tree.
And now when I say "One, two, three"
All my spots are back on me!
Look, now!
Here is one thing more. I take my spots. I make them four.
Oh! They would put me in the zoo, if they could see what I can do.

SAMPLE TITLES

LITERATURE	290L	The Class Pet From the Black Lagoon (THALER)
	280L	Puddle (YUM)
	240L	Are You My Mother? (EASTMAN)
	210L	Green Eggs and Ham (SEUSS)
	200L	Tiny Goes to the Library (MEISTER)
INFORMATIONAL	280L	Whales (LINDEEN)
	260L	Leaves in Fall (SCHUH)
	220L	Plants on a Farm (DICKMANN)
	210L	Counting in the City (STEFFORA)
	210L	The Tractor Race (SCHUH)

*** GN DENOTES GRAPHIC NOVEL, IG DENOTES ILLUSTRATED GUIDE**

Please note:

The Lexile measure (text complexity) of a book is an excellent starting point for a student's book selection. It's important, though, to understand that the book's Lexile measure should not be the only factor in a student's book selection process. Lexile measures do not consider factors such as age-appropriateness, interest and prior knowledge. These are also key factors when matching children and adolescents with books they might like and are able to read.

Lexile codes provide more information about developmental appropriateness, reading difficulty, and common or intended usage of books. For more information on Lexile codes, please visit www.Lexile.com.

TEXT LEXILE RANGES TO GUIDE READING FOR COLLEGE AND CAREER READINESS

GRADES	CCSS LEXILE TEXT RANGE
11–12	1185L–1385L
9–10	1050L–1335L
6–8	925L–1185L
4–5	740–1010L
2–3	420L–820L
1	190L–530L

Common Core State Standards for English Language Arts, Appendix A (Additional Information), NGA and CCSSO, 2012

MetaMetrics®
LINKING ASSESSMENT WITH INSTRUCTION

Linking the Oklahoma OSTP Mathematics Assessments™ with The Quantile® Framework for Mathematics

November 2017

Prepared by MetaMetrics for:

Oklahoma State Department of Education
N. Lincoln Boulevard
Oklahoma City, OK 73105

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Linking the
Oklahoma OSTP Mathematics Assessments
with
The Quantile® Framework for Mathematics

Technical Report

Prepared by MetaMetrics for Oklahoma State Department of Education
(Contract dated August 23, 2017).

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Table of Contents

List of Tables

List of Figures

Introduction

Often it is desirable to convey more information about test performance than can be incorporated into a single primary score scale. When two score scales are linked, the linkage can be used to provide a context for understanding the results of one of the assessments. It is often hard to explain what mathematical skills and concepts a student actually understands based on the results of a mathematics test. Parents typically ask the question, "Based on my child's test results, what math problems can he or she understand and how well?" Once a linkage is established with an assessment that is reported in relation to specific concepts and skills, then the results of the assessment can be explained and interpreted in the context of the specific concepts and skills that a student will likely understand.

Auxiliary score scales can be used to "convey additional normative information, test-content information, and information that is jointly normative and content based" (Petersen, Kolen, and Hoover, 1989, p. 222). One such auxiliary scale is The Quantile® Framework for Mathematics, which was developed to appropriately match students with materials at a level where the student has the background knowledge necessary to be ready for instruction on new mathematical skills and concepts.

The Quantile Framework for Mathematics takes the guesswork out of mathematics instruction. It serves as a hands-on tool demonstrating which mathematics skills and concepts a learner has likely learned and which require further instruction. Because the Quantile Framework uses a common developmental scale to measure both student mathematical achievement and mathematical task difficulty, teachers can use the Quantile Framework to determine a student's readiness to learn more advanced skills and concepts. The Quantile Framework targets instruction, forecasts understanding, and helps improve mathematics instruction and achievement by placing the mathematics curriculum, the materials to teach mathematics, and the students themselves on the same scale.

The Quantile Framework for Mathematics can be used to:

- Monitor student mathematics progress.
- Forecast student performance on end-of-year assessments.
- Match students with appropriate materials at their level.
- Determine if a student is ready for a new mathematics skill or concept.
- Link big mathematical concepts with state curriculum objectives.
- Identify student strengths and weaknesses.
- Understand the prerequisite skills needed to learn more advanced concepts in mathematics.
- Adapt instructional methods in the classroom to ensure a greater level of understanding and application.

The Quantile Framework for Mathematics is a unique resource for accurately estimating a student's ability to think mathematically and matching him/her with appropriate mathematical content. With this valuable information in the hands of educators, instruction can be more accurately tailored to the mathematical achievement of individual students. The structure of the

Quantile Framework is organized around two principles—(1) mathematics and mathematical achievement are developmental in nature and (2) mathematics is a specific domain of knowledge and skills.

Linking assessment results with the Quantile Framework provides a mechanism for matching each student with materials on a common scale. It serves as an anchor to which resources, concepts, skills, and assessments can be connected, allowing parents, teachers, and administrators to speak the same language. Because the Quantile scale can be a common, supplemental metric to the scales of many assessments, linking the Oklahoma School Testing Program (OSTP) Mathematics assessment provides a way to evaluate the progress of students across years. By using the Quantile Framework, the same metric is applied to the materials the students use, the tests they take, and the results that are reported. Parents often ask questions such as the following:

- How much has my student grown in mathematics ability?
- How can I help my child become better at mathematics?
- How do I challenge my child to think mathematically?

Questions like these can be challenging for parents and educators. By linking the OSTP Mathematics assessments for Grades 3 through 8 and 10 with the Quantile Framework, educators and parents will be able to answer these questions and will be better able to use the results from the tests to improve instruction and to develop each student's level of mathematics understanding.

The prior assessment used with the OSTP, the Oklahoma Core Curriculum Tests (OCCT), was linked with the Quantile Framework in 2011 (MetaMetrics). This current research study was designed to implement a mechanism to provide mathematics achievement levels that can be matched with mathematical skills and concepts based on scale scores from the new assessment, the OSTP Mathematics. The study was conducted by MetaMetrics with the Oklahoma State Department of Education (OSDE) in collaboration with Measured Progress (Contract dated August 23, 2017). The following are the primary purposes of this study:

- provide the OSDE with Quantile measures on the OSTP Mathematics assessments;
- provide tools (Math@Home, Quantile Teacher Assistant, and Math Skills Database) and information that can be used to answer questions related to standards, student-level accountability, test score interpretation, and test validation;
- develop tables for converting OSTP Mathematics scale scores to Quantile measures; and
- produce a report that describes the linking analysis procedures.

The Quantile Framework for Mathematics

The Quantile Framework is a scale that describes a student's mathematical achievement. Similar to how degrees on a thermometer measure temperature, the Quantile Framework uses a common metric—the Quantile—to scientifically measure a student's ability to reason mathematically, monitor a student's readiness for mathematics instruction, and locate a student on its taxonomy of mathematical skills, concepts, and applications.

The Quantile Framework uses this common metric to measure many different aspects of education in mathematics. The same metric can be applied to measure the materials used in instruction, to calibrate the assessments used to monitor instruction, and to interpret the results that are derived from the assessments. The result is an anchor to which resources, concepts, skills, and assessments can be connected.

There are dozens of mathematics tests that measure a common construct and report results in proprietary, nonexchangeable metrics. Not only are all of the tests using different units of measurement, but all use different scales on which to make measurements. Consequently, it is difficult to connect the test results with materials used in the classroom. The alignment of materials and linking of assessments with the Quantile Framework enables educators, parents, and students to communicate and improve mathematics learning. The benefits of having a common metric include being able to:

(1) Develop individual multiyear growth trajectories that denote a developmental continuum from the early elementary level to Algebra II and Precalculus. The Quantile scale is vertically constructed, so the meaning of a Quantile measure is the same regardless of grade level.
(2) Monitor and report student growth that meets the needs of state accountability systems.
(3) Help classroom teachers make day-to-day instructional decisions that foster acceleration and growth toward algebra readiness and through the next several years of secondary mathematics.
(4) Build links between mathematics curricula and major mathematics tests.
(5) Develop classroom/interim assessments that can link to the major mathematics tests and forecast how likely the student is to meet the state performance standards.

In order to develop the Quantile Framework, the following tasks were undertaken:

(1) The development of a structure of mathematics that spans the developmental continuum from first grade content through Algebra I, Geometry, and Algebra II content.
(2) The production of a bank of items that have been field tested.
(3) The development of the Quantile scale (multiplier and anchor point) based on the calibrations of the field-test items.
(4) The validation of the measurement of mathematics ability as defined by the Quantile Framework.

Each of these tasks is described in the sections that follow.

Structure of the Quantile Framework for Mathematics

In order to develop a framework of mathematical ability, first a structure needs to be established. The structure of the Quantile Framework is organized around two principles—(1) mathematics and mathematical ability are developmental in nature and (2) mathematics is a specific domain of knowledge and skills.

The Common Core State Standards for Mathematics describe one of the key shifts in mathematics called for – rigor. Rigor is defined as the pursuit of "conceptual understanding, procedural skills and fluency, and application with equal intensity" (National Governor's Association and Council of Chief State School Officers, 2014).

- *Conceptual understanding:* The standards call for conceptual understanding of key concepts, such as place value and ratios. Students must be able to access concepts from a number of perspectives in order to see math as more than a set of mnemonics or discrete procedures.

- *Procedural skills and fluency:* The standards call for speed and accuracy in calculation. Students must practice core functions, such as single-digit multiplication, in order to have access to more complex concepts and procedures. Fluency must be addressed in the classroom or through supporting materials, as some students might require more practice than others.

- *Application:* The standards call for students to use math in situations that require mathematical knowledge. Correctly applying mathematical knowledge depends on students having a solid conceptual understanding and procedural fluency.

When developing the Quantile Framework, MetaMetrics recognized that in order to adequately address the scope and complexity of mathematics, multiple proficiencies and competencies must be assessed. The Quantile Framework is an effort to recognize and define a developmental context of mathematics instruction. This notion is consistent with the National Council of Teachers of Mathematics' (NCTM) conclusions about the importance of school mathematics for college and career readiness presented in the *Administrator's Guide: Interpreting the Common Core State Standards to Improve Mathematics Education* and published in 2011.

Mathematical Strands

A strand is a major subdivision of mathematical content. The strands describe what students should know and be able to do. The National Council of Teachers of Mathematics' (NCTM) publication *Principles and Standards for School Mathematics* (2000, hereafter NCTM Standards) outlined ten standards—five content standards and five process standards. These content standards are Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability. The process standards are Communications, Connections, Problem Solving, Reasoning, and Representation.

As of March 2014, the Common Core State Standards for Mathematics (CCSSM) were adopted in 44 states, the Department of Defense Education Activity, Washington D.C., Guam, the Northern Mariana Islands and the U.S. Virgin Islands. The CCSSM identify critical areas of mathematics that students are expected to learn each year from kindergarten through Grade 8 (National Governors Association Center for Best Practices (NGA Center) & the Council of Chief State School Officers (CCSSO), 2010a, 2010b). The critical areas are divided into domains which differ at each grade level and include Counting and Cardinality, Operations and Algebraic Thinking, Number and Operations in Base Ten, Number and Operations-Fractions, Ratios and Proportional Relationships, The Number System, Expressions and Equations, Functions, Measurement and Data, Statistics and Probability, and Geometry. The CCSSM for Grades 9–12 are organized by six conceptual categories: Number and Quantity, Algebra, Functions, Modeling, Geometry, and Statistics and Probability.

The six strands of the Quantile Framework bridge the Content Standards of the NCTM Standards and the domains specified in the CCSSM.

- *Algebra and Algebraic Thinking.* The use of symbols and variables to describe the relationships between different quantities is covered by algebra. By representing unknowns and understanding the meaning of equality, students develop the ability to use algebraic thinking to make generalizations. Algebraic representations can also allow the modeling of an evolving relationship between two or more variables.

- *Number Sense.* Students with number sense are able to understand a number as a specific amount, a product of factors, and the sum of place values in expanded form. These students have an in-depth understanding of the base-ten system and understand the different representations of numbers.

- *Numerical Operations.* Students perform operations using strategies and standard algorithms on different types of numbers but can also use estimation to simplify computation and to determine how reasonable their results are. This strand also encompasses computational fluency.

- *Measurement.* The description of the characteristics of an object using numerical attributes is covered by measurement. The strand includes using the concept of a unit to determine length, area, and volume in the various systems of measurement, and the relationship between units of measurement within and between these systems.

- *Geometry.* The characteristics, properties, and comparison of shapes and structures are covered by geometry, including the composition and decomposition of shapes. Not only does geometry cover abstract shapes and concepts, but it provides a structure that can be used to observe the world.

- *Data Analysis, Statistics, and Probability.* The gathering of data and interpretation of data are included in data analysis, probability, and statistics. The ability to

apply knowledge gathered using mathematical methods to draw logical conclusions is an essential skill addressed in this strand.

The Quantile Skill and Concept

Within the Quantile Framework, a Quantile Skill and Concept, or QSC, describes a specific mathematical skill or concept a student can acquire. These QSCs were arranged in an orderly progression to create a taxonomy called the Quantile scale. Examples of QSCs include:

- Know and use addition and subtraction facts to 10 and understand the meaning of equality.
- Use addition and subtraction to find unknown measures of non-overlapping angles.
- Determine the effects of changes in slope and/or intercepts on graphs and equations of lines.

The QSCs used within the Quantile Framework were developed during Spring 2003, for Grades 1 through 8, Grade 9 (Algebra I) and Grade 10 (Geometry). The framework was extended to Algebra II and revised during Summer/Fall 2003. The content was finally extended to include material typically taught in Kindergarten and Grade 12 (Precalculus) during the Summer/Fall, 2007.

The first step in developing a content taxonomy was to review the curricular frameworks from a variety of sources (e.g., National Council of Teachers of Mathematics (NCTM), National Assessment of Educational Progress: 2005 Pre-Publication Edition, North Carolina, California, Florida, Illinois, and Texas). The review of the content frameworks resulted in the development of a list of QSCs spanning the content typically taught in kindergarten through Algebra I, Geometry, and Algebra II. Each QSC consists of a description of the content, a unique identification number, the grade at which it typically first appears, and the strand with which it is associated.

The Quantile Framework Map (Appendix A) presents a picture of the construct of mathematics ability. The map is organized by the six strands and describes the development of mathematics from basic skills to sophisticated problem solving. Exemplar QSCs and problems are used to annotate the Quantile scale and the strands. QSCs are located on the Quantile scale at the point corresponding to the mean of the ensemble of items addressing that QSC from two large, national studies (Quantile Framework field study and *PASeries* Math field study described later in this document). Items are located on the Quantile scale corresponding to their Quantile measure based on the Quantile Framework field study.

Quantile Scale Development

The second step in the process of developing The Quantile Framework of Mathematics was to develop and field test a bank of items that could be used in future linking studies. Item bank development for the Quantile Framework went through several stages—content specification, item writing and review, field-testing and analyses, and final evaluation.

Item Specification and Development

Each QSC developed during the design of the Quantile Framework was paired with a particular strand and identified as typically being taught at a particular grade level. The curricular frameworks from Florida, North Carolina, Texas, and California were synthesized to identify the QSCs instructed and/or assessed at each grade level. If a QSC was included in any state framework it was included in the list of QSCs for which items were to be developed for use with the Quantile Framework field study.

During the summer and fall of 2003, over 1,400 items were developed to assess the QSCs associated with content in Grades 1 through Algebra II. The items were written and reviewed by mathematics educators trained to develop multiple-choice items (Haladyna, 1994). Each item was associated with a strand and a QSC. In the development of the Quantile Framework item bank, the reading demand of the items was kept as low as possible to ensure that the items were testing mathematics achievement and not reading.

Item Writing and Review

Item writers were experienced teachers and item-development specialists who had experience with the everyday mathematical ability of students at various levels. The use of individuals with these types of experiences helped to ensure that the items were valid measures of mathematics. Item writers were provided with training materials concerning the development of multiple-choice items and the Quantile Framework. The item writing materials also contained incorrect and ineffective items that illustrated the criteria used to evaluate items and corrections based on those criteria. The final phase of item writer training was a short practice session with three items.

Item writers were also given additional training related to sensitivity issues. Part of the item writing materials address these issues and identify areas to avoid when developing items. These materials were developed based on material published on universal design and fair access—equal treatment of the sexes, fair representation of minority groups, and the fair representation of disabled individuals.

Items were reviewed and edited by a group of specialists that represented various perspectives—test developers, editors, and curriculum specialists. These individuals examined each item for sensitivity issues and for the quality of the response options. During the second stage of the item review process, items were approved, approved with edits, or deleted.

Linking and Field-Test Design

The next stage in the development of the Quantile item bank was the field-testing of all of the items. First, individual test items were compiled into leveled assessments distributed to groups of students. The data gathered from these assessments were then analyzed using a variety of statistical methods. The final result was a bank of test items appropriately placed within the Quantile scale, suitable for determining the mathematical achievement of students on this scale.

Assessment forms were developed for 10 levels for the purposes of field-testing. Levels 2 through 8 were aligned with the typical content taught in Grades 2 through 8, Level 9 was aligned with the typical content taught in Algebra I, Level 10 was aligned with the typical content taught in Geometry, and Level 11 was aligned with the typical content taught in Algebra II. For each level, three forms were developed with each form containing 30 items.

The final field tests were composed of 685 unique items. Besides the 660 items mentioned above, two sets of 12 linking items were developed to serve as below-level items for Grade 2 and above-level items for Algebra II. Two additional Algebra II items were developed to ensure coverage of all the QSCs at that level.

Linking the test levels vertically (across grades) employed a common-item test design (design in which items are used on multiple forms). In this design, multiple tests are given to nonrandom groups, and a set of common items is included in the test administration to allow some statistical adjustments for possible sample-selection bias. This design is most advantageous where the number of items to be tested (treatments) is large and the consideration of cost (in terms of time) forces the experiment to be smaller than is desired (Cochran and Cox, 1957).

Quantile Framework Field Study and Analysis

The Quantile Framework field study was conducted in February 2004. Thirty-seven schools from 14 districts across six states (California, Indiana, Massachusetts, North Carolina, Utah, and Wisconsin) agreed to participate in the study. Data were received from 34 of the schools (two elementary and one middle-school did not return data). A total of 9,847 students in Grades 2 through 12 were tested. The number of students per school ranged from 74 to 920. The schools were diverse in terms of geographic location, size, and type of community (e.g., suburban; small town, city, or rural communities; and urban). See *Table 1* for information about the sample at each grade level and the total sample. See *Table 2* for test administration forms by level.

Table 1. Field-study participation by grade and gender.

Grade Level	*N*	Percent Female (*N*)	Percent Male (*N*)
2	1,283	48.1 (562)	51.9 (606)
3	1,354	51.9 (667)	48.1 (617)
4	1,454	47.7 (644)	52.3 (705)
5	1,344	48.9 (622)	51.1 (650)
6	976	47.7 (423)	52.3 (463)
7	1,250	49.8 (618)	50.2 (622)
8	1,015	51.9 (518)	48.1 (481)
9	489	52.0 (252)	48.0 (233)
10	259	48.6 (125)	51.4 (132)
11	206	49.3 (101)	50.7 (104)
12	143	51.7 (74)	48.3 (69)
Missing	74	39.1 (9)	60.9 (14)
Total	9,847	49.6 (4,615)	50.4 (4,696)

Table 2. Test-form administration by level.

Test Level	*N*	Missing	Form 1	Form 2	Form 3
2	1,283	4	453	430	397
3	1,354	7	561	387	399
4	1,454	17	616	419	402
5	1,344	3	470	448	423
6	917	13	322	293	289
7	1,309	6	463	429	411
8	1,181	16	387	391	387
9	415	4	141	136	134
10	226	5	73	77	71
11	313	10	102	101	100
Missing	51	31	9	8	3
Total	9,847	116	3,596	3,119	3,016

Students administered Levels 2 through 11 were provided with rulers and students administered Levels 3 through 11 were provided with protractors. For students administered Levels 5 through 8 and 10 and 11, formulas were provided on the back of the test booklet. Administration time was approximately 45 minutes at each level. Students administered Level 2 could have the test read aloud and mark in the test booklet if that was typical of instruction.

Field-Test Analyses. At the conclusion of the field test, complete data was available for 9,678 students. Data were deleted if test level or test form was not indicated or the answer sheet was blank. The field-test data were analyzed using both the classical measurement model and the Rasch (one-parameter logistic item response theory) model. Item statistics and descriptive information (item number, field test form and item number, QSC, and answer key) were printed for each item and attached to the item record. The item record contained the statistical, descriptive, and historical information for an item; a copy of the item itself as it was field-tested; any comments by reviewers; and the psychometric notations. Each item had a separate item record.

Field-Test Analyses—Classical Measurement. For each item, the *p*-value (percent correct) and the point-biserial correlation between the item score (correct response) and the total test score were computed. Point-biserial correlations were also computed between each of the incorrect responses and the total score. In addition, frequency distributions of the response choices (including omits) were tabulated (both actual counts and percents). Items with point-biserial correlations less than 0.10 were removed from the item bank. *Table 3* displays the summary item statistics.

Table 3. Summary item statistics from the Quantile Framework field study (February 2004).

Level	Number of Items Tested	Mean *p*-value (Range)	Mean Correct Response Point-Biserial Correlation (Range)	Mean Incorrect Responses Point-Biserial Correlation (Range)
2	90	0.58 (0.12 – 0.95)	0.32 (-0.15 – 0.56)	-0.21 (-0.43 – 0.12)
3	90	0.53 (0.11 – 0.93)	0.26 (-0.08 – 0.52)	-0.22 (-0.54 – 0.02)
4	90	0.55 (0.12 – 0.92)	0.24 (-0.21 – 0.50)	-0.22 (-0.48 – 0.12)
5	90	0.54 (0.12 – 0.95)	0.28 (-0.05 – 0.50)	-0.23 (-0.45 – 0.05)
6	90	0.52 (0.04 – 0.86)	0.24 (-0.08 – 0.45)	-0.22 (-0.46 – 0.09)
7	90	0.44 (0.10 – 0.77)	0.29 (-0.12 – 0.56)	-0.21 (-0.46 – 0.25)
8	90	0.43 (0.10 – 0.81)	0.26 (-0.15 – 0.50)	-0.20 (-0.45 – 0.13)
9	90	0.40 (0.10 – 0.79)	0.21 (-0.19 – 0.52)	-0.19 (-0.53 – 0.22)
10	88	0.51 (0.01 – 0.97)	0.19 (-0.26 – 0.53)	-0.21 (-0.55 – 0.18)
11	90	0.53 (0.09 – 0.98)	0.26 (-0.09 – 0.51)	-0.22 (-0.52 – 0.07)

Field-Test Analyses—Bias. Differential item functioning (DIF) examines the relationship between the score on an item and group membership while controlling for ability. The Mantel-Haenszel procedure has become "the most widely used methodology [to examine differential item functioning] and is recognized as the testing industry standard" (Roussos, Schnipke, and Pashley, 1999, p. 293). The Mantel-Haenszel procedure examines DIF by examining j 2 × 2 contingency tables, where j is the number of different levels of ability actually achieved by the examinees (actual total scores received on the test). The focal group is the group of interest and the reference group serves as a basis for comparison for the focal group (Dorans and Holland, 1993; Camilli and Shepherd, 1994).

The Mantel-Haenszel chi-square statistic tests the alternative hypothesis that there is a linear association between the row variable (score on the item) and the column variable (group membership). The χ^2 distribution has 1 degree of freedom and is determined as

$$Q_{MH} = (n-1)r^2 \qquad \text{Equation (1)}$$

where r is the Pearson correlation between the row variable and the column variable (SAS Institute, 1985).

The Mantel-Haenszel (MH) Log Odds Ratio statistic is used to determine the direction of differential item functioning (SAS Institute Inc., 1985). This measure is obtained by combining the odds ratios, α_j, across levels with the formula for weighted averages (Camilli and Shepherd, 1994, p. 110):

$$\alpha_j = \frac{p_{Rj} / q_{Rj}}{p_{Fj} / q_{Fj}} = \frac{\Omega_{Rj}}{\Omega_{Fj}} \qquad \text{Equation (2)}$$

For this statistic, the null hypothesis of no relationship between score and group membership, or that the odds of getting the item correct are equal for the two groups, is not rejected when the odds ratio equals 1. For odds ratios greater than 1, the interpretation is that an individual at score level *j* of the Reference Group has a greater chance of answering the item correctly than an individual at score level *j* of the Focal Group. Conversely, for odds ratios less than 1, the interpretation is that an individual at score level *j* of the Focal Group has a greater chance of answering the item correctly than an individual at score level *j* of the Reference Group. The Breslow-Day Test is used to test whether the odds ratios from the *j* levels of the score are all equal. When the null hypothesis is true, the statistic is distributed approximately as a χ^2 with *j*-1 degrees of freedom (Camilli and Shepherd, 1994; SAS Institute, 1985).

For the gender analyses, males (approximately 50.4% of the population) were defined as the reference group and females (approximately 49.6% of the population) were defined as the focal group.

The results from the Quantile Framework field study were reviewed for inclusion on later linking studies. The following statistics were reviewed for each item: *p*-value, point-biserial correlation, and DIF estimates. Items that exhibited extreme statistics were removed from the item bank (47 out of 685).

From the studies conducted with the Quantile Framework item bank (Palm Beach County [FL] linking study, Mississippi linking study, DoDEA/TerraNova linking study, and Wyoming linking study), approximately 6.9% of the items in any one study were flagged as exhibiting DIF using the Mantel-Haenszel statistic and the *t*-statistic from Winsteps. For each linking study the following steps were used to review the items: (1) flag items exhibiting DIF, (2) review items to determine if the content of the item is something that all students should know and be able to do, and (3) make decision to retain or delete the item.

Field-Test Analyses—Rasch Item Response Theory. Classical test theory has two basic shortcomings: (1) the use of item indices whose values depend on the particular group of examinees from which they were obtained, and (2) the use of examinee ability estimates that depend on the particular choice of items selected for a test. The basic premises of item response theory (IRT) overcome these shortcomings by predicting the performance of an examinee on a test item based on a set of underlying abilities (Hambleton and Swaminathan, 1985). The relationship between an examinee's item performance and the set of traits underlying item performance can be described by a monotonically increasing function called an item characteristic curve (ICC). This function specifies that as the level of the trait increases, the probability of a correct response to an item increases.

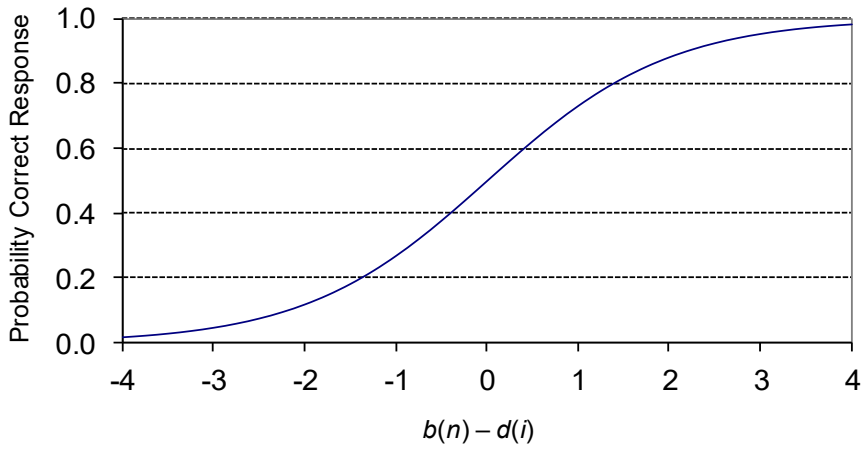
The conversion of observations into measures can be accomplished using the Rasch (1980) model, which states a requirement for the way that item calibrations and observations (count of correct items) interact in a probability model to produce measures. The Rasch IRT model expresses the probability that a person (*n*) answers a certain item (*i*) correctly by the following relationship:

$$P_{ni} = \frac{e^{b_n - d_i}}{1 + e^{b_n - d_i}} \qquad \text{Equation (3)}$$

where d_i is the difficulty of item i (i = 1, 2, …, number of items);
b_n is the ability of person n (n = 1, 2, …, number of persons);
$b_n - d_i$ is the difference between the ability of person n and the difficulty of item i; and
P_{ni} is the probability that examinee n responds correctly to item i
(Hambleton and Swaminathan, 1985; Wright and Linacre, 1994).

This measurement model assumes that item difficulty is the only item characteristic that influences the examinee's performance such that all items are equally discriminating in their ability to identify low-achieving persons and high achieving persons (Bond and Fox, 2001; and Hambleton, Swaminathan, and Rogers, 1991). In addition, the lower asymptote is zero, which specifies that examinees of very low ability have zero probability of correctly answering the item. The Rasch model has the following assumptions: (1) unidimensionality—only one ability is assessed by the set of items; and (2) local independence—when abilities influencing test performance are held constant, an examinee's responses to any pair of items are statistically independent (conditional independence, i.e., the only reason an examinee scores similarly on several items is because of his or her ability, not because the items are correlated). The Rasch model is based on fairly restrictive assumptions, but it is appropriate for criterion-referenced assessments. *Figure 1* graphically shows the probability that a person will respond correctly to an item as a function of the difference between a person's ability and an item's difficulty.

Figure 1. The Rasch Model—the probability person n responds correctly to item i.



An assumption of the Rasch model is that the probability of a response to an item is governed by the difference between the item calibration (d_i) and the person's measure (b_n). From an examination of the graph in *Figure 1*, when the ability of the person matches the difficulty of the item ($b_n - d_i = 0$), then the person has a 50% probability of responding to the item correctly.

The number of correct responses for a person is the probability of a correct response summed over the number of items. When the measure of a person greatly exceeds the calibration (difficulties) of the items ($b_n - d_i > 0$), then the expected probabilities will be high and the sum of these probabilities will yield an expectation of a high "number correct." Conversely, when the item calibrations generally exceed the person measure ($b_n - d_i < 0$), the modeled probabilities of a correct response will be low and the expectation will be a low "number correct."

Thus, Equation 3 can be rewritten in terms of the number of correct responses of a person on a test

$$O_p = \sum_{i=1}^{L} \frac{e^{b_n - d_i}}{1 + e^{b_n - d_i}} \qquad \text{Equation (4)}$$

where O_p is the number of correct responses of person p and L is the number of items on the test.

When the sum of the correct responses and the item calibrations (d_i) is known, an iterative procedure can be used to find the person measure (b_n) that will make the sum of the modeled probabilities most similar to the number of correct responses. One of the key features of the Rasch IRT model is its ability to place both persons and items on the same scale. It is possible to predict the odds of two individuals being successful on an item based on knowledge of the relationship between the abilities of the two individuals. If one person has an ability measure that is twice as high as that of another person (as measured by *b*—the ability scale), then he or she has twice the odds of successfully answering the item.

Equation 4 possesses several distinguishing characteristics:

- The key terms from the definition of measurement are placed in a precise relationship to one another.
- The individual responses of a person to each item on an instrument are absent from the equation. The only information that appears is the "count correct" (O_p), thus confirming that the raw score (i.e., number of correct responses) is "sufficient" for estimating the measure.
- For any set of items the possible raw scores are known. When it is possible to know the item calibrations (either theoretically or empirically from field studies), the only parameter that must be estimated in Equation 4 is the person measure that corresponds to each observable count correct. Thus, when the calibrations (d_i) are known, a correspondence table linking observation and measure can be constructed without reference to data on other individuals.

All students and items were submitted to a Winsteps analysis using a logit convergence criterion of 0.0001 and a residual convergence criterion of 0.001. Items that a student skipped were treated as missing, rather than being treated as incorrect. Only students who responded to at least 20 items were included in the analyses (22 students were omitted, 0.22%). The Quantile measure comes from multiplying the logit value by 180 and is anchored at 656Q. The multiplier and the

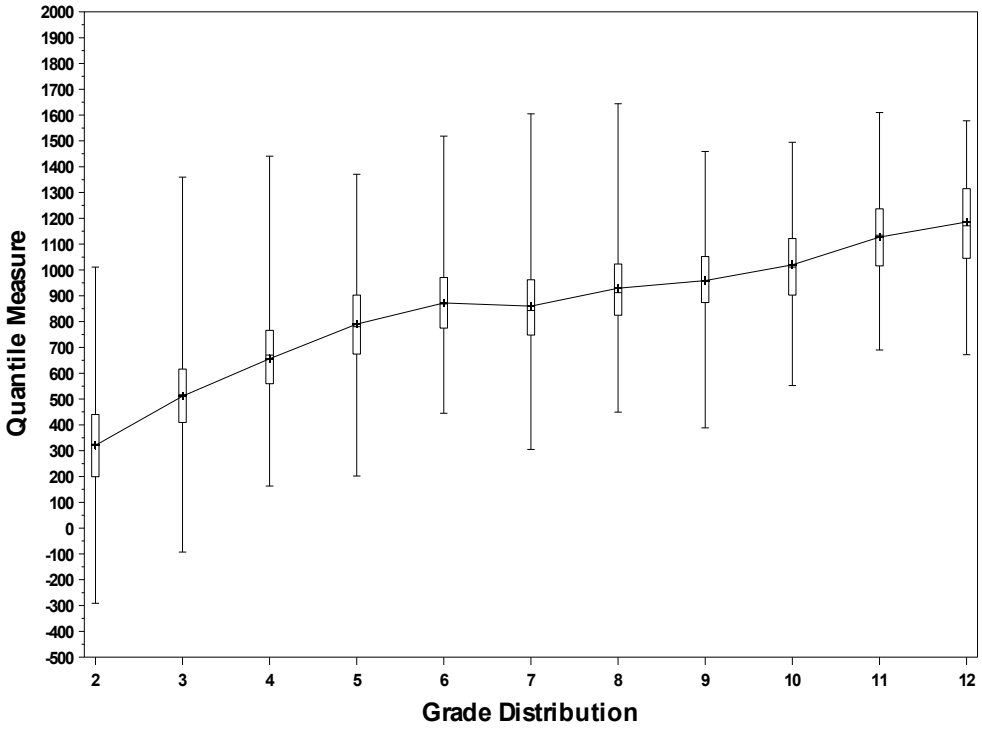
anchor point will be discussed in a later section. *Table 4* shows the mean and median Quantile measures for all students with complete data at each grade level. While there is not a monotonically increasing trend in the mean and median Quantile measures in Grades 6 and 7, the measures are not significantly different. Results from other studies (e.g., *PASeries* Math described beginning on page 26 exhibit a monotonically increasing function).

Table 4. Mean and median Quantile measures for students with complete data (N = 9,656).

Grade Level	*N*	Mean Quantile measure (SD)	Median Quantile measure
2	1,275	321 (189.1)	323
3	1,339	511 (157.7)	516
4	1,427	655 (157.5)	667
5	1,337	790 (167.7)	771
6	959	872 (153.0)	865
7	1,244	861 (174.2)	841
8	1,004	929 (157.6)	910
9	482	959 (152.8)	953
10	251	1020 (162.9)	1005
11	200	1127 (178.6)	1131
12	138	1186 (189.2)	1164

Figure 2 shows the relationship between grade level and Quantile measure. The following box and whisker plots (*Figures 2, 3,* and *4*) show the progression of the *y*-axis scores from grade to grade (the *x*-axis). For each grade, the box refers to the inter-quartile range. The line within the box indicates the median and the + indicates the mean. The end of each whisker shows the minimum and maximum values of the *y*-axis which is the Quantile measure. Across all students, the correlation between grade and Quantile measure was 0.76.

Figure 2. Box and whisker plot of the Rasch ability estimates of all students with complete data (N = 9,656).



All students with outfit mean square statistics greater than or equal to 1.8 were removed from further analyses. A total of 480 students (4.97%) were removed from further analyses. The number of students removed ranged from 8.47% (108) in Grade 2 to 2.29% (22) in Grade 6 with a mean percent decrease of 4.45% per grade.

All remaining students (9,176) and all items were submitted to a Winsteps analysis using a logit convergence criterion of 0.0001 and a residual convergence criterion of 0.001. Items that a student skipped were treated as missing, rather than being treated as incorrect. Only students who responded to at least 20 items were included in the analyses. *Table 5* shows the mean and median Quantile measures for the final set of students at each grade level. *Figure 3* shows the results from the final set of students. The correlation between grade level and Quantile measure was 0.78.

Table 5. Mean and median Quantile measures for the final set of students (N = 9,176).

Grade Level	N	Median Logit Value	Mean Quantile measure (Median)
2	1,167	-2.800	289 (292)
3	1,260	-1.650	502 (499)
4	1,352	-0.780	653 (656)
5	1,289	0.000	795 (796)
6	937	0.430	881 (874)
7	1,181	0.370	878 (863)
8	955	0.810	951 (942)
9	466	1.020	983 (980)
10	244	1.400	1044 (1048)
11	191	2.070	1160 (1169)
12	134	2.295	1220 (1210)

Figure 3. Box and whisker plot of the Rasch ability estimates for the final sample of students with outfit statistics less than 1.8 (N = 9,176).

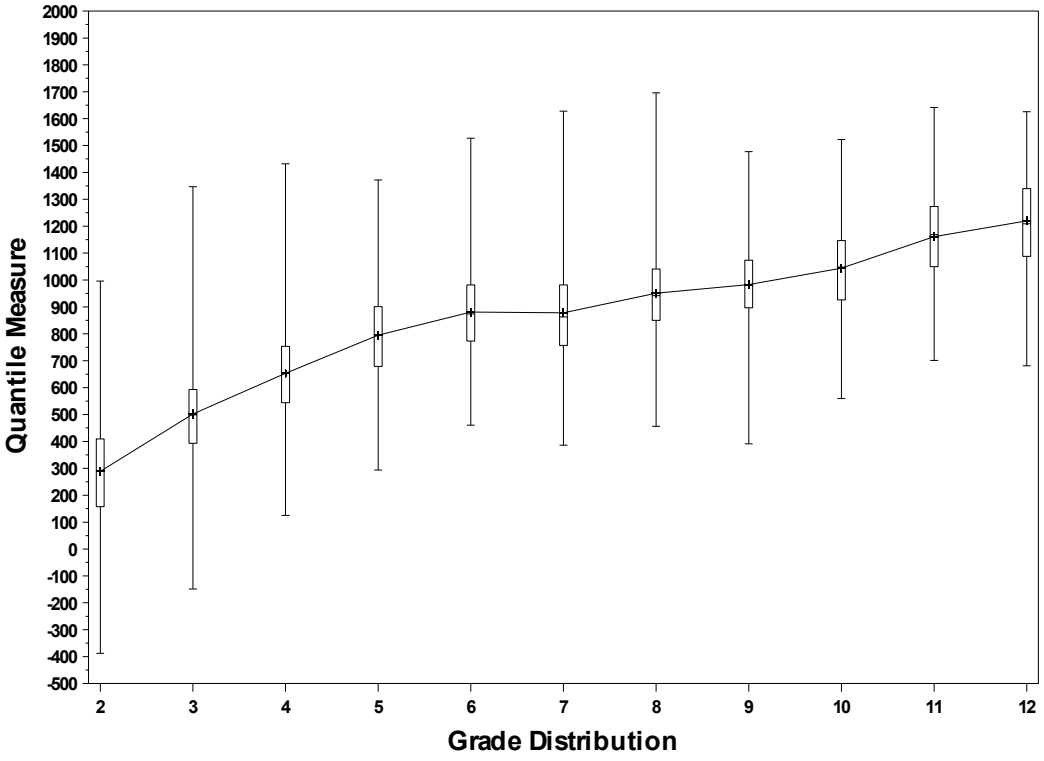
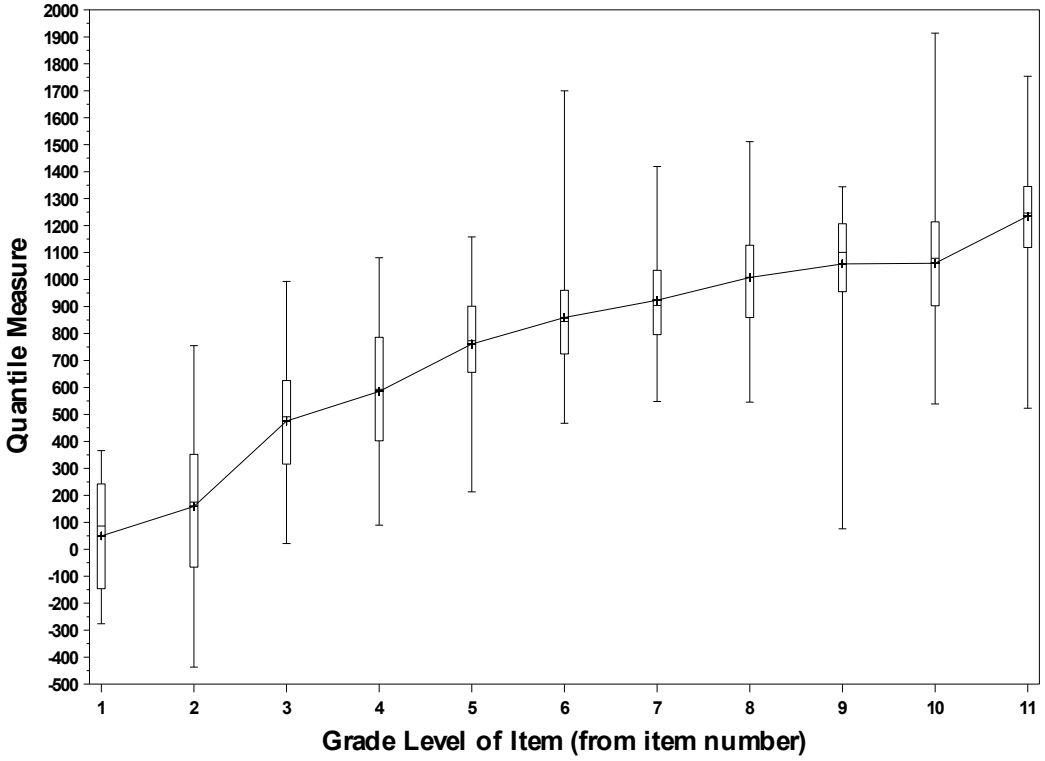


Figure 4 shows the distribution of item difficulties based on the final sample of students. For this analysis, missing data were treated as "skipped" items and not counted as wrong. There is a gradual increase in difficulty when items are sorted by level of test for which the items were written. This distribution appears to be non-linear, which is consistent with other studies. The

correlation between the grade level for which the item was written and the Quantile measure of the item was 0.80.

Figure 4. Box and whisker plot of the Rasch difficulty estimates of the 685 Quantile Framework items for the final sample of students (N = 9,176).



The field testing of the items written for the Quantile Framework indicates a strong correlation between the grade level of the item and the item difficulty.

The Specification of the Quantile Scale

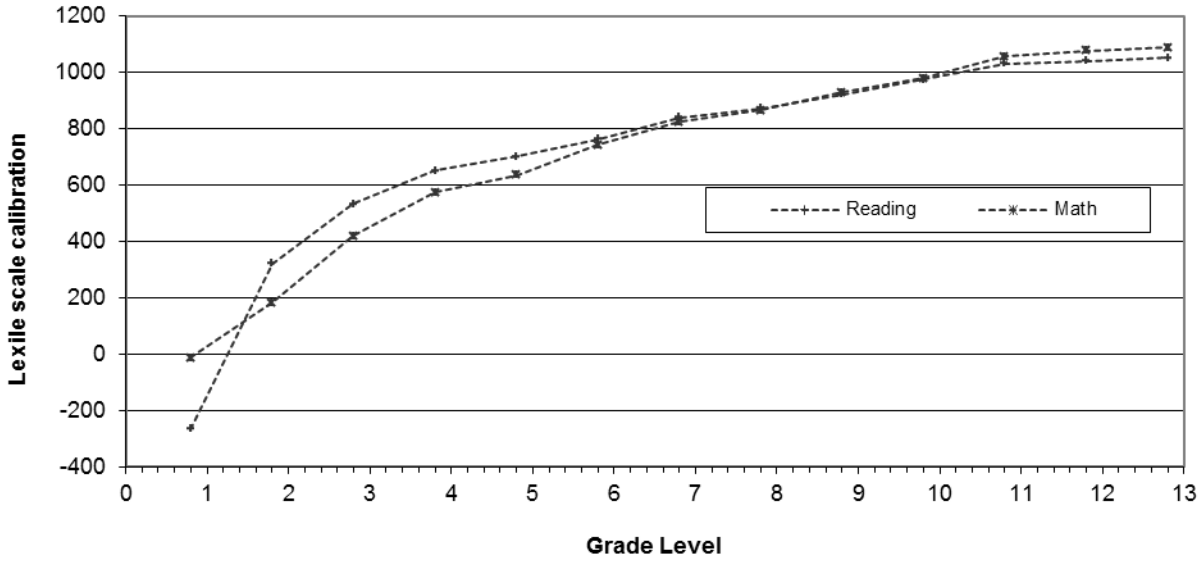
In developing the Quantile scale, two features of the scale were needed: (1) scale multiplier (conversion factor) and (2) anchor point.

As described in the previous section, the Rasch item response theory model (Wright and Stone, 1979) was used to estimate the difficulties of items and the abilities of persons on the logit scale. The calibrations of the items from the Rasch model are objective in the sense that the relative difficulties of the items will remain the same across different samples of persons (specific objectivity). When two items are administered to the same person it can be determined which item is harder and which one is easier. This ordering should hold when the same two items are administered to a second person. If two different items are administered to the second person, there is no way to know which set of items is harder and which set is easier.

The problem is that the location of the scale is not known. General objectivity requires that scores obtained from different test administrations be tied to a common zero—absolute location must be sample independent (Stenner, 1990). To achieve general objectivity, the theoretical logit difficulties must be transformed to a scale where the ambiguity regarding the location of zero is resolved.

The first step in developing the Quantile scale was to determine the conversion factor used to go from logits to Quantile measures. Based on prior research with reading and the Lexile scale, the decision was made to examine the relationship between reading and mathematics scales used with other assessments. The median scale score for each grade level on a norm-referenced assessment linked with the Lexile scale is plotted in *Figure 5* using the same conversion equation for both reading and mathematics.

Figure 5. *Relationship between reading and mathematics scale scores on a norm-referenced assessment linked to the Lexile scale in reading.*



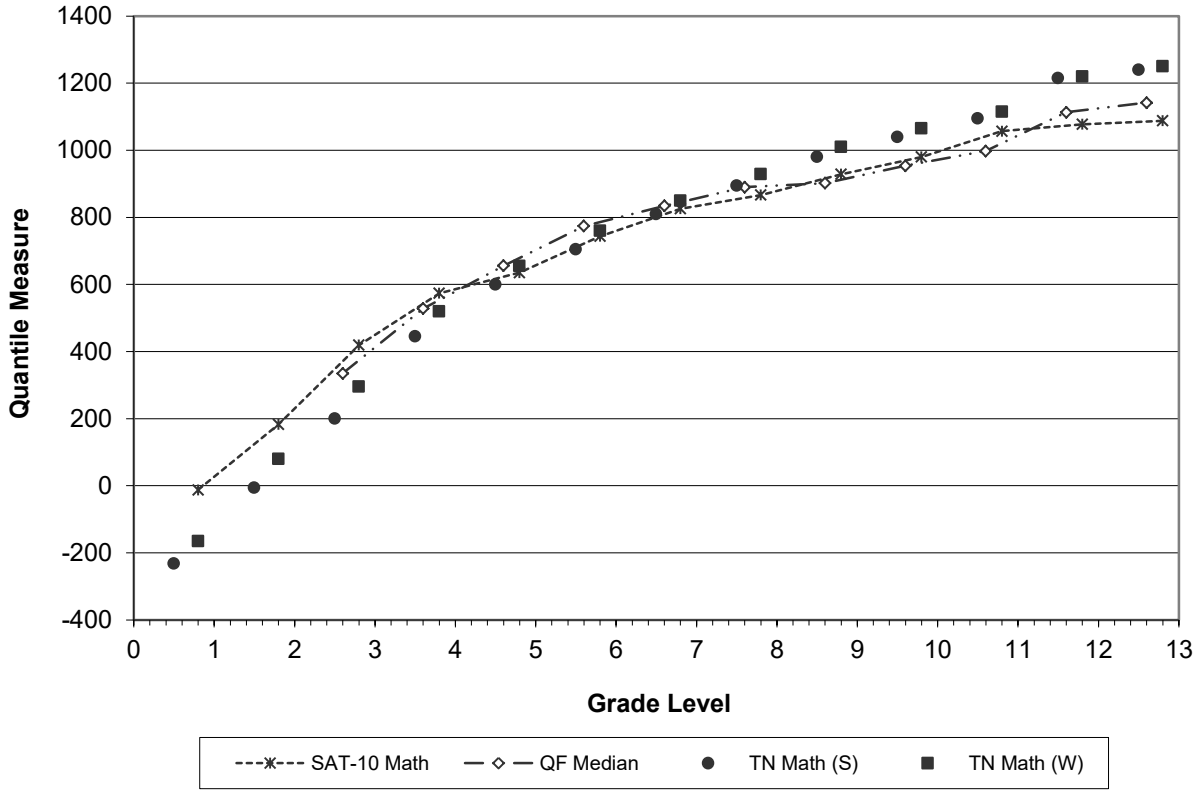
Based on an examination of *Figure 5*, it was concluded that the same conversion factor of 180 that is used with the Lexile scale could be used with the Quantile scale. Both sets of data exhibited a similar pattern across grades.

The second step in developing the Quantile scale with a fixed zero was to identify an anchor point for the scale. Given the number of students at each grade level in the field study, it was concluded that the scale should be anchored at Grade 4 or 5 (middle of grade span typically tested by state assessment programs). Median performance at the end of Grade 3 on the Lexile scale is 590L. The Quantile Framework field study was conducted in February and this point would correspond to six months (0.6) through the school year. Median performance at the end of Grade 4 on the Quantile scale is 700L. To determine the location of the scale, 66Q were added to

the median performance at the end of Grade 3 to reflect the growth of students in Grade 4 prior to the field study (700 – 590 = 110; 110 × 0.6 = 66).

Therefore, the value of 656Q was used for the location of Grade 4 median performance. The anchor point was validated with other assessment data and collateral data from the Quantile Framework field study (see *Figure 6*).

Figure 6. Relationship between grade level and mathematics performance on the Quantile Framework field study and other mathematics assessments.



Finally, a linear equation of the form

$$[(\text{Logit} - \text{Anchor Logit}) \times \text{CF}) + 656 = \text{Quantile measure} \qquad \text{Equation (5)}$$

was developed to convert logit difficulties to Quantile calibrations where the anchor logit is the median for Grade 4 in the Quantile Framework field study.

Quantile Skill and Concept (QSC) Measures

The next step in the development process was to use the Quantile Framework to estimate the Quantile measure of each QSC. Having a measure for each QSC on the Quantile scale will then allow the difficulty of skills and concepts and the complexity of other resources to be evaluated. The Quantile measure of a QSC estimates the solvability, or a prediction of how difficult the skill or concept will be for a learner.

The QSCs also fall into Knowledge Clusters along a content continuum. Recall that the Quantile Framework is a content taxonomy of mathematical skills and topics. Knowledge Clusters are a family of skills, like building blocks, that depend one upon the other to connect and demonstrate how comprehension of a mathematical topic is founded, supported, and extended along the continuum. The Knowledge Clusters illustrate the interconnectivity of the Quantile Framework and the natural progression of mathematical skills (content trajectory) needed to solve increasingly complex problems (Hudnutt, 2012).

The Quantile measures and Knowledge Clusters for QSCs were determined by a group of three to five subject-matter experts (SMEs). Each SME has had classroom experience at multiple developmental levels, has completed graduate-level courses in mathematics education, and understands basic psychometric concepts and assessment issues.

For the development of Knowledge Clusters, certain terminology was developed to describe relationships between the QSCs.

- A **focus QSC** is the skills and concept that is the focus of instruction.
- A **prerequisite QSC** is a QSC that describes a skill or concept that provides a building block necessary for another QSC. For example, adding single-digit numbers is a prerequisite for adding two-digit numbers.
- A **supporting QSC** is a QSC that describes associated skills or knowledge that assists and enriches the understanding of another QSC. For example, two supporting QSC are multiplying two fractions and determining the probability of compound events.
- An **impending QSC** describes a skill or concept that will further augment understanding, building on another QSC. An impending QSC for using division facts is simplifying equivalent fractions.

Each focus QSC was classified with prerequisite QSCs and supporting QSCs or was identified as a foundational QSC. As a part of a taxonomy, QSCs are either a single link in a chain of skills that lead to the understanding of larger mathematical concepts, or they are the first step toward such an understanding. A QSC that is classified as foundational requires only general readiness to learn.

The SMEs examined each QSC to determine where the specific QSC comes in the content continuum based on their classroom experience, instructional resources (e.g., textbooks), and other curricular frameworks (e.g., NCTM Standards). The process called for each SME to independently review the QSC and develop a draft Knowledge Cluster. The second step

consisted of the 3-5 SMEs meeting and reviewing the draft clusters. Through discussion and consensus, the SMEs developed the final Knowledge Cluster.

Once the Knowledge Cluster for a QSC was established, the information was used when determining the Quantile measure of a QSC, as described below. If necessary, Knowledge Clusters are reviewed and refined if the Quantile measures of the QSCs in the cluster are not monotonically increasing (steadily increasing) or there is not an instructional explanation for the pattern.

The Quantile Framework is a theory-referenced measurement system of mathematical understanding. As such, a QSC Quantile measure represents the "typical" difficulty of all items that could be written to represent the QSC and the collection of items can be thought of as an *ensemble* of the all of the items that could be developed for a specific skill or concept. During 2002, Stenner, Burdick, Sanford, and Burdick (2006) conducted a study to explore the "ensemble" concept to explain differences across reading items with The Lexile Framework for Reading. The theoretical Lexile measure of a piece of text is the mean theoretical difficulty of all items associated with the text. Stenner and his colleagues state that the "Lexile Theory replaces statements about individual items with statements about ensembles. The ensemble interpretation enables the elimination of irrelevant details. The extra-theoretical details are taken into account jointly, not individually, and, via averaging, are removed from the data text explained by the theory" (p. 314). The result is that when making text-dependent generalizations, text readability can be measured with high accuracy and the uncertainty in expected comprehension is largely due to the unreliability in reader measures.

To determine the Quantile measure of a QSC, actual performance by examinees is used. While expert judgment alone could be used to scale the QSCs, empirical scaling is more replicable. Items and resulting data from two national field studies were used in the process:

- Quantile Framework field study (685 items, $N = 9{,}647$, Grades 2 through Algebra II) which is described earlier in this section; and
- *PASeries* Mathematics field study (7,080 items, $N = 27{,}329$, Grades 2 through 9/Algebra I) which is described in the *PASeries* Mathematics Technical Manual (MetaMetrics, 2005).

The items initially associated with each QSC were reviewed by SMEs and accepted for inclusion in the set of items, moved to another QSC, or not included in the set. The following criteria were used:

- Psychometric (responded to by at least 50 examinees, administered at the target grade level, point-biserial correlation greater than or equal to 0.16);
- Matched grade level of introduction of concept/skill from national review of curricular frameworks (described on pages 6 and 7); and
- Appropriate for instruction of concept (first nights homework; from the A and B sections of the lesson problems in textbooks) based on consensus of the SMEs.

Once the set of items meeting the inclusion criteria is identified, the set of items is reviewed to ensure that the curricular breadth of the QSC is covered. If the group of SMEs considers the set of items to be acceptable, then the Quantile measure of the QSC is calculated. The Quantile measure of a QSC is defined as the mean Quantile measure of items that met the criteria.

The final step in the process is to review the Quantile measure of the QSC in relationship to the Quantile measures of the QSCs identified as pre-requisite and supporting to the QSC. If the group of SMEs does not consider the set of items to be acceptable, then the Quantile measure of the QSC is estimated and assigned a Quantile zone. (Quantile zone is the suggested range of Quantiles at which the student is ready for instruction. The Quantile Range for a student is from 50Q above her or his Quantile measure to 50Q below.) By assigning a Quantile zone instead of a Quantile measure to these QSCs, the SMEs are able to provide a valid estimate of the skill or concept's difficulty.

In 2007, with the extension of the Quantile Framework to include Kindergarten and Precalculus, the Quantile measures of the QSCs were reviewed. Where additional items had been tested and the data was available, estimated QSC Quantile measures were calculated. In 2014, a large data set was analyzed to examine the relationship between the original QSC Quantile measures and empirical QSC means from the items administered. The overall correlation between QSC Quantile measures and empirically estimated Quantile measures was 0.98 (N = 7,993 students). Based on the analyses, 12 QSCs were identified with larger-than-expected deviations given the "ensemble" interpretation of a QSC Quantile measure. Each QSC was reviewed in terms of the items that generated the data, linking studies where the QSC was employed, and data from other assessments developed employing the Quantile Framework. Of the 12 QSCs identified, it was concluded that the Quantile measure of nine of the QSCs should be recalculated. Five of the QSCs are targeted for Kindergarten and Grade 1 and the current data set provided data to calculate a Quantile measure (the Quantile measure for the QSC had been previously estimated). The other four QSC Quantile measures were revised because the type of "typical" item and the technology used to assess the skill or concept had shifted from the time that the QSC Quantile measure was established in 2004 (QSCs: 79, 654, 180, and 217). Three of the QSC Quantile measures were not changed (QSC: 134, 604, 408) because (1) some of the items did not reflect the intent of the QSC, or (2) not enough items were tested to indicate that the Quantile measure should be recalculated.

Validity Evidence for The Quantile Framework for Mathematics

Validity is the extent to which a test measures what its authors or users claim it measures. Specifically, test validity concerns the appropriateness of inferences "that can be made on the basis of observations or test results" (Salvia and Ysseldyke, 1998, p. 166). The 2014 *Standards for Educational and Psychological Testing* (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education) state that "validity refers to the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (p. 11). In other words, a valid test measures what it is supposed to measure.

Stenner, Smith, and Burdick state that "[t]he process of ascribing meaning to scores produced by a measurement procedure is generally recognized as the most important task in developing an educational or psychological measure, be it an achievement test, interest inventory, or personality scale" (1983). For the Quantile Framework, which measures student understanding of mathematical skills and concepts, the most important aspect of validity that should be examined is construct-identification validity. This global form of validity encompassing content-description and criterion-prediction validity may be evaluated for The Quantile Framework for Mathematics by examining how well Quantile measures relate to other measures of mathematical achievement.

Relationship of Quantile Measures to Other Measures of Mathematical Understanding

Scores from tests purporting to measure the same construct, for example "mathematical achievement," should be moderately correlated (Anastasi, 1982). The Quantile Framework for Mathematics has been linked with numerous standardized tests of mathematics achievement. When assessment scales are linked, a common frame of reference can be used to interpret the test results. This frame of reference can be "used to convey additional normative information, test-content information, and information that is jointly normative and content-based. For many test uses … [this frame of reference] conveys information that is more crucial than the information conveyed by the primary score scale" (Petersen, Kolen, and Hoover, 1993, p. 222).

Table 6 presents the results from linking studies conducted with the Quantile Framework. For each of the tests listed, student mathematics scores were reported using the test's scale, as well as by Quantile measures. This dual reporting provides a rich, criterion-related frame of reference for interpreting the standardized test scores. Each student who takes one of the standardized tests can receive, in addition to norm- or criterion-referenced test results, information related to the specific QSCs on which he or she is ready to be instructed. *Table 6* also shows that measures derived from the Quantile Framework are more than moderately correlated to other measures of mathematical understanding.

Table 6. Results from linking studies conducted with the Quantile Framework.

Standardized Test	Grades in Study	*N*	Correlation Between Test Score and Quantile measure
Mississippi Curriculum Test, Mathematics (MCT)	2 – 8	7,039	0.89
TerraNova (CTB/McGraw-Hill)	3, 5, 7, 9	6,356	0.92
Texas Assessment of Knowledge and Skills (TAKS)	3 – 11	14,286	0.69 to 0.78*
Proficiency Assessments for Wyoming Students (PAWS)	3, 5, 8, and 11	3,923	0.87
Progress Towards Standards (PTS3)	3-8 and 10	8,544	0.86 to 0.90*
Progress in Maths (PiM – GL Assessments)	1 – 8	3,183	0.71 to 0.81*
North Carolina End-of-Grade/End-of-Course Tests (NC EOG/NC EOC)	3, 5, 7, A1, G, and A2	5,069	0.88 to 0.90*
Comprehensive Testing Progressing (CPT 4 – ERB)	3, 5, and 7	953	0.87 to 0.90
Kentucky Core Content Tests (KCCT)	3 - 8 and 11	12,660	0.80 to 0.83*
Oklahoma Core Competency Tests (OCCT)	3 – 8	5,649	0.81 to 0.85*
Iowa Assessments	2, 4, 6, 8, and 10	7,365	0.92
Virginia Standards of Learning (SOL)	3-8, A1, G, and A2	12,470	0.86 to 0.89*
Kentucky Performance Rating for Educational Progress (K-PREP)	3 – 8	6,859	0.81 to 0.85*
North Carolina ACT	11	3,320	0.90
North Carolina READY End-of-Grade/End-of-Course Tests (NC EOG/NC EOC)	3, 4, 6, 8, and A1/I1	10,903	0.87 to 0.90*
aimsweb – Math Concepts and Applications (Pearson)	2 – 8	3,262	0.87

Notes: * TAKS, PTS3, PiM, NCEOC, KCCT, OCCT, K-PREP, SOL, and NC READY were not vertically scaled; separate linking equations were derived for each grade/course.

Multidimensionality of Quantile Framework Items

Test dimensionality is defined as the minimum number of abilities or constructs measured by a set of test items. A construct is a theoretical representation of an underlying trait, concept, attribute, process, and/or structure that a test purports to measure (Messick, 1993). A test can be considered to measure one latent trait, construct, or ability (in which case it is called unidimensional); or a combination of abilities (in which case it is referred to as multidimensional). The dimensional structure of a test is intricately tied to the purpose and definition of the construct to be measured. It is also an important factor in many of the model(s) used in data analyses. Though many of the models assume unidimensionality, this assumption cannot be strictly met because there are always other cognitive, personality, and test-taking factors that have some level of impact on test performance (Hambleton and Swaminathan, 1985).

The complex nature of mathematics and the curriculum standards most states have adopted also contribute to unintended dimensionality. Application and process skills, the reading demand of items, and the use of calculators could possibly add features to an assessment beyond what the developers intended. In addition, the NCTM Standards, upon which many states have based curricula, describe the growth of students' mathematical development across five content standards: Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability. These standards, or sub-domains of mathematics, are useful in organizing mathematics instruction in the classroom. These standards could represent different constructs and thereby introduce more sources of dimensionality to tests designed to assess these standards.

Study 1 – Comparison of Mathematics with Reading. The multidimensionality of the Quantile scale was examined using the Principal Components Analysis of Residuals in Winsteps (PRCOMP=S) (MetaMetrics, 2014). A three-step process was undertaken in order to examine the results and provide a context for interpreting the results.

The first step in the process was to run the Principal Components Analysis on all Quantile Framework field study items ($N = 898$). Next, the residual matrix was factor analyzed. The variance that is unexplained by the first factor (the Rasch measurement model) is 0.2% of the residual variance or 2.5 items of information. Based upon this set of data, it cannot be concluded that mathematics achievement as measured by the Quantile scale is multidimensional. The results supported the use of a unidimensional item response model on the items.

Next, the items were ordered by factor loading. Based on an examination of the item names with strand listed first, there did not appear to be any effect of strand. As a sub-analysis, items from the Geometry and Algebra and Algebraic Thinking strands were analyzed. It was hypothesized, that if multi-dimensionality were to be evidenced in the data, this would be the most likely contrast. The Rasch model explained 54.1% of the variance in the Geometry and Algebra and Algebraic Thinking items. The results from the study are consistent with the interpretation of a single construct for each of the analyses (mathematics).

The third step was to examine the results of reading (considered a unidimensional construct) with the mathematics results. The Rasch model explained 60.6% of the variance in the reading comprehension items. Along with the results presented in the first two steps of the process, these

data are consistent with the use of a unidimensional item response theory model for each of the analyses (reading and mathematics).

Study 2 – Burg (2007). A study conducted by Burg (2007) analyzed the dimensional structure of mathematical achievement tests aligned to the NCTM content standards. Since there is not a consensus within the measurement community on a single method to determine dimensionality, Burg employed four different methods for assessing dimensionality:

- exploring the conditional covariances (DETECT)
- assessment of essential unidimensionality (DIMTEST)
- item factor analysis (NOHARM) and
- principal component analysis (WINSTEPS)

All four approaches have been shown to be effective indices of dimensional structure. Burg analyzed Grades 3 through 8 data from the Quantile Framework field study previously described.

Each set of on-grade items for a test form from Grades 3 through 8 were analyzed for possible sources of dimensionality related to the five mathematical content strands. The analyses were also used to compare test structures across grades. The results indicated that although mathematical achievement tests for Grades 3 through 8 are complex and exhibit some multidimensionality, the sources of dimensionality are not related to the content strands. The complexity of the data structure, along with the known overlap of mathematical skills, suggests that mathematical achievement tests could represent a fundamentally unidimensional construct. While these sub-domains of mathematics are useful for organizing instruction, developing curricular materials such as textbooks, and describing the organization of items on assessments, they do not describe a significant psychometric property of the test or impact the interpretation of the test results. Mathematics, as measured by the Quantile Framework, can be described as one construct with various sub-domains.

These findings support the NCTM Connections Standard, which states that all students (prekindergarten through Grade 12) should be able to make and use connections among mathematical ideas and see how the mathematical ideas interconnect. Mathematics can be best described as an interconnection of overlapping skills with a high degree of correlation across the mathematical topics, skills, and strands.

Furthermore, these findings support the goals of the Common Core State Standards for Mathematics by providing the foundations of a growth model by which a single measure can inform progress toward college and career readiness.

Study 3 – Hennings and Simpson (2012). Results from Hennings and Simpson (2012) also suggest that the mathematics assessments used in MetaMetrics' linking studies are functionally unidimensional. Data from a Quantile Framework linking study involving the end-of-grade tests from a Southeastern state was examined. Scored student responses to items on the combined Quantile Linking Test and the state end-of-grade test were used. The end-of-grade tests had three polytomous items worth two points each on the forms for Grades 3 through 8, and one polytomous item worth four points on the forms for Grades 4 through 8. The remaining items on

both tests were dichotomous and scored 0/1. *Table 7* shows the number of students and the number of items, combined and by test, for each grade.

Table 7. Number of items included in analyses.

Grade	*N* of Students	Quantile Linking Test	End-of-Grade Test	Total
3	897	40	47	87
4	1,161	42	48	90
5	1,029	46	48	94
6	1,327	44	48	92
7	1,475	43	48	91
8	933	47	48	95

The polychoric item correlation matrix was analyzed for each test and grade. Because the principal components method of factor extraction in SAS does not require a positive-definite correlation matrix as input, principal component analyses were conducted instead of factor analyses.

The results support treating the data as unidimensional. The first component was dominant in all analyses. The first eigenvalue accounted for greater than 20% of the total variance in the analyses. Ratios of first-to-second eigenvalues ranged from approximately 6 to slightly over 9 (Gorsuch, 1983; Reckase, 1979). Secondary dimensions, i.e., the second and third components, accounted for approximately 5 - 6.5% of the total variance for each grade. *Table 8* lists the eigenvalues for the first five principal components by grade, *Table 9* shows the ratios of first-to-second eigenvalues, and *Table 10* shows the proportion of variance accounted for by the first five principal components for each grade.

Table 8. Eigenvalues for the first five principal components, by grade.

	Principal Components				
Grade	1	2	3	4	5
3	24.152	3.463	2.411	2.253	2.011
4	23.252	3.637	2.257	1.894	1.829
5	22.770	3.222	2.407	2.239	1.935
6	21.400	3.058	2.297	2.185	1.866
7	23.919	3.922	2.442	1.744	1.648
8	24.572	2.654	2.152	2.076	1.914

Table 9. Ratio of the first-to-second eigenvalues, by grade.

Grade	Ratio
3	6.975
4	6.394
5	7.066
6	6.997
7	6.099
8	9.257

Table 10. Proportion of variance explained for the first five principal components, by grade.

	Principal Components				
Grade	**1**	**2**	**3**	**4**	**5**
3	0.278	0.040	0.028	0.026	0.023
4	0.258	0.040	0.025	0.021	0.020
5	0.242	0.034	0.026	0.024	0.021
6	0.233	0.033	0.025	0.024	0.020
7	0.263	0.043	0.027	0.019	0.018
8	0.259	0.028	0.023	0.022	0.020

The OSTP Mathematics Assessment – Quantile Framework Linking Process

Description of the Assessments

Oklahoma School Testing Program Mathematics Assessment. The Oklahoma School Testing Program (OSTP) assesses students' levels of proficiency in mathematics, reading/English Language Arts, Science, Social Studies, and Writing. The OSTP assessments measure students' level of mastery of the content described in the Oklahoma Academic Standards adopted by the Oklahoma State Department of Education (OSDE) in 2016 (Oklahoma State Department of Education, 2016b). The OSTP assessments fulfill federal and/or state mandates for testing and are used for federal accountability as outlined in state law, 70 O.S. §1210.505. (OSDE, 2016a).

The OSTP Mathematics assessment is administered annually to students in Grades 3 through 8 and 10. Each assessment level consists of items that were written to measure specific content standards (OSDE, 2016b). The grade-level content standards are organized into four strands common across all grades:

- Number and Operations
- Algebraic Reasoning and Algebra
- Geometry and Measurement
- Data and Probability
- Functions

In addition, the OSTP Mathematics assessment items are written to address specific depth-of-knowledge (DOK) levels distributed according to target percentages that vary by grade:

- Level 1–Recall and Reproduction
- Level 2–Skills and Concepts
- Level 3–Strategic Thinking

Because the Oklahoma Academic Standards for Mathematics are subdivided into strands the test items also reflect this strand organization, with varying percentages of items written to each strand depending on the grade level focus. *Table 11* provides the percentage of items written to assess each strand by grade level (OSDE, 2017a).

Table 11. Percentage of items on the OSTP Mathematics assessments by strand and grade.

Content Strand	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
Number and Operations	46	44	46	40	20	18	10
Algebraic Reasoning and Algebra	14	16	18	22	30	46	40
Geometry and Measurement	28	28	24	24	30	20	10
Data and Probability	12	12	12	14	20	16	10
Functions	0	0	0	0	0	0	30

The OSTP Mathematics assessment forms for Grades 3 through 8 consist of 50 operational items and 10 field-test items. The Grade 10 assessment forms have an additional 10 operational items for a total of 60 operational items and 10 field-test items. At all grades, the test forms are divided into two test sections, and are administered in an untimed format, though estimated testing time is 40- to 60-minutes per section, depending on the grade. The mathematics test items are written with a reading demand that is one to two reading levels below the tested grade. The Grades 3 through 5 test items are four-choice multiple-choice items administered in a paper/pencil format. The Grades 6 through 8 and 10 items include four-choice multiple-choice items and technology-enhanced items (match, hot-spot, drag-and-drop, and drop-down). Calculators and formula sheets were not allowed for the Grades 3 through 5 assessments. An online basic calculator is available for the Grades 6 and 7 assessments, an online scientific calculator is available for Grade 8 assessment, and an online graphing calculator is available for the Grade 10 assessment. Approved grade-specific formula sheets and scratch paper are permitted during the test administrations for Grades 6 through 8 and 10.

The OSTP Mathematics items are scored as correct or incorrect (i.e. no partial credit scoring). Student responses are scaled using the three-parameter logistic item response theory model (3-PL IRT). Scale scores for each grade range from 200 to 399.

The Quantile Framework for Mathematics. The Quantile Framework for Mathematics was developed to assist teachers, parents, and students in identifying strengths and weaknesses in mathematics and forecast growth in overall mathematical achievement. Items and mathematical content are calibrated using the Rasch IRT model. The Quantile Framework spans the developmental continuum from Kindergarten mathematics through the content typically taught in Algebra II, Geometry, Trigonometry and Precalculus. The scale ranges from below EM400Q to above 1600Q ("EM" — Emerging Mathematician, 0Q and below).

The Quantile Framework was developed to assess how well a student (1) understands the natural language of mathematics, (2) knows how to read mathematical expressions and employ algorithms to solve decontextualized problems, and, (3) knows why conceptual and procedural knowledge is important and how and when to apply it. The Quantile Framework Item Bank consists of multiple-choice items aligned with first grade content through Geometry, Algebra II,

and Precalculus content and field tested with a national sample of students during the winter of 2004.

At each grade, mathematics items from the Quantile Framework Item Bank were selected for inclusion in the set of Quantile linking items used in the linking study. This process involved examining two OSTP Mathematics forms at each grade and selecting Quantile Framework items that aligned with the mathematical content of the OSTP Mathematics items.

Items were selected to reflect comparable content and difficulty based upon the target test blueprints and standards. The items used in the Quantile linking item pool predominantly match the QSCs aligned with the OSTP Mathematics assessments. When an exact QSC match did not occur, the linking item selected satisfied one or more of the following conditions:

1. The test item aligned with a QSC that addressed the same Oklahoma Academic Standard as the target item.
2. The test item aligned with a QSC that was a prerequisite to the matched QSC in the target test.
3. The test item was more appropriate for grade level or student expectations based on the Oklahoma Academic Standards.

A total of fourteen unique Quantile linking items were identified for each grade level set. The fourteen items were divided into six blocks of three items, with one item common across three blocks and another item common across the remaining three blocks. Each three-item block was embedded in an operational OSTP Mathematics assessment. The distribution of the content strands for the 14 items at each grade closely matched the distribution of the OSTP Mathematics item distributions across Oklahoma's state content strands. The alignment between the Oklahoma content strands and the Quantile Framework content strands is as follows:

- Number and Operations aligns with Number Sense and Numerical Operations;
- Algebraic Reasoning and Algebra, and Functions aligns with Algebra and Algebraic Thinking;
- Geometry and Measurement aligns with Geometry and Measurement; and
- Data and Probability aligns with Data Analysis, Statistics, and Probability.

Table 12 provides the percentage of items selected for each strand within the Quantile Framework.

Table 12. Percentage of items in the Quantile Linking items sets, by strand and grade.

Content Strands	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 10
Number Sense and Numerical Operations	43	50	57	36	21	21	14
Algebra and Algebraic Thinking*	14	14	14	21	29	43	57
Geometry and Measurement	29	29	21	29	29	21	21
Data Analysis, Statistics, and Probability	14	7	8	14	21	14	8

* Algebra and Algebraic Thinking includes Functions in the content strand.

The sets of linking items selected for each grade included from 5 to 9 items from adjacent grades to facilitate connectivity across the Quantile scale. Each Quantile linking item had an established difficulty value (Quantile measure) based on data collected from previous test administrations. The mean difficulties of the Quantile linking item sets are as follows: Grade 3, 350Q; Grade 4, 508Q; Grade 5, 614Q; Grade 6, 726Q; Grade 7, 722Q; Grade 8, 802Q; and Grade 10, 1023Q.

Students had access to the same accommodations for the Quantile linking items as for the OSTP Mathematics assessment because the Quantile linking items were embedded in the OSTP Mathematics assessment forms.

Evaluation of Quantile Linking Items. After administration, the Quantile linking items were reviewed for use in the linking analysis. Descriptive statistics for the Quantile linking items are presented in *Table 13*. A total of 340,176 student records were provided to MetaMetrics by Measured Progress. During the evaluation process, 6,516 student records were flagged for removal because of an off-grade designation or were identified as exhibiting misfit to the Rasch model, indicated by an infit statistic greater than 1.5 and outfit statistic greater than 2.0 (Linacre, 2011). A total of 333,660 student records remained in the final sample. In addition, each linking item was reviewed and evaluated for use in the linking study based on item difficulty or potential alternate answer choices being more attractive than the correct answer choice (i.e. low point-measure correlation). The number of students responding to each item ranged from 6,698 students to 26,432 students. No items were flagged for removal, so all remained in the linking analysis.

Table 13. Descriptive statistics from the administration of the Quantile linking items.

Grade	*N* Persons* (Range)	*N* Items	Percent Correct Mean (Range)	Point Measure Range
3	8,336 – 25,281	14	.76 (.54 - .96)	.17 - .53
4	8,273 – 24,957	14	.70 (.52 - .96)	.24 - .45
5	7,872 – 23,879	14	.64 (.47 - .82)	.29 - .52
6	6,698 – 24,921	14	.63 (.35 - .88)	.26 - .52
7	6,950 – 26,432	14	.60 (.33 - .96)	.17 - .49
8	7,022 – 26,259	14	.58 (.12 - .87)	.10 - .47
10	6,999 – 24,388	14	.48 (.20 - .72)	.11 - .52

* 6,516 students were removed due to off-grade testing or misfit to the Rasch model.

Study Design

A single-group/common person design was chosen for this study (Kolen and Brennen, 2014). This design is most useful when (1) administering two sets of items to examinees is operationally possible, and (2) differential order effects are not expected to occur (pp. 16–17). The Quantile item pool was embedded in the OSTP Mathematics assessment form administrations. The OSTP Mathematics assessment was administered between April 3, 2017 and April 28, 2017.

Description of the Sample

OSTP Mathematics sample. The OSTP Mathematics scale scores and item responses were provided to MetaMetrics by the OSDE and their testing contractor (Measured Progress) and included 340,176 students. This number represents all students from the statewide OSTP Mathematics administration. A total of 339,794 records had valid grade level matches for the linking analysis.

Three steps were performed prior to the linking analysis. First, a concurrent calibration of all OSTP Mathematics assessment items and Quantile linking items was conducted to evaluate the appropriateness of scaling both Quantile and OSTP items on the same scale. Second, a concurrent calibration of the OSTP Mathematics items with the Quantile linking items anchored to their theoretical Quantile values was conducted to place the OSTP Mathematics items on the Quantile scale. Finally, a scoring run using only the OSTP Mathematics items on the Quantile scale was conducted to express student results from the OSTP Mathematics assessment in the Quantile metric. These three steps were performed separately for each grade because the OSTP Mathematics scale is not a vertical scale and is unique for each grade.

During the initial concurrent calibration for each grade, all students were submitted to a Winsteps analysis using a logit convergence criterion of 0.0001. Students were removed from further analysis if they did not fit the Rasch model, indicated by an infit statistic greater than 1.5 and outfit statistic greater than 2.0 (Linacre, 2011). A total of 333,660 students, or 98.08%, of the

initial sample remained in the final sample for OSTP Mathematics link. *Table 14* presents the number of students in the initial and final samples and reasons for removal at each grade.

Table 14. Number of students in the initial and final samples and reasons for removal.

	Initial Sample	***N* removed by reason**		**Final Sample**	
Grade	***N***	**Off-Grade Test**	**Misfit to the Rasch Model**	***N***	**Percent of the Initial Sample**
3	52,526	7	1,974	50,545	96.23
4	50,684	7	846	49,831	98.32
5	48,463	2	921	47,540	98.10
6	46,561	5	1,165	45,391	97.49
7	48,155	8	689	47,458	98.55
8	47,768	4	361	47,403	99.24
10	46,019	349	178	45,492	98.85
Total	340,176	382	6,134	333,660	98.08

Tables 15 presents the demographic characteristics of all students in the OSTP Mathematics assessment initial sample and final sample. Across the demographic characteristics, the final sample compares well with the initial sample.

Table 15. Percentage of students in the OSTP Mathematics linking study initial and final samples for selected demographic characteristics.

Student Characteristic	Category	All Sample *N* = 340,176	Final Sample *N* = 333,660
Grade	3	14.86	15.15
	4	14.65	14.93
	5	13.98	14.25
	6	13.34	13.60
	7	13.95	14.22
	8	13.93	14.21
	10	13.37	13.63
	Not Available	1.92	0.00
Gender	Female	48.17	49.11
	Male	49.76	50.73
	Not Available	2.07	0.16
Ethnicity	Asian	2.11	2.08
	Black/African American	9.83	9.75
	Native American	15.41	15.46
	Pacific Islander	0.47	0.47
	White/Caucasian	71.92	71.97
	Not Available	0.26	0.26
Hispanic/Latino	Yes	16.87	17.19
	No	81.22	82.81
	Not Available	1.92	0.00
ELL	Yes	5.99	6.11
	No	92.09	93.89
	Not Available	1.92	0.00
IEP	Yes	16.00	16.31
	No	82.09	83.69
	Not Available	1.92	0.00
Economically Disadvantaged	Yes	59.92	61.09
	No	38.16	38.91
	Not Available	1.92	0.00

Relationship between OSTP Mathematics scale scores and the OSTP Mathematics Quantile Measures. Table 16 presents descriptive statistics for the OSTP Mathematics scale scores for the final sample as well as their calibrated Quantile measures. An indication that the OSTP Mathematics scale is not a vertical scale is seen in the mean scale scores for each grade being generally equivalent. The Quantile scale's vertical nature is seen in the steadily increasing calibrated OSTP Mathematics mean Quantile measures across grade levels. The correlations between the OSTP Mathematics scale scores and the calibrated Quantile measures range from 0.97 to 0.99 indicating that the scaling methods yield consistent results for both scales.

Table 16. Descriptive statistics for the OSTP Mathematics scale scores and their calibrated Quantile measures, final sample (N = 333,660).

Grade	*N*	OSTP Mathematics Scale Score Mean (SD)	OSTP Mathematics Calibrated Quantile Measure Mean (SD)	*r*
3	50,545	296Q (27.09)	692Q (227.7)	0.99
4	49,831	293Q (28.82)	739Q (207.9)	0.99
5	47,540	288Q (29.78)	819Q (218.9)	0.98
6	45,391	288Q (28.84)	911Q (194.9)	0.99
7	47,458	287Q (30.18)	979Q (192.0)	0.97
8	47,403	277Q (32.88)	986Q (195.3)	0.98
10	45,492	279Q (31.48)	1041Q (185.0)	0.97

Figures 7 through *13* show the relationship between the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for the final sample. The scatter plots indicate that the relationship between the two scales is not linear, with the departure from linearity being most pronounced near the lower end of the distributions, at approximately 220 on the OSTP Mathematics scale, but also at the upper end of the distributions. At lower level, the OSTP calibrated Quantile measures decrease at a much higher rate than at other points in the distribution of scores.

Figure 7. Scatter plot of the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for Grade 3, final sample (N = 50,545).

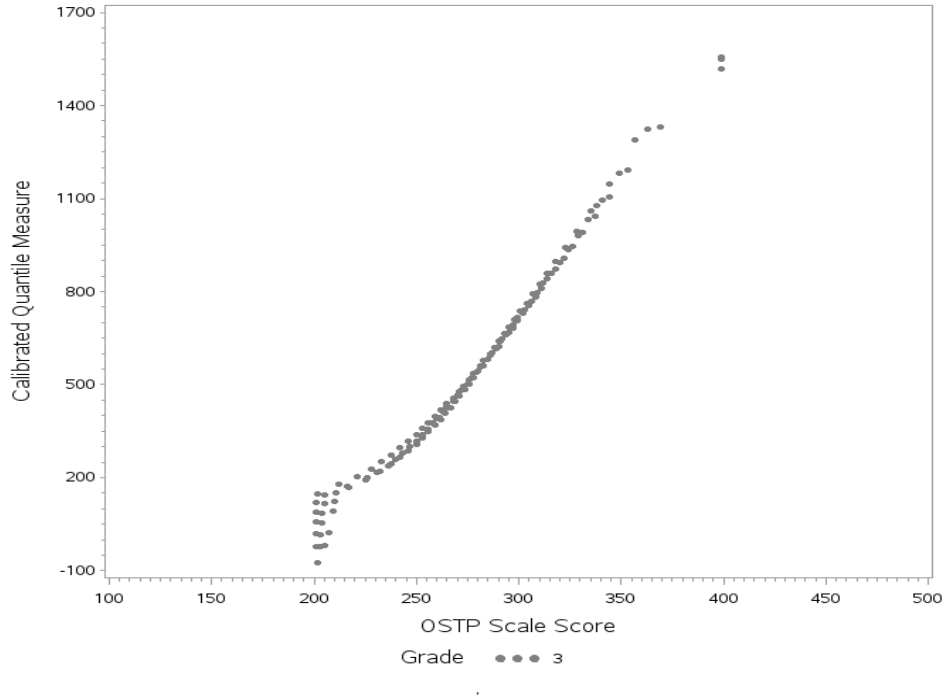


Figure 8. Scatter plot of the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for Grade 4, final sample (N = 49,831).

Figure 9. Scatter plot of the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for Grade 5, final sample (N = 47,540).

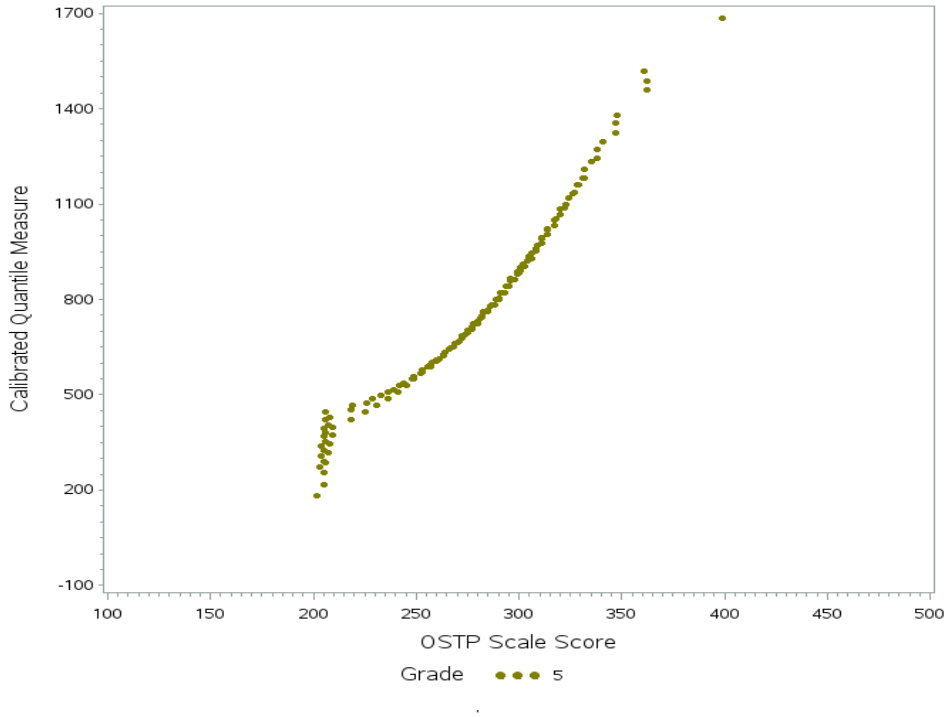


Figure 10. Scatter plot of the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for Grade 6, final sample (N = 45,391).

Figure 11. Scatter plot of the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for Grade 7, final sample (N = 47,458).

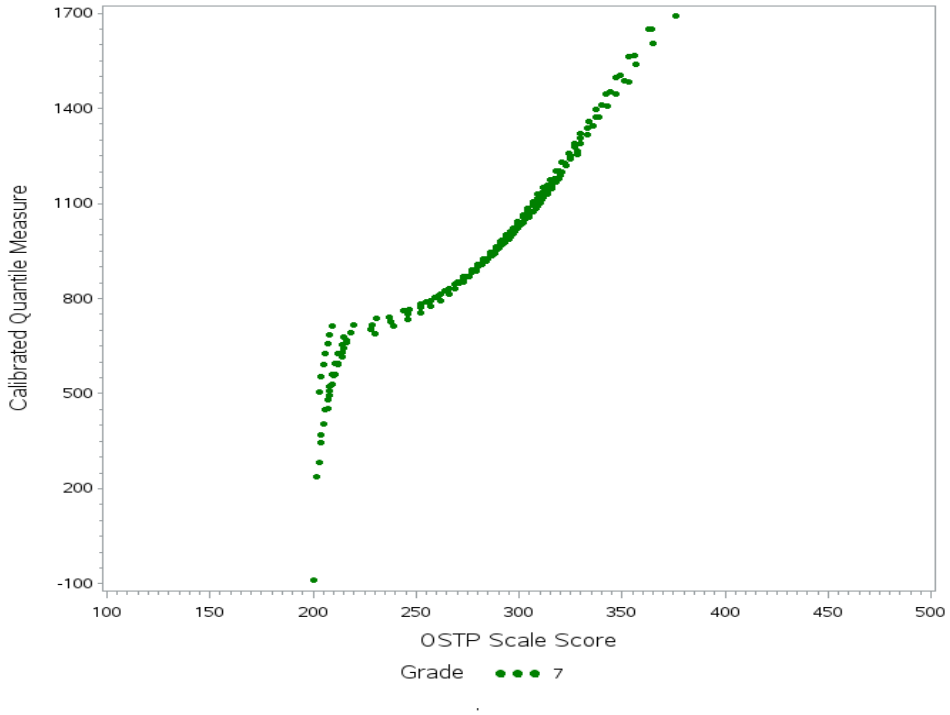


Figure 12. Scatter plot of the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for Grade 8, final sample (N = 47,403).

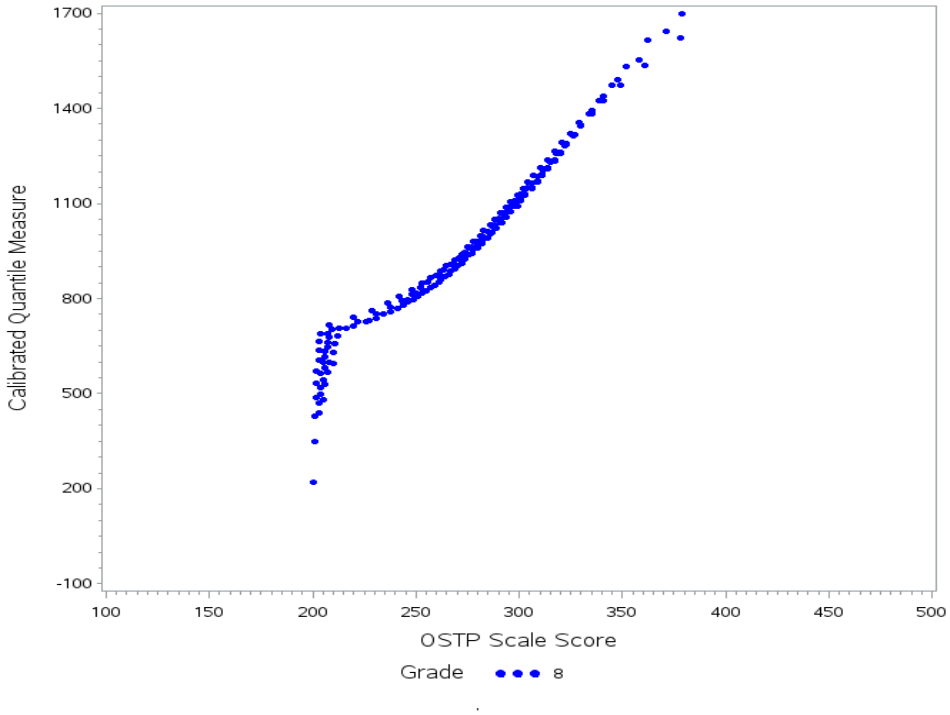
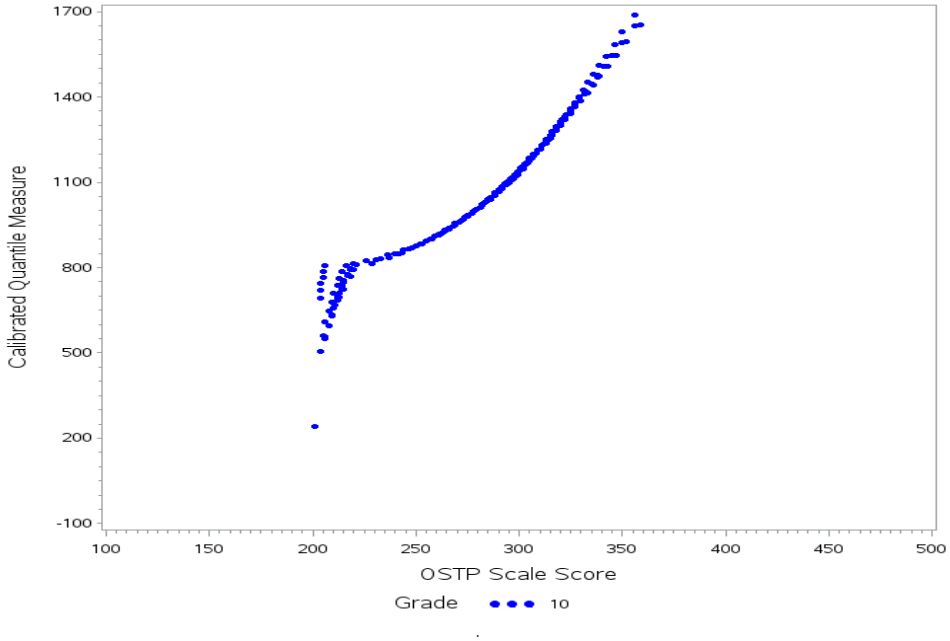


Figure 13. Scatter plot of the OSTP Mathematics scale scores and the OSTP Mathematics calibrated Quantile measures for Grade 10, final sample (N = 45,492).



Linking the OSTP Mathematics Scale with the Quantile Scale

Linking in general means "putting the scores from two or more tests on the same scale" (National Research Council, 1999, p.15). MetaMetrics and the Oklahoma State Department of Education conducted this linking study to provide information that could be used to match students' mathematical achievement with instructional resources—to identify the materials, concepts, and skills a student should be matched with for successful mathematical instruction, given their performance on the OSTP Mathematics assessment.

Linking Analyses. In scale alignment, which uses the same methods as linear equating (Dorans, Moses, and Eignor, 2010), the equating relationship requires that the transformations between two scales be symmetric (Lord, 1980). This requires means that the function used to transform Form *X* to Form *Y* can be inversely applied. When the distributions of scores from two assessments are not linear, as illustrated in *Figures 7* through *13*, equipercentile linking methods can be used to symmetrically link the two scales. In this procedure, a curve is used to describe scale-to-scale differences and is appropriate for linking scales when test forms have different distributions of item difficulties (Kolen and Brennan, 2014). This method has several advantages over the linear method:

- equipercentile equivalents are within the range of possible score points, which avoids the out-of-range problem that can occur with the mean, linear, and parallel-linear methods;
- for the equipercentile the relationship between scales is not assumed to be linear;
- the cumulative distribution function of transformed scores is approximated by the cumulative distribution function of Test *Y;* and
- the moments for transformed scores (e.g., mean, variance, skewness, and kurtosis) are approximately the same as those for Test *Y* (p. 504).

In equipercentile equating, differences in difficulty between tests are described by a non-linear transformation (Kolen and Brennan, 2014). Given scores *x* and *y* on tests *X* and *Y*, the non-linear relationship is

$$e_Y(x) = G^{-1}[F(x)] \qquad \text{Equation (6)}$$

where F is the cumulative distribution function of X, G is the cumulative distribution function of Y, and G^{-1} is the inverse of the cumulative distribution function of Y. Using percentile rank functions P and Q (for X and Y, respectively), the equipercentile equivalent of score x on the Y scale for the population is

$$\begin{aligned} e_Y(x) &= Q^{-1}[P(x)], && 0 \le P(x) < 100, \\ &= Y_j + 0.5, && P(x) = 100 \end{aligned} \qquad \text{Equation (7)}$$

where Q^{-1} is the inverse of the percentile rank function for Y, and Y_j represents the highest score for Y.

Equipercentile links often create uneven or jagged distributions. Post smoothing is typically employed to obtain equivalents with an even or unfluctuating shape.

An adapted version of a SAS software program used for calculating equivalent scores using equipercentile methods was employed to conduct an equipercentile linking of the OSTP Mathematics assessment for Grades 3 through 8 and 10 unrounded scale scores and the OSTP Mathematics calibrated Quantile measures (Price, Lurie, and Wilkins, 2001). This program generates unsmoothed functions. Polynomial smoothing splines methods were conducted for post smoothing (De Boor, 1978; Kolen and Brennan, 2014) using the SAS transformation regression procedure (SAS Institute, 2015). The program preserves the symmetry of the conversion by averaging target-to-reference and reference-to-target conversions. Thus, the OSTP Mathematics scale scores can be converted to Quantile measures and, symmetrically, scores on the Quantile scale can be converted to OSTP Mathematics scale scores resulting in the conversion tables, or linking functions.

Using the final sample data described in *Table 16*, the equipercentile linking functions relating the OSTP Mathematics scale scores and OSTP Mathematics calibrated Quantiles measures for all examinees in the sample, by grade level, were constructed.

Conversion tables were developed for all grade levels in order to express the OSTP Mathematics scale scores in the Quantile metric and were delivered to the OSDE and their testing contractor (Measured Progress) in electronic format.

Recommendations about reporting Quantile measures. Quantile measures that are reported for an individual student should reflect the purpose for which they will be used. If the purpose is research (e.g., to measure growth at the student, grade, school, district, or state level), then actual measures should be used at all score points, rounded to the nearest integer. A computed Quantile measure of 772.5Q would be represented as 773Q. If the purpose is instructional, then the Quantile measures should be capped at the upper bound of measurement error (e.g., at the 95th percentile of the national Quantile norms) to ensure developmental appropriateness of the instructional material. MetaMetrics expresses these measures used for instructional purposes as "Reported Quantile Measures" and recommends that they be used on individual score reports. The grade level caps used for reporting Quantile measures are shown in *Table 17.*

In an instructional environment, all scores below 0Q should be reported as "EMxxxQ"; no student should receive a negative Quantile measure. A Quantile student measure of -150 is reported as EM150Q where "EM" stands for "Emerging Mathematician" and replaces the negative sign in the number. The Quantile scale is like a thermometer, with numbers below zero indicating decreasing mathematical achievement as the number moves away from zero. The smaller the number following the EM code, the more advanced the student is. For example, an EM150Q student is more advanced than an EM200Q student. Above 0Q, measures indicate increasing mathematical achievement as the numbers increase. For example, a 200Q student is more advanced than a 150Q student. The lowest reported value below 0Q is EM400Q.

Some assessments report a Quantile range, which is 50Q above and 50Q below the student's actual Quantile measure. The Quantile range takes into account measurement error found in the tests and in the Quantile measures of the skills/concepts. If a student attempts material above his or her Quantile range, the level of challenge may be too great for the student to be able to

construct an understanding of the skill or concept. Likewise, material below the student's Quantile range may provide the student with little challenge.

Table 17. Maximum reported Quantile measures, by grade.

Grade	Quantile Caps
3	975Q
4	1075Q
5	1125Q
6	1200Q
7	1325Q
8	1450Q
10	1500Q

Validity of the OSTP Mathematics–Quantile Links

Table 18 presents the descriptive statistics for the OSTP Mathematics calibrated Quantile measures as well as the OSTP Mathematics equipercentile Quantile measures. The two scoring methods yield highly similar Quantile measures. Each grade level's mean Quantile measure is within 4Q.

Table 18. Descriptive statistics for the OSTP Mathematics assessments using the calibration approach and the equipercentile linking function, final sample (N = 333,660).

Grade	*N*	Final Sample Calibrated Quantile Measure Mean (SD)	Final Sample Linear Linked Quantile Measure Mean (SD)
3	50,545	692Q (227.7)	689Q (232.8)
4	49,831	739Q (207.9)	740Q (211.3)
5	47,540	819Q (218.9)	820Q (216.4)
6	45,391	911Q (194.9)	910Q (196.0)
7	47,458	979Q (192.0)	981Q (189.9)
8	47,403	986Q (195.3)	990Q (195.7)
10	45,492	1041Q (185.0)	1042Q (183.2)

Percentile Rank Distributions. To support the generalization of the reported scores from the equipercentile links, *Table 19* presents a comparison of the student Quantile measures for selected percentiles based on the calibrated OSTP Mathematics Quantile measures and the Quantile measures based on the equipercentile links. The criterion of a half standard deviation (100Q) on the Quantile scale was used to interpret the size of the difference between the two measures. In examining the values, all calibrated Quantile measures and equipercentile Quantile measures are within the 100Q criterion for all grades.

Table 19. Comparison of the calibrated Quantile measures for selected percentile ranks from the OSTP Mathematics and the equipercentile Quantile measures, by grade.

Grade 3		
Percentile	**OSTP Calibrated Quantile Measure**	**OSTP Equipercentile Quantile Measure**
1	216Q	212Q
5	329Q	331Q
10	398Q	407Q
25	536Q	523Q
50	687Q	683Q
75	840Q	842Q
90	979Q	982Q
95	1060Q	1076Q
99	1289Q	1285Q

Grade 4		
Percentile	**OSTP Calibrated Quantile Measure**	**OSTP Equipercentile Quantile Measure**
1	321Q	329Q
5	425Q	420Q
10	482Q	485Q
25	593Q	593Q
50	723Q	729Q
75	870Q	875Q
90	1015Q	1012Q
95	1103Q	1108Q
99	1333Q	1386Q

Grade 5		
Percentile	**OSTP Calibrated Quantile Measure**	**OSTP Equipercentile Quantile Measure**
1	422Q	433Q
5	509Q	500Q
10	557Q	553Q
25	660Q	659Q
50	801Q	808Q
75	952Q	966Q
90	1100Q	1111Q
95	1211Q	1195Q
99	1461Q	1427Q

Grade 6		
Percentile	**OSTP Calibrated Quantile Measure**	**OSTP Equipercentile Quantile Measure**
1	507Q	497Q
5	603Q	606Q
10	666Q	673Q
25	776Q	774Q
50	905Q	906Q
75	1037Q	1033Q
90	1162Q	1171Q
95	1237Q	1246Q
99	1397Q	1418Q

Table 19 (continued). Comparison of the calibrated Quantile measures for selected percentile ranks from the OSTP Mathematics and the equipercentile Quantile measures, by grade.

Grade 7		
Percentile	**OSTP Calibrated Quantile Measure**	**OSTP Equipercentile Quantile Measure**
1	631Q	670Q
5	718Q	702Q
10	754Q	756Q
25	832Q	845Q
50	961Q	959Q
75	1095Q	1095Q
90	1242Q	1248Q
95	1321Q	1333Q
99	1504Q	1499Q

Grade 8		
Percentile	**OSTP Calibrated Quantile Measure**	**OSTP Equipercentile Quantile Measure**
1	632Q	644Q
5	714Q	695Q
10	758Q	744Q
25	847Q	851Q
50	961Q	970Q
75	1103Q	1111Q
90	1238Q	1255Q
95	1346Q	1345Q
99	1537Q	1552Q

Grade 10		
Percentile	**OSTP Calibrated Quantile Measure**	**OSTP Equipercentile Quantile Measure**
1	735Q	767Q
5	797Q	782Q
10	834Q	838Q
25	901Q	910Q
50	1011Q	1016Q
75	1142Q	1143Q
90	1295Q	1288Q
95	1388Q	1396Q
99	1592Q	1595Q

OSTP Mathematics Performance Levels. Performance level descriptors describe the knowledge and skills students are expected to demonstrate at each level. Four performance levels have been established for the OSTP Mathematics scale scores: Advanced, Proficient, Limited and Unsatisfactory (OSDE, 2017a):

- ***Advanced***: Students demonstrate superior performance on challenging subject matter.
- ***Proficient***: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level.
- ***Limited Knowledge***: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level.
- ***Unsatisfactory***: Students have not performed at least at the Limited Knowledge level. Students scoring at the **Unsatisfactory** level should be given comprehensive mathematical instruction.

In *Table 20*, the OSTP Mathematics scale scores and their associated Quantile measures are provided for each performance level and grade. The performance levels reported as Quantile measures can provide insight with respect to aligning appropriate instructional materials with student ability.

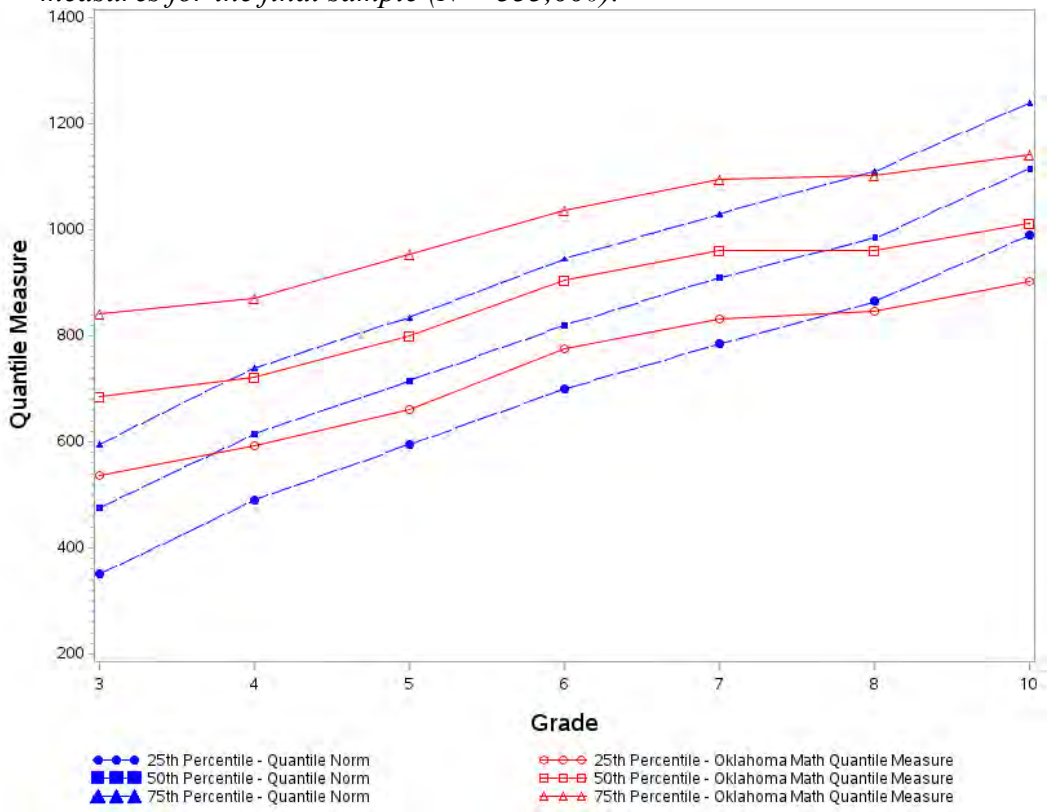
Table 20. OSTP Mathematics performance levels and associated Quantile measures.

Grade	Unsatisfactory	Quantile Measure	Limited Knowledge	Quantile Measure	Proficient	Quantile Measure	Advanced	Quantile Measure
3	200-273	EM115Q-485Q	274-299	490Q-700Q	300-320	710Q-905Q	321-399	910Q-975Q
4	200-272	65Q-575Q	273-299	580Q-770Q	300-321	775Q-955Q	322-399	960Q-1075Q
5	200-265	175Q-635Q	266-299	640Q-885Q	300-320	890Q-1085Q	321-399	1090Q-1125Q
6	200-266	315Q-750Q	267-299	755Q-970Q	300-329	980Q-1215Q	330-399	1220Q-1230Q
7	200-278	430Q-890Q	279-299	895Q-1030Q	300-328	1040Q-1290Q	329-399	1240Q-1325Q
8	200-276	530Q-960Q	277-299	965Q-1120Q	300-315	1125Q-1245Q	316-399	1250Q-1450Q
10	200-283	575Q-1030Q	284-299	1035Q-1130Q	300-319	1135Q-1300Q	320-399	1305Q-1500Q

Quantile Framework Norms. *Figure 14* shows the Quantile measures for the OSTP Mathematics Assessments for the final sample compared to the norms developed for use with The Quantile Framework for Mathematics. The normative information for The Quantile Framework for Mathematics is based on linking studies conducted with the Quantile Framework and the results of assessments that report directly in the Quantile metric (N = 3,011,815). The sample included students in Grades 1 through 12 from 38 states, districts, or territories and who were tested from 2010 to 2016. Of the students with gender information (29%), 51.0% of the students were male and 49.0% of the students were female. Of the students with race or ethnicity information (28%), the majority of the students in the norming sample were White (65.7%), with 5.1% African-American, 2.3% American Indian/Alaskan Native, 15.3% Hispanic, 5.8% Asian, and 5.5% Other. Of the students with data, 7.4 percent of the students were classified as "Needing Special Education Services." The 2017 Quantile norms have been validated in relation to a longitudinal sample of students across Grades 3 through 11 (N = 101,650).

At each percentile being examined (i.e. 25th, 50th, and 75th), Grade 3 OSTP Mathematics Quantile measures are much higher than the values from the Quantile Framework norming sample. The 25th percentile OSTP Quantile measure was higher than the 50th percentile Quantile norm, and the 50th and 75th percentile for the OSTP Quantile measures were both higher than the 75th percentile for the Quantile norms. For Grades 4 through 7, the 25th, 50th, and 75th percentiles for OSTP Mathematics Quantile measures were all above their respective percentile from the Quantile norms. In Grades 8 and 10, the Quantile measures for the 25th, 50th, and 75th were slightly below the respective percentile from the Quantile norms.

Figure 14. Selected percentiles (25th, 50th, and 75th) plotted for the OSTP Mathematics Quantile measures for the final sample (N = 333,660).



Grade-Level Progressions. The following box-and-whisker plots (*Figures 15* through *17*) show the progression of OSTP Mathematics scale scores and Quantile measures (the *y*-axis) from grade to grade (the *x*-axis). For each grade, the box refers to the interquartile range. The line within the box indicates the median. The end of each whisker represents the minimum and maximum values of the scores (the *y*-axis).

Figures 15 through *17* demonstrate the horizontal scaling for the OSTP Mathematics scale and the vertical nature of the Quantile scale. In *Figure 15*, no increase is observed from one grade to the next in terms of the OSTP Mathematics scale scores that are not reported on a vertical scale. The vertical nature of the Quantile scale can be observed in *Figures 16* and *17* highlighting the benefit of having OSTP Mathematics scores on a vertical scale. As the grade increases so do the overall Quantile measures providing a method to examine growth across grades.

Figure 15. Box-and-whisker plot of the OSTP Mathematics scale scores by grade, final sample (N = 333,660).

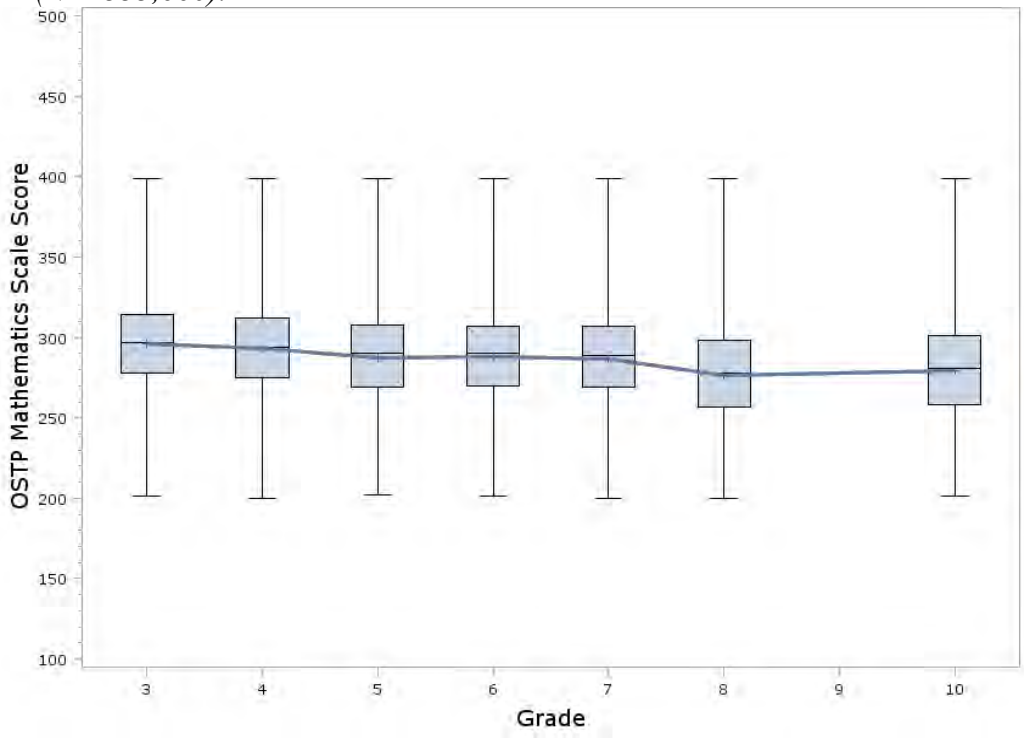


Figure 16. Box-and-whisker plot of the OSTP Mathematics calibrated Quantile measures, final sample (N = 333,660).

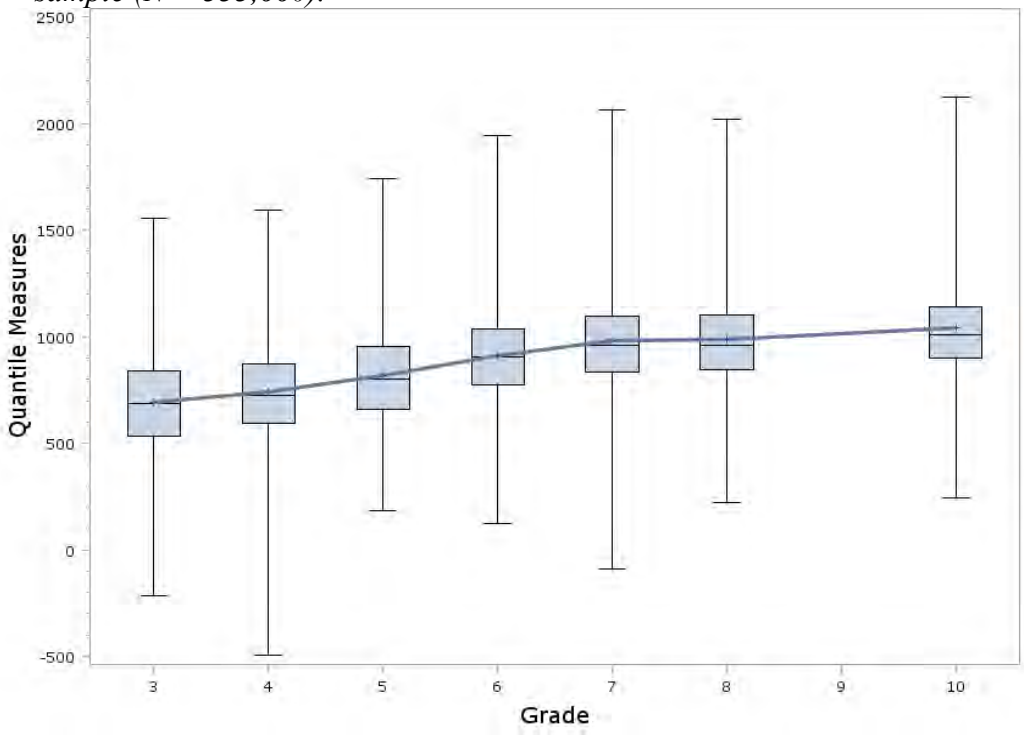
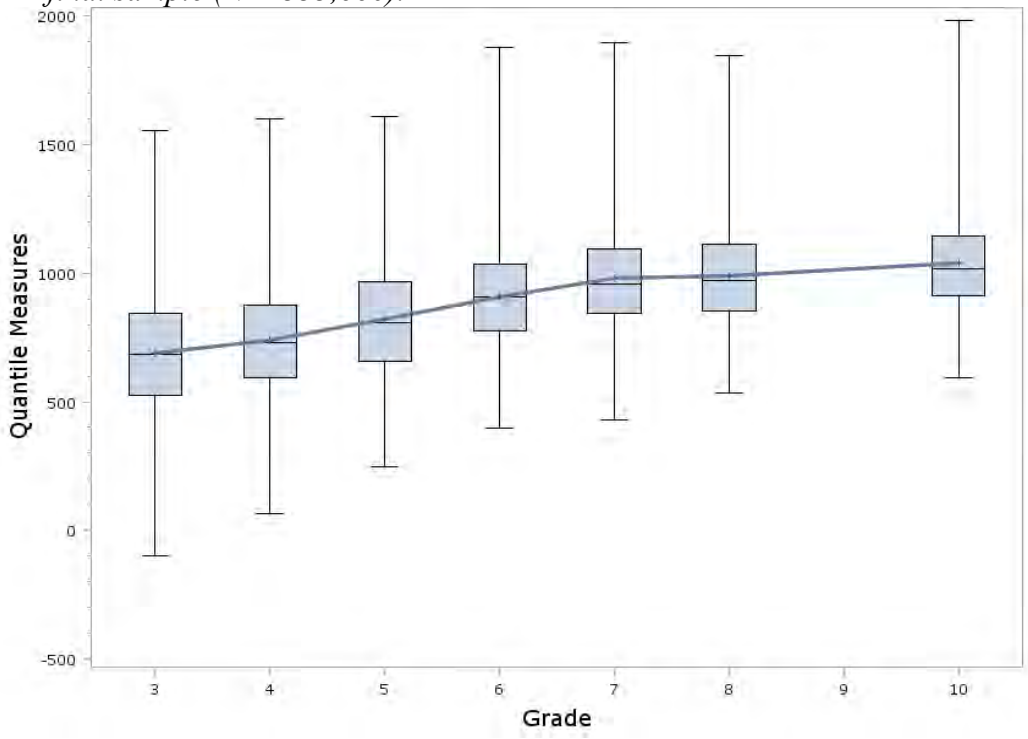


Figure 17. Box-and-whisker plot of the OSTP Mathematics equipercentile Quantile measures, final sample (N = 333,660).



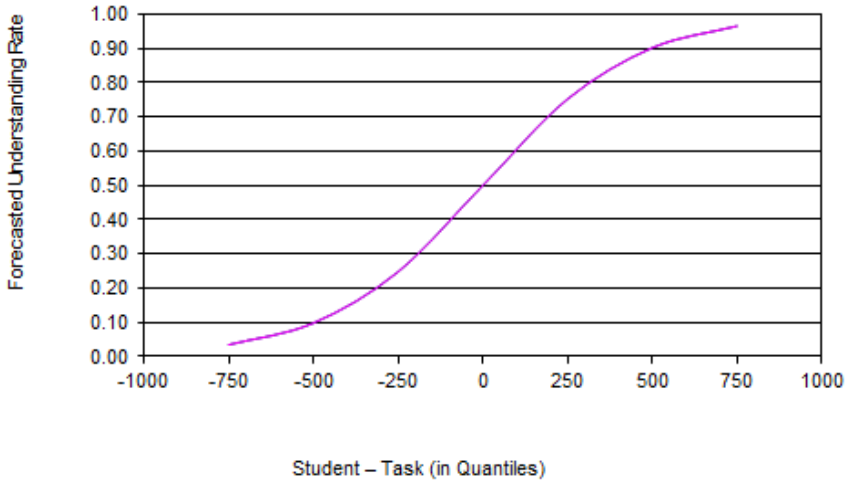
The Quantile Framework and Instruction

Quantile measures are available from many norm-referenced and criterion-referenced assessments, in addition to state tests and instructional products. Students who take a mathematics achievement test that is linked with the Quantile Framework or one that reports directly in the Quantile metric will receive a Quantile measure. Educators can use these Quantile measures to match students, by *readiness level*, to level-appropriate instructional materials and forecast understanding. For example, a student with a Quantile measure of 500Q should be ready for instruction of mathematics problems at a demand level of 500Q.

Differentiated Instruction. A Quantile measure for materials is a number indicating the mathematical demand of the material in terms of the concept/application solvability. The Quantile measure for an individual student is the level at which he or she is ready for instruction (50% competency with the material) and has knowledge of the prerequisite mathematical concepts and skills necessary to succeed. The Quantile scale ranges from below EM400Q to above 1600Q. The Quantile measure does not relate to a specific grade, per se, so the score is developmental as it spans the mathematics continuum from kindergarten mathematics through the content typically taught in Algebra II, Geometry, Trigonometry, and Precalculus. The measure can be used by a teacher to determine what mathematical instruction the student is likely to be ready for next.

Figure 18 shows the general relationship between the student-task discrepancy and forecasted understanding. When the student measure and the task mathematical demand are the same (difference of 0Q), then the forecasted understanding, or success rate, is modeled as 50% and the student is likely ready for instruction on the particular skill or concept.

Figure 18. Relationship between student mathematical demand discrepancy and forecasted understanding (success rate).



An appropriate instructional range for the Quantile measure of a student is 50Q above to 50Q below the Quantile measure of the student (44% - 56% competency). This range identifies the mathematics skills in which a student has the prerequisite knowledge and skills needed to understand the instruction and will likely have success with tasks related to the skill or concept after this introductory instruction.

Quantile measures provide reliable, actionable results because instruction and assessment are described using the same metric. When instruction is measured at a unique mathematical level of understanding and any form of assessment can be reported using the same scale, equal levels of achievement are observed.

By understanding the interaction between student measures and resource measures (e.g., textbook lessons, instructional materials), any level of understanding can be used as a benchmark. An individual can modulate his or her own likely success rate by lowering the difficulty of the task (i.e. increase to 90% understanding) or increasing the difficulty of the task (i.e. lower to 40% understanding) depending on the situation (refer to *Figure 13*). This flexibility allows the teacher, parent, or student the ultimate control to modulate the fit between person and task.

Table 21 gives an example of the forecasted understanding (or likely success rates) for specific skills for a specific student. *Table 22* shows forecasted understanding for one specific skill calculated for different student achievement measures.

Table 21. Success rates for a student with a Quantile measure of 750Q and skills of varying difficulty (demand).

Student Mathematics Achievement	Skill Demand	Skill Description	Forecasted Understanding
750Q	250Q	Locate points on a number line.	90%
750Q	500Q	Use order of operations, including parentheses, to simplify numerical expressions.	75%
750Q	750Q	Translate between models or verbal phrases and algebraic expressions.	50%
750Q	1000Q	Estimate and calculate areas with scale drawings and maps.	25%
750Q	1250Q	Recognize and apply definitions and theorems of angles formed when a transversal intersects parallel lines.	10%

Table 22. Success rates for students with different Quantile measures of achievement for a task with a Quantile measure of 850Q.

Student Mathematics Achievement	Problems Related to "Locate points in all quadrants of the coordinate plane using ordered pairs."	Forecasted Understanding
350Q	850Q	10%
600Q	850Q	25%
850Q	850Q	50%
1100Q	850Q	75%
1350Q	850Q	90%

The primary utility of the Quantile Framework is its ability to forecast what will likely happen when students confront resources and instruction on specific mathematical skills and concepts. With every application by teacher, student, or parent there is a test of the Quantile Framework's accuracy. The Quantile Framework makes a point prediction every time a resource or lesson is chosen for a student. Anecdotal evidence suggests that the Quantile Framework predicts as intended. That is not to say that there is an absence of error in forecasted understanding. There is error in resource measures based on Quantile Skill and Concept (QSC) measures, student measures, and their difference modeled as forecasted understanding. However, the error is sufficiently small that the judgments about students, resources, and understanding rates are useful.

The subjective experience of 25%, 50%, and 75% understanding/success as reported by students varies greatly. A student with a Quantile measure of 1000Q being instructed on materials that measure 1000Q (50% understanding) has a successful instructional experience—he or she has the background knowledge needed to learn and apply the new information. Teachers working with such a student report that the student can engage with the skills and concepts that are the focus of the instruction and, as a result of the instruction, are able to solve problems utilizing those skills. In short, such students appear to understand what they are learning. A student with a Quantile measure of 1000Q being instructed on materials that measure 1250Q (25% understanding) encounters so many unfamiliar skills and difficult concepts that the learning is frequently lost. Such students report frustration and seldom engage in instruction at this level of understanding. Finally, a student with a Quantile measure of 1000Q being instructed on materials that measure 750Q (75% understanding) reports that he is able to engage with the skills and concepts with minimal instruction, is able to solve complex problems related to the skills and concepts, is able to connect the skills and concepts with skills and concepts from other strands, and experiences fluency and automaticity of skills.

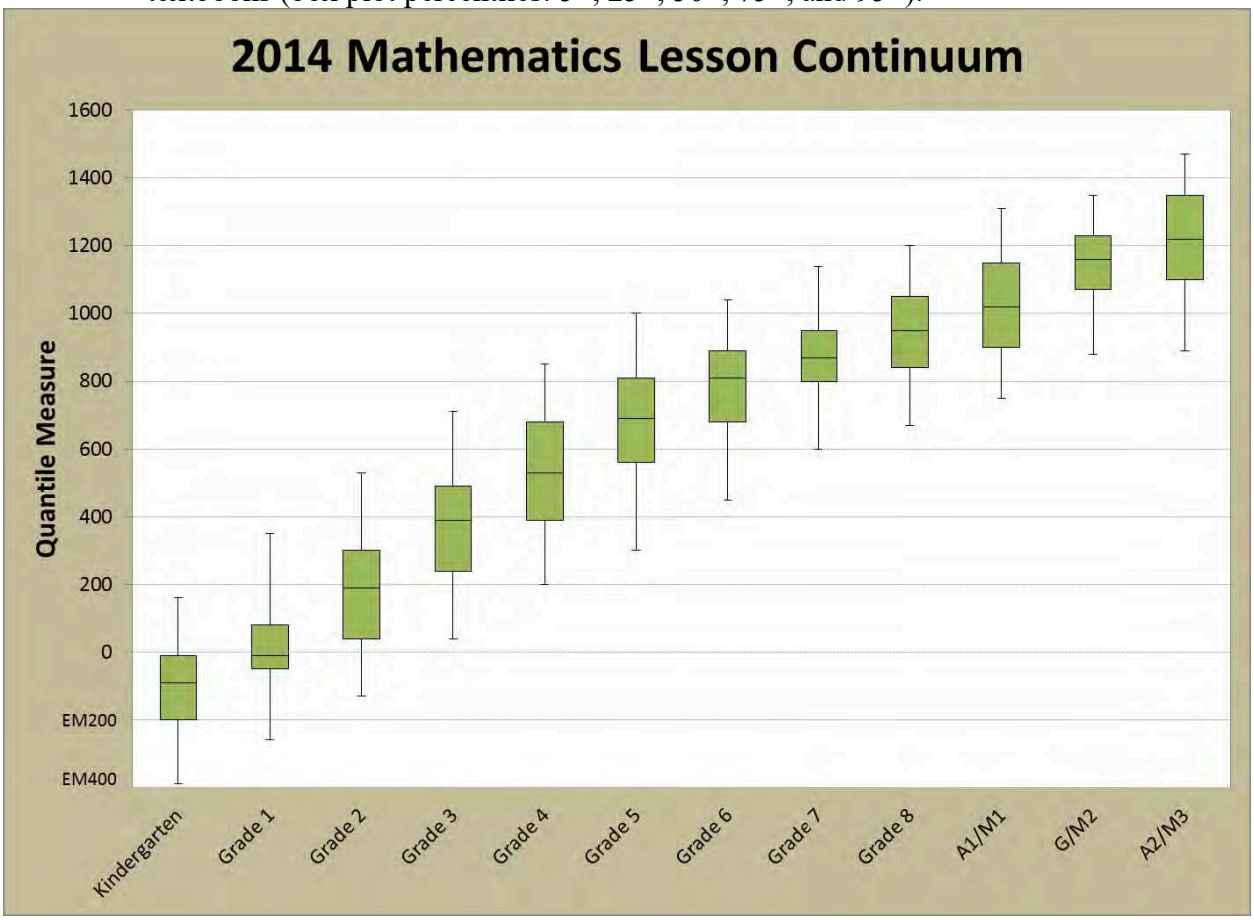
Quantile Framework and the CCSS. There is increasing recognition of the importance of bridging the gap that exists between K-12 and higher education and other postsecondary endeavors. Many state and policy leaders have formed task forces and policy committees such as P-20 councils. The Common Core State Standards (CCSS) for Mathematics were designed to enable all students to become college and career ready by the end of high school while acknowledging that students are on many different pathways to this goal: "One of the hallmarks of the Common Core State Standards for Mathematics is the specification of content that all

students must study in order to be college and career ready. This 'college and career ready line' is a minimum for all students" (NGA Center & CCSSO, 2010b, p. 4). The CCSS for Mathematics suggest that "college and career ready" means completing a sequence that covers Algebra I, Geometry, and Algebra II (or equivalently, Integrated Mathematics 1, 2 and 3) during the middle school and high school years; and, leads to a student's promotion into more advanced mathematics by their senior year. This has led some policy makers to generally equate the successful completion of Algebra II as a working definition of college and career ready. Exactly how and when this content must be covered is left to the states to designate in their implementations of the CCSS for Mathematics throughout K-12.

The *mathematical demand* of a mathematical textbook (in Quantile measures) quantitatively defines the level of mathematical achievement that a student needs in order to be ready for instruction on the mathematical content of the textbook. Assigning QSCs and Quantile measures to a textbook is done through a calibration process. Textbooks are analyzed at the lesson level and the calibrations are completed by SMEs experienced with the Quantile Framework and with the mathematics taught in mathematics classrooms. The intent of the calibration process is to determine the mathematical demand presented in the materials. Textbooks contain a variety of activities and lessons. In addition, some textbook lessons may include a variety of skills. Only one Quantile measure is calculated per lesson and is obtained through analyzing the Quantile measures of the QSCs that have been mapped to the lesson. This Quantile measure represents the composite task demand of the lesson.

MetaMetrics has calibrated more than 80,000 instructional materials (e.g., textbook lessons, instructional resources) across the K-12 mathematics curriculum (Smith & Turner, 2012). *Figure 19* shows the continuum of calibrated textbook lessons from Kindergarten through Algebra II/Math 3 from 27,630 lessons (370 test books) from materials published between 2005 and 2013 (Sanford-Moore, Williamson, Bickel, Koons, Baker, and Price, 2014).

Figure 19. A continuum of mathematical demand for Kindergarten through Precalculus textbooks (box plot percentiles: 5th, 25th, 50th, 75th, and 95th).



In 2016, Williamson, Sanford-Moore, and Bickel began the examination of the mathematics demands of college and careers to answer the question, "What mathematics must a student be capable of performing to be ready for college or career?" To address this question, the mathematical concepts and skills that students are likely to encounter as they begin their postsecondary education and/or enter the workplace were examined. For college readiness, being ready for instruction in the types of courses typical of those beyond high school graduation requirements and of first year college were examined (e.g., Precalculus, trigonometry). For career readiness, competently performing the mathematics content required for a high school diploma (e.g., Algebra I content, Algebra II content) was examined. In this research, "competently perform" was defined as 75% understanding of the mathematics skills and concepts. The range (interquartile range) of student mathematical ability associated with being ready for the mathematics demands of college and careers is 1220Q to 1440Q, with a median of 1350Q.

MetaMetrics' research on the demand of college and careers helps compare achievement levels from the OSTP Mathematics assessment with the mathematics skills and concepts a student will likely encounter. *Figure 20* shows the relationship between the "Proficient" performance level of

the OSTP Mathematics Quantile measures and the mathematics lesson complexity ranges for the next grade level/course.

Figure 20. Comparison of OSTP Mathematics Quantile measure Meets Expectation performance level and college and career mathematical demand level at the next grade.

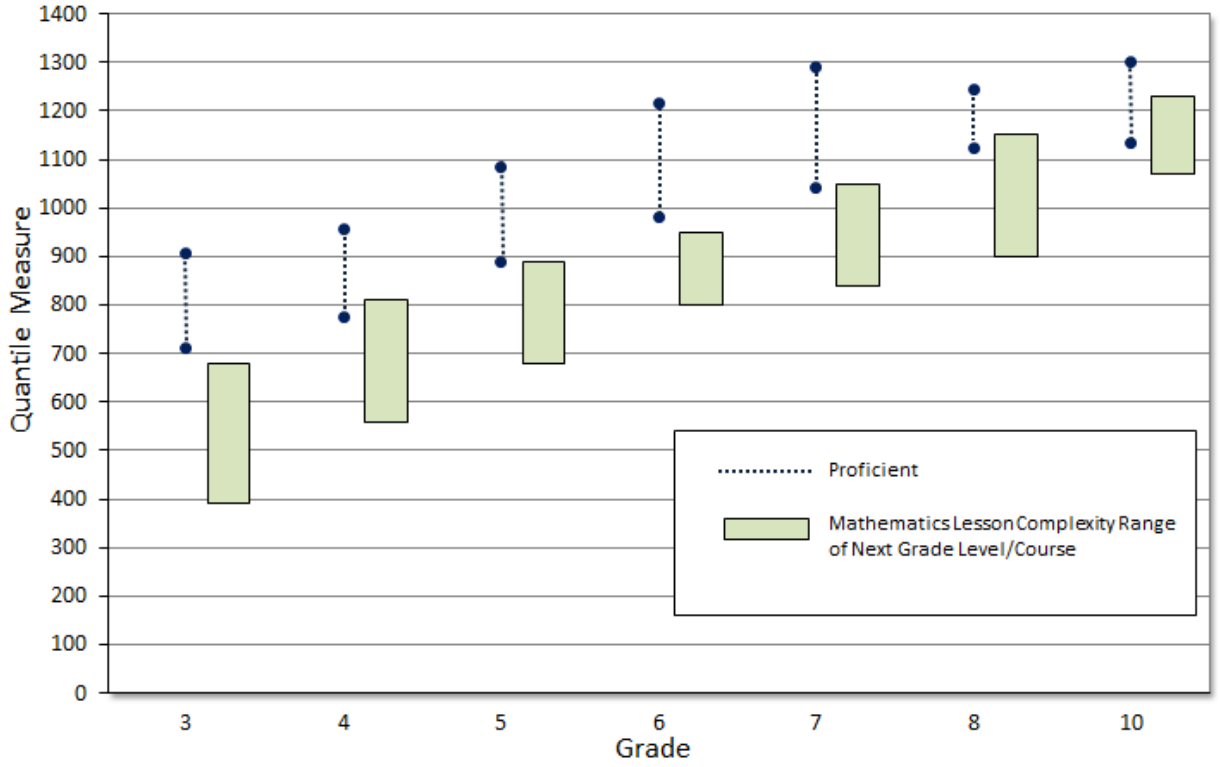
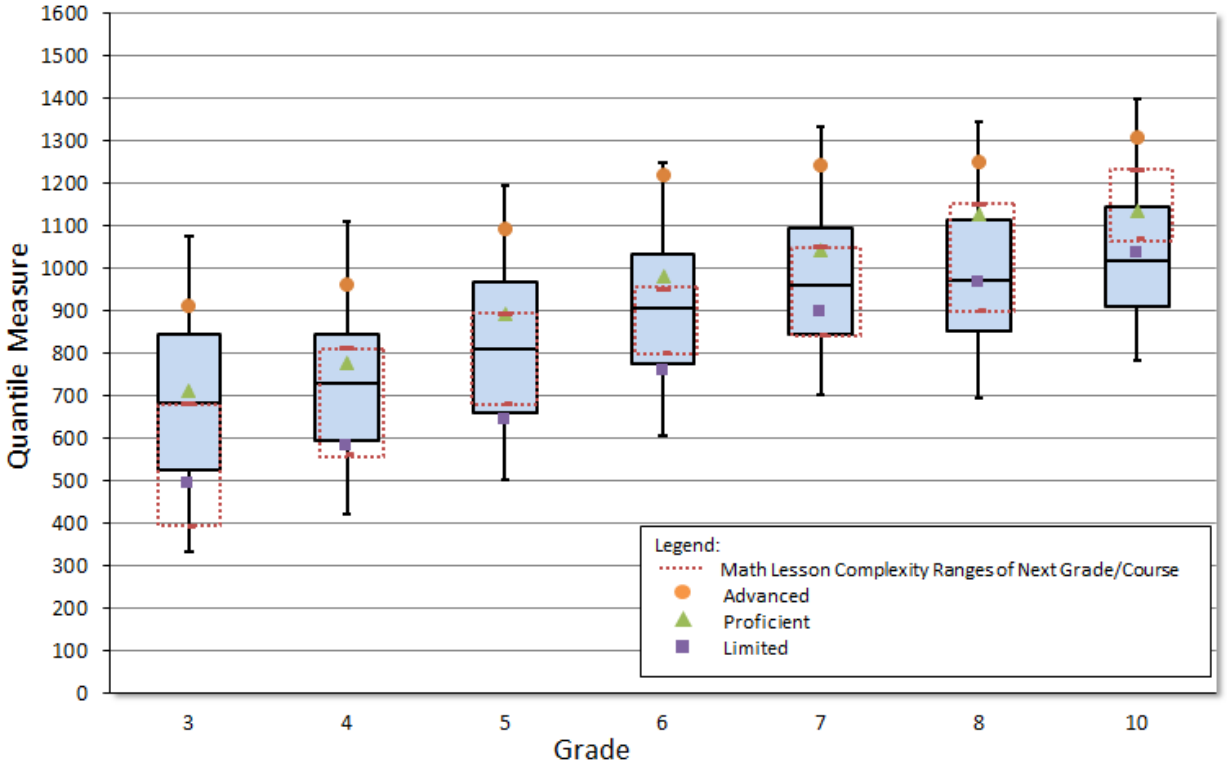


Figure 21 shows the spring 2017 student results from the OSTP Mathematics assessment as Quantile measures at each grade level. For each test level, the box refers to the interquartile range. The line within the box indicates the median. The end of each whisker represents the 5th percentile at the low end of the distribution and the 95th percentile at the high end of the distribution of scores. The square, triangle, and circle represent the OSTP Mathematics performance level cut scores as Quantile measures for Limited, Proficient, and Advanced, respectively. Additionally, the dotted box provides a reference for the complexity of lessons students will encounter at the next grade level in mathematics.

The figure provides a reference for student achievement levels compared with the distribution of student scores as Quantile measures. All grades show that the Proficient cut point is within or above the range of the mathematical demands of the following school year's mathematics content. Ultimately, placing all the information on the same scale allows students to be matched with instructional materials targeted on the skills and concepts necessary to achieve college and career readiness in mathematics.

Figure 21. OSTP Mathematics student performance (spring 2017) expressed as Quantile measures compared to the OSTP performance levels and mathematical lesson demand distributions.



Conclusions, Caveats, and Recommendations

Forging a link between scales is a way to add value to one scale without having to administer an additional test. Value can be in the form of any or all of the following:

- increased *interpretability* (e.g., "Based on this test score, what mathematical skills and concepts does my child actually know?"),
- increased *diagnostic capability* (e.g., "Based on this test score, what are the student's weaknesses?"), or
- increased *instructional use* (e.g., "Based on these test scores, I need to modify my instruction to include these skills.").

The link that has been established between the OSTP Mathematics Assessments for Grades 3 through 8 and 10 and the Quantile Framework provides a way to match students with resources and materials that provide an appropriate level of challenge while avoiding frustration. The result of this purposeful match may be that students will be less fearful of mathematics, and, thereby become better mathematical thinkers. The real power of the Quantile Framework is in examining the growth in mathematical achievement of students—wherever the student may be in the development of his or her mathematical skills and concepts. Students can be matched with resources and materials for which they are forecasted to experience 50% understanding, therefore, they are ready for instruction on the topic. As a student's mathematical achievement grows, he or she can be matched with more demanding skills and concepts. And, as the skills and concepts become more demanding, then the student grows.

The development of the link between the scores on the OSTP Mathematics scale and the Quantile scale has been described and evaluated in this study. There are many factors that can affect the linking process. In this study one factor is the sample characteristics (e.g. gender, ethnicity).

Conventions for Reporting. Quantile measures are reported as a number followed by a capital "Q" for "Quantile." There is no space between the measure and the "Q" and measures of 1,000 or greater are reported without a comma (e.g., 1050Q). All Quantile student measures should be rounded to the nearest 5Q to avoid over interpretation of the measures. As with any test score, uncertainty in the form of measurement error is present.

Some assessments report a Quantile range for each student, which is 50Q above and 50Q below the student's actual Quantile measure. For example, a student with a Quantile measure of 1000L would have a Quantile range of 950Q–1050Q. Identifying skills within a student's "learning frontier," or Quantile range, is critical to developing not only mathematics learning but creating a positive mathematical experience that can motivate and change attitudes about mathematics. If a student attempts material above his or her Quantile range, the level of challenge may be too great for the student to be able to construct an understanding of the skills and concepts. Likewise, material below the student's Quantile range may provide the student with little challenge. This range represents the area where a student will likely have a successful instructional experience. The range helps identify the background knowledge needed to learn and apply current and new

information in an instructional setting. As in any academic setting, the teachers and parents know the student best. The Quantile range is best viewed as a tractable guideline where teachers or parents selecting supplemental materials outside of the Quantile range may be deemed more appropriate.

Next Steps. To utilize the results from this study, Quantile measures need to be incorporated into the OSTP Mathematics assessment results processing and interpretation frameworks. Suggested resources need to be developed for ranges of students. Care must be taken to ensure that the resources and materials on the lists are also developmentally appropriate for the students. The Quantile measure is one factor related to understanding and is a good starting point in the selection process of materials and resources for a specific student. Other factors such as student developmental level, motivation, and interest; amount of background knowledge possessed by the student; and characteristics of the resources and skills also need to be considered when matching resources and instruction with a student.

In this era of student-level accountability and high-stakes assessment, differentiated instruction—the attempt "on the part of classroom teachers to meet students where they are in the learning process and move them along as quickly and as far as possible in the context of a mixed-ability classroom" (Tomlinson, 1999)—is a means for all educators to help students succeed. Differentiated instruction promotes high-level and powerful curriculum for all students, but varies the level of teacher support, task complexity, pacing, and avenues to learning based on student readiness, interest, and learning profile. One strategy for managing a differentiated classroom suggested by Tomlinson is the use of multiple resources and supplementary materials that can be identified with the aid of the Quantile Framework. Equipped with a student's Quantile measure, teachers can connect him or her to textbook lessons, worksheets, games, websites, and trade books that have appropriate Quantile measures (Smith, no date; Smith and Turner, 2012). By incorporating Quantile measures into the planning of mathematics instruction, it becomes possible to forecast with greater probability how successfully students are likely to understand the material presented to them. Teachers can provide instruction on QSCs with Quantile measures below the targeted instruction when students are not ready for that instruction by focusing on prerequisite QSCs. On the other hand, teachers can focus enrichment activities on the impending QSCs.

Three resources are available on the Quantile Framework website – the Math Skills Database, the Quantile Teacher Assistant, and Math@Home (Smith, no date; Smith and Turner, 2012). The Math Skills Database (math-tools.quantiles.com/math-skills-database/) allows teachers and parents to search for Quantile Skills and Concepts (QSCs) by their state standards, by keywords (e.g., adding fractions), and by Quantile measure. The database contains targeted, free resources appropriately matched to students by Quantile measure and math content. In order to support instruction with the many resources connected with the Quantile Framework, the Quantile Teacher Assistant (QTA) was developed to simplify and gather all relevant information. When using the QTA (math-tools.quantiles.com/quantile-teacher-assistant/), teachers can identify a specific state objective or a CCSSM standard and determine the knowledge base. In addition, teachers can differentiate instruction by indicating the range of Quantile measures for their students in their classrooms. Math@Home (https://math-tools.quantiles.com/math-at-home/) activities reinforce mathematical skills covered in the previous school year and lay the

groundwork for what will be taught when students return to class in the fall. By incorporating fun family games into everyday activities, students can practice mathematical skills year-round and parents can feel more confident about helping their children with mathematics.

MetaMetrics, in partnership with The Council of Chief State School Officers, has begun coordinating a national, state-led summer mathematics initiative to bolster student mathematics achievement during summer break. The Summer Math Challenge is designed to raise national awareness of the summer loss epidemic (Cooper, Nye, Charlton, Lindsay, and Greathouse, 1996), share compelling research on the importance of targeted mathematics activities, and provide access to a variety of free resources to support mathematics instruction and the initiative as a whole.

The "Summer Math Challenge" is a six-week, e-mail-based initiative designed to help students on summer vacation fight "summer slide" in mathematics skills. The initiative combats summer math slide by helping students retain mathematics skills acquired during the previous school year. The initiative, started in the summer of 2013, targets Grades 1 through 8 by reinforcing mathematics concepts presented from Kindergarten through 7 aligned with the Common Core State Standards. Participants receive targeted instructional materials for a weekly concept along with personalized e-mail activity suggestions and resources that support each concept. Features include activities grounded in everyday life on "Real World Wednesdays," and online math fact fluency practice on "Fluency Fridays." Twenty-three SEA chiefs requested assistance in launching a 2017 Summer Math initiative in conjunction with the CCSSO Chief's Summer Reading Challenge. Support materials for states and schools are available on the Quantile web site at http://math-tools.quantiles.com/summer-math-challenge/. Students from all 50 U.S. states participated in the 2017 Summer Math Challenge.

The following is a list of suggestions that can be used to leverage a student's Quantile measure in the classroom:

- Start class with warm-up problems and activities related to the prerequisite skills from a knowledge cluster.
- Enhance major themes of mathematics by building a bank of skills at varying levels that not only support a theme but also provide a way for all students to participate in the theme successfully. For example, consider how addition progresses from single numbers to multi-digit numbers, and then moves to decimals and fractions.
- Sequence mathematical skills according to their difficulty as much as possible.
- Develop a mathematics folder that goes home with students and returns weekly for review. The folder can contain examples of practice skills within a student's range, applications of topics outside the classroom, reports of recent assessments, and a parent form to record the amount of time spent working mathematics problems at home.
- Choose skills lower in a student's Quantile range when factors make the student view mathematics as more challenging, threatening, or unfamiliar. Select skills at or above a student's range to stimulate growth, when a topic holds high interest for a student, or when additional support such as background teaching or peer tutoring is provided.

- Develop individualized lists of skills that are tailored to provide appropriately challenging and curriculum suitable for all students.

Below are some suggestions related to leveraging a student's Quantile measure at home:

- Ensure that each child gets plenty of mathematical practice, concentrating on skills within his or her Quantile range. Parents can ask their child's teacher to print a list of appropriate skills or search the Math Skills Database on the Quantile website.
- Communicate with the child's teachers about the child's mathematical needs and accomplishments. They can use the Quantile scale to describe their assessment of the child's mathematical achievement.
- When a new topic proves too challenging for a child, use activities or other materials from the Web site to help. Review the prerequisite QSCs to ensure that gaps or misconceptions are not interfering with the current topic.
- Celebrate a child's mathematical accomplishments. The Quantile Framework provides an easy way for students to track their own growth. Parents and children can set goals for mathematics—spending so much time daily working on mathematical problems, discussing situational topics such as statistics from a newspaper or discounts at the store, reading a book about a mathematical topic, trying new kinds of Web sites and games, or working a certain number of mathematics problems per week. When children reach the goal, make it an occasion!

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Appendix

The Quantile® Framework for Mathematics Map

THE QUANTILE® FRAMEWORK FOR MATHEMATICS MAP

Linking assessment with mathematics instruction

Imagine empowering and accelerating students' learning in mathematics by better differentiating instruction and monitoring growth in student ability. With the Quantile Framework, educators can help achieve this goal by identifying level-appropriate mathematical tasks for students and track their progress!

HOW IT WORKS

The Quantile Framework for Mathematics is a unique measurement system that uses a common scale and metric to assess a student's mathematical achievement level and the difficulty of specific skills and concepts. The Quantile Framework describes a student's ability to solve mathematical problems and the demand of the skills and concepts typically taught in kindergarten mathematics through Algebra II, Geometry, Trigonometry and Precalculus. The Quantile Map provides educators with a sampling of primary mathematical skills and concepts from over 500 Quantile Skills and Concepts (QSCs) throughout the Quantile scale. This sampling of QSCs ranges from EM (Emerging Mathematician) for early, foundational mathematical skills and concepts to 1500Q for more advanced skills and concepts. As the difficulty, or demand of the skill increases, so does the Quantile measure.

HOW TO USE IT

With the Quantile Framework, educators can explore the interconnectedness of mathematical skills and concepts and identify those elements that are critical for progressing student learning. Educators are better able to inform their instruction on how to best teach a skill or concept by pinpointing which skills build upon each other. The skill mapping of mathematical concepts enables educators to build an instructional path that best fits their students' unique abilites. Both students and QSCs receive a Quantile measure. Numerous tests report Quantile student measures including many state end-of-year assessments, national norm-referenced assessments and math programs. On the QSC side, more than 580 textbooks, 64,000 lessons and 3,100 downloadable resources have received Quantile measures.

Quantile measures provide educators with the information they need to identify gaps in mathematical knowledge, as well as serve as a guide for progressing to more advanced topics. Every QSC is part of a knowledge cluster that shows relationships and connections between mathematical skills and offers their relative difficulty among different skills. Both the *prerequisite* and *impending* skills are elements of knowledge clusters and serve as building blocks that support students' success. Educators can advance student learning by using prerequisite and impending skills to build mathematical knowledge and understanding. Prerequisite skills help educators see the pieces of the puzzle that make up a skill or concept, showing what needs to be understood first. Impending skills are skills and concepts that build upon a focus skill and allow educators to see a trajectory of knowledge across grades and content strands.

James: 1190Q

Sophia: 770Q

Donald: 450Q

Aliyah: EM100Q

15000+
14000Q
13000Q
12000Q
11000Q
10000Q
9000Q
8000Q
7000Q
6000Q
5000Q
4000Q
3000Q
2000Q
1000Q
0Q
EM1000Q

MetaMetrics®
LINKING ASSESSMENT WITH INSTRUCTION

For more information, free resources, and to search the Math Skills Database, visit Quantiles.com.

THE QUANTILE® FRAMEWORK FOR MATHEMATICS MAP

Linking assessment with mathematics instruction

High School Example
James

Heritage High School | Geometry Course

Quantile Measure: 1190Q

James is exploring theorems about lines and angles in his Geometry class. In his current learning path, the focus skill being taught is *use properties, definitions, and theorems of angles and lines to solve problems related to adjacent, vertical, complementary, supplementary, and linear pairs of angles.* This focus skill is part of a knowledge cluster that contains prerequisite and impending skills. Working with prerequisite skills can help students struggling to learn and impending skills can help students progress to the next level of learning.

Since James' Quantile measure is within the range of the focus skill being taught (his Quantile measure +/- 50Q), James will be ready for this type of instruction. With his mathematical ability being at the same level as the focus skill, learning will be optimal. Once James is performing well with the focus skill, he will be better prepared to learn the impending skills connected with this focus skill.

1250Q
IMPENDING SKILL
Use definitions and theorems of angles formed when a transversal intersects parallel lines.

1220Q
IMPENDING SKILL
Use properties, definitions, and theorems of polygons to solve problems related to the interior and exterior angles of a convex polygon.

1160Q
FOCUS SKILL
Use properties, definitions, and theorems of angles and lines to solve problems related to adjacent, vertical, complementary, supplementary, and linear pairs of angles.
CCSS G.CO.9

1010Q
PREREQUISITE SKILL
Define and identify alternate interior, alternate exterior, corresponding, adjacent and vertical angles.

1020Q
PREREQUISITE SKILL
Define and identify complementary and supplementary angles.

800Q
PREREQUISITE SKILL
Write a linear equation or inequality to represent a given number or word problem; solve.

◆ ALGEBRA & ALGEBRAIC THINKING ★ NUMBER SENSE ■ NUMERICAL OPERATIONS ● MEASUREMENT ▲ GEOMETRY ▲ DATA ANALYSIS , STATISTICS & PROBABILITY

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THE QUANTILE® FRAMEWORK FOR MATHEMATICS MAP

Linking assessment with mathematics instruction

Middle School Example
Sophia

Heritage Middle School | Grade 6

Quantile Measure: 770Q

Sophia is using variables to represent mathematical expressions in her math class. In her current learning path, the focus skill being taught is *translate between models or verbal phrases and algebraic expressions.* This focus skill is part of a knowledge cluster that contains prerequisite and impending skills. Working with prerequisite skills can help students struggling to learn and impending skills can help students progress to the next level of learning.

Since Sophia's Quantile measure is within the range of the focus skill being taught (her Quantile measure +/- 50Q), Sophia will be ready for this type of instruction. With her mathematical ability being at the same level as the focus skill, learning will be optimal. Once Sophia is performing well with the focus skill, she will be better prepared to learn the impending skills connected with this focus skill.

810Q
IMPENDING SKILL
Write an equation to describe the algebraic relationship between two defined variables in number and word problems, including recognizing which variable is dependent.

800Q
IMPENDING SKILL
Identify parts of a numerical or algebraic expression.

800Q
IMPENDING SKILL
Write a linear equation or inequality to represent a given number or word problem; solve.

750Q
FOCUS SKILL
Translate between models or verbal phrases and algebraic expressions.
CCSS 6.EE.6

620Q
PREREQUISITE SKILL
Translate between models or verbal phrases and numerical expressions.

430Q
PREREQUISITE SKILL
Describe the meaning of an unknown in the context of a word problem.

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THE QUANTILE® FRAMEWORK FOR MATHEMATICS MAP

Linking assessment with mathematics instruction

Late Elementary Example
Donald

Heritage Elementary School | Grade 4

Student Quantile Measure: 450Q

Donald is learning about line graphs with very large data values. In his current learning path, the focus skill being taught is *organize, display, and interpret information in graphs containing scales that represent multiple units.* This focus skill is part of a knowledge cluster that contains prerequisite and impending skills. Working with prerequisite skills can help students struggling to learn and impending skills can help students progress to the next level of learning.

Since Donald's Quantile measure is within the range of the focus skill being taught (his Quantile measure +/- 50Q), Donald will be ready for this type of instruction. With his mathematical ability being at the same level as the focus skill, learning will be optimal. Once Donald is performing well with the focus skill, he will be better prepared to learn the impending skills connected with this focus skill.

800Q

IMPENDING SKILL

Identify and use appropriate scales and intervals in graphs and data displays.

480Q

FOCUS SKILL

Organize, display, and interpret information in graphs containing scales that represent multiple units.

CCSS 3.MD.3

480Q

IMPENDING SKILL

Organize, display, and interpret information in bar graphs.

470Q

IMPENDING SKILL

Organize, display, and interpret information in line graphs.

200Q

PREREQUISITE SKILL

Organize, display, and interpret information in line plots and tally charts.

110Q

PREREQUISITE SKILL

Skip count by 2s, 5s and 10s beginning at any number.

90Q

PREREQUISITE SKILL

Skip count by 3s, 4s, 6s, 7s, 8s, and 9s.

EM10Q

PREREQUISITE SKILL

Organize, display, and interpret information in picture graphs and bar graphs using grids.

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THE QUANTILE® FRAMEWORK FOR MATHEMATICS MAP

Linking assessment with mathematics instruction

Early Elementary Example
Aliyah

Heritage Elementary School | Kindergarten

Quantile Measure: EM100Q

Aliyah is exploring unknown-addend problems in her class. In her current learning path, the focus skill being taught is *know and use related addition and subtraction facts*. This focus skill is part of a knowledge cluster that contains prerequisite and impending skills. Working with prerequisite skills can help students struggling to learn and impending skills can help students progress to the next level of learning.

Since Aliyah's Quantile measure is within the range of the focus skill being taught (her Quantile measure +/- 50Q), Aliyah will be ready for this type of instruction. With her mathematical ability being at the same level as the focus skill, learning will be optimal. Once Aliyah is performing well with the focus skill, she will be better prepared to learn the impending skills connected with this focus skill.

EM25Q
IMPENDING SKILL
Model the concept of subtraction using numbers less than or equal to 10.

EM80Q
FOCUS SKILL
Know and use related addition and subtraction facts.
CCSS 1.OA.4

EM110Q
PREREQUISITE SKILL
Identify missing addends for addition facts.

EM260Q
PREREQUISITE SKILL
Model the concept of addition for sums to 10.

MetaMetrics.

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ALGEBRA & ALGEBRAIC THINKING | NUMBER SENSE | NUMERICAL OPERATIONS | MEASUREMENT | GEOMETRY | DATA ANALYSIS , STATISTICS & PROBABILITY

APPENDIX G—TEST ACCOMMODATIONS

OKLAHOMA SCHOOL TESTING PROGRAM (OSTP)

ACCOMMODATIONS *for* STUDENTS *with an* INDIVIDUALIZED EDUCATION PROGRAM (IEP) *or* SECTION 504 PLAN

2016-2017

Table of Contents

Definition & Purpose of Oklahoma School Testing Program (OSTP) Accommodations

A test accommodation is a change in the way a test is administered or in the way a student responds to test questions. Similar to instructional accommodations, test accommodations are intended to offset the effects of a student's disability and to provide him/her with the opportunity to demonstrate knowledge and skills on statewide assessments.

Eligibility for OSTP Accommodations

The right of a student with a disability to receive allowable accommodations on OSTP tests is protected by both federal and state laws. The student's current IEP/504 plan must specify precisely which test accommodation(s) he/she will receive. In cases where an IEP/504 plan is under development, the school personnel responsible for writing the plan must have already met and agreed upon the necessary accommodation(s) before a student may be provided the accommodation(s).

A student who does not have a documented disability or is not served by a current IEP/504 plan is not eligible to receive accommodations on OSTP tests, except for Emergency Accommodation situations. Scribes may be provided for any student (with or without an IEP or Section 504 plan) who has a short-term medical condition that affects his/her physical dexterity which impedes his/her ability to respond to the assessment format.

Protocol for Emergency Accommodation on State Assessments

If prior to or during testing, the school principal (or designee) determines that a student requires an emergency accommodation (e.g., broken hand). **Form EA** must be completed and submitted to the District Test Coordinator (DTC) for approval. A copy of this form must be filed in the testing archives and a copy must be retained by the DTC at the central office.

Definition of Standard and Nonstandard OSTP Accommodations

For the purposes of the OSTP, a **standard accommodation** is defined as a change in the routine conditions under which students take OSTP tests that does not alter what the test is intended to measure. Standard accommodations are grouped into the following four categories:

- Setting; for example, administering the test in a small group or a separate setting
- Timing or scheduling of the test; for example, administering the test in short intervals or at a specific time of day
- Presentation; for example, using a large-print or Braille edition of the test
- Response; for example, dictating responses to a scribe

For the purposes of the OSTP, a **nonstandard accommodation** is defined as an accommodation that is needed for the student to access the assessment but not included on the allowable list of accommodations and requires OSDE approval for use on OSTP tests.

General Requirements for the Use of Standard and Nonstandard Accommodations

All accommodations require adherence to test security protocols, including the presence of both a Test Administrator and a Test Proctor during periods requiring access to secure testing materials (e.g., human read-aloud). IEP teams must reconvene annually in order to determine which accommodations will be needed and to document any changes to accommodations. If the IEP/504 team believes that a test accommodation listed in the student's IEP/504 plan should be removed because it is no longer necessary and appropriate for the student, the team must amend the plan accordingly prior to testing. If a **nonstandard accommodation** will be provided, the student meets all of the eligibility criteria for that accommodation and has been submitted for consideration and received approval from the Oklahoma State Department of Education. The use of accommodations is based on the individual needs of a student with a disability and may only be provided when **ALL** of the following conditions have been met:

1. The student has a disability that is documented in a current IEP/504 plan.

2. The student uses the **accommodation routinely** (with rare exceptions) during classroom instruction and assessment in the subject, both before and after the OSTP test is administered. However, use of a **nonstandard accommodation** during instruction does not necessarily qualify a student to receive the same nonstandard accommodation during OSTP testing; the student must meet additional eligibility requirements to receive a nonstandard accommodation on an OSTP test.

3. The accommodation is documented on the Assessment page of the student's current IEP/504 Plan.

4. The student requires the accommodation in order to participate in OSTP testing.

5. The accommodation is listed as a current accommodation in this appendix (or, prior to testing, the district or school has consulted with the OSDE and received permission to use a unique accommodation not included in this appendix).

Accommodations **may not:**

1) Alter, explain, simplify, paraphrase, or eliminate any test question, reading passage, writing prompt, or multiple-choice answer option;

2) Provide verbal or other clues or suggestions that hint at or give away the correct response to the student;

3) Contradict test administration requirements or result in the violation of test security; for example,
   - Test questions may not be modified, reordered, or reformatted in any way for any student;
   - Tests may not be photocopied, enlarged, altered, or duplicated;
   - English-language dictionaries are not allowed for any student on any test.

If the above five conditions have been met and the IEP/504 team determines an accommodation is necessary, then it must be provided to the student during OSTP testing. If an accommodation is provided that does not meet the conditions stated above, the student's test score may be invalidated. If a student refuses an accommodation listed in his/her plan, the accommodation must be offered and remain available to the student during testing. The school may want to document in writing that the student refused the accommodation and keep this documentation on file at the school. Students should never be asked to sign an agreement waiving their right to receive an accommodation. Accommodations used by the student must be indicated on the student's answer booklet and/or personal information profile (online).

Test Formatting Options	Paper	Online
3-5 ELA/Math/Grade 5 Science	X	
6-8 ELA/Math/Grade 8 Science		X
Grade 10 ELA/Math/Science + U.S. History		X
Braille Tests	X	
Large Print tests may be provided in paper format for Online tests.	*	*

Paper & Pencil Test Formats

IEP/504 teams are encouraged to provide students with disabilities the same test formats provided to their non-disabled peers based on the test formatting options listed above. IEP/504 teams should base their decision upon individualized, objective evidence to determine whether or not a student is able to access a computer-based test. Students unable to access an OSTP computer-based test must also receive classroom assessments, benchmark assessments, and districtwide assessments in this manner. Consequently, a student on an IEP/504 Plan does not automatically receive paper & pencil test formats. Blanket policies predetermining specific accommodations for students with disabilities are not in accordance with the Individuals with Disabilities Education Act (IDEA) and Section 504 of the Rehabilitation Act of 1973.

OSTP Standard Accommodations

I. Setting/Timing/Schedule	Procedures & Guidance
S1. Individual testing	This accommodation is required for many presentation or response accommodations. This accommodation is intended to reduce student distractions. Students must be actively monitored and may use a testing carrel or test in a special education resource room or other location that maintains test security.
S2. Small group testing (**8-10 maximum**)	This accommodation is intended to reduce student distractions and may be required for certain accommodations. Students must be actively monitored and may use a testing carrel or test in a special education resource room or other location that maintains test security. **Students should be tested with their non-disabled peers to the greatest extent possible.**
S3. Preferential seating	Students may need to sit close to the front of the room so they can see or hear more easily, increase physical access, or have access to special equipment.
S4. Separate location **(No limit on number of students)**	This accommodation is intended to reduce student distractions. Students may use a testing carrel, test in a special education resource room, or other location that maintains test security.
S5. Provide special lighting	Specify type (e.g., 75 Watt incandescent, light box, etc.)
S6. Provide adaptive or special furniture	Students may need accommodations to provide better access (e.g., slant board, stander, etc.)
T1. Flexible schedule same day **Student test book(s) must be secured between sessions.**	Students are scheduled to allow for the best conditions/ timing for their performance, and/or may be allowed to take the test during more than one sitting during a single day. Students are not allowed to study for or discuss tests between sessions. This is not intended for lunch or recess breaks. **(S4)** must be selected for this accommodation.
T2. Administer test over several sessions or "chunking" (except writing tasks/sections). **Student test books must be secured between sessions.**	The test may be separated into smaller sections and administered over several days within the state testing window. Student may only work in one separated section at a time and may not go to previous sections or work ahead. **(S4)** must be selected for this accommodation.
T3. Allow frequent breaks during one test session **(maximum 10-15 minute duration)** **Student test book(s) must be secured during the break(s).**	Students must be monitored during breaks and may not study for or discuss the test during these breaks or view/change previously answered questions after a break. **This accommodation is not intended for lunch or recess breaks—students must complete a Section before being dismissed.**

II. Presentation	Procedures & Guidance
P1. Alternate Formats a. Large-Print Version (Instructions provided within kits.) b. Contracted Braille Version (Instructions provided within kits.) c. Large-print through Online Testing Client (Vector-based Magnification)	The Test Administrator must transcribe student answers verbatim into the standard answer document/test book that was provided in the large-print (paper/pencil) or Braille kit. Braille test formats will be provided on paper using contracted Braille and Nemeth code for numbers and formulas. Large print formats may be configured in the online testing client for certain assessments.
P2. Reverse Color Contrast	Students who have a visual impairment may require this to access the computer screen. This accommodation option must be selected in the online testing client student profile.
P3. Use of assistive technology (AT) devices or supports: e.g., color overlays, magnifier, pencil grips, auditory amplification devices, noise buffers, slant board, wedge for positioning, and multiplication table/chart.	The specific device or support should be specified in the IEP/504 Plan, be routinely used by the student, and not alter the construct being measured. **(S1, S2, or S4)** may be appropriate for this accommodation as some AT devices may be distracting to other students.
P4. Text-to-Speech, Human Reader, or Sign Language Interpretation a. Text-to-Speech is built into the online testing client, requires the use of ear phones, and may be administered individually, small groups, or regular setting. b. Human Reader reads test directions, test items, and answer choices and must log the test booklet serial number on the Nondisclosure agreement (NDA). This is limited to small group or individualized testing. c. Sign Language Interpretation may be accomplished by using a separate test booklet in a separate location. Please refer to the Human Reader directions on pages 13-14.	**P4 applies to Math, Science, US History, and Grades 5, 8, and 10 ELA writing/constructed response sections only.** Online tests have built in Text-to-Speech functionality **(must be selected in online testing client)**. Ear phones are required. Students may test with nondisabled peers. However, if a Human Reader is required for the student, then the test must be read from the computer screen verbatim. **(S1 or S2)** is required when utilizing a Human Reader for Online Only tests. Paper tests **(test forms must be the same)** are read by a Human Reader. Test Administrator uses separate test booklet or reads over a student's shoulder and must log the test booklet serial number on the Nondisclosure agreement (NDA). Small group testing (**S2: 8-10 maximum**) is required and test forms must be the same. **Students may request items be read more than once.**
P5. Use of Secure Braille Note-taker (students with a visual impairment)	An electronic note-taker, which may have a Braille or QWERTY-type keyboard, is an adaptive device similar to a PDA. This device may have built-in speech output and/or a refreshable Braille display. **(S1 or S2)** must be selected for this accommodation.

P6. Simplification/repetition/signage of directions	Student may ask for clarification, simplification, signage of directions. This does not include test questions or answer choices. Students may have directions reread for each page of questions.
P7. Turn off Universal Tools/Accessibility Features	Disable any tools that may be distracting to a student, or a student does not need to use, or that the student may be unable to use.
P8. Use of an Abacus.	Students who have a visual impairment/blindness or access mathematical calculations tactilely may use an abacus.
P9. Use of a calculator on Grades 3–5 Mathematics. See Calculator Requirements on pages 11-12	A four-function calculator may be used. Calculators with Computer Algebra Systems are prohibited.
P10. Provide cues (arrows, stop signs) on answer form	This applies to Paper Only tests. Cues may not clue a student to a correct or incorrect answer.
P11. Use masking or templates to reduce the amount of visible print.	Masking involves blocking off content that is distracting to the student. Students are able to focus their attention on a specific part of a test item by masking. This feature is built into the online testing client.
P12. Secure paper to work area with tape or magnets.	This applies to Paper Only tests. Please be cautious when adhering tape to the test booklet or answer document by avoiding the tracking marks (black bars) for the scoring process.
P13. Student may read the test aloud or sign the test to himself or herself.	This requires individual testing and non-disclosure forms signed by Test Administrator/Test Proctor. **(S1)** must be selected for this accommodation.
P14. Placeholders, templates, or markers to maintain place	This applies to Paper Only tests.
P15. Audio Calculator	This requires ear phones for group testing. A non-embedded calculator for students needing a special calculator, such as a Braille calculator or a talking calculator, is currently unavailable within the online assessment platform. **(S1, S2, or S4)** may be appropriate for this accommodation.
P16. Paper & Pencil Test Please see Paper & Pencil Test Format guidelines on page 4.	Students unable to access an OSTP computer-based test must also receive classroom assessments, benchmark assessments, and districtwide assessments in this manner. Consequently, a student on an IEP/504 Plan does not automatically receive a paper & pencil test format.

III. Response	Procedures & Guidance
R1. Student marks answers in test book and not on an answer document for later transfer by a Test Administrator to an answer document.	The Test Administrator with the Test Proctor present must transcribe answers verbatim into the standard answer document. **Does not apply to Grade 3 tests.** This accommodation applies to Paper Only tests.
R2. Human Scribe ELA, Mathematics, Science, Social Studies: a. Student dictates response to a scribe who records responses on an answer document or through the Online Testing Client by Test Administrator or Proctor. b. Student signs response to a scribe who records responses on an answer document or through the Online Testing Client by Test Administrator or Proctor. c. Student tapes or records response for a writing portion of the test for verbatim transcription by Test Administrator or Proctor. Please see Scribe Instructions and Guidelines on pages 16-19.	A scribe is a Test Administrator or Proctor who writes down what a student dictates by speech or through an assistive technology communication device. Signed Nondisclosure Agreements (NDAs) are required for both Test Administrator and Proctor. Students who have documented significant motor or processing difficulties that make it difficult to produce responses may need to dictate their responses to a human, who then records the students' responses verbatim. The use of this support may result in the student needing additional overall time to complete the assessment. **The guiding principle in scribing is to assist the student in accessing the test and responding to it.** **(S1)** must be selected for this accommodation.
R3. Use computer or other assistive technology device to respond. a. Student utilizes an electronic input device without the "help" features, such as spell check, an electronic dictionary, a thesaurus, or access to the Internet. Please see Scribe Instructions and Guidelines on pages 16-19.	Students may use a computer, typewriter, or other assistive technology device to respond. This may include software dictation or dictation devices the student uses during routine instruction. Extended written responses must be printed off for transcription. Return the original typed student response for secure materials submission. The Test Administrator must transcribe words verbatim into an answer document/test book or Online Testing Client. The electronic responses or recordings must be destroyed or erased by District Test Coordinator. **(S1 or S2)** must be selected for this accommodation.
R4. Test Administrator monitors placement of student responses on the answer document or the online testing client.	Test Administrator may redirect students. Students may not be directed to correct or incorrect answers in any way.
R5. Brailler/Secure, Braille Note-taker/Abacus (students with a visual impairment)	The Test Administrator must transcribe answers verbatim into the standard answer document/test book that was provided in the large-print (paper/pencil) or Braille kit. **(S1, S2, or S4)** must be selected for this accommodation.

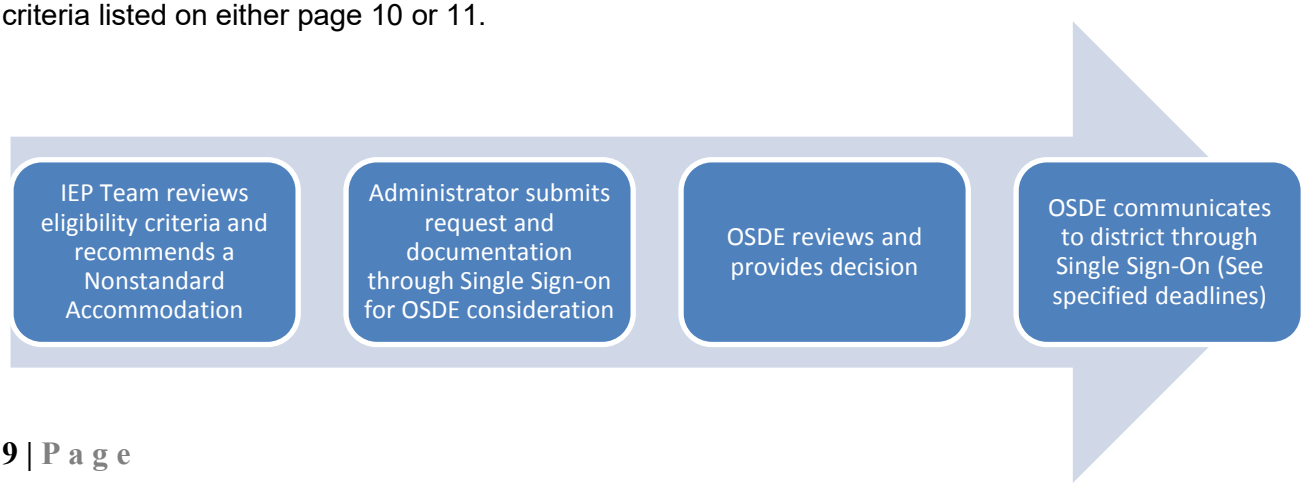
Requirements for the Use of Nonstandard Accommodations

IEP and 504 teams may request the use of one or more of the following OSTP nonstandard accommodations (ELA Read-Aloud or Unique Accommodation) only when all of the criteria are met, as described on either page 10 or 11. The decision to use a nonstandard accommodation is recommended by the IEP/504 team based on the nonstandard accommodation eligibility criteria. Nonstandard accommodations for use on OSTP tests must be approved by the OSDE. The nonstandard accommodation can only be provided to a student with a disability on an OSTP test when it is documented on the Assessment page in a current IEP or listed in the student's 504 plan specifically as an OSTP accommodation. Once OSDE approves the accommodation, this documentation may be addressed through an IEP meeting or an IEP amendment. Use of a nonstandard accommodation during instruction does not necessarily qualify a student to receive the same nonstandard accommodation on an OSTP test.

The **ELA Test Read-Aloud accommodation (NS1)** request may only be submitted when all three prongs of the eligibility requirements are met as described on page 10. The **OSTP ELA Test Read-Aloud Protocol** will be used by the IEP/504 team to document all three prongs, including submission of any documents or evaluations to the OSDE. The information from this protocol must be submitted through the Nonstandard Accommodation Application located on the Single Sign-on Website for consideration by the OSDE.

A **Unique Accommodation (NS 2)** is an accommodation that requires changes or alterations to the test materials/booklet or media presentation. The unique accommodation must be one that is regularly used by the student for classroom instruction, must be on the student's IEP, and must not alter the underlying content of the assessment. The unique accommodation request must be submitted through the Nonstandard Accommodation Tool located on the Single Sign-on Website for consideration by the OSDE. Please refer to page 11 & **Form U**, Unique Accommodation (NS2), for specific requirements.

IEP and 504 teams are encouraged to make consistent, defensible, and appropriate decisions for each student and to amend the IEPs and 504 plans of students who do not meet the nonstandard accommodation eligibility criteria. The OSDE will continue to review the number of students with disabilities who receive nonstandard accommodations in each district. Nonstandard accommodation requests must be approved by the OSDE before a student may use the accommodation on a state test. The use of a nonstandard accommodation on the OSTP without OSDE approval may result in a testing invalidation. Please do not submit a request if the student does not meet the specific eligibility criteria listed on either page 10 or 11.



OSTP Nonstandard Accommodations

IV. ELA Read-Aloud*	Eligibility Requirements
NS1. Text-to-Speech, Human Reader, or Sign Language Interpretation Accommodations for the English Language Arts Assessments. a. Text-to-Speech is built into the testing client and requires the use of ear phones and may be administered individually or small group (preferred method). b. Human Reader reads test directions, test items, and answer choices from separate test booklet and must log the test booklet serial number on the Nondisclosure Agreement (NDA). This is limited to small group or individualized testing c. Sign Language Interpretation may be accomplished by using a separate test booklet. Test directions, test items, and answer choices may be read verbatim. Refer to test formatting options. Students may request items be read more than once. **Due Date for Requests:** Requests must be submitted to the OSDE through the Nonstandard Accommodations on the SDE Single Sign-on by February 1st for the Spring testing window and responses will be provided on a case-by-case basis no later than March 15th. ***Score reports for students receiving a read-aloud on an ELA/Reading test will indicate the student received this nonstandard accommodation.**	This accommodation must be determined by the following 3-pronged approach: 1.The student has a specific disability that severely limits or prevents him/her from decoding printed text at any level of difficulty, even after varied and repeated attempts to teach the student to do so (i.e., the student is a non-reader, not simply reading below grade level); **and** 2.The student can only access printed materials through a screen reader (assistive technology) or human reader and/or is provided with spoken text on audiotape, CD, video, or other electronic format during routine instruction (includes Sign Language Interpretation), except while the student is actually being taught to decode; **and** 3. The IEP/504 team will utilize and provide the required documentation from the **OSTP ELA Test Read-Aloud Protocol**, which includes the use of the Protocol for Accommodations in Reading (PAR) or the AEM Navigator for deaf or blind students. This documentation must be uploaded into the Nonstandard Accommodation Single Sign-on Application for consideration by the OSDE. Paper tests are read by a Human Reader. **(S1 or S2)** is required and test forms must be the same. Online tests have built in Text-to-Speech functionality. This is the preferred method for providing read aloud to students. However, if a human reader is required for the student, then the test must be read from the computer screen verbatim. **(S1, S2, or S4)** is required. **The request will be submitted annually through the Nonstandard Accommodation Tool Single Sign-on application.**

OSTP Accommodations for Students with an IEP or 504 Plan

NS2. Unique Accommodations Students with disabilities who have IEPs/504 plans are eligible for consideration for unique accommodations on state assessments (e.g., allow projection of test for students receiving the Sign Language Interpretation accommodation in small groups, manipulatives, etc.). A unique accommodation is an accommodation that requires changes or alterations to the test materials/ booklet or media presentation. The unique accommodation must be one that is regularly used by the student for classroom instruction, must be on the student's IEP, and must not alter the underlying content of the assessment.	A request may be made (pursuant to the IEP/504 team's determination) for a unique accommodation utilizing **Form U** for a student with a disability on any specified subject area(s) of the OSTP. The **Form U** must be submitted: • Due to the student's need for an accommodation that would enable the student to access the state assessment. • Through the Nonstandard Accommodation Tool Single Sign-on Application. • With completed student information and any other requested information. **The requested accommodation must not impact the reliability or validity of the test and the request may not exempt a student from taking any portion of the OSTP test(s).**

Calculator Requirements

The items on the Grades 6-8 and Grade 10 Math and Science assessments are designed so that calculators are not required to solve any of the problems. However, certain tasks are more difficult if a calculator is not available.

Before the first day of the test, students using a calculator for any Grades 6-8 and Grade 10 Math and Science assessments should be familiar with the use of the specific calculator that will be utilized. Students must be instructed in the use of calculators; otherwise, it may hinder students' performance on the assessment.

Subject-Specific Requirements

- Grades 3-5 Math:
  - Calculators are only allowed as an approved accommodation for students on an IEP/ 504 Plan and only a basic four-function calculator with square root and percent may be used.
- Grades 6-7 Math:
  - ***All Students***: Basic four-function calculator with square root and percent.
- Grade 8 Math and Science:
  - ***All Students***: Scientific Calculators meeting general requirements.
- Grade 10 Math and Science:
  - ***All Students***: Graphing Calculators and/or scientific calculators meeting general requirements.

General Requirements

- Calculators are permitted but are not required.
- Calculator capabilities described for a specific subject give the maximum capabilities allowed; calculators with less capability are acceptable.
- Students may not share calculators.
- Students may use their own calculators or those provided by the school.
- Calculators that make noise must have the sound feature turned off.
- Calculators that have paper tape must have the tape removed.
- All calculators must have the memory cleared before and after the test session.
- Any programs or applications must be removed prior to the test session.

Prohibited Calculators

- Pocket organizers
- Handheld or laptop computers
- Electronic writing pads or pen-input devices
- Calculators built into cellular phones, smart watches, tablets or other electronic communication devices
- Calculators with a typewriter keypad (QWERTY format)
- Calculators with programs or applications that cannot be removed or disabled (e.g., Polynomial Root-Finder and Simultaneous Equation Solver on TI-86)
- Calculators with built-in computer algebra systems (CAS), such as, but not limited to:
    - Casio: Algebra fx 2.0, ClassPad 300, and all model numbers that begin with CFX-9970G
    - Texas Instruments: All model numbers that begin with TI-89 or TI-92, TI-Nspire CAS
    - Hewlett-Packard: HP-48GII and all model numbers that begin with HP-40G or HP-49G

Test Security and Validity

Using a calculator that does not meet the above requirements invalidates the test results and is a violation of test security and test validity. Any violation will be reported to the State Superintendent and may result in revocation of teaching and/or administrative certificates.

Protocol for Human Readers Providing Verbatim Read-Aloud Test Accommodations

A Test Administrator (human reader) who provides the verbatim reading accommodation to a student must comply with the following procedures when working with a student in a testing situation:

- Human Reader: A state certified educator who reads orally to a student.
- All Human Readers must receive Test Administrator training by the local district and the district must retain documentation, which may be requested by the OSDE at any time.
- **A test proctor who is employed by the school district is required**. Small group (8-10 maximum) or individual testing required.
- Human Readers must sign the Test Administrator Test Security Form and a Non-Disclosure agreement form (NDA).
- Human Readers must read from the computer screen for online test formats or from a separate test booklet or over the student's shoulder for paper/pencil formats (log test booklet serial number on NDA)
- Students without the verbatim read-aloud accommodation should not be tested in the same location as students with the verbatim read-aloud accommodation.
- If students are taking the paper test, the students grouped together must have the **same paper test form.**

Verbatim Read-Aloud Procedures for Human Reader Accommodators

To ensure uniformity in presentation of standardized tests in Oklahoma, **built-in Text-to-Speech software on the secure online testing client** should be used whenever possible. Human readers must follow the procedures outlined below:

1. Human readers must read, verbatim (word-for-word), only the words in the test book or on the computer screen, without changing or adding words, or otherwise assisting the test-taker in any way to influence the test taker's selection of a response.
2. Human readers must speak in a clear and consistent voice throughout the test administration, using correct pronunciation.
3. Human readers may not clarify, elaborate, or provide assistance to students.
4. Human readers must give special emphasis only to words printed in boldface, italics, or capitals and tell the test-taker that the words are printed in that way. No other emphasis or special vocal inflection is permissible. Readers should use even inflection so that the student does not receive any cues by the way the information is read.
5. Human readers must be patient and understand that the test-taker may need to have test items repeated several times.

6. Human readers must not attempt to solve problems or determine the correct answer to an item while reading as this may result in an unconscious pause or change in inflection which could be misleading to the test-taker.

7. Human readers must maintain a neutral facial expression and must not smile or frown which may be interpreted by the test-taker as approval or disapproval of the student's answers.

8. Human readers must recognize that test-takers who are blind or who have low vision may also have additional special tools or equipment (e.g., abacus, brailler, slate, stylus) that have been approved for use during the test.

9. Human readers must be familiar with the student's IEP/504 Plan and know in advance the exact type of verbatim reading accommodation required by the student. The test-taker may require all or portions of the test to be read aloud, depending on his or her particular set of accommodations.

10. If a human reader finds an unfamiliar word or one that he or she is not sure how to pronounce, advise the test-taker of the uncertainty about the word and spell the word.

11. When reading a word that is pronounced like another word with a different spelling, if there is any doubt about which word is intended, readers must spell the word after pronouncing it.

12. Human readers must spell any words requested by the test-taker.

13. When reading passages, readers must be alert to all punctuation marks. Human readers may read the passage through once so that the test-taker can grasp the content of the passage. Some test-takers may ask for the passage to be read through a second time with punctuation marks indicated. When required or asked to read with punctuation, specific lines within a passage indicate all punctuation found within those lines.

14. When test items refer to particular lines of a passage, reread the lines before reading the question and answer choices. For example, a human reader might say, "Question X refers to the following lines…" Reading the lines referred to would then be followed by reading question X and its response options.

15. When reading selected response items, readers must be particularly careful to give equal stress to each response option and to read all of them before waiting for a response. The test-taker will record the answer or provide the answer to the test scribe, who will record it for the test-taker.

16. If a human reader is also serving as a scribe, and if the test-taker designates a response choice by letter only ("D", for example), the human reader must ask the test-taker if he/she would like the complete response be reread before the answer is recorded.

17. If the test-taker chooses an answer before the reader has read all the answer choices, the human reader must ask if the test-taker wants the other response options to be read.

18. After a human reader finishes reading a test item, the human reader must allow the test-taker to pause before responding. However, if the test-taker pauses for a considerable time following the reading of the answer choices, say: “Do you want me to read the question again...or any part of it?” In rereading questions, readers must be careful to avoid any special emphasis on words not emphasized in the printed copy by italics or capital letters.

Special Guidelines for Reading, Mathematics, and Science Content

Mathematical expressions and science vocabulary must be read precisely and carefully to avoid misrepresentation. For mathematics items involving algebraic expressions or other mathematical notation, it may be preferable for the reader to silently read the entire question before reading it aloud to the test-taker. Use technically correct yet simple terms, and be consistent in the treatment of similar expressions.

Sign Language Interpreters

Test-takers who are deaf or hard of hearing may require the services of an interpreter. The interpreter typically provides support to the student in understanding test instructions that would normally be read aloud to all students.

1. Discussions with the interpreter on testing procedures should be conducted with the test-taker present before (and not during) the test session.

2. Before the session, the interpreter must become familiar with the test instructions and the terminology used in the test that he or she will be interpreting.

3. An interpreter always lags a few words or phrases behind the person who is speaking. Allow short pauses for the test-taker to respond or to ask questions.

4. As the test administrator, remember to speak directly to the test-taker even when an interpreter is present.

5. Courtesy requires that test examiners not say things to the interpreter that they do not want repeated to the test taker. (For example, do not ask the interpreter’s opinion about the test taker or the situation.)

6. An interpreter may also provide a verbatim read-aloud accommodation for students who require this accommodation, as listed in the student’s IEP/504 plan.

Procedures for Scribing and Student Responses

Overview

A scribe is a Test Administrator or Proctor who writes down what a student dictates by speech, or through an assistive technology communication device. The guiding principle in scribing is to assist the student in accessing the test and responding to it. **Alterations or changes to an OSTP tests are not allowed and will result in test invalidation.** Any variation in the assessment environment or

process that fundamentally alters what the test measures or affects the comparability of scores is considered a modification.

A scribe must be currently employed educator/paraprofessional, must be familiar with scribing, and must have been trained as a Test Administrator or Proctor, and must have on file a signed Non-Disclosure (NDA) Form (See Test Preparation Manual). Individuals who serve as scribes need to be carefully prepared to ensure that they know the vocabulary involved and understand the boundaries of the assistance to be provided.

Scribes must be impartial and experienced in transcription. It is preferable for the scribe to be a familiar person, such as the teacher who is typically responsible for scribing during regular instruction. Scribes will review the test security procedures and will sign all statements required of Test Administrators/Proctors.

Scribes must fulfill the following duties:

- Sign a test security form acknowledging that they will ensure that the content of the written responses directly represents the independent work of the student.
- Sign a Nondisclosure Agreement (NDA) form.
- List the names and enrollment grades of the students whose responses were transcribed and send the form to the building test coordinator upon completion.
- Demonstrate proficiency in signing (ASL and/or signed English) if serving as both the interpreter and scribe.
- Test in a location where other examinees are not able to hear or see other students' responses.
- Remain silent while students are dictating or signing.
- Ask students to repeat a word or phrase for understanding when needed.
- Indicate when he/she was unable to understand the student's oral or signed response.
- Record the interpreter's response.

Produce legible text so that the written portion of the test can be scored.

- When transcribing from a handwritten or word-processed response, record punctuation, capitalization, and spelling as provided by the student.

Refrain from

- Communicating verbally or nonverbally whether the response is correct or incorrect
- Prompting the student in any way that would result in a better response or essay
- Influencing the student's response in any way
- Editing student work or completing a student's incomplete essay
- Discussing the student's essay with the student or any other person

Scribing Multiple-Choice Questions

The scribe should confirm the student's response before recording the student's answer on the score sheet or entering the student's response into the secure online testing client. If the scribe cannot understand a student's pattern of speech, or it is barely audible, large cards, each indicating one of the response options (e.g., A-D), can be used. The student can then choose the card that indicates the student's desired response to the multiple-choice question.

Scribing Constructed/Extended-Response Questions (Writing Tasks)

The scribe should determine the preferred mode of recording the student's response ***before*** the date of the test. At testing time, the student may then dictate the constructed/extended response directly to a scribe. A student with disabilities must be given the same opportunity as other students to plan, draft, and revise the constructed/extended response. The scribe's responsibility is to be both accurate and fair, neither diminishing the fluency of the student's response nor helping to improve or alter what the student asks to be recorded. This means that the scribe may write an outline or other plan as directed by the student. For Online Only tests, transcribing involves the transfer of a student's written response into the secure testing client.

The student does not have to specify repeatedly spelling and language conventions once the student has demonstrated knowledge and skills in the use of these spelling and language conventions. The scribe may apply these conventions automatically. Examples include the following:

- Once a student has demonstrated the knowledge of indicating the beginning of sentences with a capital letter, the student does not need to specify this throughout the remainder of the constructed/extended response. That is, scribes can automatically capitalize the first letter in the beginning of a sentence if the student has indicated punctuation ending the previous sentence. If the student has not indicated punctuation ending the previous sentence and says, "The dog ran. The dog jumped," the scribe would write "the dog ran the dog jumped".

- Homonyms and often-confused words such as "to," "two," and "too," or "there," "their," and "they're," or "than" and "then" should be spelled by the student each time they are used.

Scribing Procedures

To maintain the student's fluency of thought and to allow the student to demonstrate the requisite knowledge and skill in English-language arts conventions, the scribe should adhere to the following process:

1. The student dictates the response without interruption directly to the scribe or electronic recording device.

    a. Students may punctuate as they dictate. For example, when stating the sentence "The cat ran.", the student may say, "The cat ran period."

    b. Students may dictate more than one sentence at a time and add punctuation after the fact, when given the scribed sentences to proofread.

    c. The scribe transcribes a draft of the student's response exactly as dictated without including any conventions other than spelling. Probing or clarifying questions are not allowed except in the case of classifiers for students using ASL. Scribes may not question or correct student choices. Scribes may draw a diagram or a picture described by the student if the student is unable to draw the diagram or picture.

2. The scribe reads the draft to the student without vocal inflection that would indicate punctuation or alert the student to possible mistakes.

3. The student then provides letter-by-letter spelling for each word in the response that the scribe has determined must be spelled by the student. The scribe edits the draft of the constructed/extended response as spelled by the student.

4. The student views the draft and/or listens to the scribe as the scribe reads the draft of the constructed/extended response (i.e., written transcription). Students MUST be given the opportunity to review their responses in the way that the student prefers:

    a. Scribes may read back the dictation for proofreading to the student; or

    b. Students may review the written or typed response on paper or on the computer screen after having indicated word-for-word spelling according to these guidelines.

5. The student indicates additional edits to the scribe, including but not limited to paragraph structure, capitalization (for proper nouns, acronyms, and so forth), wording, spelling, or punctuation. The scribe will make those changes exactly as dictated by student, even if incorrect.

6. The scribe records the final written response. Scribes may handwrite (there is no penalty for cross-outs and insertions), type, or use a laptop to record the student's work. If the scribe types and prints out the student's responses, the responses need to be transcribed into the response booklet for paper based tests or typed directly into the secure testing client for online tests. The transcriber must copy the student's marks or responses exactly as he/she has written—including all errors in grammar, mechanics, spelling, etc.

    If necessary, proofread the student essay with another scribe before word processing the student response.

    - ✓ For an accuracy check, scribes may record the session on audio or videotape for play back.

    - ✓ Corrections of exclusively Braille errors will be at the discretion of the Scribe. Braille errors are those errors that occur specifically to that population due to recording medium. An example could be the result of the physical typing on a Braille machine, such as typing an 'f' as opposed to the intended 'd' due to finger misplacement. The transcriber has the option to verify student response with another examiner trained in Braille.

    - ✓ To increase accuracy, it is advisable to have one person reading the student's responses, as another transcribes them to the test booklet. The persons then switch roles to check the transcription. Transcriptions must take place in a secure environment and, whenever possible, under the direction of the building test coordinator. Please note that all test material—including the test booklet the student originally used—must be returned to the testing vendor.

    - ✓ Collect scratch paper, rough drafts, and login information immediately at the end of the testing session. These items are considered secure material and must be collected and shredded by the building testing coordinator at the end of the testing session.

Oklahoma Alternate Assessment Program (OAAP)

Oklahoma has developed the Oklahoma Alternate Assessment Program (OAAP) in order to to provide an appropriate assessment for students with the most significant cognitive disabilities. The Every Student Succeeds Act (ESSA) language identifies that only 1% of the total tested population can take the alternate assessment. The Criteria Checklist is intended to assist IEP teams in determining whether a student should participate in the regular assessment, with or without accommodations, or in an alternate assessment and to address documentation requirements under IDEA. For additional information on the OAAP, visit **http://ok.gov/sde/assessment** or contact the Special Education Office at (405) 521-3351.

Supporting Documents

OSTP ELA/Reading Test Read-Aloud Protocol

Form EA (Emergency Accommodation)

Form U (Unique Accommodation)

APPENDIX H—ONLINE TESTING ACCOMMODATION FREQUENCIES

Table H-1. 2016–17 OSTP: Numbers of Students Tested With Accommodations by Accommodation Type and Grade—Mathematics

Accommodation Code	Grade 6	Grade 7	Grade 8	Grade 10
AccomBasicCalculator	0	0	0	0
AccomColorContrast	226	191	213	158
AccomGeneralMasking	203	155	188	114
AccomMagnification	247	193	222	151
AccomReadAloudELA	0	0	0	0
AccomReadAloudMAT	4,305	4,948	4,645	2,808
AccomReadAloudSCI	0	0	0	0
AccomReadAloudUSH	0	0	0	0
AccomTurnoffUniversal	59	64	50	20
ELLWithAccoms	414	392	494	415
IEPWithAccoms	4,305	4,556	4,659	2,645
Plan504WithAccoms	338	236	213	80

Table H-2. 2016–17 OSTP: Numbers of Students Tested With Accommodations by Accommodation Type and Grade—ELA

Accommodation Code	Grade 6	Grade 7	Grade 8	Grade 10
AccomBasicCalculator	0	0	0	0
AccomColorContrast	225	189	213	157
AccomGeneralMasking	202	155	187	114
AccomMagnification	252	193	226	152
AccomReadAloudELA	88	106	293	191
AccomReadAloudMAT	0	0	0	0
AccomReadAloudSCI	0	0	0	0
AccomReadAloudUSH	0	0	0	0
AccomTurnoffUniversal	59	64	49	20
ELLWithAccoms	265	278	333	258
IEPWithAccoms	3,750	3,806	4,042	2,122
Plan504WithAccoms	327	225	210	80

Table H-3. 2016–17 OSTP: Numbers of Students Tested With Accommodations by Accommodation Type and Grade—Science

Accommodation Code	Grade 5	Grade 8	Grade 10
AccomBasicCalculator	0	0	0
AccomColorContrast	0	214	131
AccomGeneralMasking	0	188	93
AccomMagnification	0	222	125
AccomReadAloudELA	0	0	0
AccomReadAloudMAT	0	0	0
AccomReadAloudSCI	0	4,345	2,507
AccomReadAloudUSH	0	0	0
AccomTurnoffUniversal	0	49	17
ELLWithAccoms	883	438	395
IEPWithAccoms	5,250	4,271	2,222
Plan504WithAccoms	496	207	66

Table H-4. 2016–17 OSTP: Numbers of Students Tested With Accommodations by Accommodation Type and Grade—U.S. History

Accommodation Code	Grade 10
AccomBasicCalculator	0
AccomColorContrast	137
AccomGeneralMasking	99
AccomMagnification	130
AccomReadAloudELA	0
AccomReadAloudMAT	0
AccomReadAloudSCI	0
AccomReadAloudUSH	2,054
AccomTurnoffUniversal	24
ELLWithAccoms	185
IEPWithAccoms	2,032
Plan504WithAccoms	63

APPENDIX I—SCORE REPORTS

Table I-1. 2016–17 OSTP: Double Blind Report—Grade 5—Trait 1

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,964	1,220	176	14.4	138	78.4	36	20.5	2	1.1
	20,862	1,335	181	13.6	126	69.6	52	28.7	3	1.7
	20,990	1,240	155	12.5	117	75.5	34	21.9	4	2.6
	20,972	1,541	218	14.1	173	79.4	41	18.8	4	1.8
	20,880	737	78	10.6	57	73.1	19	24.4	2	2.6
	20,935	1,017	152	14.9	116	76.3	34	22.4	2	1.3
	20,963	1,360	167	12.3	125	74.9	36	21.6	6	3.6
	20,882	1,167	142	12.2	109	76.8	32	22.5	1	0.7
	20,974	1,723	386	22.4	292	75.6	79	20.5	15	3.9
	20,975	1,591	204	12.8	143	70.1	57	27.9	4	2
	20,892	750	86	11.5	69	80.2	15	17.4	2	2.3
	20,308	772	75	9.7	61	81.3	12	16	2	2.7
	20,938	1,229	198	16.1	160	80.8	33	16.7	5	2.5
	20,619	758	72	9.5	57	79.2	14	19.4	1	1.4
	20,885	259	29	11.2	24	82.8	5	17.2	0	0
	20,864	915	162	17.7	118	72.8	39	24.1	5	3.1
	20,886	945	116	12.3	79	68.1	30	25.9	7	6
	20,921	555	60	10.8	45	75	10	16.7	5	8.3
	20,976	2,410	313	13	242	77.3	59	18.8	12	3.8
	20,977	1,918	268	14	202	75.4	56	20.9	10	3.7
	20,627	1,097	133	12.1	94	70.7	29	21.8	10	7.5
	20,982	446	41	9.2	30	73.2	8	19.5	3	7.3
	18,435	739	77	10.4	62	80.5	15	19.5	0	0
	20,695	871	115	13.2	96	83.5	16	13.9	3	2.6
	20,978	2,593	300	11.6	235	78.3	62	20.7	3	1
	20,979	2,205	277	12.6	214	77.3	57	20.6	6	2.2

continued

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,888	1,686	257	15.2	200	77.8	53	20.6	4	1.6
	20,922	1,056	140	13.3	105	75	31	22.1	4	2.9
	20,907	3,023	371	12.3	269	72.5	81	21.8	21	5.7
	20,942	630	50	7.9	36	72	11	22	3	6
	20,988	1,521	208	13.7	154	74	48	23.1	6	2.9
	20,890	1,354	160	11.8	109	68.1	42	26.3	9	5.6
	20,891	1,081	118	10.9	91	77.1	24	20.3	3	2.5
	20,894	1,244	135	10.9	99	73.3	29	21.5	7	5.2
	20,916	365	23	6.3	16	69.6	7	30.4	0	0
	20,980	1,134	201	17.7	162	80.6	36	17.9	3	1.5
	20,962	1,114	110	9.9	83	75.5	20	18.2	7	6.4
	20,943	2,639	338	12.8	268	79.3	59	17.5	11	3.3
	20,944	1,134	122	10.8	93	76.2	23	18.9	6	4.9
	20,932	708	107	15.1	87	81.3	18	16.8	2	1.9
	20,918	653	60	9.2	40	66.7	17	28.3	3	5
	20,898	1,522	181	11.9	152	84	25	13.8	4	2.2
	20,899	535	43	8	33	76.7	9	20.9	1	2.3
	19,419	740	99	13.4	75	75.8	23	23.2	1	1
	20,901	949	130	13.7	101	77.7	25	19.2	4	3.1
	20,981	741	86	11.6	70	81.4	14	16.3	2	2.3
	20,919	1,003	118	11.8	91	77.1	19	16.1	8	6.8
	20,989	687	82	11.9	63	76.8	17	20.7	2	2.4
	18,211	1,237	142	11.5	102	71.8	34	23.9	6	4.2
	20,910	641	60	9.4	50	83.3	9	15	1	1.7
Total	**999,999**	**58,790**	**7,522**	**12.8**	**5,733**	**76.2**	**1,554**	**20.7**	**235**	**3.1**

Table I-2. 2016–17 OSTP: Double Blind Report—Grade 5—Trait 2

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,964	1,220	176	14.4	137	77.8	37	21	2	1.1
	20,862	1,335	181	13.6	131	72.4	46	25.4	4	2.2
	20,990	1,240	155	12.5	119	76.8	32	20.6	4	2.6
	20,972	1,541	218	14.1	173	79.4	41	18.8	4	1.8
	20,880	737	78	10.6	58	74.4	19	24.4	1	1.3
	20,935	1,017	152	14.9	114	75	35	23	3	2
	20,963	1,360	167	12.3	120	71.9	41	24.6	6	3.6
	20,882	1,167	142	12.2	105	73.9	36	25.4	1	0.7
	20,974	1,723	386	22.4	284	73.6	88	22.8	14	3.6
	20,975	1,591	204	12.8	144	70.6	57	27.9	3	1.5
	20,892	750	86	11.5	65	75.6	19	22.1	2	2.3
	20,308	772	75	9.7	63	84	10	13.3	2	2.7
	20,938	1,229	198	16.1	156	78.8	37	18.7	5	2.5
	20,619	758	72	9.5	59	81.9	12	16.7	1	1.4
	20,885	259	29	11.2	25	86.2	4	13.8	0	0
	20,864	915	162	17.7	116	71.6	41	25.3	5	3.1
	20,886	945	116	12.3	78	67.2	30	25.9	8	6.9
	20,921	555	60	10.8	42	70	13	21.7	5	8.3
	20,976	2,410	313	13	236	75.4	64	20.4	13	4.2
	20,977	1,918	268	14	204	76.1	54	20.1	10	3.7
	20,627	1,097	133	12.1	93	69.9	27	20.3	13	9.8
	20,982	446	41	9.2	27	65.9	11	26.8	3	7.3
	18,435	739	77	10.4	60	77.9	16	20.8	1	1.3
	20,695	871	115	13.2	93	80.9	19	16.5	3	2.6
	20,978	2,593	300	11.6	243	81	52	17.3	5	1.7
	20,979	2,205	277	12.6	208	75.1	63	22.7	6	2.2

continued

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,888	1,686	257	15.2	198	77	53	20.6	6	2.3
	20,922	1,056	140	13.3	108	77.1	28	20	4	2.9
	20,907	3,023	371	12.3	271	73	81	21.8	19	5.1
	20,942	630	50	7.9	37	74	10	20	3	6
	20,988	1,521	208	13.7	149	71.6	52	25	7	3.4
	20,890	1,354	160	11.8	98	61.3	53	33.1	9	5.6
	20,891	1,081	118	10.9	90	76.3	25	21.2	3	2.5
	20,894	1,244	135	10.9	101	74.8	26	19.3	8	5.9
	20,916	365	23	6.3	15	65.2	8	34.8	0	0
	20,980	1,134	201	17.7	165	82.1	33	16.4	3	1.5
	20,962	1,114	110	9.9	81	73.6	21	19.1	8	7.3
	20,943	2,639	338	12.8	266	78.7	61	18	11	3.3
	20,944	1,134	122	10.8	87	71.3	29	23.8	6	4.9
	20,932	708	107	15.1	84	78.5	21	19.6	2	1.9
	20,918	653	60	9.2	43	71.7	17	28.3	0	0
	20,898	1,522	181	11.9	149	82.3	28	15.5	4	2.2
	20,899	535	43	8	32	74.4	10	23.3	1	2.3
	19,419	740	99	13.4	69	69.7	29	29.3	1	1
	20,901	949	130	13.7	98	75.4	28	21.5	4	3.1
	20,981	741	86	11.6	65	75.6	19	22.1	2	2.3
	20,919	1,003	118	11.8	90	76.3	20	16.9	8	6.8
	20,989	687	82	11.9	61	74.4	19	23.2	2	2.4
	18,211	1,237	142	11.5	104	73.2	33	23.2	5	3.5
	20,910	641	60	9.4	50	83.3	9	15	1	1.7
Total	**999,999**	**58,790**	**7,522**	**12.8**	**5,664**	**75.3**	**1,617**	**21.5**	**241**	**3.2**

Table I-3. 2016–17 OSTP: Double Blind Report—Grade 5—Trait 3

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,964	1,220	176	14.4	133	75.6	40	22.7	3	1.7
	20,862	1,335	181	13.6	137	75.7	41	22.7	3	1.7
	20,990	1,240	155	12.5	116	74.8	35	22.6	4	2.6
	20,972	1,541	218	14.1	175	80.3	39	17.9	4	1.8
	20,880	737	78	10.6	58	74.4	19	24.4	1	1.3
	20,935	1,017	152	14.9	116	76.3	33	21.7	3	2
	20,963	1,360	167	12.3	124	74.3	37	22.2	6	3.6
	20,882	1,167	142	12.2	109	76.8	32	22.5	1	0.7
	20,974	1,723	386	22.4	283	73.3	88	22.8	15	3.9
	20,975	1,591	204	12.8	143	70.1	57	27.9	4	2
	20,892	750	86	11.5	64	74.4	20	23.3	2	2.3
	20,308	772	75	9.7	59	78.7	14	18.7	2	2.7
	20,938	1,229	198	16.1	158	79.8	35	17.7	5	2.5
	20,619	758	72	9.5	60	83.3	11	15.3	1	1.4
	20,885	259	29	11.2	26	89.7	2	6.9	1	3.4
	20,864	915	162	17.7	120	74.1	38	23.5	4	2.5
	20,886	945	116	12.3	80	69	28	24.1	8	6.9
	20,921	555	60	10.8	41	68.3	14	23.3	5	8.3
	20,976	2,410	313	13	240	76.7	61	19.5	12	3.8
	20,977	1,918	268	14	191	71.3	69	25.7	8	3
	20,627	1,097	133	12.1	93	69.9	28	21.1	12	9
	20,982	446	41	9.2	26	63.4	12	29.3	3	7.3
	18,435	739	77	10.4	60	77.9	16	20.8	1	1.3
	20,695	871	115	13.2	93	80.9	19	16.5	3	2.6
	20,978	2,593	300	11.6	240	80	57	19	3	1
	20,979	2,205	277	12.6	210	75.8	62	22.4	5	1.8

continued

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,888	1,686	257	15.2	205	79.8	47	18.3	5	1.9
	20,922	1,056	140	13.3	110	78.6	26	18.6	4	2.9
	20,907	3,023	371	12.3	281	75.7	72	19.4	18	4.9
	20,942	630	50	7.9	37	74	10	20	3	6
	20,988	1,521	208	13.7	150	72.1	50	24	8	3.8
	20,890	1,354	160	11.8	99	61.9	53	33.1	8	5
	20,891	1,081	118	10.9	88	74.6	26	22	4	3.4
	20,894	1,244	135	10.9	101	74.8	27	20	7	5.2
	20,916	365	23	6.3	15	65.2	8	34.8	0	0
	20,980	1,134	201	17.7	157	78.1	41	20.4	3	1.5
	20,962	1,114	110	9.9	78	70.9	24	21.8	8	7.3
	20,943	2,639	338	12.8	270	79.9	56	16.6	12	3.6
	20,944	1,134	122	10.8	87	71.3	29	23.8	6	4.9
	20,932	708	107	15.1	87	81.3	18	16.8	2	1.9
	20,918	653	60	9.2	44	73.3	16	26.7	0	0
	20,898	1,522	181	11.9	146	80.7	31	17.1	4	2.2
	20,899	535	43	8	33	76.7	9	20.9	1	2.3
	19,419	740	99	13.4	71	71.7	27	27.3	1	1
	20,901	949	130	13.7	99	76.2	28	21.5	3	2.3
	20,981	741	86	11.6	62	72.1	22	25.6	2	2.3
	20,919	1,003	118	11.8	89	75.4	21	17.8	8	6.8
	20,989	687	82	11.9	62	75.6	18	22	2	2.4
	18,211	1,237	142	11.5	106	74.6	32	22.5	4	2.8
	20,910	641	60	9.4	49	81.7	10	16.7	1	1.7
Total	**999,999**	**58,790**	**7,522**	**12.8**	**5,681**	**75.5**	**1,608**	**21.4**	**233**	**3.1**

Table I-4. 2016–17 OSTP: Double Blind Report—Grade 5—Trait 4

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,964	1,220	176	14.4	136	77.3	38	21.6	2	1.1
	20,862	1,335	181	13.6	135	74.6	42	23.2	4	2.2
	20,990	1,240	155	12.5	114	73.5	37	23.9	4	2.6
	20,972	1,541	218	14.1	174	79.8	40	18.3	4	1.8
	20,880	737	78	10.6	58	74.4	19	24.4	1	1.3
	20,935	1,017	152	14.9	116	76.3	33	21.7	3	2
	20,963	1,360	167	12.3	124	74.3	37	22.2	6	3.6
	20,882	1,167	142	12.2	109	76.8	32	22.5	1	0.7
	20,974	1,723	386	22.4	281	72.8	90	23.3	15	3.9
	20,975	1,591	204	12.8	147	72.1	54	26.5	3	1.5
	20,892	750	86	11.5	62	72.1	22	25.6	2	2.3
	20,308	772	75	9.7	59	78.7	14	18.7	2	2.7
	20,938	1,229	198	16.1	158	79.8	35	17.7	5	2.5
	20,619	758	72	9.5	57	79.2	14	19.4	1	1.4
	20,885	259	29	11.2	26	89.7	3	10.3	0	0
	20,864	915	162	17.7	120	74.1	38	23.5	4	2.5
	20,886	945	116	12.3	80	69	28	24.1	8	6.9
	20,921	555	60	10.8	40	66.7	15	25	5	8.3
	20,976	2,410	313	13	242	77.3	59	18.8	12	3.8
	20,977	1,918	268	14	189	70.5	70	26.1	9	3.4
	20,627	1,097	133	12.1	90	67.7	30	22.6	13	9.8
	20,982	446	41	9.2	25	61	13	31.7	3	7.3
	18,435	739	77	10.4	60	77.9	16	20.8	1	1.3
	20,695	871	115	13.2	94	81.7	18	15.7	3	2.6
	20,978	2,593	300	11.6	240	80	57	19	3	1
	20,979	2,205	277	12.6	205	74	67	24.2	5	1.8

continued

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,888	1,686	257	15.2	193	75.1	61	23.7	3	1.2
	20,922	1,056	140	13.3	113	80.7	23	16.4	4	2.9
	20,907	3,023	371	12.3	276	74.4	76	20.5	19	5.1
	20,942	630	50	7.9	37	74	10	20	3	6
	20,988	1,521	208	13.7	151	72.6	50	24	7	3.4
	20,890	1,354	160	11.8	100	62.5	52	32.5	8	5
	20,891	1,081	118	10.9	83	70.3	32	27.1	3	2.5
	20,894	1,244	135	10.9	98	72.6	30	22.2	7	5.2
	20,916	365	23	6.3	16	69.6	7	30.4	0	0
	20,980	1,134	201	17.7	161	80.1	38	18.9	2	1
	20,962	1,114	110	9.9	76	69.1	27	24.5	7	6.4
	20,943	2,639	338	12.8	267	79	59	17.5	12	3.6
	20,944	1,134	122	10.8	91	74.6	25	20.5	6	4.9
	20,932	708	107	15.1	85	79.4	20	18.7	2	1.9
	20,918	653	60	9.2	44	73.3	16	26.7	0	0
	20,898	1,522	181	11.9	141	77.9	36	19.9	4	2.2
	20,899	535	43	8	33	76.7	8	18.6	2	4.7
	19,419	740	99	13.4	70	70.7	28	28.3	1	1
	20,901	949	130	13.7	98	75.4	29	22.3	3	2.3
	20,981	741	86	11.6	65	75.6	19	22.1	2	2.3
	20,919	1,003	118	11.8	89	75.4	21	17.8	8	6.8
	20,989	687	82	11.9	64	78	16	19.5	2	2.4
	18,211	1,237	142	11.5	104	73.2	34	23.9	4	2.8
	20,910	641	60	9.4	51	85	8	13.3	1	1.7
Total	**999,999**	**58,790**	**7,522**	**12.8**	**5,647**	**75.1**	**1,646**	**21.9**	**229**	**3**

Table I-5. 2016–17 OSTP: Double Blind Report—Grade 5—Trait 5

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,964	1,220	176	14.4	134	76.1	39	22.2	3	1.7
	20,862	1,335	181	13.6	132	72.9	46	25.4	3	1.7
	20,990	1,240	155	12.5	113	72.9	38	24.5	4	2.6
	20,972	1,541	218	14.1	177	81.2	37	17	4	1.8
	20,880	737	78	10.6	58	74.4	19	24.4	1	1.3
	20,935	1,017	152	14.9	119	78.3	30	19.7	3	2
	20,963	1,360	167	12.3	126	75.4	35	21	6	3.6
	20,882	1,167	142	12.2	113	79.6	28	19.7	1	0.7
	20,974	1,723	386	22.4	282	73.1	90	23.3	14	3.6
	20,975	1,591	204	12.8	147	72.1	53	26	4	2
	20,892	750	86	11.5	62	72.1	22	25.6	2	2.3
	20,308	772	75	9.7	60	80	13	17.3	2	2.7
	20,938	1,229	198	16.1	158	79.8	35	17.7	5	2.5
	20,619	758	72	9.5	56	77.8	15	20.8	1	1.4
	20,885	259	29	11.2	26	89.7	3	10.3	0	0
	20,864	915	162	17.7	115	71	43	26.5	4	2.5
	20,886	945	116	12.3	81	69.8	27	23.3	8	6.9
	20,921	555	60	10.8	41	68.3	14	23.3	5	8.3
	20,976	2,410	313	13	245	78.3	56	17.9	12	3.8
	20,977	1,918	268	14	191	71.3	69	25.7	8	3
	20,627	1,097	133	12.1	91	68.4	30	22.6	12	9
	20,982	446	41	9.2	26	63.4	12	29.3	3	7.3
	18,435	739	77	10.4	59	76.6	18	23.4	0	0
	20,695	871	115	13.2	93	80.9	19	16.5	3	2.6
	20,978	2,593	300	11.6	240	80	56	18.7	4	1.3
	20,979	2,205	277	12.6	205	74	67	24.2	5	1.8

continued

Reader Name	MPID	Total Scored	Total # of Double Blinds	% DB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,888	1,686	257	15.2	193	75.1	61	23.7	3	1.2
	20,922	1,056	140	13.3	111	79.3	25	17.9	4	2.9
	20,907	3,023	371	12.3	281	75.7	70	18.9	20	5.4
	20,942	630	50	7.9	37	74	10	20	3	6
	20,988	1,521	208	13.7	150	72.1	51	24.5	7	3.4
	20,890	1,354	160	11.8	98	61.3	53	33.1	9	5.6
	20,891	1,081	118	10.9	84	71.2	31	26.3	3	2.5
	20,894	1,244	135	10.9	99	73.3	29	21.5	7	5.2
	20,916	365	23	6.3	16	69.6	7	30.4	0	0
	20,980	1,134	201	17.7	162	80.6	37	18.4	2	1
	20,962	1,114	110	9.9	77	70	25	22.7	8	7.3
	20,943	2,639	338	12.8	263	77.8	63	18.6	12	3.6
	20,944	1,134	122	10.8	92	75.4	24	19.7	6	4.9
	20,932	708	107	15.1	83	77.6	22	20.6	2	1.9
	20,918	653	60	9.2	43	71.7	17	28.3	0	0
	20,898	1,522	181	11.9	141	77.9	36	19.9	4	2.2
	20,899	535	43	8	31	72.1	10	23.3	2	4.7
	19,419	740	99	13.4	71	71.7	27	27.3	1	1
	20,901	949	130	13.7	99	76.2	28	21.5	3	2.3
	20,981	741	86	11.6	65	75.6	19	22.1	2	2.3
	20,919	1,003	118	11.8	89	75.4	21	17.8	8	6.8
	20,989	687	82	11.9	65	79.3	15	18.3	2	2.4
	18,211	1,237	142	11.5	104	73.2	34	23.9	4	2.8
	20,910	641	60	9.4	50	83.3	9	15	1	1.7
Total	**999,999**	**58,790**	**7,522**	**12.8**	**5,654**	**75.2**	**1,638**	**21.8**	**230**	**3.1**

Table I-6. 2016–17 OSTP: Read Behinds Report—Grade 8—Trait 1

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,861	518	80	15.4	68	85	10	12.5	2	2.5
	20,964	1,507	150	10	137	91.3	12	8	1	0.7
	20,912	1,451	170	11.7	153	90	16	9.4	1	0.6
	20,880	851	131	15.4	107	81.7	23	17.6	1	0.8
	20,935	1,514	155	10.2	134	86.5	21	13.5	0	0
	20,963	1,299	150	11.5	139	92.7	10	6.7	1	0.7
	20,882	1,271	196	15.4	191	97.4	5	2.6	0	0
	20,883	2,176	230	10.6	213	92.6	17	7.4	0	0
	20,892	856	124	14.5	114	91.9	10	8.1	0	0
	20,928	810	113	14	99	87.6	14	12.4	0	0
	20,936	1,063	118	11.1	102	86.4	16	13.6	0	0
	20,937	1,200	150	12.5	130	86.7	19	12.7	1	0.7
	20,938	704	94	13.4	86	91.5	8	8.5	0	0
	20,914	1,831	164	9	151	92.1	13	7.9	0	0
	20,619	668	114	17.1	96	84.2	18	15.8	0	0
	20,885	418	61	14.6	55	90.2	6	9.8	0	0
	20,864	728	114	15.7	98	86	16	14	0	0
	20,886	1,272	135	10.6	126	93.3	9	6.7	0	0
	20,888	2,089	229	11	207	90.4	21	9.2	1	0.4
	20,922	2,308	235	10.2	216	91.9	19	8.1	0	0
	20,889	163	32	19.6	27	84.4	5	15.6	0	0
	20,942	997	124	12.4	112	90.3	12	9.7	0	0
	18,565	2,798	298	10.7	271	90.9	27	9.1	0	0
	20,890	1,629	238	14.6	223	93.7	14	5.9	1	0.4
	20,891	1,111	137	12.3	133	97.1	4	2.9	0	0
	20,915	865	116	13.4	109	94	7	6	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,894	1,673	208	12.4	200	96.2	8	3.8	0	0
	20,916	875	135	15.4	132	97.8	3	2.2	0	0
	20,939	1,277	138	10.8	122	88.4	16	11.6	0	0
	20,917	898	97	10.8	84	86.6	12	12.4	1	1
	20,962	791	116	14.7	95	81.9	20	17.2	1	0.9
	20,943	2,907	219	7.5	169	77.2	49	22.4	1	0.5
	20,944	944	135	14.3	123	91.1	11	8.1	1	0.7
	20,932	830	117	14.1	111	94.9	6	5.1	0	0
	20,918	924	165	17.9	150	90.9	13	7.9	2	1.2
	20,897	749	107	14.3	95	88.8	12	11.2	0	0
	20,898	1,386	191	13.8	178	93.2	13	6.8	0	0
	20,899	821	168	20.5	159	94.6	9	5.4	0	0
	19,419	751	108	14.4	97	89.8	11	10.2	0	0
	20,901	903	110	12.2	105	95.5	5	4.5	0	0
	20,875	1,714	138	8.1	112	81.2	25	18.1	1	0.7
	20,919	2,086	167	8	133	79.6	33	19.8	1	0.6
	20,940	965	109	11.3	103	94.5	6	5.5	0	0
Total	**999,999**	**52,591**	**6,286**	**12**	**5,665**	**90.1**	**604**	**9.6**	**17**	**0.3**

Table I-7. 2016–17 OSTP: Read Behinds Report—Grade 8—Trait 2

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,861	518	80	15.4	71	88.8	8	10	1	1.3
	20,964	1,507	150	10	139	92.7	10	6.7	1	0.7
	20,912	1,451	170	11.7	156	91.8	13	7.6	1	0.6
	20,880	851	131	15.4	106	80.9	24	18.3	1	0.8
	20,935	1,514	155	10.2	134	86.5	21	13.5	0	0
	20,963	1,299	150	11.5	138	92	11	7.3	1	0.7
	20,882	1,271	196	15.4	189	96.4	6	3.1	1	0.5
	20,883	2,176	230	10.6	216	93.9	13	5.7	1	0.4
	20,892	856	124	14.5	114	91.9	10	8.1	0	0
	20,928	810	113	14	102	90.3	11	9.7	0	0
	20,936	1,063	118	11.1	102	86.4	16	13.6	0	0
	20,937	1,200	150	12.5	132	88	17	11.3	1	0.7
	20,938	704	94	13.4	87	92.6	7	7.4	0	0
	20,914	1,831	164	9	143	87.2	21	12.8	0	0
	20,619	668	114	17.1	97	85.1	17	14.9	0	0
	20,885	418	61	14.6	53	86.9	8	13.1	0	0
	20,864	728	114	15.7	102	89.5	11	9.6	1	0.9
	20,886	1,272	135	10.6	127	94.1	8	5.9	0	0
	20,888	2,089	229	11	203	88.6	26	11.4	0	0
	20,922	2,308	235	10.2	221	94	14	6	0	0
	20,889	163	32	19.6	29	90.6	3	9.4	0	0
	20,942	997	124	12.4	112	90.3	12	9.7	0	0
	18,565	2,798	298	10.7	272	91.3	26	8.7	0	0
	20,890	1,629	238	14.6	219	92	18	7.6	1	0.4
	20,891	1,111	137	12.3	130	94.9	6	4.4	1	0.7
	20,915	865	116	13.4	110	94.8	6	5.2	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,894	1,673	208	12.4	200	96.2	7	3.4	1	0.5
	20,916	875	135	15.4	130	96.3	5	3.7	0	0
	20,939	1,277	138	10.8	122	88.4	15	10.9	1	0.7
	20,917	898	97	10.8	83	85.6	13	13.4	1	1
	20,962	791	116	14.7	95	81.9	20	17.2	1	0.9
	20,943	2,907	219	7.5	169	77.2	49	22.4	1	0.5
	20,944	944	135	14.3	120	88.9	14	10.4	1	0.7
	20,932	830	117	14.1	113	96.6	4	3.4	0	0
	20,918	924	165	17.9	149	90.3	15	9.1	1	0.6
	20,897	749	107	14.3	100	93.5	7	6.5	0	0
	20,898	1,386	191	13.8	177	92.7	14	7.3	0	0
	20,899	821	168	20.5	156	92.9	12	7.1	0	0
	19,419	751	108	14.4	97	89.8	11	10.2	0	0
	20,901	903	110	12.2	97	88.2	13	11.8	0	0
	20,875	1,714	138	8.1	118	85.5	20	14.5	0	0
	20,919	2,086	167	8	135	80.8	30	18	2	1.2
	20,940	965	109	11.3	99	90.8	10	9.2	0	0
Total	**999,999**	**52,591**	**6,286**	**12**	**5,664**	**90.1**	**602**	**9.6**	**20**	**0.3**

Table I-8. 2016–17 OSTP: Read Behinds Report—Grade 8—Trait 3

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,861	518	80	15.4	67	83.8	12	15	1	1.3
	20,964	1,507	150	10	137	91.3	12	8	1	0.7
	20,912	1,451	170	11.7	154	90.6	15	8.8	1	0.6
	20,880	851	131	15.4	100	76.3	29	22.1	2	1.5
	20,935	1,514	155	10.2	135	87.1	19	12.3	1	0.6
	20,963	1,299	150	11.5	135	90	14	9.3	1	0.7
	20,882	1,271	196	15.4	187	95.4	8	4.1	1	0.5
	20,883	2,176	230	10.6	208	90.4	22	9.6	0	0
	20,892	856	124	14.5	111	89.5	13	10.5	0	0
	20,928	810	113	14	98	86.7	14	12.4	1	0.9
	20,936	1,063	118	11.1	102	86.4	16	13.6	0	0
	20,937	1,200	150	12.5	133	88.7	17	11.3	0	0
	20,938	704	94	13.4	88	93.6	6	6.4	0	0
	20,914	1,831	164	9	148	90.2	16	9.8	0	0
	20,619	668	114	17.1	96	84.2	18	15.8	0	0
	20,885	418	61	14.6	50	82	11	18	0	0
	20,864	728	114	15.7	98	86	16	14	0	0
	20,886	1,272	135	10.6	126	93.3	9	6.7	0	0
	20,888	2,089	229	11	207	90.4	22	9.6	0	0
	20,922	2,308	235	10.2	215	91.5	20	8.5	0	0
	20,889	163	32	19.6	25	78.1	7	21.9	0	0
	20,942	997	124	12.4	112	90.3	12	9.7	0	0
	18,565	2,798	298	10.7	271	90.9	27	9.1	0	0
	20,890	1,629	238	14.6	214	89.9	24	10.1	0	0
	20,891	1,111	137	12.3	126	92	10	7.3	1	0.7
	20,915	865	116	13.4	112	96.6	4	3.4	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,894	1,673	208	12.4	193	92.8	15	7.2	0	0
	20,916	875	135	15.4	128	94.8	7	5.2	0	0
	20,939	1,277	138	10.8	122	88.4	16	11.6	0	0
	20,917	898	97	10.8	80	82.5	16	16.5	1	1
	20,962	791	116	14.7	94	81	21	18.1	1	0.9
	20,943	2,907	219	7.5	169	77.2	49	22.4	1	0.5
	20,944	944	135	14.3	123	91.1	12	8.9	0	0
	20,932	830	117	14.1	110	94	7	6	0	0
	20,918	924	165	17.9	147	89.1	17	10.3	1	0.6
	20,897	749	107	14.3	96	89.7	11	10.3	0	0
	20,898	1,386	191	13.8	178	93.2	13	6.8	0	0
	20,899	821	168	20.5	153	91.1	15	8.9	0	0
	19,419	751	108	14.4	97	89.8	11	10.2	0	0
	20,901	903	110	12.2	102	92.7	8	7.3	0	0
	20,875	1,714	138	8.1	123	89.1	15	10.9	0	0
	20,919	2,086	167	8	142	85	23	13.8	2	1.2
	20,940	965	109	11.3	100	91.7	9	8.3	0	0
Total	**999,999**	**52,591**	**6,286**	**12**	**5,612**	**89.3**	**658**	**10.5**	**16**	**0.3**

Table I-9. 2016–17 OSTP: Read Behinds Report—Grade 8—Trait 4

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,861	518	80	15.4	72	90	6	7.5	2	2.5
	20,964	1,507	150	10	137	91.3	12	8	1	0.7
	20,912	1,451	170	11.7	153	90	16	9.4	1	0.6
	20,880	851	131	15.4	102	77.9	27	20.6	2	1.5
	20,935	1,514	155	10.2	138	89	17	11	0	0
	20,963	1,299	150	11.5	138	92	10	6.7	2	1.3
	20,882	1,271	196	15.4	189	96.4	6	3.1	1	0.5
	20,883	2,176	230	10.6	216	93.9	13	5.7	1	0.4
	20,892	856	124	14.5	111	89.5	13	10.5	0	0
	20,928	810	113	14	102	90.3	11	9.7	0	0
	20,936	1,063	118	11.1	102	86.4	16	13.6	0	0
	20,937	1,200	150	12.5	135	90	15	10	0	0
	20,938	704	94	13.4	88	93.6	6	6.4	0	0
	20,914	1,831	164	9	140	85.4	24	14.6	0	0
	20,619	668	114	17.1	98	86	16	14	0	0
	20,885	418	61	14.6	51	83.6	10	16.4	0	0
	20,864	728	114	15.7	99	86.8	15	13.2	0	0
	20,886	1,272	135	10.6	127	94.1	8	5.9	0	0
	20,888	2,089	229	11	210	91.7	19	8.3	0	0
	20,922	2,308	235	10.2	218	92.8	17	7.2	0	0
	20,889	163	32	19.6	29	90.6	3	9.4	0	0
	20,942	997	124	12.4	112	90.3	12	9.7	0	0
	18,565	2,798	298	10.7	271	90.9	27	9.1	0	0
	20,890	1,629	238	14.6	221	92.9	17	7.1	0	0
	20,891	1,111	137	12.3	127	92.7	9	6.6	1	0.7
	20,915	865	116	13.4	112	96.6	4	3.4	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,894	1,673	208	12.4	201	96.6	7	3.4	0	0
	20,916	875	135	15.4	130	96.3	5	3.7	0	0
	20,939	1,277	138	10.8	122	88.4	16	11.6	0	0
	20,917	898	97	10.8	83	85.6	13	13.4	1	1
	20,962	791	116	14.7	93	80.2	22	19	1	0.9
	20,943	2,907	219	7.5	172	78.5	46	21	1	0.5
	20,944	944	135	14.3	122	90.4	13	9.6	0	0
	20,932	830	117	14.1	113	96.6	4	3.4	0	0
	20,918	924	165	17.9	149	90.3	15	9.1	1	0.6
	20,897	749	107	14.3	98	91.6	9	8.4	0	0
	20,898	1,386	191	13.8	182	95.3	9	4.7	0	0
	20,899	821	168	20.5	154	91.7	14	8.3	0	0
	19,419	751	108	14.4	96	88.9	12	11.1	0	0
	20,901	903	110	12.2	103	93.6	7	6.4	0	0
	20,875	1,714	138	8.1	124	89.9	14	10.1	0	0
	20,919	2,086	167	8	141	84.4	24	14.4	2	1.2
	20,940	965	109	11.3	101	92.7	8	7.3	0	0
Total	**999,999**	**52,591**	**6,286**	**12**	**5,682**	**90.4**	**587**	**9.3**	**17**	**0.3**

Table I-10. 2016–17 OSTP: Read Behinds Report—Grade 8—Trait 5

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,861	518	80	15.4	72	90	6	7.5	2	2.5
	20,964	1,507	150	10	137	91.3	12	8	1	0.7
	20,912	1,451	170	11.7	151	88.8	18	10.6	1	0.6
	20,880	851	131	15.4	104	79.4	25	19.1	2	1.5
	20,935	1,514	155	10.2	139	89.7	16	10.3	0	0
	20,963	1,299	150	11.5	139	92.7	9	6	2	1.3
	20,882	1,271	196	15.4	188	95.9	8	4.1	0	0
	20,883	2,176	230	10.6	213	92.6	17	7.4	0	0
	20,892	856	124	14.5	112	90.3	12	9.7	0	0
	20,928	810	113	14	102	90.3	11	9.7	0	0
	20,936	1,063	118	11.1	101	85.6	17	14.4	0	0
	20,937	1,200	150	12.5	135	90	15	10	0	0
	20,938	704	94	13.4	86	91.5	8	8.5	0	0
	20,914	1,831	164	9	142	86.6	22	13.4	0	0
	20,619	668	114	17.1	98	86	16	14	0	0
	20,885	418	61	14.6	54	88.5	7	11.5	0	0
	20,864	728	114	15.7	99	86.8	15	13.2	0	0
	20,886	1,272	135	10.6	128	94.8	7	5.2	0	0
	20,888	2,089	229	11	210	91.7	19	8.3	0	0
	20,922	2,308	235	10.2	218	92.8	17	7.2	0	0
	20,889	163	32	19.6	28	87.5	4	12.5	0	0
	20,942	997	124	12.4	112	90.3	12	9.7	0	0
	18,565	2,798	298	10.7	271	90.9	27	9.1	0	0
	20,890	1,629	238	14.6	223	93.7	15	6.3	0	0
	20,891	1,111	137	12.3	127	92.7	8	5.8	2	1.5
	20,915	865	116	13.4	110	94.8	6	5.2	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,894	1,673	208	12.4	200	96.2	8	3.8	0	0
	20,916	875	135	15.4	130	96.3	5	3.7	0	0
	20,939	1,277	138	10.8	119	86.2	19	13.8	0	0
	20,917	898	97	10.8	83	85.6	13	13.4	1	1
	20,962	791	116	14.7	94	81	21	18.1	1	0.9
	20,943	2,907	219	7.5	168	76.7	50	22.8	1	0.5
	20,944	944	135	14.3	123	91.1	12	8.9	0	0
	20,932	830	117	14.1	112	95.7	5	4.3	0	0
	20,918	924	165	17.9	151	91.5	13	7.9	1	0.6
	20,897	749	107	14.3	97	90.7	10	9.3	0	0
	20,898	1,386	191	13.8	183	95.8	8	4.2	0	0
	20,899	821	168	20.5	156	92.9	12	7.1	0	0
	19,419	751	108	14.4	94	87	14	13	0	0
	20,901	903	110	12.2	101	91.8	9	8.2	0	0
	20,875	1,714	138	8.1	125	90.6	13	9.4	0	0
	20,919	2,086	167	8	142	85	23	13.8	2	1.2
	20,940	965	109	11.3	99	90.8	10	9.2	0	0
Total	**999,999**	**52,591**	**6,286**	**12**	**5,676**	**90.3**	**594**	**9.4**	**16**	**0.3**

Table I-11. 2016–17 OSTP: Read Behinds Report—Grade 10—Trait 1

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,601	861	124	14.4	113	91.1	9	7.3	2	1.6
	20,912	747	87	11.6	73	83.9	14	16.1	0	0
	20,880	396	69	17.4	59	85.5	9	13	1	1.4
	20,320	1,425	168	11.8	148	88.1	20	11.9	0	0
	20,935	792	99	12.5	93	93.9	6	6.1	0	0
	20,881	50	22	44	21	95.5	1	4.5	0	0
	20,882	848	99	11.7	84	84.8	15	15.2	0	0
	20,883	884	100	11.3	92	92	8	8	0	0
	18,401	722	7	1	7	100	0	0	0	0
	20,933	606	73	12	66	90.4	7	9.6	0	0
	20,913	352	56	15.9	49	87.5	7	12.5	0	0
	20,892	507	74	14.6	67	90.5	7	9.5	0	0
	20,928	500	63	12.6	54	85.7	9	14.3	0	0
	20,863	637	73	11.5	65	89	8	11	0	0
	20,573	592	80	13.5	76	95	4	5	0	0
	20,914	935	114	12.2	100	87.7	13	11.4	1	0.9
	20,619	420	75	17.9	59	78.7	15	20	1	1.3
	20,885	296	51	17.2	44	86.3	7	13.7	0	0
	17,130	945	4	0.4	4	100	0	0	0	0
	20,886	897	96	10.7	87	90.6	9	9.4	0	0
	18,470	2,216	109	4.9	80	73.4	28	25.7	1	0.9
	20,887	1,402	136	9.7	116	85.3	19	14	1	0.7
	20,921	915	85	9.3	74	87.1	11	12.9	0	0
	20,866	533	81	15.2	77	95.1	4	4.9	0	0
	20,867	1,121	124	11.1	108	87.1	14	11.3	2	1.6
	20,075	583	70	12	56	80	14	20	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,627	646	99	15.3	87	87.9	12	12.1	0	0
	18,435	597	72	12.1	59	81.9	13	18.1	0	0
	18,528	1,591	193	12.1	187	96.9	6	3.1	0	0
	20,868	369	69	18.7	58	84.1	11	15.9	0	0
	15,262	1,100	16	1.5	16	100	0	0	0	0
	16,766	1,815	201	11.1	190	94.5	11	5.5	0	0
	19,507	849	74	8.7	59	79.7	14	18.9	1	1.4
	20,888	1,088	119	10.9	110	92.4	9	7.6	0	0
	20,922	1,079	124	11.5	105	84.7	19	15.3	0	0
	20,934	738	88	11.9	81	92	7	8	0	0
	20,891	492	80	16.3	76	95	4	5	0	0
	16,742	680	10	1.5	8	80	2	20	0	0
	20,915	576	68	11.8	62	91.2	6	8.8	0	0
	20,894	871	120	13.8	108	90	12	10	0	0
	19,314	1,681	171	10.2	147	86	24	14	0	0
	20,269	1,501	148	9.9	124	83.8	23	15.5	1	0.7
	18,104	585	74	12.6	71	95.9	3	4.1	0	0
	16,274	491	5	1	4	80	1	20	0	0
	20,916	495	80	16.2	70	87.5	10	12.5	0	0
	20,917	535	69	12.9	63	91.3	6	8.7	0	0
	20,869	1,186	133	11.2	113	85	19	14.3	1	0.8
	19,614	879	14	1.6	11	78.6	3	21.4	0	0
	20,932	497	73	14.7	68	93.2	5	6.8	0	0
	20,872	61	7	11.5	6	85.7	1	14.3	0	0
	20,918	546	73	13.4	65	89	7	9.6	1	1.4
	20,873	10	4	40	3	75	1	25	0	0
	20,897	347	71	20.5	70	98.6	1	1.4	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,898	1,148	124	10.8	114	91.9	10	8.1	0	0
	19,674	764	95	12.4	84	88.4	11	11.6	0	0
	18,196	764	149	19.5	127	85.2	22	14.8	0	0
	20,899	487	102	20.9	94	92.2	7	6.9	1	1
	20,874	666	93	14	88	94.6	4	4.3	1	1.1
	16,327	309	41	13.3	35	85.4	6	14.6	0	0
	20,901	736	82	11.1	79	96.3	3	3.7	0	0
	20,875	1,011	109	10.8	89	81.7	19	17.4	1	0.9
	20,876	598	86	14.4	77	89.5	9	10.5	0	0
	20,919	1,184	131	11.1	112	85.5	19	14.5	0	0
	20,877	649	85	13.1	79	92.9	6	7.1	0	0
	20,062	1,804	192	10.6	158	82.3	34	17.7	0	0
	20,878	509	59	11.6	48	81.4	11	18.6	0	0
	20,879	3,266	346	10.6	308	89	38	11	0	0
Total	**999,999**	**55,382**	**6,088**	**11**	**5,385**	**88.5**	**687**	**11.3**	**16**	**0.3**

Table I-12. 2016–17 OSTP: Read Behinds Report—Grade 10—Trait 2

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,601	861	124	14.4	111	89.5	13	10.5	0	0
	20,912	747	87	11.6	75	86.2	12	13.8	0	0
	20,880	396	69	17.4	53	76.8	16	23.2	0	0
	20,320	1,425	168	11.8	153	91.1	15	8.9	0	0
	20,935	792	99	12.5	94	94.9	5	5.1	0	0
	20,881	50	22	44	20	90.9	2	9.1	0	0
	20,882	848	99	11.7	83	83.8	16	16.2	0	0
	20,883	884	100	11.3	94	94	6	6	0	0
	18,401	722	7	1	7	100	0	0	0	0
	20,933	606	73	12	67	91.8	6	8.2	0	0
	20,913	352	56	15.9	51	91.1	5	8.9	0	0
	20,892	507	74	14.6	68	91.9	6	8.1	0	0
	20,928	500	63	12.6	55	87.3	8	12.7	0	0
	20,863	637	73	11.5	65	89	8	11	0	0
	20,573	592	80	13.5	74	92.5	6	7.5	0	0
	20,914	935	114	12.2	95	83.3	19	16.7	0	0
	20,619	420	75	17.9	59	78.7	14	18.7	2	2.7
	20,885	296	51	17.2	46	90.2	5	9.8	0	0
	17,130	945	4	0.4	4	100	0	0	0	0
	20,886	897	96	10.7	84	87.5	12	12.5	0	0
	18,470	2,216	109	4.9	85	78	24	22	0	0
	20,887	1,402	136	9.7	122	89.7	14	10.3	0	0
	20,921	915	85	9.3	74	87.1	11	12.9	0	0
	20,866	533	81	15.2	79	97.5	2	2.5	0	0
	20,867	1,121	124	11.1	107	86.3	15	12.1	2	1.6
	20,075	583	70	12	53	75.7	17	24.3	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,627	646	99	15.3	88	88.9	11	11.1	0	0
	18,435	597	72	12.1	59	81.9	13	18.1	0	0
	18,528	1,591	193	12.1	187	96.9	6	3.1	0	0
	20,868	369	69	18.7	59	85.5	10	14.5	0	0
	15,262	1,100	16	1.5	16	100	0	0	0	0
	16,766	1,815	201	11.1	192	95.5	9	4.5	0	0
	19,507	849	74	8.7	61	82.4	13	17.6	0	0
	20,888	1,088	119	10.9	104	87.4	15	12.6	0	0
	20,922	1,079	124	11.5	103	83.1	21	16.9	0	0
	20,934	738	88	11.9	82	93.2	6	6.8	0	0
	20,891	492	80	16.3	70	87.5	10	12.5	0	0
	16,742	680	10	1.5	8	80	2	20	0	0
	20,915	576	68	11.8	65	95.6	3	4.4	0	0
	20,894	871	120	13.8	109	90.8	11	9.2	0	0
	19,314	1,681	171	10.2	153	89.5	18	10.5	0	0
	20,269	1,501	148	9.9	124	83.8	23	15.5	1	0.7
	18,104	585	74	12.6	66	89.2	8	10.8	0	0
	16,274	491	5	1	4	80	1	20	0	0
	20,916	495	80	16.2	69	86.3	9	11.3	2	2.5
	20,917	535	69	12.9	63	91.3	6	8.7	0	0
	20,869	1,186	133	11.2	109	82	23	17.3	1	0.8
	19,614	879	14	1.6	11	78.6	3	21.4	0	0
	20,932	497	73	14.7	69	94.5	4	5.5	0	0
	20,872	61	7	11.5	6	85.7	1	14.3	0	0
	20,918	546	73	13.4	63	86.3	9	12.3	1	1.4
	20,873	10	4	40	4	100	0	0	0	0
	20,897	347	71	20.5	71	100	0	0	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,898	1,148	124	10.8	115	92.7	9	7.3	0	0
	19,674	764	95	12.4	84	88.4	10	10.5	1	1.1
	18,196	764	149	19.5	126	84.6	23	15.4	0	0
	20,899	487	102	20.9	96	94.1	6	5.9	0	0
	20,874	666	93	14	84	90.3	8	8.6	1	1.1
	16,327	309	41	13.3	35	85.4	6	14.6	0	0
	20,901	736	82	11.1	76	92.7	6	7.3	0	0
	20,875	1,011	109	10.8	91	83.5	18	16.5	0	0
	20,876	598	86	14.4	73	84.9	13	15.1	0	0
	20,919	1,184	131	11.1	113	86.3	18	13.7	0	0
	20,877	649	85	13.1	80	94.1	5	5.9	0	0
	20,062	1,804	192	10.6	164	85.4	28	14.6	0	0
	20,878	509	59	11.6	53	89.8	6	10.2	0	0
	20,879	3,266	346	10.6	307	88.7	39	11.3	0	0
Total	**999,999**	**55,382**	**6,088**	**11**	**5,390**	**88.5**	**687**	**11.3**	**11**	**0.2**

Table I-13. 2016–17 OSTP: Read Behinds Report—Grade 10—Trait 3

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,601	861	124	14.4	107	86.3	17	13.7	0	0
	20,912	747	87	11.6	73	83.9	14	16.1	0	0
	20,880	396	69	17.4	58	84.1	10	14.5	1	1.4
	20,320	1,425	168	11.8	152	90.5	16	9.5	0	0
	20,935	792	99	12.5	93	93.9	6	6.1	0	0
	20,881	50	22	44	20	90.9	2	9.1	0	0
	20,882	848	99	11.7	81	81.8	18	18.2	0	0
	20,883	884	100	11.3	92	92	8	8	0	0
	18,401	722	7	1	7	100	0	0	0	0
	20,933	606	73	12	67	91.8	6	8.2	0	0
	20,913	352	56	15.9	52	92.9	4	7.1	0	0
	20,892	507	74	14.6	65	87.8	9	12.2	0	0
	20,928	500	63	12.6	53	84.1	10	15.9	0	0
	20,863	637	73	11.5	65	89	8	11	0	0
	20,573	592	80	13.5	76	95	4	5	0	0
	20,914	935	114	12.2	101	88.6	13	11.4	0	0
	20,619	420	75	17.9	58	77.3	16	21.3	1	1.3
	20,885	296	51	17.2	46	90.2	5	9.8	0	0
	17,130	945	4	0.4	4	100	0	0	0	0
	20,886	897	96	10.7	80	83.3	16	16.7	0	0
	18,470	2,216	109	4.9	83	76.1	26	23.9	0	0
	20,887	1,402	136	9.7	121	89	15	11	0	0
	20,921	915	85	9.3	73	85.9	12	14.1	0	0
	20,866	533	81	15.2	73	90.1	8	9.9	0	0
	20,867	1,121	124	11.1	104	83.9	18	14.5	2	1.6
	20,075	583	70	12	54	77.1	16	22.9	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,627	646	99	15.3	93	93.9	6	6.1	0	0
	18,435	597	72	12.1	59	81.9	13	18.1	0	0
	18,528	1,591	193	12.1	187	96.9	6	3.1	0	0
	20,868	369	69	18.7	62	89.9	7	10.1	0	0
	15,262	1,100	16	1.5	16	100	0	0	0	0
	16,766	1,815	201	11.1	195	97	6	3	0	0
	19,507	849	74	8.7	56	75.7	18	24.3	0	0
	20,888	1,088	119	10.9	104	87.4	15	12.6	0	0
	20,922	1,079	124	11.5	99	79.8	25	20.2	0	0
	20,934	738	88	11.9	82	93.2	5	5.7	1	1.1
	20,891	492	80	16.3	68	85	12	15	0	0
	16,742	680	10	1.5	9	90	1	10	0	0
	20,915	576	68	11.8	63	92.6	5	7.4	0	0
	20,894	871	120	13.8	109	90.8	11	9.2	0	0
	19,314	1,681	171	10.2	154	90.1	17	9.9	0	0
	20,269	1,501	148	9.9	123	83.1	24	16.2	1	0.7
	18,104	585	74	12.6	69	93.2	5	6.8	0	0
	16,274	491	5	1	4	80	1	20	0	0
	20,916	495	80	16.2	68	85	11	13.8	1	1.3
	20,917	535	69	12.9	63	91.3	6	8.7	0	0
	20,869	1,186	133	11.2	112	84.2	20	15	1	0.8
	19,614	879	14	1.6	11	78.6	3	21.4	0	0
	20,932	497	73	14.7	71	97.3	2	2.7	0	0
	20,872	61	7	11.5	7	100	0	0	0	0
	20,918	546	73	13.4	63	86.3	9	12.3	1	1.4
	20,873	10	4	40	3	75	1	25	0	0
	20,897	347	71	20.5	71	100	0	0	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,898	1,148	124	10.8	115	92.7	9	7.3	0	0
	19,674	764	95	12.4	84	88.4	11	11.6	0	0
	18,196	764	149	19.5	125	83.9	24	16.1	0	0
	20,899	487	102	20.9	91	89.2	11	10.8	0	0
	20,874	666	93	14	86	92.5	6	6.5	1	1.1
	16,327	309	41	13.3	35	85.4	6	14.6	0	0
	20,901	736	82	11.1	78	95.1	4	4.9	0	0
	20,875	1,011	109	10.8	92	84.4	17	15.6	0	0
	20,876	598	86	14.4	73	84.9	13	15.1	0	0
	20,919	1,184	131	11.1	106	80.9	25	19.1	0	0
	20,877	649	85	13.1	75	88.2	10	11.8	0	0
	20,062	1,804	192	10.6	163	84.9	29	15.1	0	0
	20,878	509	59	11.6	52	88.1	7	11.9	0	0
	20,879	3,266	346	10.6	306	88.4	40	11.6	0	0
Total	**999,999**	**55,382**	**6,088**	**11**	**5,360**	**88**	**718**	**11.8**	**10**	**0.2**

Table I-14. 2016–17 OSTP: Read Behinds Report—Grade 10—Trait 4

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,601	861	124	14.4	109	87.9	15	12.1	0	0
	20,912	747	87	11.6	73	83.9	14	16.1	0	0
	20,880	396	69	17.4	57	82.6	12	17.4	0	0
	20,320	1,425	168	11.8	149	88.7	19	11.3	0	0
	20,935	792	99	12.5	94	94.9	5	5.1	0	0
	20,881	50	22	44	21	95.5	1	4.5	0	0
	20,882	848	99	11.7	80	80.8	19	19.2	0	0
	20,883	884	100	11.3	90	90	10	10	0	0
	18,401	722	7	1	7	100	0	0	0	0
	20,933	606	73	12	68	93.2	5	6.8	0	0
	20,913	352	56	15.9	51	91.1	5	8.9	0	0
	20,892	507	74	14.6	68	91.9	6	8.1	0	0
	20,928	500	63	12.6	52	82.5	11	17.5	0	0
	20,863	637	73	11.5	65	89	8	11	0	0
	20,573	592	80	13.5	76	95	4	5	0	0
	20,914	935	114	12.2	100	87.7	14	12.3	0	0
	20,619	420	75	17.9	56	74.7	18	24	1	1.3
	20,885	296	51	17.2	49	96.1	2	3.9	0	0
	17,130	945	4	0.4	4	100	0	0	0	0
	20,886	897	96	10.7	78	81.3	18	18.8	0	0
	18,470	2,216	109	4.9	79	72.5	30	27.5	0	0
	20,887	1,402	136	9.7	120	88.2	16	11.8	0	0
	20,921	915	85	9.3	74	87.1	11	12.9	0	0
	20,866	533	81	15.2	71	87.7	10	12.3	0	0
	20,867	1,121	124	11.1	105	84.7	17	13.7	2	1.6
	20,075	583	70	12	55	78.6	15	21.4	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,627	646	99	15.3	92	92.9	7	7.1	0	0
	18,435	597	72	12.1	59	81.9	13	18.1	0	0
	18,528	1,591	193	12.1	187	96.9	6	3.1	0	0
	20,868	369	69	18.7	63	91.3	5	7.2	1	1.4
	15,262	1,100	16	1.5	16	100	0	0	0	0
	16,766	1,815	201	11.1	198	98.5	3	1.5	0	0
	19,507	849	74	8.7	57	77	17	23	0	0
	20,888	1,088	119	10.9	104	87.4	15	12.6	0	0
	20,922	1,079	124	11.5	100	80.6	24	19.4	0	0
	20,934	738	88	11.9	84	95.5	4	4.5	0	0
	20,891	492	80	16.3	72	90	8	10	0	0
	16,742	680	10	1.5	9	90	1	10	0	0
	20,915	576	68	11.8	64	94.1	4	5.9	0	0
	20,894	871	120	13.8	112	93.3	8	6.7	0	0
	19,314	1,681	171	10.2	153	89.5	18	10.5	0	0
	20,269	1,501	148	9.9	124	83.8	23	15.5	1	0.7
	18,104	585	74	12.6	71	95.9	3	4.1	0	0
	16,274	491	5	1	4	80	1	20	0	0
	20,916	495	80	16.2	71	88.8	8	10	1	1.3
	20,917	535	69	12.9	63	91.3	6	8.7	0	0
	20,869	1,186	133	11.2	110	82.7	22	16.5	1	0.8
	19,614	879	14	1.6	11	78.6	3	21.4	0	0
	20,932	497	73	14.7	72	98.6	1	1.4	0	0
	20,872	61	7	11.5	7	100	0	0	0	0
	20,918	546	73	13.4	65	89	7	9.6	1	1.4
	20,873	10	4	40	4	100	0	0	0	0
	20,897	347	71	20.5	70	98.6	1	1.4	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,898	1,148	124	10.8	115	92.7	9	7.3	0	0
	19,674	764	95	12.4	86	90.5	9	9.5	0	0
	18,196	764	149	19.5	123	82.6	26	17.4	0	0
	20,899	487	102	20.9	93	91.2	9	8.8	0	0
	20,874	666	93	14	86	92.5	6	6.5	1	1.1
	16,327	309	41	13.3	34	82.9	7	17.1	0	0
	20,901	736	82	11.1	77	93.9	5	6.1	0	0
	20,875	1,011	109	10.8	92	84.4	17	15.6	0	0
	20,876	598	86	14.4	73	84.9	13	15.1	0	0
	20,919	1,184	131	11.1	104	79.4	27	20.6	0	0
	20,877	649	85	13.1	78	91.8	7	8.2	0	0
	20,062	1,804	192	10.6	163	84.9	29	15.1	0	0
	20,878	509	59	11.6	48	81.4	11	18.6	0	0
	20,879	3,266	346	10.6	307	88.7	39	11.3	0	0
Total	**999,999**	**55,382**	**6,088**	**11**	**5,372**	**88.2**	**707**	**11.6**	**9**	**0.1**

Table I-15. 2016–17 OSTP: Read Behinds Report—Grade 10—Trait 5

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,601	861	124	14.4	106	85.5	17	13.7	1	0.8
	20,912	747	87	11.6	73	83.9	14	16.1	0	0
	20,880	396	69	17.4	59	85.5	10	14.5	0	0
	20,320	1,425	168	11.8	151	89.9	17	10.1	0	0
	20,935	792	99	12.5	92	92.9	7	7.1	0	0
	20,881	50	22	44	20	90.9	2	9.1	0	0
	20,882	848	99	11.7	80	80.8	19	19.2	0	0
	20,883	884	100	11.3	83	83	17	17	0	0
	18,401	722	7	1	7	100	0	0	0	0
	20,933	606	73	12	69	94.5	4	5.5	0	0
	20,913	352	56	15.9	49	87.5	7	12.5	0	0
	20,892	507	74	14.6	66	89.2	8	10.8	0	0
	20,928	500	63	12.6	52	82.5	11	17.5	0	0
	20,863	637	73	11.5	65	89	8	11	0	0
	20,573	592	80	13.5	78	97.5	2	2.5	0	0
	20,914	935	114	12.2	98	86	16	14	0	0
	20,619	420	75	17.9	58	77.3	16	21.3	1	1.3
	20,885	296	51	17.2	46	90.2	5	9.8	0	0
	17,130	945	4	0.4	4	100	0	0	0	0
	20,886	897	96	10.7	76	79.2	20	20.8	0	0
	18,470	2,216	109	4.9	81	74.3	28	25.7	0	0
	20,887	1,402	136	9.7	120	88.2	16	11.8	0	0
	20,921	915	85	9.3	72	84.7	13	15.3	0	0
	20,866	533	81	15.2	73	90.1	8	9.9	0	0
	20,867	1,121	124	11.1	105	84.7	17	13.7	2	1.6
	20,075	583	70	12	58	82.9	12	17.1	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,627	646	99	15.3	92	92.9	7	7.1	0	0
	18,435	597	72	12.1	59	81.9	13	18.1	0	0
	18,528	1,591	193	12.1	187	96.9	6	3.1	0	0
	20,868	369	69	18.7	62	89.9	6	8.7	1	1.4
	15,262	1,100	16	1.5	16	100	0	0	0	0
	16,766	1,815	201	11.1	198	98.5	3	1.5	0	0
	19,507	849	74	8.7	58	78.4	16	21.6	0	0
	20,888	1,088	119	10.9	105	88.2	14	11.8	0	0
	20,922	1,079	124	11.5	100	80.6	24	19.4	0	0
	20,934	738	88	11.9	83	94.3	5	5.7	0	0
	20,891	492	80	16.3	71	88.8	9	11.3	0	0
	16,742	680	10	1.5	9	90	1	10	0	0
	20,915	576	68	11.8	63	92.6	5	7.4	0	0
	20,894	871	120	13.8	111	92.5	9	7.5	0	0
	19,314	1,681	171	10.2	153	89.5	18	10.5	0	0
	20,269	1,501	148	9.9	124	83.8	23	15.5	1	0.7
	18,104	585	74	12.6	69	93.2	5	6.8	0	0
	16,274	491	5	1	4	80	1	20	0	0
	20,916	495	80	16.2	68	85	11	13.8	1	1.3
	20,917	535	69	12.9	63	91.3	6	8.7	0	0
	20,869	1,186	133	11.2	112	84.2	20	15	1	0.8
	19,614	879	14	1.6	11	78.6	3	21.4	0	0
	20,932	497	73	14.7	71	97.3	2	2.7	0	0
	20,872	61	7	11.5	5	71.4	2	28.6	0	0
	20,918	546	73	13.4	64	87.7	8	11	1	1.4
	20,873	10	4	40	4	100	0	0	0	0
	20,897	347	71	20.5	71	100	0	0	0	0

continued

Reader Name	MPID	Total Scored	Total # of Read Behinds	% RB	# Exact	% Exact	# Adjacent	% Adjacent	# Discrepant	% Discrepant
	20,898	1,148	124	10.8	115	92.7	9	7.3	0	0
	19,674	764	95	12.4	85	89.5	10	10.5	0	0
	18,196	764	149	19.5	124	83.2	25	16.8	0	0
	20,899	487	102	20.9	92	90.2	10	9.8	0	0
	20,874	666	93	14	86	92.5	6	6.5	1	1.1
	16,327	309	41	13.3	34	82.9	7	17.1	0	0
	20,901	736	82	11.1	76	92.7	6	7.3	0	0
	20,875	1,011	109	10.8	90	82.6	19	17.4	0	0
	20,876	598	86	14.4	74	86	12	14	0	0
	20,919	1,184	131	11.1	105	80.2	26	19.8	0	0
	20,877	649	85	13.1	77	90.6	8	9.4	0	0
	20,062	1,804	192	10.6	163	84.9	29	15.1	0	0
	20,878	509	59	11.6	53	89.8	6	10.2	0	0
	20,879	3,266	346	10.6	307	88.7	39	11.3	0	0
Total	**999,999**	**55,382**	**6,088**	**11**	**5,355**	**88**	**723**	**11.9**	**10**	**0.2**

APPENDIX J—INTERRATER AGREEMENT

Table J-1. 2016–17 OK OSTP: Item-Level Interrater Agreement Statistics

Subject	Grade	Item	Number of		Percent		Correlation	Percent of Third Scores
			Score Categories	*Examinee Scores*	*Exact*	*Adjacent*		
ELA	5	140927AG	5	4,883	66.05	33.22	0.56	0.74
		140927AI	5	4,883	67.66	31.50	0.55	0.84
		140927AO	5	4,883	66.21	32.83	0.55	0.96
		140927AS	5	4,883	65.90	33.38	0.56	0.72
		140927AW	5	4,883	66.58	32.62	0.54	0.80
	8	141500AG	5	4,752	62.31	36.49	0.61	1.20
		141500AI	5	4,752	63.28	35.12	0.59	1.60
		141500AO	5	4,752	61.93	36.64	0.61	1.43
		141500AS	5	4,752	62.21	36.49	0.61	1.30
		141500AW	5	4,752	62.02	36.74	0.61	1.24
	10	489583G	5	4,589	61.02	37.79	0.62	1.20
		489583I	5	4,589	63.35	35.24	0.58	1.42
		489583O	5	4,589	62.45	36.57	0.62	0.98
		489583S	5	4,589	62.19	36.81	0.64	1.00
		489583W	5	4,589	61.89	37.11	0.62	1.00

APPENDIX K—ITEM-LEVEL CLASSICAL STATISTICS

Table K-1. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Mathematics Grade 3

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
146908A	MC	0.83	0.31	0.00
146911A	MC	0.41	0.40	0.00
146922A	MC	0.88	0.36	0.00
146947A	MC	0.39	0.34	0.00
146955A	MC	0.73	0.37	0.00
147026A	MC	0.85	0.44	0.00
147044A	MC	0.70	0.41	0.00
147055A	MC	0.80	0.43	2.00
147064A	MC	0.93	0.34	0.00
147073A	MC	0.73	0.50	0.00
147300A	MC	0.65	0.36	0.00
147330A	MC	0.85	0.50	0.00
147382A	MC	0.89	0.48	0.00
147423A	MC	0.77	0.37	0.00
147503A	MC	0.80	0.58	0.00
147510A	MC	0.59	0.55	0.00
147528A	MC	0.58	0.57	0.00
147530A	MC	0.73	0.46	0.00
147532A	MC	0.75	0.41	0.00
147533A	MC	0.52	0.53	0.00
147542A	MC	0.70	0.46	0.00
147708A	MC	0.60	0.52	0.00
147712A	MC	0.82	0.51	0.00
147718A	MC	0.77	0.39	2.00
147722A	MC	0.77	0.32	0.00
147726A	MC	0.88	0.27	0.00
147727A	MC	0.61	0.44	0.00
147728A	MC	0.69	0.41	0.00
147741A	MC	0.89	0.43	0.00
147966A	MC	0.46	0.23	0.00
148041A	MC	0.83	0.51	0.00
148162A	MC	0.45	0.38	0.00
148514A	MC	0.17	0.22	0.00
148671A	MC	0.53	0.12	0.00
149283A	MC	0.34	0.33	0.00
149306A	MC	0.31	0.12	1.00
149309A	MC	0.36	0.22	0.00
150658A	MC	0.49	0.42	0.00
150663A	MC	0.74	0.41	0.00
151006A	MC	0.76	0.45	0.00
151476A	MC	0.90	0.43	0.00
151522A	MC	0.80	0.40	0.00
151560A	MC	0.80	0.39	0.00
152031A	MC	0.86	0.48	0.00
152320A	MC	0.46	0.39	0.00
152325A	MC	0.79	0.41	0.00
152349A	MC	0.74	0.29	0.00
152422A	MC	0.58	0.50	0.00
152546A	MC	0.83	0.42	0.00
152580A	MC	0.86	0.33	0.00
152598A	MC	0.56	0.50	0.00
152620A	MC	0.81	0.39	0.00
152623A	MC	0.70	0.26	0.00
152759A	MC	0.69	0.46	0.00
152842A	MC	0.31	0.37	0.00
152845A	MC	0.37	0.41	0.00
152857A	MC	0.45	0.31	1.00
152864A	MC	0.56	0.32	1.00
152867A	MC	0.67	0.40	0.00
152884A	MC	0.50	0.38	0.00
153154A	MC	0.81	0.36	0.00
153168A	MC	0.74	0.57	1.00
154307A	MC	0.49	0.40	0.00
154329A	MC	0.88	0.41	0.00
154340A	MC	0.89	0.42	0.00
154482A	MC	0.91	0.31	0.00
154484A	MC	0.82	0.49	0.00
154516A	MC	0.67	0.57	0.00
154553A	MC	0.31	0.41	0.00
154758A	MC	0.71	0.55	0.00
154760A	MC	0.66	0.58	0.00
155162A	MC	0.27	0.29	0.00
155185A	MC	0.31	0.37	0.00
155196A	MC	0.84	0.37	0.00
155226A	MC	0.55	0.33	1.00
155260A	MC	0.88	0.49	0.00
155261A	MC	0.79	0.42	0.00
155264A	MC	0.88	0.38	0.00
155265A	MC	0.65	0.45	0.00
155268A	MC	0.52	0.45	0.00
155314A	MC	0.72	0.43	0.00
152598A	MC	0.56	0.50	0.00
152620A	MC	0.81	0.39	0.00
152623A	MC	0.70	0.26	0.00
152759A	MC	0.69	0.46	0.00
152842A	MC	0.31	0.37	0.00
152845A	MC	0.37	0.41	0.00
152857A	MC	0.45	0.31	1.00
152864A	MC	0.56	0.32	1.00
152867A	MC	0.67	0.40	0.00
152884A	MC	0.50	0.38	0.00
153154A	MC	0.81	0.36	0.00
153168A	MC	0.74	0.57	1.00
154307A	MC	0.49	0.40	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
154329A	MC	0.88	0.41	0.00
154340A	MC	0.89	0.42	0.00
154482A	MC	0.91	0.31	0.00
154484A	MC	0.82	0.49	0.00
154516A	MC	0.67	0.57	0.00
154553A	MC	0.31	0.41	0.00
154758A	MC	0.71	0.55	0.00
154760A	MC	0.66	0.58	0.00
155162A	MC	0.27	0.29	0.00
155185A	MC	0.31	0.37	0.00
155196A	MC	0.84	0.37	0.00
155226A	MC	0.55	0.33	1.00
155260A	MC	0.88	0.49	0.00
155261A	MC	0.79	0.42	0.00
155264A	MC	0.88	0.38	0.00
155265A	MC	0.65	0.45	0.00
155268A	MC	0.52	0.45	0.00
155314A	MC	0.72	0.43	0.00
155404A	MC	0.92	0.33	0.00
155455A	MC	0.49	0.42	0.00
155478A	MC	0.66	0.49	0.00
155486A	MC	0.92	0.40	0.00
155495A	MC	0.77	0.45	0.00
155525A	MC	0.81	0.56	0.00
155550A	MC	0.80	0.49	0.00
155594A	MC	0.62	0.42	0.00
155617A	MC	0.54	0.21	0.00
155918A	MC	0.75	0.43	0.00
155934A	MC	0.83	0.47	0.00
155999A	MC	0.58	0.34	0.00
156021A	MC	0.85	0.45	0.00
161166A	MC	0.85	0.50	0.00
184059A	MC	0.57	0.34	0.00
184065A	MC	0.81	0.41	0.00
184068A	MC	0.86	0.24	0.00
187104A	MC	0.31	0.17	0.00
479031	MC	0.91	0.30	1.00
479103	MC	0.94	0.25	1.00
479105	MC	0.93	0.28	1.00
479107	MC	0.94	0.28	0.00
479109	MC	0.75	0.47	0.00
479111	MC	0.71	0.46	0.00
479113	MC	0.91	0.40	0.00
479115	MC	0.56	0.43	0.00
479117	MC	0.73	0.39	0.00
479119	MC	0.56	0.48	0.00
479121	MC	0.64	0.37	0.00
479123	MC	0.86	0.46	0.00
479125	MC	0.96	0.32	0.00
479127	MC	0.85	0.34	0.00
479129	MC	0.94	0.22	0.00
479131	MC	0.91	0.38	0.00
479136	MC	0.70	0.46	0.00
479138	MC	0.49	0.45	0.00
479140	MC	0.76	0.40	0.00
479142	MC	0.49	0.33	0.00
488998	MC	0.46	0.35	0.00

Table K-2. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Mathematics Grade 4

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
146927A	MC	0.59	0.50	0.00
146938A	MC	0.63	0.39	0.00
146941A	MC	0.62	0.46	0.00
146944A	MC	0.55	0.40	0.00
147045A	MC	0.96	0.29	0.00
147295A	MC	0.86	0.32	0.00
147318A	MC	0.93	0.32	0.00
147319A	MC	0.87	0.32	0.00
147409A	MC	0.59	0.49	0.00
147525A	MC	0.76	0.46	0.00
147734A	MC	0.73	0.25	0.00
147975A	MC	0.51	0.25	0.00
148069A	MC	0.85	0.38	0.00
148236A	MC	0.62	0.44	0.00
148258A	MC	0.66	0.46	0.00
148259A	MC	0.59	0.46	0.00
148261A	MC	0.82	0.49	0.00
148264A	MC	0.70	0.49	0.00
148287A	MC	0.56	0.40	0.00
148301A	MC	0.49	0.39	0.00
148346A	MC	0.73	0.45	0.00
148500A	MC	0.56	0.43	0.00
148627A	MC	0.55	0.34	0.00
148649A	MC	0.55	0.49	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
148664A	MC	0.65	0.36	0.00
148669A	MC	0.87	0.39	0.00
148675A	MC	0.33	0.24	0.00
149223A	MC	0.83	0.28	0.00
149250A	MC	0.78	0.40	0.00
149254A	MC	0.54	0.53	0.00
149486A	MC	0.34	0.26	0.00
149504A	MC	0.85	0.36	0.00
149642A	MC	0.48	0.14	0.00
149723A	MC	0.58	0.45	0.00
150204A	MC	0.29	0.18	0.00
150227A	MC	0.40	0.20	0.00
150584A	MC	0.91	0.39	0.00
150642A	MC	0.45	0.31	0.00
150654A	MC	0.80	0.41	0.00
150664A	MC	0.69	0.49	0.00
150722A	MC	0.37	0.21	0.00
150858A	MC	0.52	0.22	0.00
150931A	MC	0.56	0.46	0.00
151071A	MC	0.78	0.30	0.00
151080A	MC	0.61	0.37	0.00
151081A	MC	0.47	0.26	0.00
151278A	MC	0.59	0.31	0.00
151289A	MC	0.90	0.30	0.00
151506A	MC	0.49	0.44	0.00
151513A	MC	0.77	0.39	0.00
151515A	MC	0.52	0.24	0.00
151519A	MC	0.87	0.39	0.00
151549A	MC	0.82	0.35	0.00
151550A	MC	0.71	0.50	0.00
151553A	MC	0.88	0.37	0.00
151554A	MC	0.83	0.35	0.00
151556A	MC	0.72	0.50	0.00
151561A	MC	0.58	0.41	0.00
151997A	MC	0.62	0.51	0.00
152039A	MC	0.33	0.10	0.00
152143A	MC	0.56	0.39	0.00
152152A	MC	0.68	0.38	0.00
152185A	MC	0.85	0.34	0.00
152193A	MC	0.77	0.33	0.00
152197A	MC	0.78	0.31	0.00
152343A	MC	0.46	0.51	0.00
152353A	MC	0.60	0.45	0.00
152518A	MC	0.81	0.39	0.00
152635A	MC	0.56	0.55	0.00
152776A	MC	0.58	0.16	0.00
152789A	MC	0.54	0.44	0.00
152872A	MC	0.82	0.41	0.00
152874A	MC	0.38	0.40	0.00
152881A	MC	0.58	0.47	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
152904A	MC	0.48	0.53	0.00
152985A	MC	0.78	0.41	0.00
152988A	MC	0.73	0.46	0.00
153171A	MC	0.52	0.45	0.00
153189A	MC	0.49	0.46	0.00
153206A	MC	0.69	0.42	0.00
153325A	MC	0.39	0.42	0.00
153327A	MC	0.67	0.46	0.00
153346A	MC	0.93	0.19	0.00
153935A	MC	0.56	0.37	0.00
153938A	MC	0.80	0.16	0.00
153941A	MC	0.67	0.40	0.00
153951A	MC	0.87	0.35	0.00
154024A	MC	0.55	0.50	0.00
154479A	MC	0.44	0.28	0.00
154501A	MC	0.81	0.53	0.00
154503A	MC	0.83	0.43	0.00
154512A	MC	0.77	0.41	0.00
154619A	MC	0.51	0.27	0.00
155121A	MC	0.33	0.32	0.00
155167A	MC	0.91	0.32	0.00
155192A	MC	0.54	0.30	0.00
155207A	MC	0.92	0.38	0.00
155220A	MC	0.72	0.32	0.00
155948A	MC	0.95	0.29	0.00
156018A	MC	0.65	0.52	0.00
156019A	MC	0.68	0.49	0.00
156031A	MC	0.59	0.47	0.00
163986A	MC	0.62	0.09	0.00
163993A	MC	0.93	0.37	0.00
181118A	MC	0.89	0.32	0.00
184099A	MC	0.65	0.39	0.00
184121A	MC	0.93	0.32	0.00
184203A	MC	0.52	0.42	0.00
184241A	MC	0.75	0.42	0.00
184250A	MC	0.93	0.36	0.00
479500	MC	0.91	0.29	0.00
479502	MC	0.74	0.42	0.00
479504	MC	0.48	0.53	0.00
479507	MC	0.77	0.24	0.00
479555	MC	0.38	0.32	0.00
479917	MC	0.60	0.27	0.00
479919	MC	0.54	0.46	0.00
479930	MC	0.74	0.25	0.00
479932	MC	0.41	0.23	0.00
491952	MC	0.94	0.31	0.00

Table K-3. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Mathematics Grade 5

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
146915A	MC	0.79	0.47	0.00
146930A	MC	0.64	0.35	0.00
146959A	MC	0.64	0.36	0.00
147291A	MC	0.80	0.35	0.00
147537A	MC	0.88	0.31	0.00
147747A	MC	0.71	0.40	1.00
147753A	MC	0.85	0.36	0.00
147925A	MC	0.93	0.19	0.00
147932A	MC	0.70	0.35	0.00
147968A	MC	0.88	0.33	0.00
147990A	MC	0.51	0.50	0.00
148011A	MC	0.73	0.46	0.00
148098A	MC	0.78	0.40	0.00
148173A	MC	0.40	0.34	0.00
148344A	MC	0.79	0.39	0.00
148629A	MC	0.57	0.42	0.00
148635A	MC	0.72	0.51	0.00
148644A	MC	0.77	0.36	0.00
148659A	MC	0.68	0.52	0.00
148852A	MC	0.49	0.39	0.00
149230A	MC	0.60	0.50	0.00
149232A	MC	0.90	0.34	0.00
149241A	MC	0.78	0.37	0.00
149244A	MC	0.82	0.24	0.00
149246A	MC	0.65	0.44	0.00
149255A	MC	0.91	0.27	0.00
149258A	MC	0.79	0.41	0.00
149261A	MC	0.40	0.46	0.00
149274A	MC	0.55	0.29	0.00
149275A	MC	0.54	0.32	0.00
149280A	MC	0.65	0.43	0.00
149284A	MC	0.59	0.39	0.00
149289A	MC	0.50	0.40	0.00
149290A	MC	0.57	0.58	0.00
149292A	MC	0.66	0.47	0.00
149305A	MC	0.43	0.37	0.00
149310A	MC	0.65	0.54	0.00
149384A	MC	0.74	0.42	0.00
149559A	MC	0.35	0.25	0.00
149611A	MC	0.62	0.45	0.00
149624A	MC	0.55	0.28	0.00
149639A	MC	0.82	0.39	0.00
149640A	MC	0.39	0.43	0.00
150183A	MC	0.41	0.33	0.00
150239A	MC	0.79	0.17	0.00
150267A	MC	0.49	0.32	0.00
150433A	MC	0.39	0.35	0.00
150628A	MC	0.84	0.37	0.00
150631A	MC	0.72	0.49	0.00
150703A	MC	0.25	0.13	0.00
151248A	MC	0.76	0.24	0.00
152006A	MC	0.77	0.36	0.00
152041A	MC	0.79	0.44	0.00
152807A	MC	0.55	0.39	0.00
152859A	MC	0.62	0.31	0.00
152878A	MC	0.74	0.45	0.00
152933A	MC	0.51	0.20	0.00
152946A	MC	0.72	0.45	0.00
152989A	MC	0.81	0.31	0.00
153075A	MC	0.51	0.54	0.00
153076A	MC	0.54	0.53	0.00
153107A	MC	0.57	0.47	0.00
153144A	MC	0.91	0.26	0.00
153162A	MC	0.87	0.30	0.00
153165A	MC	0.47	0.48	0.00
153308A	MC	0.39	0.40	0.00
153416A	MC	0.52	0.39	0.00
153420A	MC	0.65	0.39	0.00
153942A	MC	0.43	0.43	0.00
153950A	MC	0.87	0.32	0.00
153972A	MC	0.68	0.40	0.00
153979A	MC	0.59	0.43	0.00
154022A	MC	0.70	0.43	0.00
154031A	MC	0.90	0.30	0.00
154046A	MC	0.48	0.52	0.00
154048A	MC	0.55	0.54	0.00
154530A	MC	0.53	0.48	0.00
154532A	MC	0.52	0.49	0.00
154536A	MC	0.54	0.42	0.00
154551A	MC	0.68	0.46	0.00
155103A	MC	0.23	0.39	0.00
155134A	MC	0.17	0.40	0.00
155145A	MC	0.53	0.35	0.00
155155A	MC	0.56	0.44	0.00
155157A	MC	0.45	0.41	0.00
155215A	MC	0.87	0.41	0.00
155232A	MC	0.81	0.48	0.00
155234A	MC	0.20	0.43	0.00
155328A	MC	0.42	0.42	0.00
155329A	MC	0.63	0.47	0.00
155335A	MC	0.78	0.32	0.00
155337A	MC	0.59	0.45	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
155403A	MC	0.60	0.47	0.00
155409A	MC	0.84	0.38	0.00
155434A	MC	0.61	0.42	0.00
155462A	MC	0.34	0.49	0.00
155469A	MC	0.51	0.42	0.00
155479A	MC	0.43	0.40	0.00
155489A	MC	0.56	0.46	0.00
155505A	MC	0.82	0.31	0.00
155515A	MC	0.73	0.42	1.00
155520A	MC	0.69	0.40	0.00
156035A	MC	0.87	0.22	0.00
161469A	MC	0.85	0.37	0.00
161578A	MC	0.39	0.32	0.00
181426A	MC	0.60	0.26	0.00
184260A	MC	0.55	0.41	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
184261A	MC	0.65	0.34	0.00
184263A	MC	0.82	0.28	0.00
184306A	MC	0.81	0.34	0.00
184319A	MC	0.69	0.40	0.00
187144A	MC	0.55	0.37	0.00
187149A	MC	0.59	0.41	0.00
187209A	MC	0.34	0.29	0.00
484706	MC	0.58	0.36	0.00
484712	MC	0.19	0.39	0.00
484716	MC	0.22	0.34	0.00
484718	MC	0.91	0.29	0.00
489954	MC	0.89	0.31	0.00
489964	MC	0.86	0.37	0.00
489975	MC	0.41	0.29	0.00

Table K-4. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Mathematics Grade 6

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
146958A	MC	0.80	0.44	0.00
147412A	MC	0.68	0.46	0.00
147432A	MC	0.74	0.52	0.00
147578A	MC	0.43	0.32	0.00
148159A	MC	0.76	0.20	0.00
148179A	MC	0.36	0.16	0.00
148231A	MC	0.75	0.47	0.00
148275A	MC	0.86	0.28	0.00
148336A	MC	0.81	0.43	
148642A	MC	0.45	0.09	0.00
148828A	MC	0.59	0.31	0.00
148847A	MC	0.37	0.25	0.00
148897A	MC	0.66	0.29	0.00
148926A	MC	0.86	0.34	0.00
149062A	MC	0.83	0.30	
149140A	MC	0.60	0.38	0.00
149231A	MC	0.68	0.50	0.00
149234A	MC	0.79	0.45	0.00
149259A	MC	0.77	0.52	0.00
149333A	MC	0.42	0.36	0.00
149341A	MC	0.64	0.41	
149380A	MC	0.91	0.34	0.00
149470A	MC	0.89	0.33	
149511A	MC	0.68	0.35	0.00
149730A	MC	0.61	0.43	0.00
149750A	MC	0.34	0.36	0.00
150270A	MC	0.59	0.32	0.00
150604A	MC	0.49	0.38	0.00
150617A	MC	0.85	0.28	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
150723A	MC	0.79	0.48	0.00
150912A	MC	0.93	0.16	0.00
150963A	MC	0.48	0.42	0.00
150972A	MC	0.50	0.51	0.00
150977A	MC	0.63	0.44	0.00
151145A	MC	0.70	0.36	0.00
151235A	MC	0.50	0.39	0.00
151316A	MC	0.67	0.48	0.00
151512A	MC	0.50	0.27	0.00
151710A	MC	0.77	0.46	0.00
151782A	MC	0.25	0.21	0.00
151921A	MC	0.73	0.22	
152301A	MC	0.68	0.40	0.00
152379A	MC	0.62	0.57	
152527A	MC	0.86	0.35	
152528A	MC	0.94	0.27	0.00
152531A	MC	0.78	0.35	0.00
152633A	MC	0.78	0.49	0.00
152666A	MC	0.33	0.40	
152754A	MC	0.39	0.35	
152834A	MC	0.77	0.30	0.00
152840A	MC	0.79	0.45	
152853A	MC	0.37	0.32	0.00
152908A	MC	0.62	0.48	0.00
152957A	MC	0.72	0.24	0.00
153088A	MC	0.92	0.18	0.00
153103A	MC	0.54	0.39	0.00
153270A	MC	0.49	0.25	0.00
153298A	MC	0.39	0.28	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
153315A	MC	0.52	0.46	0.00
153382A	MC	0.46	0.33	0.00
153445A	MC	0.50	0.40	0.00
153512A	MC	0.72	0.33	
153601A	MC	0.66	0.44	0.00
153952A	MC	0.86	0.28	0.00
153988A	MC	0.73	0.23	
154011A	MC	0.71	0.33	0.00
154500A	MC	0.93	0.35	0.00
155138A	MC	0.48	0.36	0.00
155177A	MC	0.93	0.35	0.00
155218A	MC	0.84	0.41	0.00
155298A	MC	0.66	0.49	0.00
155323A	MC	0.86	0.37	0.00
155450A	MC	0.52	0.26	0.00
155464A	MC	0.76	0.14	0.00
155496A	MC	0.92	0.37	0.00
161493A	MC	0.31	0.38	0.00
181240A	MC	0.73	0.45	0.00
181405A	MC	0.43	0.27	
181415A	MC	0.31	0.31	0.00
181448A	MC	0.34	0.17	0.00
181455A	MC	0.62	0.41	0.00
181997A	MC	0.27	0.12	0.00
184316A	MC	0.77	0.43	0.00
187093A	MC	0.48	0.19	0.00
187116A	MC	0.48	0.45	0.00
187119A	MC	0.68	0.43	0.00
187202A	MC	0.43	0.25	0.00
479039	MC	0.51	0.28	0.00
479041	MC	0.81	0.39	0.00
479043	MC	0.31	0.24	0.00
479045	MC	0.58	0.26	0.00
479047	MC	0.38	0.21	0.00
479049	MC	0.29	0.13	0.00
479051	MC	0.48	0.37	0.00
479053	MC	0.35	0.36	0.00
479055	MC	0.75	0.23	0.00
479057	MC	0.72	0.36	0.00
479059	MC	0.59	0.43	0.00
479061	MC	0.62	0.45	0.00
479063	MC	0.22	0.27	
479065	MC	0.17	0.23	0.00
479067	MC	0.40	0.18	0.00
479069	MC	0.80	0.37	0.00
479071	MC	0.70	0.35	0.00
479073	MC	0.85	0.39	0.00
479075	MC	0.95	0.28	0.00
479077	MC	0.38	0.32	0.00
479081	MC	0.76	0.43	0.00
479083	MC	0.60	0.38	0.00
479087	MC	0.41	0.19	0.00
479095	TEI	0.16	0.36	0.00
479097	TEI	0.35	0.43	0.00
479099	TEI	0.20	0.30	0.00
479101	TEI	0.07	0.19	0.00
479133	TEI	0.08	0.29	0.00
479146	TEI	0.12	0.37	0.00
479148	TEI	0.13	0.37	0.00
509462	MC	0.28	0.10	0.00
509941	MC	0.39	0.26	0.00
510212	MC	0.26	0.08	

Table K-5. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Mathematics Grade 7

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
147366A	MC	0.60	0.53	0.00
147541A	MC	0.83	0.39	0.00
147576A	MC	0.69	0.44	0.00
148009A	MC	0.35	0.34	0.00
148193A	MC	0.30	0.32	0.00
148268A	MC	0.37	0.38	0.00
148330A	MC	0.51	0.47	0.00
148478A	MC	0.29	0.31	0.00
148524A	MC	0.64	0.29	0.00
148527A	MC	0.63	0.43	0.00
148704A	MC	0.58	0.44	0.00
148711A	MC	0.59	0.52	0.00
148739A	MC	0.69	0.46	0.00
148826A	MC	0.89	0.29	0.00
148912A	MC	0.54	0.36	0.00
148934A	MC	0.52	0.44	0.00
149061A	MC	0.80	0.37	0.00
149063A	MC	0.73	0.44	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
149081A	MC	0.80	0.28	0.00
149102A	MC	0.33	0.24	0.00
149204A	MC	0.61	0.43	0.00
149208A	MC	0.57	0.43	
149256A	MC	0.46	0.24	0.00
149295A	MC	0.62	0.53	0.00
149298A	MC	0.94	0.15	
149537A	MC	0.77	0.13	0.00
149705A	MC	0.67	0.33	0.00
149708A	MC	0.61	0.33	0.00
149719A	MC	0.23	0.17	0.00
149732A	MC	0.51	0.30	0.00
149759A	MC	0.54	0.43	0.00
150189A	MC	0.70	0.46	0.00
150199A	MC	0.53	0.49	0.00
150232A	MC	0.19	0.40	0.00
150237A	MC	0.13	0.13	0.00
150618A	MC	0.48	0.23	0.00
150629A	MC	0.17	0.21	0.00
150891A	MC	0.35	0.22	0.00
150897A	MC	0.64	0.42	0.00
150952A	MC	0.43	0.26	0.00
151733A	MC	0.56	0.38	0.00
151811A	MC	0.71	0.50	0.00
151849A	MC	0.33	0.15	0.00
151850A	MC	0.73	0.35	0.00
151879A	MC	0.69	0.47	0.00
151964A	MC	0.76	0.44	0.00
151991A	MC	0.81	0.38	0.00
152007A	MC	0.68	0.27	0.00
152009A	MC	0.40	0.40	0.00
152029A	MC	0.79	0.40	0.00
152045A	MC	0.72	0.44	0.00
152051A	MC	0.26	0.41	0.00
152056A	MC	0.63	0.46	0.00
152137A	MC	0.38	0.33	0.00
152288A	MC	0.30	0.35	0.00
152745A	MC	0.56	0.33	0.00
152819A	MC	0.33	0.25	0.00
152901A	MC	0.62	0.38	0.00
152915A	MC	0.59	0.33	0.00
153291A	MC	0.59	0.38	0.00
153294A	MC	0.71	0.30	0.00
153299A	MC	0.35	0.43	0.00
153452A	MC	0.56	0.35	0.00
153485A	MC	0.60	0.44	0.00
153499A	MC	0.61	0.20	0.00
153504A	MC	0.37	0.44	0.00
153922A	MC	0.83	0.28	0.00
154028A	MC	0.83	0.29	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
155126A	MC	0.31	0.35	0.00
155443A	MC	0.37	0.47	0.00
161470A	MC	0.54	0.28	0.00
163883A	MC	0.82	0.35	
181941A	MC	0.77	0.39	0.00
181978A	MC	0.38	0.35	0.00
181984A	MC	0.57	0.50	0.00
181998A	MC	0.58	0.27	0.00
182005A	MC	0.56	0.52	0.00
182010A	MC	0.21	0.37	0.00
182015A	MC	0.30	0.36	0.00
182026A	MC	0.72	0.20	0.00
182027A	MC	0.51	0.29	0.00
182028A	MC	0.46	0.55	0.00
182033A	MC	0.77	0.40	0.00
183739A	MC	0.50	0.47	0.00
187098A	MC	0.61	0.34	0.00
480259	MC	0.42	0.23	0.00
480264	MC	0.48	0.29	0.00
480267	MC	0.35	0.32	0.00
480272	MC	0.51	0.23	0.00
480274	MC	0.34	0.23	0.00
480287	MC	0.43	0.34	0.00
480293	MC	0.41	0.32	0.00
480295	MC	0.36	0.29	0.00
480297	MC	0.36	0.40	0.00
480299	MC	0.53	0.34	
480301	MC	0.19	0.36	0.00
480303	MC	0.25	0.23	0.00
480305	MC	0.12	0.30	0.00
480307	MC	0.28	0.11	0.00
480311	MC	0.20	0.26	0.00
480315	MC	0.41	0.25	0.00
480333	MC	0.73	0.45	0.00
480335	MC	0.72	0.49	0.00
480339	MC	0.33	0.41	0.00
480343	MC	0.34	0.34	0.00
480350	MC	0.45	0.42	0.00
480358	TEI	0.04	0.23	0.00
480360	TEI	0.11	0.35	0.00
480371	TEI	0.32	0.47	0.00
480373	TEI	0.19	0.47	0.00
480375	TEI	0.13	0.50	0.00
480378	TEI	0.09	0.43	0.00
480380	TEI	0.16	0.51	0.00
489119	MC	0.29	0.41	0.00
489176	MC	0.57	0.54	0.00
489216	MC	0.45	0.43	
490048	MC	0.43	0.31	0.00
490454	MC	0.29	0.24	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
490609	MC	0.91	0.17	0.00
492694	TEI	0.11	0.34	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
509655	MC	0.28	0.12	0.00

Table K-6. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Mathematics Grade 8

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
147999A	MC	0.35	0.37	0.00
148061A	MC	0.38	0.49	0.00
148272A	MC	0.82	0.39	0.00
148273A	MC	0.44	0.36	0.00
148303A	MC	0.45	0.42	0.00
148310A	MC	0.39	0.21	0.00
148321A	MC	0.37	0.34	0.00
148327A	MC	0.46	0.52	0.00
148368A	MC	0.68	0.35	0.00
148379A	MC	0.69	0.45	0.00
148472A	MC	0.57	0.45	0.00
148531A	MC	0.86	0.30	
148889A	MC	0.71	0.47	0.00
149067A	MC	0.68	0.45	0.00
149710A	MC	0.62	0.49	0.00
150198A	MC	0.44	0.54	0.00
150202A	MC	0.49	0.40	0.00
150215A	MC	0.51	0.32	0.00
150223A	MC	0.68	0.50	0.00
150226A	MC	0.58	0.47	0.00
150256A	MC	0.52	0.52	0.00
150947A	MC	0.54	0.39	0.00
150961A	MC	0.49	0.43	0.00
151253A	MC	0.50	0.44	0.00
151257A	MC	0.87	0.28	0.00
151260A	MC	0.71	0.37	0.00
151271A	MC	0.71	0.34	0.00
151283A	MC	0.56	0.43	0.00
151302A	MC	0.42	0.48	0.00
151314A	MC	0.62	0.52	0.00
151317A	MC	0.66	0.39	0.00
151382A	MC	0.67	0.44	
151455A	MC	0.48	0.43	0.00
151931A	MC	0.77	0.42	0.00
152213A	MC	0.51	0.34	
152296A	MC	0.68	0.31	0.00
152336A	MC	0.64	0.27	
152847A	MC	0.56	0.36	
152854A	MC	0.65	0.32	
152944A	MC	0.52	0.52	0.00
153249A	MC	0.44	0.36	
153271A	MC	0.45	0.41	0.00
153283A	MC	0.25	0.53	0.00
153423A	MC	0.69	0.41	0.00
153487A	MC	0.62	0.43	0.00
153516A	MC	0.45	0.29	
153529A	MC	0.35	0.45	0.00
153599A	MC	0.46	0.23	
154134A	MC	0.68	0.35	0.00
154152A	MC	0.47	0.49	
154156A	MC	0.91	0.29	
154159A	MC	0.67	0.33	0.00
154160A	MC	0.53	0.33	0.00
154320A	MC	0.54	0.30	0.00
154367A	MC	0.42	0.33	0.00
161462A	MC	0.48	0.55	0.00
181901A	MC	0.35	0.32	0.00
181903A	MC	0.79	0.41	0.00
181934A	MC	0.33	0.32	
181973A	MC	0.50	0.42	0.00
183763A	MC	0.31	0.22	0.00
183764A	MC	0.42	0.31	0.00
183778A	MC	0.47	0.49	0.00
183781A	MC	0.64	0.39	
183795A	MC	0.45	0.37	0.00
183885A	MC	0.57	0.33	0.00
484739	TEI	0.06	0.21	0.00
484750	TEI	0.20	0.26	0.00
484755	TEI	0.19	0.18	0.00
484757	TEI	0.28	0.19	0.00
484762	TEI	0.72	0.43	0.00
484764	TEI	0.11	0.45	0.00
484766	TEI	0.52	0.26	0.00
484768	MC	0.73	0.31	
484770	MC	0.49	0.32	
484772	MC	0.46	0.32	0.00
484781	MC	0.43	0.14	0.00
484815	MC	0.36	0.24	
484817	MC	0.74	0.45	0.00
484819	MC	0.84	0.39	0.00
484821	MC	0.57	0.46	0.00
484823	MC	0.69	0.45	0.00
484826	MC	0.23	0.20	0.00
484828	MC	0.62	0.35	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
484837	MC	0.39	0.22	0.00
484841	MC	0.23	0.18	0.00
484843	MC	0.51	0.26	0.00
484845	MC	0.56	0.37	0.00
484847	MC	0.66	0.35	0.00
484849	MC	0.64	0.27	
484851	MC	0.75	0.36	0.00
484853	MC	0.63	0.51	0.00
484860	MC	0.33	0.20	0.00
484862	MC	0.52	0.38	0.00
484866	MC	0.36	0.39	0.00
484871	MC	0.45	0.25	0.00
484873	MC	0.39	0.23	0.00
484875	MC	0.34	0.44	0.00
484877	MC	0.75	0.34	0.00
484879	MC	0.28	0.17	0.00
484881	MC	0.62	0.31	0.00
484883	MC	0.56	0.47	
484889	MC	0.36	0.45	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
484894	MC	0.57	0.28	0.00
484977	MC	0.47	0.27	0.00
484979	MC	0.33	0.30	0.00
484984	MC	0.25	0.36	0.00
490067	MC	0.45	0.52	0.00
490116	MC	0.55	0.30	0.00
490151	MC	0.39	0.36	0.00
490178	MC	0.30	0.25	0.00
490241	MC	0.44	0.26	0.00
490262	MC	0.54	0.46	
490353	MC	0.43	0.42	0.00
490472	MC	0.28	0.20	
490595	MC	0.21	0.41	0.00
492696	TEI	0.08	0.19	0.00
499651	TEI	0.13	0.42	0.00
509470	MC	0.24	0.24	0.00
509480	MC	0.25	0.10	1.00
509528	MC	0.28	0.12	0.00

Table K-7. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Math Grade 10

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
141996A	MC	0.53	0.49	0.00
142002A	MC	0.43	0.37	0.00
142007A	MC	0.43	0.45	0.00
142018A	MC	0.20	0.16	0.00
142022A	MC	0.42	0.50	0.00
142043A	MC	0.44	0.41	0.00
142046A	MC	0.54	0.51	0.00
142047A	MC	0.24	0.30	0.00
142055A	MC	0.50	0.40	0.00
142062A	MC	0.50	0.43	0.00
142089A	MC	0.71	0.46	0.00
142092A	MC	0.62	0.55	0.00
142210A	MC	0.78	0.38	0.00
142216A	MC	0.82	0.39	0.00
142344A	MC	0.40	0.44	0.00
142371A	MC	0.66	0.34	0.00
142418A	MC	0.58	0.35	0.00
142431A	MC	0.51	0.48	0.00
142440A	MC	0.38	0.24	0.00
142456A	MC	0.52	0.56	0.00
142681A	MC	0.37	0.52	0.00
142742A	MC	0.55	0.44	0.00
142792A	MC	0.61	0.31	0.00
142899A	MC	0.60	0.45	0.00
142909A	MC	0.58	0.50	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
143026A	MC	0.45	0.41	0.00
143118A	MC	0.53	0.45	0.00
143621A	MC	0.51	0.36	0.00
143634A	MC	0.66	0.43	0.00
143934A	MC	0.51	0.46	0.00
144122A	MC	0.55	0.45	0.00
148477A	MC	0.82	0.40	0.00
148837A	MC	0.63	0.34	0.00
149745A	MC	0.64	0.40	
150211A	MC	0.67	0.42	0.00
150860A	MC	0.75	0.41	0.00
150866A	MC	0.74	0.44	0.00
152449A	MC	0.49	0.42	0.00
152998A	MC	0.68	0.47	0.00
155759A	MC	0.44	0.60	0.00
155763A	MC	0.33	0.36	0.00
155844A	MC	0.45	0.25	0.00
156160A	MC	0.59	0.33	0.00
156187A	MC	0.84	0.36	0.00
157639A	MC	0.59	0.31	0.00
161611A	MC	0.37	0.30	0.00
164397A	MC	0.34	0.24	0.00
164565A	MC	0.37	0.36	0.00
164639A	MC	0.45	0.36	0.00
164644A	MC	0.59	0.31	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
164652A	MC	0.60	0.47	0.00
164693A	MC	0.58	0.44	0.00
164715A	MC	0.79	0.43	0.00
164834A	MC	0.45	0.30	0.00
165015A	MC	0.58	0.31	0.00
165187A	MC	0.46	0.18	0.00
165342A	MC	0.24	0.35	0.00
165662A	MC	0.55	0.50	0.00
165761A	MC	0.70	0.46	0.00
165789A	MC	0.76	0.33	0.00
165825A	MC	0.58	0.41	0.00
169976A	MC	0.46	0.52	0.00
169985A	MC	0.66	0.48	0.00
170065A	MC	0.53	0.36	0.00
170436A	MC	0.65	0.49	0.00
170502A	MC	0.33	0.30	0.00
170528A	MC	0.48	0.44	0.00
170551A	MC	0.64	0.42	0.00
170563A	MC	0.45	0.46	0.00
170746A	MC	0.63	0.45	0.00
170755A	MC	0.55	0.28	0.00
170780A	MC	0.29	0.29	0.00
170830A	MC	0.69	0.50	0.00
171427A	MC	0.45	0.31	0.00
171548A	MC	0.38	0.29	0.00
171778A	MC	0.51	0.29	0.00
171913A	MC	0.40	0.34	0.00
172891A	MC	0.41	0.38	0.00
172999A	MC	0.27	0.37	0.00
173288A	MC	0.28	0.15	0.00
173296A	MC	0.38	0.28	0.00
173300A	MC	0.48	0.33	0.00
173318A	MC	0.41	0.32	0.00
173355A	MC	0.67	0.41	0.00
173587A	MC	0.21	0.39	0.00
173659A	MC	0.51	0.43	0.00
173761A	MC	0.39	0.41	0.00
173804A	MC	0.36	0.24	0.00
173837A	MC	0.42	0.19	0.00
173868A	MC	0.33	0.41	0.00
173938A	MC	0.29	0.37	0.00
173962A	MC	0.20	0.38	0.00
173970A	MC	0.38	0.27	0.00
176233A	MC	0.39	0.15	0.00
179238A	MC	0.32	0.30	0.00
180171A	MC	0.35	0.21	0.00
180260A	MC	0.14	0.20	0.00
181035A	MC	0.21	0.27	0.00
181892A	MC	0.58	0.31	0.00
184044A	MC	0.42	0.21	0.00
184049A	MC	0.55	0.35	0.00
480384	MC	0.20	0.30	0.00
480386	MC	0.18	0.34	0.00
480388	MC	0.55	0.31	0.00
480390	MC	0.35	0.26	0.00
480392	MC	0.54	0.34	0.00
480396	MC	0.26	0.17	0.00
480398	MC	0.47	0.46	0.00
480400	MC	0.72	0.40	0.00
480402	MC	0.44	0.24	0.00
480406	MC	0.48	0.34	0.00
480408	MC	0.37	0.17	0.00
480410	MC	0.42	0.38	0.00
480412	MC	0.32	0.40	0.00
480414	MC	0.34	0.29	0.00
480420	MC	0.38	0.29	0.00
480436	MC	0.44	0.30	0.00
480438	MC	0.51	0.29	0.00
480440	MC	0.68	0.28	0.00
480442	TEI	0.29	0.50	0.00
480444	TEI	0.10	0.38	0.00
492698	TEI	0.17	0.55	0.00
493410	MC	0.45	0.13	0.00
495899	MC	0.70	0.46	0.00
496110	MC	0.30	0.48	0.00
496119	MC	0.33	0.52	0.00
496125	MC	0.27	0.29	0.00
496156	MC	0.22	0.20	0.00
496185	MC	0.53	0.43	0.00
496201	MC	0.41	0.23	0.00
496213	MC	0.34	0.11	0.00
496285	MC	0.37	0.22	0.00
500416	TEI	0.32	0.54	0.00
500569	MC	0.48	0.29	0.00
500575	TEI	0.18	0.59	0.00
500579	TEI	0.30	0.55	0.00
500595	TEI	0.59	0.52	0.00
510478	MC	0.24	0.15	
510482	MC	0.47	0.35	0.00
510488	MC	0.21	0.11	

Table K-8. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—ELA Grade 3

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
146833A	MC	0.50	0.30	0.00
146971A	MC	0.65	0.44	0.00
146972A	MC	0.67	0.48	0.00
146994A	MC	0.69	0.49	0.00
147007A	MC	0.68	0.46	0.00
147008A	MC	0.71	0.32	1.00
147010A	MC	0.39	0.28	0.00
147012A	MC	0.74	0.40	1.00
147016A	MC	0.51	0.35	1.00
147018A	MC	0.76	0.54	0.00
147341A	MC	0.87	0.33	0.00
147348A	MC	0.76	0.43	0.00
147351A	MC	0.85	0.46	0.00
147358A	MC	0.75	0.31	1.00
147359A	MC	0.72	0.43	0.00
147416A	MC	0.40	0.20	1.00
147433A	MC	0.58	0.37	0.00
147436A	MC	0.85	0.53	0.00
147456A	MC	0.57	0.47	0.00
147768A	MC	0.75	0.39	0.00
147845A	MC	0.41	0.29	0.00
147861A	MC	0.56	0.40	0.00
147864A	MC	0.86	0.48	0.00
147866A	MC	0.62	0.43	0.00
147870A	MC	0.71	0.43	0.00
148631A	MC	0.86	0.44	0.00
148632A	MC	0.90	0.45	0.00
148636A	MC	0.77	0.47	0.00
155253A	MC	0.61	0.37	0.00
155254A	MC	0.56	0.34	0.00
155255A	MC	0.54	0.42	0.00
155272A	MC	0.49	0.36	0.00
155274A	MC	0.86	0.48	0.00
155277A	MC	0.42	0.27	0.00
155278A	MC	0.75	0.30	0.00
155279A	MC	0.69	0.45	0.00
155282A	MC	0.64	0.37	0.00
155283A	MC	0.73	0.41	0.00
155295A	MC	0.57	0.38	0.00
155348A	MC	0.79	0.40	0.00
155349A	MC	0.65	0.38	0.00
155350A	MC	0.90	0.46	1.00
155352A	MC	0.73	0.53	0.00
155353A	MC	0.71	0.46	1.00
155427A	MC	0.83	0.47	0.00
155965A	MC	0.82	0.47	1.00
155966A	MC	0.52	0.36	0.00
155968A	MC	0.79	0.54	0.00
156102A	MC	0.48	0.23	0.00
156120A	MC	0.78	0.50	0.00
156121A	MC	0.68	0.45	0.00
156123A	MC	0.58	0.42	1.00
156124A	MC	0.79	0.40	0.00
156125A	MC	0.54	0.35	1.00
156126A	MC	0.60	0.51	0.00
156336A	MC	0.84	0.50	0.00
156355A	MC	0.72	0.23	0.00
156356A	MC	0.71	0.46	0.00
156357A	MC	0.66	0.36	0.00
156360A	MC	0.51	0.36	0.00
156362A	MC	0.56	0.21	0.00
184195A	MC	0.64	0.35	0.00
184197A	MC	0.75	0.37	0.00
184210A	MC	0.62	0.36	1.00
184212A	MC	0.69	0.34	0.00
184214A	MC	0.64	0.41	0.00
184225A	MC	0.38	0.17	0.00
184852A	MC	0.90	0.49	0.00
481996	MC	0.39	0.16	0.00
482165	MC	0.38	0.31	0.00
482170	MC	0.36	0.17	0.00
482183	MC	0.39	0.27	0.00
482190	MC	0.19	0.10	0.00
482316	MC	0.62	0.22	0.00
482320	MC	0.83	0.24	0.00
482322	MC	0.28	0.20	0.00
482324	MC	0.52	0.20	1.00
482326	MC	0.76	0.38	0.00
482328	MC	0.69	0.34	0.00
482502	MC	0.43	0.30	0.00
482851	MC	0.32	0.12	0.00
482860	MC	0.36	0.12	0.00
482867	MC	0.36	0.32	0.00
482898	MC	0.66	0.46	0.00
482911	MC	0.35	0.30	0.00
484468	MC	0.48	0.39	0.00
484474	MC	0.79	0.46	0.00
484476	MC	0.74	0.56	1.00
484478	MC	0.53	0.49	1.00
484490	MC	0.62	0.45	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
484494	MC	0.71	0.45	0.00
484541	MC	0.91	0.45	1.00
484543	MC	0.34	0.27	1.00
484545	MC	0.76	0.46	1.00
484549	MC	0.60	0.40	0.00
484551	MC	0.49	0.30	0.00
484553	MC	0.61	0.42	0.00
484559	MC	0.47	0.40	1.00
484563	MC	0.36	0.32	1.00
484565	MC	0.60	0.47	0.00
484567	MC	0.31	0.24	0.00
484569	MC	0.70	0.31	0.00
484571	MC	0.24	0.16	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
484575	MC	0.63	0.39	1.00
484579	MC	0.52	0.42	1.00
484581	MC	0.43	0.17	1.00
484584	MC	0.53	0.32	0.00
484590	MC	0.49	0.43	0.00
484592	MC	0.55	0.28	1.00
484594	MC	0.69	0.39	1.00
484596	MC	0.38	0.33	1.00
484598	MC	0.37	0.21	0.00
484600	MC	0.66	0.32	2.00
484602	MC	0.64	0.48	1.00
484617	MC	0.64	0.39	0.00

Table K-9. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—ELA Grade 4

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
146846A	MC	0.67	0.43	0.00
146863A	MC	0.70	0.37	0.00
146864A	MC	0.64	0.28	0.00
146865A	MC	0.49	0.23	0.00
146866A	MC	0.68	0.34	0.00
146867A	MC	0.70	0.44	0.00
146878A	MC	0.53	0.38	0.00
146880A	MC	0.84	0.51	0.00
146887A	MC	0.67	0.41	0.00
146893A	MC	0.67	0.39	0.00
146896A	MC	0.81	0.41	0.00
146904A	MC	0.74	0.35	0.00
148588A	MC	0.62	0.26	0.00
148597A	MC	0.81	0.47	
148613A	MC	0.63	0.47	0.00
148685A	MC	0.58	0.50	0.00
148686A	MC	0.67	0.33	0.00
148719A	MC	0.48	0.17	0.00
148754A	MC	0.66	0.34	0.00
148877A	MC	0.70	0.49	0.00
148938A	MC	0.88	0.48	0.00
149114A	MC	0.79	0.42	0.00
149115A	MC	0.52	0.34	0.00
149116A	MC	0.85	0.51	0.00
149122A	MC	0.71	0.48	0.00
149136A	MC	0.57	0.44	0.00
155473A	MC	0.70	0.36	0.00
155490A	MC	0.56	0.47	0.00
155569A	MC	0.61	0.38	0.00
155571A	MC	0.81	0.44	0.00
155572A	MC	0.84	0.41	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
155580A	MC	0.78	0.46	0.00
155636A	MC	0.48	0.33	0.00
155638A	MC	0.91	0.43	0.00
158547A	MC	0.54	0.23	0.00
158548A	MC	0.91	0.44	0.00
158553A	MC	0.91	0.44	0.00
158554A	MC	0.64	0.43	0.00
158557A	MC	0.77	0.39	0.00
158559A	MC	0.66	0.29	0.00
158564A	MC	0.88	0.46	0.00
158566A	MC	0.46	0.31	0.00
158587A	MC	0.70	0.47	0.00
158589A	MC	0.76	0.54	0.00
158602A	MC	0.59	0.30	0.00
158603A	MC	0.48	0.19	0.00
158604A	MC	0.76	0.25	0.00
158611A	MC	0.75	0.29	0.00
158691A	MC	0.89	0.36	0.00
158692A	MC	0.61	0.39	0.00
184821A	MC	0.63	0.46	0.00
184822A	MC	0.39	0.21	0.00
184823A	MC	0.74	0.36	0.00
184824A	MC	0.90	0.39	0.00
184827A	MC	0.34	0.32	0.00
184829A	MC	0.74	0.48	0.00
185497A	MC	0.74	0.40	0.00
185498A	MC	0.76	0.43	0.00
185508A	MC	0.40	0.27	0.00
185590A	MC	0.37	0.28	0.00
185616A	MC	0.88	0.43	0.00
185625A	MC	0.79	0.51	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
185806A	MC	0.52	0.29	0.00
186016A	MC	0.81	0.26	0.00
186018A	MC	0.33	0.25	0.00
186065A	MC	0.53	0.34	0.00
483076	MC	0.67	0.36	0.00
483078	MC	0.43	0.16	0.00
483084	MC	0.69	0.35	0.00
483086	MC	0.60	0.26	0.00
483088	MC	0.46	0.28	0.00
483100	MC	0.97	0.28	0.00
483104	MC	0.68	0.23	0.00
483106	MC	0.71	0.48	0.00
483108	MC	0.79	0.37	0.00
483111	MC	0.83	0.39	0.00
483119	MC	0.38	0.19	0.00
483121	MC	0.62	0.20	0.00
483123	MC	0.87	0.48	0.00
484623	MC	0.55	0.35	0.00
484626	MC	0.78	0.41	0.00
484628	MC	0.79	0.50	0.00
484632	MC	0.71	0.53	0.00
484636	MC	0.54	0.16	0.00
484638	MC	0.75	0.49	0.00
484646	MC	0.61	0.42	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
484648	MC	0.67	0.43	0.00
484652	MC	0.42	0.29	0.00
484654	MC	0.50	0.33	0.00
484658	MC	0.71	0.48	0.00
484660	MC	0.47	0.36	0.00
484668	MC	0.70	0.48	0.00
484672	MC	0.59	0.49	0.00
484674	MC	0.53	0.35	0.00
484676	MC	0.38	0.12	0.00
484678	MC	0.29	0.21	0.00
484682	MC	0.75	0.46	0.00
484684	MC	0.66	0.36	0.00
484686	MC	0.35	0.19	0.00
484688	MC	0.68	0.50	0.00
484690	MC	0.58	0.28	0.00
484701	MC	0.64	0.39	0.00
485165	MC	0.51	0.31	0.00
485331	MC	0.44	0.38	0.00
485333	MC	0.42	0.25	0.00
485335	MC	0.45	0.22	0.00
485354	MC	0.56	0.53	0.00
485357	MC	0.79	0.45	0.00
487992	MC	0.72	0.44	0.00

Table K-10. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—ELA Grade 5

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
140927A	WP	0.52	0.44	0.00
147920A	MC	0.90	0.37	0.00
147921A	MC	0.78	0.40	0.00
147923A	MC	0.70	0.39	0.00
147924A	MC	0.80	0.38	0.00
147926A	MC	0.66	0.32	0.00
147969A	MC	0.89	0.43	0.00
147974A	MC	0.70	0.30	0.00
148003A	MC	0.65	0.33	0.00
148005A	MC	0.58	0.26	0.00
148007A	MC	0.70	0.26	0.00
148008A	MC	0.45	0.28	0.00
148019A	MC	0.82	0.52	0.00
148026A	MC	0.58	0.44	0.00
148834A	MC	0.90	0.35	0.00
148839A	MC	0.84	0.43	0.00
148841A	MC	0.84	0.51	0.00
148893A	MC	0.71	0.38	0.00
148904A	MC	0.80	0.46	0.00
148906A	MC	0.88	0.41	0.00
148925A	MC	0.70	0.30	0.00
148930A	MC	0.70	0.45	0.00
148933A	MC	0.75	0.52	0.00
148961A	MC	0.63	0.41	0.00
148963A	MC	0.84	0.49	0.00
148967A	MC	0.83	0.54	0.00
148971A	MC	0.74	0.41	0.00
149152A	MC	0.89	0.38	0.00
149158A	MC	0.46	0.32	0.00
149196A	MC	0.76	0.39	0.00
149318A	MC	0.74	0.45	0.00
149321A	MC	0.76	0.37	0.00
149334A	MC	0.68	0.40	0.00
149338A	MC	0.68	0.51	0.00
149339A	MC	0.55	0.26	0.00
158697A	MC	0.75	0.38	0.00
158749A	MC	0.53	0.38	0.00
158753A	MC	0.48	0.33	0.00
158832A	MC	0.81	0.40	0.00
158887A	MC	0.52	0.35	0.00
158889A	MC	0.58	0.35	0.00
158900A	MC	0.56	0.46	0.00
158903A	MC	0.77	0.44	0.00
159151A	MC	0.66	0.45	0.00
159157A	MC	0.56	0.37	0.00
159164A	MC	0.74	0.46	0.00
159165A	MC	0.63	0.36	0.00
159364A	MC	0.87	0.53	0.00
159367A	MC	0.67	0.31	0.00
159368A	MC	0.61	0.39	0.00
159398A	MC	0.70	0.46	0.00
159408A	MC	0.62	0.46	0.00
159467A	MC	0.72	0.44	0.00
159475A	MC	0.79	0.47	0.00
159477A	MC	0.62	0.37	0.00
159544A	MC	0.57	0.20	0.00
159546A	MC	0.80	0.41	0.00
159592A	MC	0.77	0.44	0.00
159600A	MC	0.87	0.42	0.00
160270A	MC	0.72	0.49	0.00
160276A	MC	0.79	0.47	0.00
160288A	MC	0.58	0.40	0.00
160514A	MC	0.76	0.36	0.00
160563A	MC	0.51	0.37	0.00
160565A	MC	0.39	0.17	0.00
160568A	MC	0.76	0.48	0.00
160573A	MC	0.73	0.50	0.00
160579A	MC	0.42	0.35	0.00
160682A	MC	0.68	0.34	0.00
160718A	MC	0.84	0.44	0.00
186097A	MC	0.42	0.37	0.00
186107A	MC	0.75	0.49	0.00
186115A	MC	0.56	0.39	0.00
186121A	MC	0.67	0.45	0.00
186131A	MC	0.56	0.27	0.00
186469A	MC	0.52	0.46	0.00
186471A	MC	0.89	0.47	0.00
186474A	MC	0.60	0.35	0.00
186476A	MC	0.60	0.40	0.00
186488A	MC	0.44	0.27	0.00
186505A	MC	0.51	0.35	0.00
186777A	MC	0.85	0.51	0.00
483126	MC	0.74	0.38	0.00
483130	MC	0.43	0.24	0.00
483134	MC	0.58	0.32	0.00
483136	MC	0.39	0.12	0.00
483138	MC	0.66	0.33	0.00
483140	MC	0.88	0.41	0.00
483142	MC	0.61	0.12	0.00
483144	MC	0.81	0.42	0.00
483146	MC	0.55	0.36	0.00
483148	MC	0.65	0.37	0.00
483150	MC	0.67	0.39	0.00
483154	MC	0.37	0.11	0.00
483160	MC	0.15	0.15	0.00
483162	MC	0.92	0.45	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
483166	MC	0.87	0.35	0.00
483172	MC	0.71	0.46	0.00
483179	MC	0.78	0.30	0.00
485372	MC	0.60	0.22	0.00
485377	MC	0.56	0.38	0.00
485379	MC	0.64	0.51	0.00
485386	MC	0.52	0.31	0.00
485397	MC	0.27	0.09	0.00
485399	MC	0.42	0.16	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
485401	MC	0.62	0.30	0.00
485403	MC	0.65	0.39	0.00
485405	MC	0.70	0.49	0.00
485407	MC	0.43	0.30	0.00
485417	MC	0.57	0.30	0.00
485429	MC	0.54	0.35	0.00
485431	MC	0.83	0.55	0.00
488027	MC	0.81	0.44	0.00

Table K-11. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—ELA Grade 6

Item:		Difficulty	Discrimination	Percent Omitted	Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*				*Number*	*Type*			
147159A	MC	0.52	0.30	0.00	158937A	MC	0.56	0.36	0.00
147165A	MC	0.61	0.30		158943A	MC	0.46	0.29	0.00
147252A	MC	0.51	0.16	0.00	158947A	MC	0.64	0.41	0.00
147260A	MC	0.53	0.20		158954A	MC	0.76	0.47	0.00
147261A	MC	0.87	0.39	0.00	158978A	MC	0.43	0.27	0.00
147283A	MC	0.80	0.38	0.00	158996A	MC	0.47	0.44	0.00
147289A	MC	0.79	0.29	0.00	158998A	MC	0.68	0.37	0.00
147290A	MC	0.77	0.40	0.00	159011A	MC	0.49	0.22	
149396A	MC	0.68	0.42	0.00	159016A	MC	0.77	0.36	0.00
149400A	MC	0.73	0.38	0.00	159018A	MC	0.59	0.35	0.00
149414A	MC	0.68	0.38	0.00	159031A	MC	0.73	0.44	0.00
149458A	MC	0.57	0.30	0.00	159058A	MC	0.65	0.42	0.00
149466A	MC	0.59	0.40	0.00	159272A	MC	0.87	0.50	0.00
149499A	MC	0.90	0.32	0.00	159273A	MC	0.74	0.42	0.00
149526A	MC	0.79	0.31	0.00	159297A	MC	0.73	0.43	0.00
149536A	MC	0.47	0.36	0.00	159346A	MC	0.46	0.45	
149538A	MC	0.65	0.31		159418A	MC	0.54	0.27	
149570A	MC	0.66	0.40	0.00	159424A	MC	0.63	0.39	0.00
149571A	MC	0.72	0.52	0.00	159432A	MC	0.67	0.42	0.00
149592A	MC	0.77	0.35	0.00	159451A	MC	0.78	0.32	0.00
149718A	MC	0.90	0.44	0.00	159453A	MC	0.80	0.34	0.00
149724A	MC	0.73	0.29	0.00	159454A	MC	0.58	0.36	0.00
149726A	MC	0.80	0.49	0.00	159455A	MC	0.52	0.32	0.00
149737A	MC	0.65	0.31	0.00	159457A	MC	0.83	0.36	0.00
158700A	MC	0.75	0.50	0.00	159458A	MC	0.73	0.36	0.00
158702A	MC	0.54	0.53	0.00	181821A	MC	0.67	0.38	0.00
158705A	MC	0.89	0.49	0.00	181824A	MC	0.80	0.35	0.00
158723A	MC	0.85	0.44	0.00	181832A	MC	0.66	0.40	0.00
158739A	MC	0.83	0.43	0.00	181867A	MC	0.65	0.22	
158740A	MC	0.67	0.26		181880A	MC	0.72	0.41	0.00
158756A	MC	0.45	0.10	0.00	181882A	MC	0.87	0.46	0.00
158760A	MC	0.66	0.35	0.00	181883A	MC	0.71	0.46	0.00
158774A	MC	0.74	0.52	0.00	181886A	MC	0.72	0.47	0.00
158775A	MC	0.90	0.44	0.00	181888A	MC	0.74	0.37	0.00
158782A	MC	0.76	0.41	0.00	181889A	MC	0.72	0.32	0.00
158786A	MC	0.83	0.42	0.00	181893A	MC	0.57	0.23	0.00
158811A	MC	0.52	0.40	0.00	181904A	MC	0.71	0.45	0.00
158827A	MC	0.73	0.32	0.00	485437	MC	0.72	0.34	0.00
158830A	MC	0.79	0.37	0.00	485439	MC	0.83	0.40	
158858A	MC	0.83	0.46	0.00	485443	MC	0.40	0.35	
158860A	MC	0.68	0.43		485688	MC	0.79	0.50	0.00
158877A	MC	0.84	0.52	0.00	485690	MC	0.73	0.46	0.00
158886A	MC	0.87	0.42	0.00	485692	MC	0.36	0.21	0.00
158893A	MC	0.82	0.32	0.00	485694	MC	0.51	0.14	0.00
158897A	MC	0.73	0.37	0.00	485696	MC	0.77	0.39	0.00
158935A	MC	0.62	0.37	0.00	485700	MC	0.31	0.17	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
485702	MC	0.84	0.48	0.00
485704	MC	0.57	0.39	0.00
485708	MC	0.61	0.35	
485710	MC	0.88	0.40	0.00
485986	MC	0.39	0.30	0.00
486350	MC	0.50	0.25	0.00
486369	MC	0.64	0.42	0.00
486371	MC	0.69	0.40	0.00
486376	MC	0.78	0.50	0.00
486378	MC	0.50	0.19	0.00
486474	MC	0.75	0.24	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
486482	MC	0.41	0.15	0.00
486494	MC	0.68	0.33	
486504	MC	0.42	0.20	0.00
486517	MC	0.35	0.08	0.00
486523	MC	0.47	0.27	0.00
486538	MC	0.29	0.16	0.00
486553	MC	0.86	0.39	0.00
486562	MC	0.52	0.24	0.00
486565	MC	0.61	0.41	0.00
486567	MC	0.38	0.36	0.00

Table K-12. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—ELA Grade 7

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
148104A	MC	0.76	0.46	0.00
148117A	MC	0.68	0.39	0.00
148190A	MC	0.62	0.19	0.00
148194A	MC	0.61	0.37	0.00
148205A	MC	0.86	0.39	0.00
148759A	MC	0.64	0.27	0.00
148760A	MC	0.74	0.42	0.00
148762A	MC	0.77	0.37	0.00
148765A	MC	0.75	0.30	0.00
148772A	MC	0.61	0.39	0.00
148777A	MC	0.68	0.29	0.00
148780A	MC	0.69	0.33	0.00
148785A	MC	0.39	0.25	0.00
148795A	MC	0.82	0.36	0.00
148796A	MC	0.51	0.37	0.00
148797A	MC	0.42	0.43	0.00
148801A	MC	0.62	0.43	0.00
148806A	MC	0.70	0.40	
148812A	MC	0.70	0.36	0.00
148823A	MC	0.76	0.39	0.00
148831A	MC	0.95	0.33	0.00
148859A	MC	0.88	0.43	0.00
148866A	MC	0.72	0.38	0.00
148935A	MC	0.53	0.34	0.00
148944A	MC	0.68	0.37	0.00
148946A	MC	0.68	0.35	0.00
148948A	MC	0.67	0.42	0.00
148950A	MC	0.64	0.45	0.00
148952A	MC	0.82	0.42	0.00
154639A	MC	0.51	0.31	0.00
154710A	MC	0.69	0.20	0.00
154730A	MC	0.71	0.45	0.00
158719A	MC	0.47	0.37	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
158724A	MC	0.72	0.46	
158765A	MC	0.64	0.44	
158766A	MC	0.71	0.35	
158769A	MC	0.62	0.10	
158819A	MC	0.70	0.45	0.00
158826A	MC	0.93	0.35	0.00
158833A	MC	0.62	0.45	
158845A	MC	0.63	0.26	0.00
158847A	MC	0.81	0.32	0.00
158849A	MC	0.68	0.28	0.00
158871A	MC	0.68	0.48	0.00
158888A	MC	0.80	0.39	0.00
158892A	MC	0.83	0.37	
158896A	MC	0.87	0.34	0.00
158906A	MC	0.81	0.36	0.00
159033A	MC	0.94	0.27	0.00
159046A	MC	0.76	0.15	0.00
159102A	MC	0.63	0.29	0.00
159111A	MC	0.75	0.37	0.00
159114A	MC	0.78	0.57	0.00
159118A	MC	0.84	0.47	0.00
159120A	MC	0.70	0.52	
159122A	MC	0.45	0.34	0.00
159133A	MC	0.49	0.26	0.00
159137A	MC	0.48	0.30	0.00
159393A	MC	0.42	0.16	0.00
159394A	MC	0.55	0.22	0.00
159646A	MC	0.57	0.38	0.00
160457A	MC	0.53	0.20	0.00
160475A	MC	0.55	0.32	0.00
160498A	MC	0.70	0.38	0.00
160508A	MC	0.71	0.43	0.00
160511A	MC	0.68	0.30	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
160522A	MC	0.87	0.42	0.00
160526A	MC	0.61	0.17	0.00
160594A	MC	0.81	0.45	
160692A	MC	0.70	0.46	0.00
160706A	MC	0.77	0.46	0.00
160835A	MC	0.71	0.43	0.00
160937A	MC	0.80	0.45	0.00
160940A	MC	0.88	0.46	0.00
160974A	MC	0.47	0.20	0.00
161015A	MC	0.88	0.43	0.00
161017A	MC	0.60	0.39	0.00
182584A	MC	0.57	0.31	0.00
182596A	MC	0.82	0.49	0.00
182597A	MC	0.65	0.30	
485445	MC	0.57	0.20	0.00
485447	MC	0.80	0.38	0.00
485451	MC	0.54	0.38	0.00
485453	MC	0.61	0.43	0.00
485457	MC	0.66	0.46	0.00
485459	MC	0.62	0.28	0.00
485461	MC	0.51	0.27	0.00
485463	MC	0.61	0.34	0.00
485465	MC	0.79	0.43	
485467	MC	0.47	0.25	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
486284	MC	0.55	0.36	0.00
486286	MC	0.32	0.14	0.00
486288	MC	0.46	0.24	0.00
486290	MC	0.79	0.44	
486292	MC	0.61	0.28	0.00
486294	MC	0.39	0.30	0.00
486298	MC	0.48	0.24	0.00
486300	MC	0.83	0.49	0.00
486302	MC	0.61	0.31	0.00
486304	MC	0.38	0.15	
486317	MC	0.46	0.19	0.00
486333	MC	0.67	0.46	0.00
486444	MC	0.38	0.19	0.00
486448	MC	0.44	0.23	
486477	MC	0.34	0.19	0.00
486519	MC	0.23	0.08	
486529	MC	0.56	0.40	0.00
486595	MC	0.76	0.39	0.00
486597	MC	0.50	0.35	0.00
486607	MC	0.62	0.18	0.00
486613	MC	0.74	0.33	0.00
486661	MC	0.71	0.44	0.00
486665	MC	0.42	0.21	0.00

Table K-13. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—ELA Grade 8

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
141500A	WP	0.58	0.54	0.00
148071A	MC	0.79	0.41	0.00
148080A	MC	0.89	0.46	0.00
148085A	MC	0.82	0.49	0.00
148088A	MC	0.61	0.28	0.00
148133A	MC	0.75	0.42	0.00
148134A	MC	0.73	0.36	
148141A	MC	0.71	0.27	
148177A	MC	0.77	0.44	0.00
148187A	MC	0.77	0.29	0.00
148189A	MC	0.61	0.31	0.00
148191A	MC	0.69	0.36	0.00
149371A	MC	0.66	0.51	0.00
149373A	MC	0.91	0.50	0.00
149374A	MC	0.84	0.48	0.00
149416A	MC	0.78	0.29	0.00
149426A	MC	0.65	0.31	0.00
149431A	MC	0.90	0.47	0.00
149500A	MC	0.48	0.28	0.00
149507A	MC	0.65	0.32	0.00
149583A	MC	0.36	0.23	0.00
149591A	MC	0.54	0.48	0.00
149597A	MC	0.75	0.38	0.00
149600A	MC	0.63	0.22	0.00
149619A	MC	0.58	0.34	0.00
149623A	MC	0.74	0.45	
149626A	MC	0.50	0.36	0.00
149650A	MC	0.56	0.48	0.00
149653A	MC	0.68	0.36	0.00
149688A	MC	0.84	0.47	0.00
149689A	MC	0.50	0.28	
149700A	MC	0.48	0.36	0.00
149744A	MC	0.67	0.50	0.00
149771A	MC	0.71	0.37	0.00
149772A	MC	0.73	0.39	0.00
160000A	MC	0.58	0.37	0.00
160461A	MC	0.39	0.22	0.00
160464A	MC	0.71	0.42	0.00
160467A	MC	0.75	0.29	0.00
160469A	MC	0.38	0.11	0.00
160472A	MC	0.77	0.29	
160477A	MC	0.39	0.23	0.00
160584A	MC	0.92	0.49	0.00
160726A	MC	0.66	0.36	0.00
160742A	MC	0.76	0.46	0.00
160745A	MC	0.72	0.35	0.00
160767A	MC	0.85	0.37	
160770A	MC	0.95	0.41	0.00
160771A	MC	0.64	0.44	
160780A	MC	0.31	0.28	0.00
160782A	MC	0.68	0.36	0.00
160783A	MC	0.63	0.40	0.00
160784A	MC	0.94	0.41	0.00
160785A	MC	0.93	0.38	0.00
160787A	MC	0.67	0.36	0.00
160788A	MC	0.74	0.26	0.00
160789A	MC	0.48	0.32	0.00
160790A	MC	0.84	0.23	0.00
160791A	MC	0.93	0.34	0.00
160795A	MC	0.84	0.30	0.00
160800A	MC	0.70	0.43	0.00
160802A	MC	0.75	0.35	
160836A	MC	0.72	0.25	0.00
160872A	MC	0.44	0.39	
160873A	MC	0.53	0.39	
160875A	MC	0.48	0.09	0.00
160877A	MC	0.40	0.38	
160920A	MC	0.90	0.34	
160930A	MC	0.70	0.37	
160935A	MC	0.65	0.37	0.00
160938A	MC	0.58	0.31	
160946A	MC	0.65	0.50	0.00
160956A	MC	0.72	0.28	0.00
160989A	MC	0.51	0.20	0.00
160992A	MC	0.73	0.29	0.00
160993A	MC	0.61	0.17	0.00
485469	MC	0.47	0.36	0.00
485471	MC	0.68	0.30	0.00
485473	MC	0.72	0.37	0.00
485477	MC	0.49	0.31	
485479	MC	0.72	0.38	0.00
485481	MC	0.76	0.44	0.00
485485	MC	0.48	0.18	
485487	MC	0.50	0.35	0.00
485491	MC	0.66	0.29	
485493	MC	0.72	0.31	0.00
485495	MC	0.74	0.39	0.00
485497	MC	0.39	0.26	0.00
485504	MC	0.44	0.09	0.00
485506	MC	0.20	0.12	0.00
485510	MC	0.56	0.31	0.00
486340	MC	0.52	0.21	0.00
486392	MC	0.70	0.49	
486394	MC	0.48	0.21	0.00
486398	MC	0.52	0.20	0.00
486404	MC	0.35	0.09	

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
486744	MC	0.57	0.31	0.00
486757	MC	0.43	0.24	0.00
486763	MC	0.83	0.29	0.00
486998	MC	0.25	0.14	0.00
487006	MC	0.83	0.39	0.00
487037	MC	0.33	0.32	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
487053	MC	0.30	0.10	0.00
487071	MC	0.40	0.14	0.00
487144	MC	0.61	0.23	0.00
487170	MC	0.95	0.33	0.00
487254	MC	0.34	0.18	0.00

Table K-14. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—ELA Grade 10

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
141069A	MC	0.59	0.28	0.00
141079A	MC	0.45	0.43	0.00
141082A	MC	0.68	0.35	0.00
144222A	MC	0.55	0.36	0.00
144223A	MC	0.62	0.37	0.00
144225A	MC	0.66	0.45	0.00
144226A	MC	0.73	0.51	0.00
144273A	MC	0.53	0.26	0.00
144279A	MC	0.56	0.37	0.00
144283A	MC	0.60	0.32	0.00
144284A	MC	0.80	0.43	0.00
144285A	MC	0.47	0.33	0.00
144286A	MC	0.58	0.42	0.00
156932A	MC	0.84	0.37	0.00
156951A	MC	0.45	0.46	0.00
156953A	MC	0.56	0.40	0.00
156955A	MC	0.48	0.31	0.00
156956A	MC	0.10	0.23	0.00
157488A	MC	0.58	0.35	0.00
157489A	MC	0.50	0.35	0.00
157490A	MC	0.09	0.21	0.00
166485A	MC	0.23	0.18	0.00
166884A	MC	0.36	0.19	0.00
166890A	MC	0.37	0.28	0.00
166896A	MC	0.49	0.33	0.00
167402A	MC	0.43	0.18	0.00
167409A	MC	0.36	0.26	0.00
167520A	MC	0.53	0.39	0.00
167522A	MC	0.81	0.49	0.00
167523A	MC	0.56	0.32	0.00
171238A	MC	0.40	0.15	0.00
171245A	MC	0.61	0.50	0.00
171285A	MC	0.72	0.40	
171325A	MC	0.70	0.37	0.00
171390A	MC	0.63	0.15	0.00
171418A	MC	0.58	0.34	0.00
171435A	MC	0.48	0.43	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
171476A	MC	0.65	0.39	0.00
171586A	MC	0.47	0.29	0.00
171648A	MC	0.68	0.43	0.00
171661A	MC	0.55	0.32	0.00
171711A	MC	0.41	0.14	0.00
171726A	MC	0.37	0.13	0.00
171754A	MC	0.46	0.08	0.00
171757A	MC	0.48	0.21	0.00
171763A	MC	0.46	0.30	0.00
171766A	MC	0.68	0.35	0.00
171817A	MC	0.56	0.23	0.00
171911A	MC	0.53	0.36	0.00
171923A	MC	0.76	0.48	0.00
171974A	MC	0.43	0.15	0.00
171988A	MC	0.64	0.41	0.00
171996A	MC	0.41	0.46	0.00
172025A	MC	0.41	0.27	0.00
172397A	MC	0.34	0.16	0.00
172406A	MC	0.36	0.26	0.00
172606A	MC	0.57	0.51	0.00
173001A	MC	0.54	0.26	0.00
173012A	MC	0.63	0.45	0.00
173016A	MC	0.46	0.33	0.00
173024A	MC	0.29	0.21	0.00
173042A	MC	0.68	0.38	0.00
173049A	MC	0.58	0.24	0.00
173106A	MC	0.61	0.34	0.00
173131A	MC	0.45	0.15	0.00
173168A	MC	0.45	0.12	0.00
173320A	MC	0.80	0.46	0.00
174109A	MC	0.66	0.33	0.00
174113A	MC	0.76	0.40	0.00
174533A	MC	0.54	0.28	0.00
174825A	MC	0.30	0.17	0.00
174944A	MC	0.59	0.24	0.00
174953A	MC	0.84	0.44	0.00
174954A	MC	0.46	0.38	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
174955A	MC	0.72	0.50	0.00
175003A	MC	0.56	0.26	0.00
175033A	MC	0.66	0.42	0.00
175211A	MC	0.51	0.14	0.00
175441A	MC	0.51	0.26	0.00
175456A	MC	0.40	0.31	0.00
175466A	MC	0.82	0.41	0.00
175735A	MC	0.34	0.22	0.00
179051A	MC	0.54	0.41	0.00
179057A	MC	0.91	0.36	0.00
179099A	MC	0.65	0.44	0.00
179264A	MC	0.74	0.29	0.00
179265A	MC	0.62	0.48	0.00
179267A	MC	0.72	0.42	0.00
179269A	MC	0.66	0.35	0.00
179270A	MC	0.55	0.49	0.00
179273A	MC	0.61	0.30	0.00
179303A	MC	0.67	0.45	0.00
179336A	MC	0.72	0.43	0.00
180486A	MC	0.65	0.35	0.00
180512A	MC	0.40	0.21	0.00
180515A	MC	0.53	0.39	
180730A	MC	0.37	0.27	0.00
180738A	MC	0.64	0.26	0.00
180741A	MC	0.52	0.24	0.00
180744A	MC	0.48	0.28	0.00
180756A	MC	0.62	0.40	0.00
180758A	MC	0.74	0.44	0.00
180762A	MC	0.58	0.35	0.00
180769A	MC	0.73	0.56	0.00
180774A	MC	0.78	0.24	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
180776A	MC	0.39	0.41	0.00
180794A	MC	0.59	0.40	0.00
180972A	MC	0.34	0.36	0.00
180974A	MC	0.28	0.29	0.00
180975A	MC	0.67	0.38	0.00
180978A	MC	0.48	0.39	0.00
181087A	MC	0.72	0.30	0.00
181096A	MC	0.68	0.49	0.00
181310A	MC	0.54	0.28	0.00
485515	MC	0.53	0.25	0.00
485518	MC	0.59	0.34	0.00
485520	MC	0.67	0.47	0.00
485522	MC	0.43	0.35	0.00
485533	MC	0.58	0.34	0.00
485547	MC	0.60	0.18	0.00
485554	MC	0.39	0.17	0.00
485556	MC	0.73	0.36	0.00
489583	WP	0.58	0.54	0.00
494974	MC	0.56	0.37	0.00
499622	PMC	0.50	0.51	0.00
499624	PMC	0.47	0.44	0.00
499627	PMC	0.44	0.28	0.00
499629	PMC	0.23	0.26	0.00
499638	PMC	0.45	0.39	0.00
499647	PMC	0.27	0.19	0.00
504439	MC	0.45	0.45	0.00

Table K-15. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Science Grade 5

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
184387A	MC	0.63	0.43	0.00
184423A	MC	0.50	0.34	0.00
184525A	MC	0.48	0.22	0.00
184530A	MC	0.43	0.39	0.00
184534A	MC	0.47	0.31	0.00
185413A	MC	0.38	0.36	0.00
186452A	MC	0.57	0.28	0.00
186458A	MC	0.30	0.17	0.00
186464A	MC	0.45	0.33	0.00
186473A	MC	0.58	0.40	0.00
186475A	MC	0.66	0.32	0.00
186478A	MC	0.60	0.33	0.00
186483A	MC	0.58	0.22	0.00
186489A	MC	0.48	0.17	0.00
186490A	MC	0.45	0.24	0.00
186506A	MC	0.54	0.34	0.00
186508A	MC	0.63	0.27	0.00
186510A	MC	0.56	0.34	0.00
187286A	MC	0.46	0.36	0.00
187288A	MC	0.32	0.18	0.00
187289A	MC	0.35	0.20	0.00
187487A	MC	0.43	0.28	0.00
187491A	MC	0.37	0.23	0.00
187497A	MC	0.32	0.28	0.00
187503A	MC	0.52	0.28	0.00
187505A	MC	0.82	0.34	0.00
187510A	MC	0.90	0.36	0.00
188304A	MC	0.51	0.35	0.00
188318A	MC	0.68	0.26	0.00
188323A	MC	0.40	0.40	0.00
188334A	MC	0.57	0.28	0.00
188338A	MC	0.61	0.41	0.00
188340A	MC	0.61	0.42	0.00
188377A	MC	0.56	0.41	0.00
188378A	MC	0.35	0.19	0.00
188380A	MC	0.51	0.15	0.00
188387A	MC	0.49	0.31	0.00
188389A	MC	0.52	0.26	0.00
188390A	MC	0.62	0.30	0.00
188432A	MC	0.56	0.37	0.00
188433A	MC	0.40	0.24	0.00
188439A	MC	0.85	0.37	0.00
188452A	MC	0.72	0.23	0.00
188453A	MC	0.44	0.25	0.00
188456A	MC	0.68	0.44	0.00
188717A	MC	0.72	0.45	0.00
188718A	MC	0.85	0.42	0.00
188720A	MC	0.82	0.39	0.00
188728A	MC	0.87	0.30	0.00
188729A	MC	0.69	0.36	0.00
188731A	MC	0.45	0.18	0.00
188904A	MC	0.71	0.31	0.00
188907A	MC	0.37	0.40	0.00
188908A	MC	0.76	0.35	0.00
189235A	MC	0.77	0.36	0.00
189237A	MC	0.56	0.40	0.00
189238A	MC	0.51	0.27	0.00
189340A	MC	0.72	0.47	0.00
189341A	MC	0.61	0.37	0.00
189345A	MC	0.39	0.29	0.00
189348A	MC	0.82	0.44	0.00
189349A	MC	0.76	0.44	0.00
189352A	MC	0.81	0.42	0.00
189356A	MC	0.52	0.39	0.00
189358A	MC	0.58	0.40	0.00
189361A	MC	0.86	0.37	0.00

Table K-16. 2016–17 OSP: Item-Level Classical Test Theory Statistics—Science Grade 8

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
185793A	MC	0.46	0.23	0.00
185805A	MC	0.54	0.36	0.00
185826A	MC	0.50	0.38	0.00
185899A	MC	0.64	0.47	0.00
185901A	MC	0.32	0.22	0.00
185916A	MC	0.61	0.41	0.00
186154A	MC	0.35	0.26	0.00
186293A	MC	0.47	0.24	0.00
186309A	MC	0.49	0.36	0.00
186997A	MC	0.49	0.36	0.00
186999A	MC	0.32	0.18	0.00
187000A	MC	0.28	0.26	0.00
187032A	MC	0.62	0.40	0.00
187038A	MC	0.57	0.37	0.00
187047A	MC	0.47	0.27	0.00
187676A	MC	0.34	0.35	0.00
187681A	MC	0.62	0.21	0.00
187688A	MC	0.89	0.27	0.00
188149A	MC	0.56	0.27	0.00
188150A	MC	0.53	0.40	0.00
188153A	MC	0.34	0.30	0.00
188158A	MC	0.68	0.46	0.00
188160A	MC	0.66	0.44	0.00
188176A	MC	0.39	0.31	0.00
188250A	MC	0.45	0.45	0.00
188251A	MC	0.47	0.38	
188253A	MC	0.53	0.40	0.00
188317A	MC	0.74	0.42	0.00
188320A	MC	0.26	0.13	0.00
188328A	MC	0.60	0.51	0.00
188332A	MC	0.57	0.44	0.00
188838A	MC	0.50	0.38	0.00
188841A	MC	0.37	0.31	0.00
188843A	MC	0.42	0.26	0.00
188846A	MC	0.50	0.28	0.00
188847A	MC	0.56	0.42	0.00
188849A	MC	0.49	0.32	0.00
188863A	MC	0.61	0.43	0.00
188866A	MC	0.65	0.51	0.00
188868A	MC	0.30	0.15	0.00
189061A	MC	0.43	0.39	0.00
189076A	MC	0.60	0.35	0.00
189080A	MC	0.60	0.32	0.00
189087A	MC	0.57	0.38	0.00
189090A	MC	0.67	0.47	0.00
189095A	MC	0.64	0.38	
189099A	MC	0.55	0.38	
189100A	MC	0.38	0.26	
189438A	MC	0.55	0.23	0.00
189440A	MC	0.65	0.20	0.00
189442A	MC	0.81	0.43	0.00
300070A	MC	0.51	0.33	0.00
300072A	MC	0.65	0.38	0.00
300074A	MC	0.41	0.27	0.00
300078A	MC	0.51	0.25	0.00
300080A	MC	0.38	0.18	0.00
300081A	MC	0.51	0.33	0.00
300093A	MC	0.67	0.44	
300095A	MC	0.42	0.35	
300097A	MC	0.67	0.49	
300109A	MC	0.41	0.18	
300111A	MC	0.42	0.22	
494074	TEI	0.78	0.51	0.00
494236	TEI	0.84	0.34	0.00
494991	TEI	0.68	0.43	0.00

Table K-17. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—Science Grade 10

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
186821A	MC	0.33	0.38	0.00
186828A	MC	0.42	0.39	0.00
186834A	MC	0.43	0.24	0.00
186972A	MC	0.45	0.30	0.00
186989A	MC	0.52	0.33	0.00
186992A	MC	0.76	0.38	0.00
187525A	MC	0.42	0.30	0.00
187933A	MC	0.50	0.48	0.00
187934A	MC	0.40	0.28	0.00
187938A	MC	0.44	0.34	0.00
187974A	MC	0.61	0.43	
187978A	MC	0.32	0.24	0.00
187985A	MC	0.48	0.32	
187996A	MC	0.68	0.45	0.00
187999A	MC	0.37	0.33	0.00
188011A	MC	0.34	0.22	0.00
188070A	MC	0.51	0.39	
188072A	MC	0.46	0.29	0.00
188075A	MC	0.40	0.39	
188474A	MC	0.63	0.20	0.00
188475A	MC	0.48	0.33	0.00
188478A	MC	0.79	0.31	0.00
188500A	MC	0.39	0.28	0.00
188502A	MC	0.41	0.16	0.00
188503A	MC	0.28	0.16	0.00
188544A	MC	0.39	0.33	0.00
188545A	MC	0.57	0.32	0.00
188546A	MC	0.46	0.34	0.00
188647A	MC	0.58	0.43	0.00
188649A	MC	0.37	0.32	0.00
188653A	MC	0.31	0.27	0.00
188657A	MC	0.49	0.15	0.00
188658A	MC	0.40	0.19	0.00
188659A	MC	0.47	0.24	0.00
188833A	MC	0.32	0.16	0.00
188834A	MC	0.49	0.42	0.00
188835A	MC	0.52	0.42	0.00
188964A	MC	0.48	0.38	0.00
188965A	MC	0.47	0.21	0.00
188970A	MC	0.70	0.31	0.00
189104A	MC	0.58	0.37	0.00
189106A	MC	0.33	0.21	
189220A	MC	0.33	0.19	0.00
189223A	MC	0.44	0.28	0.00
189224A	MC	0.42	0.39	0.00
189383A	MC	0.30	0.22	
189384A	MC	0.36	0.16	0.00
189387A	MC	0.42	0.22	
189393A	MC	0.44	0.27	0.00
189394A	MC	0.53	0.45	0.00
189403A	MC	0.56	0.45	
189407A	MC	0.50	0.31	
189408A	MC	0.40	0.35	
189414A	MC	0.28	0.16	0.00
189415A	MC	0.48	0.29	0.00
189421A	MC	0.31	0.17	0.00
189423A	MC	0.40	0.17	0.00
189425A	MC	0.38	0.19	0.00
189597A	MC	0.37	0.16	0.00
300014A	MC	0.42	0.21	0.00
300028A	MC	0.39	0.16	0.00
493046	TEI	0.34	0.34	0.00
493306	TEI	0.19	0.41	1.00
493561	TEI	0.67	0.36	0.00

Table K-18. 2016–17 OSTP: Item-Level Classical Test Theory Statistics—U.S. History Grade 10

Item:		Difficulty	Discrimination	Percent Omitted	Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*				*Number*	*Type*			
140941A	MC				143366A	MC			
141054A	MC	0.70	0.43	0.00	143368A	MC			
141057A	MC	0.54	0.33	0.00	143370A	MC			
141113A	MC				143374A	MC			
141140A	MC	0.74	0.46	0.00	143377A	MC			
141143A	MC	0.66	0.52	0.00	143381A	MC			
141225A	MC	0.78	0.45	0.00	143393A	MC	0.55	0.26	0.00
141227A	MC	0.65	0.38	0.00	143402A	MC	0.68	0.30	0.00
143190A	MC				143416A	MC			
143250A	MC				143417A	MC	0.65	0.52	0.00
143252A	MC				143439A	MC			
143254A	MC				143440A	MC	0.49	0.39	0.00
143255A	MC				143441A	MC	0.69	0.44	0.00
143257A	MC				143442A	MC	0.69	0.40	0.00
143261A	MC				143443A	MC	0.62	0.49	0.00
143262A	MC				143445A	MC			
143264A	MC				143446A	MC	0.67	0.40	0.00
143276A	MC	0.62	0.45	0.00	143447A	MC			
143278A	MC				143513A	MC	0.60	0.29	0.00
143281A	MC				143516A	MC	0.50	0.29	0.00
143285A	MC				143521A	MC	0.80	0.49	0.00
143289A	MC				143524A	MC	0.57	0.48	0.00
143291A	MC				143526A	MC	0.50	0.31	0.00
143292A	MC	0.74	0.49	0.00	143528A	MC	0.66	0.51	0.00
143295A	MC				143531A	MC	0.65	0.19	0.00
143297A	MC	0.50	0.45	0.00	156292A	MC	0.65	0.34	0.00
143298A	MC				156328A	MC	0.36	0.25	0.00
143301A	MC				156331A	MC	0.51	0.14	0.00
143305A	MC				156439A	MC	0.54	0.37	0.00
143307A	MC				156440A	MC	0.46	0.38	0.00
143314A	MC				156491A	MC	0.60	0.23	0.00
143323A	MC				156499A	MC	0.57	0.30	0.00
143326A	MC				156545A	MC	0.53	0.38	0.00
143327A	MC				157469A	MC	0.63	0.37	0.00
143331A	MC				158335A	MC	0.77	0.41	0.00
143337A	MC				158336A	MC	0.68	0.34	0.00
143340A	MC				158642A	MC	0.61	0.40	0.00
143344A	MC				158648A	MC	0.77	0.29	0.00
143345A	MC				164738A	MC	0.68	0.47	0.00
143348A	MC	0.62	0.45	0.00	164749A	MC	0.49	0.27	0.00
143358A	MC				164760A	MC	0.62	0.20	0.00
143360A	MC	0.82	0.30	0.00	165128A	MC	0.67	0.50	0.00
143361A	MC				165131A	MC	0.64	0.45	0.00
143363A	MC				166128A	MC	0.68	0.21	0.00
143364A	MC				167589A	MC	0.42	0.38	0.00
143365A	MC				167661A	MC	0.60	0.38	0.00

Item:		Difficulty	Discrimination	Percent Omitted
Number	*Type*			
167663A	MC	0.23	0.18	0.00
167679A	MC	0.79	0.34	0.00
167686A	MC	0.65	0.40	0.00
167708A	MC	0.69	0.26	0.00
167763A	MC	0.86	0.32	0.00
167777A	MC	0.72	0.45	0.00
167780A	MC	0.67	0.28	0.00
167785A	MC	0.64	0.47	0.00
167788A	MC	0.75	0.41	0.00
167806A	MC	0.54	0.33	0.00
167818A	MC	0.72	0.48	0.00
167819A	MC	0.66	0.40	0.00
167823A	MC	0.38	0.34	0.00

Table K-19. 2016–17 OSTP: Item-Level Non-MC Items—Across Grades & Content Areas

Content Area	Grade	PvMax	Item	P0	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
ELA	5	5	140927A	0.68	22.65	5.60	58.61	11.54	0.43	0.00	0.00	0.00	0.00	0.00	0.00
	8	7	141500A	0.68	0.00	13.74	3.71	50.10	27.30	1.62	2.49	0.00	0.00	0.00	0.00
	10	11	489583	0.78	0.00	0.00	10.63	2.57	1.24	42.98	11.82	24.91	0.88	0.89	2.88
		2	499622	44.60	10.16	45.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	499624	33.60	37.84	28.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	499627	46.40	18.36	35.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	499629	70.45	12.95	16.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	499638	51.37	6.78	41.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	499647	67.15	12.50	20.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Science	8	2	494074	15.71	12.25	71.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	494236	13.78	4.52	81.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	494991	20.24	23.46	56.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	10	2	493046	52.47	25.84	21.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	493306	61.55	37.68	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	493561	24.55	16.99	58.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

APPENDIX L—DIFFERENTIAL ITEM FUNCTIONING RESULTS

Table L-1. 2016–17 OSTP: Number of Items Classified as "Low" or "High" DIF Overall and by Grade and Group Favored—Mathematics

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
3	Male	Female	MC	120	6	5	1	0	0	0
	White/Caucasian	Black/African American	MC	120	15	11	4	1	0	1
		Hispanic or Latino	MC	120	7	6	1	0	0	0
		American Indian/Alaskan Native	MC	120	0	0	0	0	0	0
		Asian	MC	120	13	3	10	7	3	4
		Pacific Islander	MC	120	0	0	0	0	0	0
		Two or More Races	MC	120	0	0	0	0	0	0
	Non-IEP	IEP	MC	120	2	1	1	0	0	0
	Non-EconDis	EconDis	MC	120	0	0	0	0	0	0
	Non-ELL	ELL	MC	120	8	8	0	0	0	0
4	Male	Female	MC	120	9	6	3	0	0	0
	White/Caucasian	Black/African American	MC	120	12	11	1	4	4	0
		Hispanic or Latino	MC	120	5	5	0	0	0	0
		American Indian/Alaskan Native	MC	120	0	0	0	0	0	0
		Asian	MC	120	27	11	16	1	1	0
		Pacific Islander	MC	120	0	0	0	0	0	0
		Two or More Races	MC	120	0	0	0	0	0	0
	Non-IEP	IEP	MC	120	17	11	6	0	0	0
	Non-EconDis	EconDis	MC	120	0	0	0	0	0	0
	Non-ELL	ELL	MC	120	11	10	1	1	1	0
5	Male	Female	MC	121	14	11	3	3	2	1
	White/Caucasian	Black/African American	MC	121	13	12	1	3	3	0
		Hispanic or Latino	MC	121	3	3	0	0	0	0
		American Indian/Alaskan Native	MC	121	0	0	0	0	0	0
		Asian	MC	121	27	8	19	4	1	3
		Pacific Islander	MC	121	0	0	0	0	0	0
		Two or More Races	MC	121	0	0	0	0	0	0
	Non-IEP	IEP	MC	121	16	10	6	2	0	2
	Non-EconDis	EconDis	MC	121	0	0	0	0	0	0
	Non-ELL	ELL	MC	121	21	19	2	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
6	Male	Female	MC	113	17	10	7	1	1	0
	White/Caucasian	Black/African American	MC	113	13	12	1	0	0	0
		Hispanic or Latino	MC	113	6	6	0	0	0	0
		American Indian/Alaskan Native	MC	113	0	0	0	0	0	0
		Asian	MC	113	25	11	14	4	1	3
		Pacific Islander	MC	113	0	0	0	0	0	0
		Two or More Races	MC	113	0	0	0	0	0	0
	Non-IEP	IEP	MC	113	7	7	0	0	0	0
	Non-EconDis	EconDis	MC	113	0	0	0	0	0	0
	Non-ELL	ELL	MC	113	26	22	4	8	7	1
	Male	Female	OR	7	0	0	0	0	0	0
	White/Caucasian	Black/African American	OR	7	0	0	0	0	0	0
		Hispanic or Latino	OR	7	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	7	0	0	0	0	0	0
		Asian	OR	7	2	0	2	0	0	0
		Pacific Islander	OR	7	0	0	0	0	0	0
		Two or More Races	OR	7	0	0	0	0	0	0
	Non-IEP	IEP	OR	7	0	0	0	0	0	0
	Non-EconDis	EconDis	OR	7	0	0	0	0	0	0
	Non-ELL	ELL	OR	7	2	0	2	0	0	0
7	Male	Female	MC	113	23	12	11	1	1	0
	White/Caucasian	Black/African American	MC	113	13	12	1	1	1	0
		Hispanic or Latino	MC	113	4	4	0	0	0	0
		American Indian/Alaskan Native	MC	113	0	0	0	0	0	0
		Asian	MC	113	23	6	17	2	1	1
		Pacific Islander	MC	113	0	0	0	0	0	0
		Two or More Races	MC	113	0	0	0	0	0	0
	Non-IEP	IEP	MC	113	10	10	0	0	0	0
	Non-EconDis	EconDis	MC	113	1	1	0	0	0	0
	Non-ELL	ELL	MC	113	18	16	2	7	7	0
	Male	Female	OR	8	0	0	0	0	0	0
	White/Caucasian	Black/African American	OR	8	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
7	White/Caucasian	Hispanic or Latino	OR	8	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	8	0	0	0	0	0	0
		Asian	OR	8	1	0	1	0	0	0
		Pacific Islander	OR	8	0	0	0	0	0	0
		Two or More Races	OR	8	0	0	0	0	0	0
	Non-IEP	IEP	OR	8	0	0	0	0	0	0
	Non-EconDis	EconDis	OR	8	0	0	0	0	0	0
	Non-ELL	ELL	OR	8	0	0	0	0	0	0
8	Male	Female	MC	112	10	2	8	1	1	0
	White/Caucasian	Black/African American	MC	112	17	14	3	0	0	0
		Hispanic or Latino	MC	112	3	3	0	0	0	0
		American Indian/Alaskan Native	MC	112	0	0	0	0	0	0
		Asian	MC	112	23	6	17	7	4	3
		Pacific Islander	MC	112	0	0	0	0	0	0
		Two or More Races	MC	112	1	1	0	0	0	0
	Non-IEP	IEP	MC	112	10	10	0	1	1	0
	Non-EconDis	EconDis	MC	112	1	1	0	0	0	0
	Non-ELL	ELL	MC	112	28	24	4	5	5	0
	Male	Female	OR	9	0	0	0	0	0	0
	White/Caucasian	Black/African American	OR	9	2	2	0	0	0	0
		Hispanic or Latino	OR	9	1	1	0	0	0	0
		American Indian/Alaskan Native	OR	9	0	0	0	0	0	0
		Asian	OR	9	1	0	1	0	0	0
		Pacific Islander	OR	9	0	0	0	0	0	0
		Two or More Races	OR	9	0	0	0	0	0	0
	Non-IEP	IEP	OR	9	1	1	0	0	0	0
	Non-EconDis	EconDis	OR	9	0	0	0	0	0	0
	Non-ELL	ELL	OR	9	1	1	0	1	1	0
10	Male	Female	MC	133	14	9	5	0	0	0
	White/Caucasian	Black/African American	MC	133	12	12	0	0	0	0
		Hispanic or Latino	MC	133	1	1	0	0	0	0
		American Indian/Alaskan Native	MC	133	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
10	White/Caucasian	Asian	MC	133	32	12	20	4	2	2
		Pacific Islander	MC	133	0	0	0	0	0	0
		Two or More Races	MC	133	0	0	0	0	0	0
	Non-IEP	IEP	MC	133	24	24	0	0	0	0
	Non-EconDis	EconDis	MC	133	1	1	0	0	0	0
	Non-ELL	ELL	MC	133	29	21	8	9	9	0
	Male	Female	OR	7	0	0	0	0	0	0
	White/Caucasian	Black/African American	OR	7	1	1	0	0	0	0
		Hispanic or Latino	OR	7	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	7	0	0	0	0	0	0
		Asian	OR	7	1	0	1	1	0	1
		Pacific Islander	OR	7	0	0	0	0	0	0
		Two or More Races	OR	7	0	0	0	0	0	0
	Non-IEP	IEP	OR	7	1	1	0	0	0	0
	Non-EconDis	EconDis	OR	7	0	0	0	0	0	0
	Non-ELL	ELL	OR	7	3	1	2	1	1	0

Table L-2. 2016–17 OSTP: Number of Items Classified as "Low" or "High" DIF Overall and by Grade and Group Favored—ELA

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
3	Male	Female	MC	115	8	5	3	0	0	0
	White/Caucasian	Black/African American	MC	115	4	4	0	2	2	0
		Hispanic or Latino	MC	115	5	5	0	1	1	0
		American Indian/Alaskan Native	MC	115	1	1	0	0	0	0
		Asian	MC	115	16	4	12	5	4	1
		Pacific Islander	MC	115	0	0	0	0	0	0
		Two or More Races	MC	115	0	0	0	0	0	0
	Non-IEP	IEP	MC	115	5	5	0	0	0	0
	Non-EconDis	EconDis	MC	115	1	1	0	0	0	0
	Non-ELL	ELL	MC	115	18	17	1	2	2	0
4	Male	Female	MC	109	4	2	2	0	0	0
	White/Caucasian	Black/African American	MC	109	14	14	0	1	1	0
		Hispanic or Latino	MC	109	8	8	0	0	0	0
		American Indian/Alaskan Native	MC	109	1	1	0	0	0	0
		Asian	MC	109	23	11	12	2	2	0
		Pacific Islander	MC	109	0	0	0	0	0	0
		Two or More Races	MC	109	0	0	0	0	0	0
	Non-IEP	IEP	MC	109	6	5	1	0	0	0
	Non-EconDis	EconDis	MC	109	0	0	0	0	0	0
	Non-ELL	ELL	MC	109	15	15	0	5	5	0
5	Male	Female	MC	112	9	4	5	0	0	0
	White/Caucasian	Black/African American	MC	112	11	11	0	1	1	0
		Hispanic or Latino	MC	112	11	9	2	1	1	0
		American Indian/Alaskan Native	MC	112	0	0	0	0	0	0
		Asian	MC	112	24	12	12	3	2	1
		Pacific Islander	MC	112	0	0	0	0	0	0
		Two or More Races	MC	112	0	0	0	0	0	0
	Non-IEP	IEP	MC	112	5	5	0	0	0	0
	Non-EconDis	EconDis	MC	112	0	0	0	0	0	0
	Non-ELL	ELL	MC	112	24	21	3	6	5	1
	Male	Female	OR	1	1	0	1	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
5	White/Caucasian	Black/African American	OR	1	0	0	0	0	0	0
		Hispanic or Latino	OR	1	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	1	0	0	0	0	0	0
		Asian	OR	1	0	0	0	0	0	0
		Pacific Islander	OR	1	0	0	0	0	0	0
		Two or More Races	OR	1	0	0	0	0	0	0
	Non-IEP	IEP	OR	1	1	1	0	0	0	0
	Non-EconDis	EconDis	OR	1	0	0	0	0	0	0
	Non-ELL	ELL	OR	1	0	0	0	0	0	0
6	Male	Female	MC	113	13	6	7	0	0	0
	White/Caucasian	Black/African American	MC	113	10	10	0	1	1	0
		Hispanic or Latino	MC	113	10	7	3	1	1	0
		American Indian/Alaskan Native	MC	113	0	0	0	0	0	0
		Asian	MC	113	26	15	11	5	0	5
		Pacific Islander	MC	113	0	0	0	0	0	0
		Two or More Races	MC	113	0	0	0	0	0	0
	Non-IEP	IEP	MC	113	9	9	0	0	0	0
	Non-EconDis	EconDis	MC	113	1	1	0	0	0	0
	Non-ELL	ELL	MC	113	26	22	4	9	7	2
7	Male	Female	MC	113	15	6	9	0	0	0
	White/Caucasian	Black/African American	MC	113	16	12	4	2	2	0
		Hispanic or Latino	MC	113	11	10	1	0	0	0
		American Indian/Alaskan Native	MC	113	0	0	0	0	0	0
		Asian	MC	113	19	6	13	9	5	4
		Pacific Islander	MC	113	0	0	0	0	0	0
		Two or More Races	MC	113	0	0	0	0	0	0
	Non-IEP	IEP	MC	113	9	9	0	0	0	0
	Non-EconDis	EconDis	MC	113	2	2	0	0	0	0
	Non-ELL	ELL	MC	113	25	22	3	8	8	0
8	Male	Female	MC	106	11	5	6	0	0	0
	White/Caucasian	Black/African American	MC	106	13	12	1	3	3	0
		Hispanic or Latino	MC	106	9	6	3	2	2	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
8	White/Caucasian	American Indian/Alaskan Native	MC	106	0	0	0	0	0	0
		Asian	MC	106	19	5	14	9	4	5
		Pacific Islander	MC	106	0	0	0	0	0	0
		Two or More Races	MC	106	1	1	0	0	0	0
	Non-IEP	IEP	MC	106	11	10	1	0	0	0
	Non-EconDis	EconDis	MC	106	2	2	0	0	0	0
	Non-ELL	ELL	MC	106	26	20	6	5	5	0
	Male	Female	OR	1	0	0	0	0	0	0
	White/Caucasian	Black/African American	OR	1	0	0	0	0	0	0
		Hispanic or Latino	OR	1	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	1	0	0	0	0	0	0
		Asian	OR	1	0	0	0	0	0	0
		Pacific Islander	OR	1	0	0	0	0	0	0
		Two or More Races	OR	1	0	0	0	0	0	0
	Non-IEP	IEP	OR	1	1	1	0	0	0	0
	Non-EconDis	EconDis	OR	1	0	0	0	0	0	0
	Non-ELL	ELL	OR	1	0	0	0	0	0	0
10	Male	Female	MC	124	16	11	5	3	2	1
	White/Caucasian	Black/African American	MC	124	10	9	1	0	0	0
		Hispanic or Latino	MC	124	6	6	0	0	0	0
		American Indian/Alaskan Native	MC	124	0	0	0	0	0	0
		Asian	MC	124	30	16	14	7	1	6
		Pacific Islander	MC	124	0	0	0	0	0	0
		Two or More Races	MC	124	0	0	0	0	0	0
	Non-IEP	IEP	MC	124	17	16	1	1	1	0
	Non-EconDis	EconDis	MC	124	1	1	0	0	0	0
	Non-ELL	ELL	MC	124	42	31	11	14	12	2
	Male	Female	OR	7	0	0	0	0	0	0
	White/Caucasian	Black/African American	OR	7	0	0	0	0	0	0
		Hispanic or Latino	OR	7	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	7	0	0	0	0	0	0
		Asian	OR	7	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
10	White/Caucasian	Pacific Islander	OR	7	0	0	0	0	0	0
		Two or More Races	OR	7	0	0	0	0	0	0
	Non-IEP	IEP	OR	7	1	1	0	0	0	0
	Non-EconDis	EconDis	OR	7	0	0	0	0	0	0
	Non-ELL	ELL	OR	7	3	2	1	0	0	0

Table L-3. 2016–17 OSTP: Number of Items Classified as "Low" or "High" DIF Overall and by Grade and Group Favored—Science

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
5	Male	Female	MC	66	8	3	5	0	0	0
	White/Caucasian	Black/African American	MC	66	5	5	0	1	1	0
		Hispanic or Latino	MC	66	1	1	0	0	0	0
		American Indian/Alaskan Native	MC	66	0	0	0	0	0	0
		Asian	MC	66	2	1	1	0	0	0
		Pacific Islander	MC	66	0	0	0	0	0	0
		Two or More Races	MC	66	0	0	0	0	0	0
	Non-IEP	IEP	MC	66	2	2	0	0	0	0
	Non-EconDis	EconDis	MC	66	1	1	0	0	0	0
	Non-ELL	ELL	MC	66	11	10	1	0	0	0
8	Male	Female	MC	62	5	3	2	0	0	0
	White/Caucasian	Black/African American	MC	62	7	7	0	0	0	0
		Hispanic or Latino	MC	62	2	2	0	0	0	0
		American Indian/Alaskan Native	MC	62	0	0	0	0	0	0
		Asian	MC	62	11	3	8	1	0	1
		Pacific Islander	MC	62	0	0	0	0	0	0
		Two or More Races	MC	62	0	0	0	0	0	0
	Non-IEP	IEP	MC	62	2	2	0	1	1	0
	Non-EconDis	EconDis	MC	62	0	0	0	0	0	0
	Non-ELL	ELL	MC	62	14	13	1	4	4	0
	Male	Female	OR	3	1	0	1	0	0	0
	White/Caucasian	Black/African American	OR	3	0	0	0	0	0	0
		Hispanic or Latino	OR	3	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	3	0	0	0	0	0	0
		Asian	OR	3	1	0	1	0	0	0
		Pacific Islander	OR	3	0	0	0	0	0	0
		Two or More Races	OR	3	0	0	0	0	0	0
	Non-IEP	IEP	OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	OR	3	0	0	0	0	0	0
	Non-ELL	ELL	OR	3	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
10	Male	Female	MC	61	1	1	0	0	0	0
	White/Caucasian	Black/African American	MC	61	8	8	0	0	0	0
		Hispanic or Latino	MC	61	3	3	0	0	0	0
		American Indian/Alaskan Native	MC	61	0	0	0	0	0	0
		Asian	MC	61	6	3	3	0	0	0
		Pacific Islander	MC	61	0	0	0	0	0	0
		Two or More Races	MC	61	1	1	0	0	0	0
	Non-IEP	IEP	MC	61	11	11	0	0	0	0
	Non-EconDis	EconDis	MC	61	0	0	0	0	0	0
	Non-ELL	ELL	MC	61	13	12	1	0	0	0
	Male	Female	OR	3	0	0	0	0	0	0
	White/Caucasian	Black/African American	OR	3	1	1	0	0	0	0
		Hispanic or Latino	OR	3	0	0	0	0	0	0
		American Indian/Alaskan Native	OR	3	0	0	0	0	0	0
		Asian	OR	3	1	1	0	0	0	0
		Pacific Islander	OR	3	0	0	0	0	0	0
		Two or More Races	OR	3	0	0	0	0	0	0
	Non-IEP	IEP	OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	OR	3	0	0	0	0	0	0
	Non-ELL	ELL	OR	3	1	1	0	1	1	0

Table L-4. 2016–17 OSTP: Number of Items Classified as "Low" or "High" DIF Overall and by Grade and Group Favored—U.S. History

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
10	Male	Female	MC	71	5	4	1	1	1	0
	White/Caucasian	Black/African American	MC	71	4	3	1	0	0	0
		Hispanic or Latino	MC	71	2	2	0	0	0	0
		American Indian/Alaskan Native	MC	71	0	0	0	0	0	0
		Asian	MC	71	7	2	5	1	1	0
		Pacific Islander	MC	71	0	0	0	0	0	0
		Two or More Races	MC	71	0	0	0	0	0	0
	Non-IEP	IEP	MC	71	3	2	1	0	0	0
	Non-EconDis	EconDis	MC	71	0	0	0	0	0	0
	Non-ELL	ELL	MC	71	11	9	2	2	2	0

APPENDIX M—ITEM RESPONSE THEORY PARAMETERS

Table M-1. 2016–17 OSTP: IRT Parameters for Dichotomous Items

Mathematics Grade 3

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
146908A	0.69526	0.01936	-0.99990	0.06934	0.40409	0.02166
146911A	0.98918	0.03200	0.69298	0.02049	0.13517	0.00807
146922A	0.91213	0.02080	-1.34766	0.05058	0.37481	0.02160
146947A	0.93788	0.02001	0.89585	0.01312	0.15998	0.00472
146955A	0.71371	0.02787	-0.63238	0.07387	0.25691	0.02691
147026A	0.96766	0.02676	-1.36881	0.04971	0.11909	0.02830
147044A	0.72307	0.02340	-0.70000	0.05828	0.13231	0.02434
147055A	0.87951	0.02662	-1.04484	0.05479	0.16564	0.02707
147064A	0.92226	0.03650	-1.87536	0.10641	0.34454	0.05251
147073A	1.21919	0.03436	-0.43156	0.02784	0.23552	0.01408
147300A	1.06584	0.04038	0.20622	0.03207	0.36827	0.01178
147330A	1.11592	0.02638	-1.40286	0.03257	0.06240	0.01925
147382A	1.30049	0.03558	-1.45653	0.03654	0.12813	0.02475
147423A	0.70447	0.02708	-0.86182	0.08344	0.23705	0.03217
147503A	1.65145	0.03841	-0.88037	0.01825	0.09959	0.01215
147510A	1.20485	0.01580	-0.16786	0.01008	0.07101	0.00503
147528A	1.51076	0.03485	-0.05604	0.01413	0.11265	0.00761
147530A	1.00064	0.02895	-0.59004	0.03697	0.18634	0.01807
147532A	0.91576	0.01818	-0.56920	0.02888	0.28646	0.01202
147533A	1.08498	0.02521	0.02335	0.01747	0.06085	0.00785
147542A	1.01975	0.03053	-0.40893	0.03440	0.22757	0.01558
147708A	1.57511	0.04075	0.01579	0.01556	0.19442	0.00834
147712A	1.20672	0.03280	-1.05029	0.03447	0.17971	0.01995
147718A	0.86371	0.03117	-0.63773	0.05744	0.31076	0.02233
147722A	0.55397	0.02204	-1.24735	0.12250	0.15351	0.04517
147726A	0.53914	0.01514	-2.52598	0.06028	0.00000	0.00000
147727A	1.00132	0.03074	-0.00329	0.02899	0.20475	0.01269
147728A	0.77492	0.01538	-0.48445	0.03138	0.18450	0.01292
147741A	1.06710	0.01824	-1.61704	0.03196	0.12723	0.02060
147966A	0.50948	0.03451	1.08856	0.06609	0.21960	0.01951
148041A	1.71977	0.05265	-0.74430	0.02470	0.35279	0.01393
148162A	1.12602	0.03741	0.66768	0.01982	0.19642	0.00790
148514A	1.20878	0.02889	1.67673	0.01459	0.08043	0.00215
148671A	1.04514	0.07461	1.52522	0.03969	0.45741	0.00713
149283A	1.32434	0.04722	1.06507	0.01719	0.17960	0.00565
149306A	1.16139	0.07661	1.89218	0.03956	0.25533	0.00536
149309A	0.49366	0.03456	1.52059	0.05583	0.15267	0.01658
150658A	1.14959	0.03473	0.43587	0.01950	0.18057	0.00847
150663A	0.67583	0.02002	-1.04096	0.06274	0.08650	0.02686
151006A	1.29786	0.04154	-0.35657	0.03011	0.35973	0.01366
151476A	1.14752	0.02976	-1.69928	0.03955	0.07636	0.02540
151522A	0.76203	0.02355	-1.18416	0.06691	0.12739	0.03177
151560A	0.78046	0.01639	-1.03324	0.04493	0.23439	0.01924
152031A	1.23298	0.03443	-1.20982	0.03761	0.17803	0.02318
152320A	0.83922	0.02826	0.49714	0.02656	0.13447	0.01043
152325A	0.86003	0.01689	-0.87833	0.03513	0.23978	0.01556
152349A	0.46868	0.01241	-1.25107	0.09521	0.10743	0.03196
152422A	1.12174	0.02921	-0.02994	0.02101	0.13379	0.00990
152546A	0.85089	0.02650	-1.33012	0.06580	0.16842	0.03305
152580A	0.65358	0.01552	-2.01146	0.03905	0.00000	0.00000
152598A	1.19821	0.01777	0.05091	0.01085	0.13069	0.00526
152620A	0.69235	0.01696	-1.47995	0.04849	0.04821	0.02076
152623A	0.36486	0.01044	-1.47621	0.04501	0.00000	0.00000
152759A	1.07280	0.03242	-0.29372	0.03141	0.25020	0.01406
152842A	0.89098	0.02967	1.01086	0.02049	0.07450	0.00665
152845A	1.39936	0.04075	0.76547	0.01415	0.13566	0.00557
152857A	1.03510	0.04142	0.86461	0.02404	0.25562	0.00841
152864A	0.85118	0.03532	0.48516	0.03535	0.28928	0.01220
152867A	1.17606	0.04017	0.05882	0.02851	0.34643	0.01156
152884A	0.72167	0.01852	0.30686	0.02649	0.12434	0.01028
153154A	0.64663	0.02175	-1.46179	0.09491	0.13426	0.04097
153168A	1.39094	0.03348	-0.60748	0.02107	0.13522	0.01236
154307A	0.94932	0.03125	0.43105	0.02503	0.17398	0.01029
154329A	0.84713	0.02192	-1.77009	0.05378	0.07485	0.02914

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
154340A	1.09981	0.03203	-1.51751	0.05035	0.15464	0.03166
154482A	0.78722	0.02819	-2.02369	0.11258	0.20686	0.05973
154484A	1.14292	0.01763	-1.10676	0.02115	0.13356	0.01259
154516A	1.29545	0.02969	-0.39025	0.01886	0.09627	0.01023
154553A	0.99282	0.02891	0.88884	0.01708	0.05938	0.00569
154758A	1.20820	0.01657	-0.57041	0.01327	0.09933	0.00729
154760A	1.33413	0.02984	-0.39180	0.01769	0.08659	0.00964
155162A	1.03443	0.03900	1.27296	0.02143	0.11663	0.00559
155185A	1.25121	0.03973	1.01142	0.01598	0.11661	0.00526
155196A	0.75829	0.02680	-1.38109	0.08957	0.20959	0.04084
155226A	0.80081	0.03317	0.44892	0.03815	0.25581	0.01357
155260A	1.18642	0.02885	-1.53025	0.03294	0.06620	0.02059
155261A	0.73327	0.01680	-1.28957	0.03874	0.03787	0.01627
155264A	0.86773	0.02490	-1.71114	0.06452	0.11095	0.03660
155265A	0.91227	0.02662	-0.31109	0.03444	0.14676	0.01576
155268A	0.81295	0.02341	0.08004	0.02829	0.08009	0.01175
155314A	0.84712	0.02688	-0.63206	0.04874	0.19274	0.02119
155404A	0.85873	0.02895	-1.96892	0.09318	0.18396	0.05329
155455A	0.93712	0.02878	0.33346	0.02415	0.14208	0.01003
155478A	0.86687	0.02242	-0.54056	0.03330	0.07621	0.01536
155486A	1.19677	0.04026	-1.69814	0.06001	0.24962	0.03818
155495A	0.79166	0.02068	-1.13258	0.04774	0.07265	0.02285
155525A	1.45289	0.03550	-0.94230	0.02325	0.12303	0.01489
155550A	1.00279	0.02072	-1.14433	0.02508	0.03007	0.01191
155594A	0.93898	0.02994	-0.06156	0.03277	0.21565	0.01366
155617A	0.76062	0.04670	1.08959	0.04373	0.38323	0.01164
155918A	0.73128	0.01404	-1.10120	0.02073	0.00000	0.00000
155934A	1.02150	0.02447	-1.25755	0.03515	0.06525	0.01993
155999A	0.76362	0.01856	0.27924	0.02603	0.26565	0.00903
156021A	1.03009	0.03084	-1.21109	0.05034	0.19937	0.02760
161166A	1.09674	0.02614	-1.37252	0.03349	0.06606	0.01969

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
184059A	0.66269	0.02898	0.24029	0.05456	0.21461	0.01859
184065A	0.80839	0.02673	-1.15094	0.06927	0.19817	0.03171
184068A	0.47879	0.01972	-2.22191	0.19256	0.17694	0.06870
187104A	0.62675	0.04618	1.98284	0.05918	0.18830	0.01009
479031	0.67296	0.02128	-2.35432	0.10335	0.12413	0.05156
479103	0.65064	0.02238	-2.73144	0.11876	0.13289	0.05796
479105	0.71529	0.02468	-2.40295	0.11973	0.16430	0.06304
479107	0.78590	0.02513	-2.49596	0.09040	0.11917	0.05080
479109	0.89053	0.02411	-0.88207	0.04223	0.10395	0.02111
479111	0.95417	0.02803	-0.51414	0.03771	0.17728	0.01785
479113	0.95553	0.02433	-1.94246	0.04661	0.06514	0.02676
479115	1.08759	0.03406	0.26219	0.02383	0.21881	0.01025
479117	0.81940	0.02977	-0.49862	0.05613	0.28029	0.02142
479119	1.02444	0.02804	0.06315	0.02311	0.12701	0.01058
479121	0.96044	0.03560	0.11986	0.03535	0.32406	0.01296
479123	1.11101	0.03291	-1.31741	0.04728	0.20388	0.02722
479125	1.12336	0.03708	-2.39145	0.06675	0.12751	0.04836
479127	0.66741	0.02081	-1.76582	0.09070	0.11436	0.04266
479129	0.60242	0.02163	-3.06090	0.12216	0.11460	0.05206
479131	0.98150	0.02584	-1.86578	0.04880	0.07538	0.02932
479136	0.97687	0.02886	-0.43050	0.03583	0.19333	0.01665
479138	0.89354	0.02543	0.23821	0.02363	0.09223	0.00993
479140	0.72533	0.02147	-1.07710	0.06138	0.09684	0.02808
479142	0.79015	0.03184	0.60735	0.03346	0.20390	0.01223
488998	0.98780	0.03509	0.67136	0.02353	0.20087	0.00908

Table M-2. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Mathematics Grade 4

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
146927A	0.94965	0.02449	-0.23233	0.02583	0.07222	0.01223
146938A	0.72822	0.02594	-0.26091	0.05213	0.17084	0.02019
146941A	1.33601	0.04080	0.05579	0.02169	0.26885	0.01020
146944A	0.97751	0.03397	0.32027	0.02844	0.23967	0.01115
147045A	1.26164	0.04308	-2.23582	0.05958	0.12804	0.04619
147295A	0.73437	0.01828	-1.41431	0.07078	0.30106	0.02899
147318A	0.96885	0.02901	-2.12015	0.06485	0.10984	0.04120
147319A	0.68138	0.01600	-1.80609	0.08244	0.18447	0.03905
147409A	0.95567	0.02573	-0.18658	0.02681	0.09201	0.01266
147525A	1.09537	0.01898	-0.68967	0.02168	0.22857	0.01102
147734A	0.65470	0.03868	0.02670	0.09442	0.46054	0.02289
147975A	1.06819	0.03069	1.04310	0.01645	0.36492	0.00473
148069A	1.02390	0.03807	-0.91595	0.06011	0.38448	0.02571
148236A	0.91443	0.02729	-0.16546	0.03291	0.14455	0.01491
148258A	0.91683	0.02611	-0.40337	0.03505	0.12425	0.01666
148259A	0.89026	0.02586	-0.14159	0.03086	0.10772	0.01399
148261A	1.35309	0.03699	-0.96904	0.03015	0.17841	0.01899
148264A	1.25842	0.03640	-0.33478	0.02619	0.23937	0.01334
148287A	1.06320	0.03635	0.34189	0.02629	0.25457	0.01074
148301A	0.81438	0.02927	0.41085	0.03182	0.16800	0.01219
148346A	1.14984	0.03451	-0.45975	0.03182	0.26218	0.01514
148500A	0.85378	0.01589	0.05600	0.01917	0.14328	0.00811
148627A	1.64344	0.06289	0.67500	0.01814	0.37124	0.00673
148649A	1.93438	0.05632	0.29191	0.01344	0.25592	0.00674
148664A	0.90570	0.03596	0.13498	0.04124	0.33224	0.01477
148669A	0.97733	0.02751	-1.56661	0.05320	0.10679	0.03236
148675A	1.14409	0.05467	1.43684	0.02558	0.22190	0.00591
149223A	0.55783	0.02358	-1.65229	0.15673	0.19240	0.05978
149250A	0.76082	0.02276	-1.09670	0.06116	0.10390	0.02924
149254A	1.70068	0.04452	0.16567	0.01359	0.17694	0.00717
149486A	0.58120	0.03106	1.31995	0.04087	0.11503	0.01293
149504A	0.79843	0.02535	-1.53686	0.07707	0.13872	0.04039
149642A	0.32058	0.04238	1.76249	0.16624	0.27765	0.03558
149723A	0.96166	0.02942	0.00428	0.02888	0.16036	0.01291
150204A	0.80295	0.05056	1.82527	0.04550	0.19450	0.00757
150227A	0.56640	0.04236	1.60736	0.05537	0.24793	0.01386
150584A	1.14426	0.03805	-1.59024	0.06067	0.22908	0.03834
150642A	0.75325	0.03456	0.80646	0.03552	0.21070	0.01233
150654A	1.18161	0.04074	-0.58929	0.04008	0.37528	0.01782
150664A	1.21614	0.03528	-0.30161	0.02667	0.24568	0.01287
150722A	1.35902	0.06747	1.41517	0.02360	0.27557	0.00551
150858A	0.65492	0.04208	1.03329	0.05241	0.33023	0.01468
150931A	0.86399	0.02407	-0.05073	0.02866	0.08028	0.01274
151071A	0.56427	0.02581	-1.17157	0.14042	0.23482	0.04752
151080A	0.78032	0.03033	0.06163	0.04706	0.23895	0.01748
151081A	0.80260	0.04105	0.99687	0.03528	0.27793	0.01103
151278A	0.80528	0.03686	0.45852	0.04312	0.33316	0.01369
151289A	0.73326	0.02403	-2.10502	0.09971	0.13785	0.05305
151506A	0.98224	0.03039	0.34330	0.02374	0.15497	0.00988
151513A	0.72945	0.02157	-1.15605	0.06227	0.09141	0.02925
151515A	0.87539	0.04422	0.95332	0.03491	0.34112	0.01049
151519A	0.97677	0.02242	-1.64153	0.03362	0.04012	0.01694
151549A	0.77036	0.03074	-1.06659	0.09129	0.29991	0.03665
151550A	1.16419	0.03211	-0.49739	0.02846	0.18021	0.01503
151553A	1.13950	0.04518	-0.95332	0.05946	0.47310	0.02398
151554A	0.98253	0.02306	-0.71822	0.03622	0.44613	0.01311
151556A	1.15709	0.03102	-0.56436	0.02824	0.17179	0.01474
151561A	0.92774	0.03171	0.11316	0.03245	0.21323	0.01345
151997A	1.24912	0.03384	-0.13375	0.02150	0.17471	0.01095
152039A	1.24958	0.08866	1.96154	0.04047	0.28862	0.00517
152143A	0.96326	0.03370	0.32052	0.02956	0.23507	0.01185
152152A	1.05150	0.03984	0.02187	0.03582	0.36632	0.01348
152185A	0.69085	0.01974	-1.72185	0.07199	0.08396	0.03441
152193A	0.58716	0.02139	-1.23090	0.10384	0.12876	0.04120
152197A	0.50634	0.01248	-1.72464	0.03936	0.00000	0.00000
152343A	1.71910	0.02635	0.42442	0.00713	0.15303	0.00342

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
152353A	0.95297	0.02905	-0.05974	0.03042	0.17829	0.01318
152518A	0.81741	0.01630	-1.14536	0.04247	0.18857	0.02030
152635A	1.40170	0.03462	0.00396	0.01586	0.12565	0.00825
152776A	0.21013	0.00550	-0.89309	0.03365	0.00000	0.00000
152789A	0.89088	0.02841	0.16574	0.02961	0.15869	0.01222
152872A	0.94458	0.02992	-1.12134	0.05661	0.19599	0.02956
152874A	1.24962	0.02281	0.79664	0.00960	0.14929	0.00365
152881A	1.00187	0.02941	-0.03059	0.02695	0.15109	0.01240
152904A	1.29626	0.03254	0.27318	0.01521	0.10641	0.00693
152985A	0.79880	0.02296	-1.10871	0.05491	0.09503	0.02722
152988A	1.23590	0.02208	-0.37468	0.01732	0.29681	0.00829
153171A	1.01491	0.03079	0.25068	0.02390	0.16561	0.01018
153189A	1.21396	0.03496	0.36133	0.01841	0.16831	0.00807
153206A	0.93021	0.03138	-0.33447	0.04188	0.24499	0.01799
153325A	1.51272	0.04605	0.73887	0.01432	0.17109	0.00568
153327A	1.39836	0.04373	-0.05237	0.02287	0.31290	0.01078
153346A	0.49162	0.01942	-3.21071	0.17069	0.14470	0.06437
153935A	0.92877	0.03482	0.38120	0.03210	0.26185	0.01221
153938A	0.26104	0.01155	-3.18833	0.13822	0.00000	0.00000
153941A	0.79197	0.02751	-0.35144	0.04991	0.20525	0.01991
153951A	0.83628	0.03186	-1.43881	0.09490	0.28469	0.04422
154024A	1.09561	0.02811	0.02801	0.02040	0.09956	0.00978
154479A	0.76981	0.03838	1.05686	0.03457	0.24480	0.01073
154501A	1.64671	0.04520	-0.78305	0.02279	0.21963	0.01487
154503A	1.22896	0.03985	-0.86328	0.04049	0.32226	0.02082
154512A	1.02554	0.03511	-0.54875	0.04504	0.32026	0.01961
154619A	0.55138	0.01914	0.69525	0.04042	0.23183	0.01210
155121A	0.80824	0.01943	1.15759	0.01539	0.12264	0.00485
155167A	0.84190	0.02503	-2.06404	0.07326	0.11018	0.04214
155192A	0.63192	0.03319	0.60677	0.05763	0.25836	0.01795

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
155207A	1.20063	0.03420	-1.81986	0.04506	0.09387	0.03154
155220A	0.63774	0.02961	-0.46866	0.09253	0.30098	0.02903
155948A	1.19406	0.03717	-2.20822	0.05197	0.09122	0.03677
156018A	1.20856	0.03030	-0.34281	0.02204	0.13268	0.01141
156019A	1.05773	0.02975	-0.35967	0.03006	0.16678	0.01491
156031A	1.03468	0.01736	-0.02796	0.01514	0.16145	0.00698
163986A	0.13273	0.00934	-2.22958	0.16761	0.00000	0.00000
163993A	1.13149	0.03821	-1.84031	0.06744	0.19842	0.04565
181118A	0.74003	0.01774	-2.14464	0.03815	0.00000	0.00000
184099A	0.82881	0.02963	-0.15513	0.04576	0.22853	0.01826
184121A	1.02090	0.01635	-2.17619	0.02869	0.04102	0.01761
184203A	1.48559	0.04731	0.45206	0.01697	0.25544	0.00752
184241A	0.76499	0.01975	-1.05245	0.04532	0.06161	0.02095
184250A	1.14587	0.03185	-1.99703	0.04374	0.06904	0.02817
479500	0.73449	0.02439	-2.21672	0.10496	0.14828	0.05563
479502	0.95881	0.03134	-0.51711	0.04411	0.24934	0.01984
479504	1.04020	0.02314	0.11004	0.01578	0.02922	0.00654
479507	0.82645	0.05001	0.26324	0.06707	0.58902	0.01397
479555	0.87284	0.03462	0.99747	0.02558	0.15996	0.00881
479917	0.46002	0.02532	-0.18198	0.12589	0.15489	0.03639
479919	0.93819	0.02708	0.09069	0.02626	0.11655	0.01174
479930	0.47189	0.02765	-0.86758	0.18967	0.25439	0.05260
479932	0.75552	0.04400	1.38062	0.03811	0.26264	0.00991
491952	0.92840	0.03125	-2.23353	0.08757	0.15482	0.05633

Table M-3. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Mathematics Grade 5

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
146915A	1.31086	0.03924	-0.76502	0.03170	0.25599	0.01759
146930A	0.96198	0.02315	0.21402	0.02261	0.36446	0.00782
146959A	0.53576	0.01200	-0.76314	0.02337	0.00000	0.00000
147291A	0.76667	0.01891	-0.92551	0.05378	0.32019	0.02050
147537A	0.71546	0.01488	-1.89737	0.06847	0.12014	0.03674
147747A	0.82192	0.02989	-0.45679	0.05631	0.22981	0.02325
147753A	0.83670	0.02816	-1.45514	0.07781	0.17658	0.04058
147925A	0.52250	0.02314	-2.97822	0.22382	0.22714	0.08966
147932A	0.88879	0.03779	-0.06374	0.05156	0.37825	0.01754
147968A	0.80899	0.02395	-1.73709	0.07092	0.10418	0.03939
147990A	1.31063	0.02119	0.27803	0.01008	0.15804	0.00469
148011A	1.01564	0.02999	-0.68546	0.03820	0.17268	0.01937
148098A	0.93838	0.03332	-0.70335	0.05500	0.29558	0.02393
148173A	1.08040	0.02446	0.95580	0.01278	0.20535	0.00437
148344A	0.77000	0.02421	-1.11522	0.06676	0.11887	0.03242
148629A	0.82042	0.02784	-0.00091	0.03744	0.15197	0.01537
148635A	1.29484	0.03581	-0.46875	0.02569	0.19864	0.01405
148644A	0.67848	0.02328	-1.10241	0.08274	0.12660	0.03641
148659A	1.31555	0.03571	-0.39980	0.02318	0.18438	0.01248
148852A	0.68082	0.02598	0.27184	0.04220	0.11201	0.01589
149230A	1.27528	0.03674	-0.02152	0.02139	0.20422	0.01027
149232A	0.95186	0.03250	-1.67048	0.07942	0.19732	0.04740
149241A	0.76252	0.02810	-0.96358	0.07816	0.21708	0.03366
149244A	0.42229	0.00759	-2.30975	0.03819	0.00000	0.00000
149246A	0.91959	0.01727	-0.24597	0.02219	0.18893	0.00981
149255A	0.71499	0.02862	-2.11550	0.14524	0.23641	0.07118
149258A	0.97181	0.03222	-0.93348	0.05306	0.24273	0.02593
149261A	1.04951	0.03160	0.55685	0.01911	0.10809	0.00761
149274A	1.40149	0.06286	0.81365	0.02297	0.40300	0.00718
149275A	0.70363	0.03384	0.53444	0.04890	0.24686	0.01639
149280A	0.79314	0.02527	-0.38312	0.04575	0.11816	0.02012
149284A	0.68142	0.02498	-0.14417	0.05381	0.12647	0.02086
149289A	1.27879	0.04343	0.55440	0.02004	0.24854	0.00815
149290A	1.58844	0.03929	-0.00162	0.01451	0.13423	0.00779
149292A	1.03909	0.03035	-0.30178	0.03130	0.16667	0.01519
149305A	1.07314	0.03914	0.78062	0.02190	0.19965	0.00831
149310A	1.46623	0.03888	-0.18894	0.01905	0.18442	0.01043
149384A	1.01838	0.03481	-0.52576	0.04323	0.29472	0.01894
149559A	0.70167	0.04078	1.45342	0.03933	0.19066	0.01022
149611A	0.89680	0.02724	-0.18339	0.03460	0.13010	0.01566
149624A	0.81278	0.04245	0.74923	0.04135	0.35101	0.01230
149639A	0.94259	0.03288	-1.01756	0.06216	0.27304	0.02957
149640A	1.05711	0.03401	0.67440	0.01964	0.12974	0.00752
150183A	0.94969	0.03905	0.93727	0.02565	0.20702	0.00881
150239A	1.03449	0.08048	0.79249	0.05469	0.70670	0.00854
150267A	0.65494	0.03080	0.57139	0.04866	0.18127	0.01691
150433A	0.81651	0.03257	0.87052	0.02786	0.14506	0.01002
150628A	0.83562	0.02492	-1.43245	0.06518	0.11223	0.03549
150631A	1.21431	0.03475	-0.56307	0.02921	0.20671	0.01548
150703A	1.07002	0.07467	2.09279	0.04871	0.19946	0.00520
151248A	0.62301	0.04119	-0.09178	0.12048	0.49735	0.02655
152006A	0.67649	0.02220	-1.15852	0.07777	0.11286	0.03446
152041A	0.97705	0.02622	-1.03799	0.04136	0.09291	0.02315
152807A	0.78552	0.01701	0.16480	0.02357	0.17673	0.00919
152859A	0.44845	0.00649	-0.74709	0.01563	0.00000	0.00000
152878A	1.12975	0.03550	-0.54790	0.03545	0.26331	0.01714
152933A	0.78324	0.05283	1.29618	0.04420	0.38105	0.01050
152946A	0.93526	0.02801	-0.67458	0.04159	0.15262	0.02038
152989A	0.60942	0.02498	-1.33364	0.12778	0.18639	0.05096
153075A	1.44626	0.03854	0.20668	0.01542	0.14885	0.00738
153076A	1.33522	0.03551	0.11715	0.01755	0.14797	0.00863
153107A	1.56656	0.04878	0.23649	0.01760	0.27548	0.00809
153144A	0.67514	0.02377	-2.17960	0.12168	0.15599	0.06128
153162A	0.87308	0.04060	-1.06588	0.09624	0.48495	0.03190
153165A	1.16138	0.03426	0.37900	0.01906	0.14735	0.00820
153308A	1.21641	0.03994	0.78600	0.01788	0.16158	0.00680

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
153416A	1.02747	0.03675	0.47194	0.02621	0.23447	0.01033
153420A	1.01553	0.03733	0.01078	0.03532	0.31643	0.01365
153942A	1.01948	0.03283	0.59575	0.02127	0.13837	0.00856
153950A	0.67841	0.02115	-1.91437	0.08843	0.10603	0.04305
153972A	0.85920	0.03080	-0.33534	0.04792	0.24126	0.01947
153979A	0.78202	0.02571	-0.11465	0.04087	0.12352	0.01710
154022A	0.96718	0.03183	-0.39219	0.04104	0.23952	0.01828
154031A	0.70969	0.01849	-2.20731	0.04404	0.00000	0.00000
154046A	1.26054	0.03281	0.28472	0.01628	0.10556	0.00758
154048A	1.57496	0.04138	0.16933	0.01481	0.16284	0.00763
154530A	1.05490	0.03132	0.13135	0.02369	0.15295	0.01054
154532A	1.12585	0.03281	0.17267	0.02149	0.15680	0.00966
154536A	1.10482	0.03670	0.33254	0.02449	0.22962	0.01025
154551A	0.88009	0.02619	-0.47151	0.04025	0.12070	0.01898
155103A	1.14629	0.03710	1.24073	0.01797	0.05915	0.00430
155134A	1.41250	0.04212	1.31914	0.01563	0.03556	0.00279
155145A	0.66017	0.02794	0.28767	0.05104	0.15932	0.01829
155155A	0.82547	0.02644	0.02694	0.03463	0.12133	0.01464
155157A	0.91179	0.03091	0.55270	0.02499	0.13567	0.01011
155215A	1.14763	0.03740	-1.29286	0.05201	0.24592	0.03063
155232A	1.24014	0.03443	-0.93870	0.03294	0.16798	0.01994
155234A	1.78085	0.05334	1.13592	0.01260	0.05986	0.00298
155328A	0.93802	0.01803	0.61035	0.01326	0.12370	0.00527
155329A	1.24239	0.03802	0.00501	0.02432	0.24655	0.01139
155335A	0.72834	0.03372	-0.63857	0.09385	0.36193	0.03110
155337A	1.04864	0.03296	0.04946	0.02795	0.20552	0.01237
155403A	0.92129	0.02726	-0.13308	0.03140	0.12705	0.01425
155409A	0.82584	0.02538	-1.39361	0.06691	0.12534	0.03536
155434A	0.86142	0.02927	-0.12361	0.03911	0.18671	0.01625
155462A	1.71822	0.04837	0.73795	0.01203	0.11170	0.00454

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
155469A	1.14739	0.03774	0.44277	0.02205	0.21529	0.00932
155479A	1.10118	0.03862	0.68929	0.02119	0.19348	0.00800
155489A	0.88209	0.02739	-0.02168	0.03158	0.12847	0.01365
155505A	0.56928	0.01838	-1.68320	0.09796	0.09652	0.04047
155515A	0.88250	0.02871	-0.61532	0.04901	0.19269	0.02244
155520A	0.73173	0.02543	-0.54904	0.06060	0.14039	0.02558
156035A	0.43480	0.00854	-2.83058	0.04948	0.00000	0.00000
161469A	0.86067	0.02356	-1.58752	0.05460	0.08305	0.03046
161578A	0.93505	0.03985	1.05275	0.02566	0.19610	0.00856
181426A	0.52729	0.03373	0.27357	0.10372	0.29456	0.02746
184260A	0.92814	0.03274	0.29276	0.03096	0.20642	0.01256
184261A	0.59951	0.02670	-0.37198	0.08647	0.18507	0.02966
184263A	0.62365	0.03432	-1.00208	0.15228	0.41804	0.04289
184306A	0.78610	0.03255	-0.92579	0.08750	0.33262	0.03341
184319A	0.73313	0.02530	-0.55707	0.06017	0.13750	0.02551
187144A	1.16848	0.02570	0.54051	0.01428	0.31051	0.00535
187149A	0.90674	0.03111	0.06958	0.03488	0.20649	0.01437
187209A	1.52656	0.06208	1.22501	0.01776	0.21146	0.00526
484706	0.81167	0.01911	0.21827	0.02496	0.25279	0.00910
484712	1.29325	0.02370	1.30885	0.00990	0.04850	0.00196
484716	1.35278	0.04889	1.35187	0.01802	0.09635	0.00419
484718	0.78249	0.02066	-2.26952	0.04336	0.00000	0.00000
489954	0.77480	0.02289	-1.97395	0.07300	0.09699	0.03960
489964	0.81705	0.02190	-1.63077	0.05423	0.07161	0.02862
489975	1.28050	0.05544	1.11332	0.02137	0.27327	0.00667

Table M-4. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Mathematics Grade 6

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
146958A	0.99318	0.03094	-0.88960	0.04742	0.13309	0.02645
147412A	1.24950	0.02264	-0.18485	0.01559	0.26874	0.00744
147432A	1.28351	0.03423	-0.68518	0.02569	0.23606	0.01320
147578A	0.53504	0.01501	0.62522	0.03186	0.07320	0.01102
148159A	0.30632	0.00671	-2.32348	0.05013	0.00000	0.00000
148179A	1.41318	0.07164	1.42571	0.02381	0.28156	0.00486
148231A	1.12781	0.03137	-0.80674	0.03266	0.23374	0.01614
148275A	0.72426	0.03928	-1.03412	0.14265	0.43281	0.04638
148336A	1.11208	0.03740	-0.80969	0.04718	0.22645	0.02628
148642A	0.13706	0.01930	2.35462	0.58368	0.15022	0.05884
148828A	0.70981	0.03662	0.39359	0.06080	0.27462	0.02040
148847A	0.75242	0.04479	1.42052	0.03884	0.20125	0.01136
148897A	0.57414	0.03270	-0.11885	0.11217	0.24664	0.03506
148926A	0.71088	0.01916	-1.98934	0.07060	0.08773	0.03538
149062A	0.80442	0.03945	-0.79683	0.10314	0.40651	0.03655
149140A	0.93136	0.02115	0.23877	0.02095	0.28675	0.00787
149231A	1.14009	0.02943	-0.54411	0.02559	0.17879	0.01256
149234A	0.91159	0.01118	-1.17660	0.01505	0.01435	0.00621
149259A	1.14644	0.02374	-1.16366	0.02287	0.04284	0.01245
149333A	1.44290	0.04770	0.72707	0.01604	0.23699	0.00573
149341A	0.98905	0.03630	0.02384	0.03764	0.23433	0.01668
149380A	1.09727	0.04300	-1.42631	0.07621	0.28720	0.04473
149470A	0.82888	0.02786	-1.68957	0.08100	0.12443	0.04529
149511A	0.57442	0.01901	-0.93489	0.07607	0.09291	0.02829
149730A	0.73254	0.02217	-0.42666	0.04280	0.10816	0.01731
149750A	1.11928	0.04197	1.04086	0.02062	0.13381	0.00727
150270A	0.49685	0.01292	-0.36784	0.02394	0.00000	0.00000
150604A	0.99591	0.03431	0.47845	0.02402	0.23724	0.00873
150617A	0.60479	0.02207	-1.75410	0.11342	0.12151	0.04953
150723A	1.33402	0.02295	-0.77054	0.01797	0.23531	0.01026
150912A	0.45909	0.02303	-3.29802	0.22546	0.17371	0.07597
150963A	1.22598	0.04188	0.55814	0.02109	0.19372	0.00934
150972A	1.08415	0.02683	0.04232	0.01828	0.10376	0.00797
150977A	0.78488	0.01435	-0.37204	0.02514	0.08990	0.01110
151145A	0.80723	0.01951	-0.23807	0.03400	0.30956	0.01219
151235A	1.08882	0.03666	0.44895	0.02233	0.25729	0.00824
151316A	1.03510	0.02823	-0.51338	0.02967	0.18866	0.01374
151512A	0.84729	0.04670	0.98904	0.03928	0.30933	0.01255
151710A	0.90925	0.02276	-1.17451	0.03976	0.08686	0.02059
151782A	1.30679	0.03739	1.60066	0.01480	0.16699	0.00282
151921A	0.42092	0.03298	-0.58125	0.26569	0.29938	0.06242
152301A	0.87510	0.03087	-0.33416	0.04838	0.16979	0.02239
152379A	1.56840	0.04067	-0.07063	0.01611	0.11608	0.00947
152527A	0.75842	0.02360	-1.79818	0.08438	0.14862	0.04275
152528A	0.85057	0.03069	-2.19297	0.09205	0.13009	0.05388
152531A	0.67917	0.02267	-1.08052	0.07457	0.09393	0.03350
152633A	1.18157	0.03227	-0.77119	0.03103	0.09420	0.01869
152666A	1.09014	0.03774	0.98010	0.01949	0.09757	0.00697
152754A	0.76876	0.03288	0.88073	0.03141	0.11010	0.01206
152834A	0.61097	0.02956	-0.91307	0.13196	0.22678	0.04849
152840A	1.20593	0.03898	-0.63369	0.03759	0.22736	0.02107
152853A	1.41990	0.04970	0.93157	0.01647	0.21365	0.00522
152908A	1.12099	0.03500	-0.03715	0.02789	0.17138	0.01401
152957A	0.39758	0.01778	-1.18029	0.15190	0.10140	0.04368
153088A	0.43850	0.02160	-3.12292	0.23428	0.17936	0.07757
153103A	0.73930	0.02593	0.08451	0.03840	0.16926	0.01414
153270A	0.59200	0.03924	0.91879	0.06615	0.23891	0.02077
153298A	1.07680	0.05149	1.22320	0.02631	0.23041	0.00817
153315A	1.18339	0.02044	0.25818	0.01192	0.16977	0.00543
153382A	1.29573	0.04664	0.72778	0.01901	0.28271	0.00646
153445A	0.90310	0.03328	0.44274	0.03064	0.14737	0.01311
153512A	0.81423	0.03815	-0.14580	0.06747	0.35103	0.02362
153601A	0.91351	0.02790	-0.42584	0.03684	0.22110	0.01534
153952A	0.56369	0.00902	-2.22915	0.03015	0.00000	0.00000
153988A	0.39458	0.02313	-1.04327	0.22918	0.17010	0.06174
154011A	0.88450	0.04157	0.00559	0.05786	0.38857	0.01984

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
154500A	1.17999	0.03849	-1.75847	0.05446	0.11010	0.03804
155138A	1.09287	0.04368	0.74245	0.02544	0.23513	0.01000
155177A	1.23399	0.02265	-1.95440	0.03095	0.08400	0.02361
155218A	0.96778	0.02479	-1.27929	0.03661	0.04661	0.01904
155298A	1.16653	0.03118	-0.39840	0.02455	0.20983	0.01159
155323A	0.82324	0.02010	-1.56073	0.03144	0.00000	0.00000
155450A	1.29379	0.06378	0.97742	0.02568	0.36786	0.00841
155464A	0.23117	0.01666	-2.31860	0.54166	0.22102	0.08668
155496A	1.23371	0.04113	-1.60743	0.05352	0.13783	0.03813
161493A	0.70421	0.02481	0.90866	0.02512	0.06278	0.00798
181240A	1.38956	0.02657	-0.27217	0.01590	0.34694	0.00751
181405A	1.02768	0.05323	1.18018	0.02911	0.27337	0.00915
181415A	0.98223	0.03797	1.14383	0.02255	0.15490	0.00605
181448A	1.19639	0.07835	1.73148	0.03496	0.26282	0.00641
181455A	1.22291	0.04532	0.23990	0.02819	0.30265	0.01242
181997A	2.27143	0.15016	1.75525	0.02199	0.22875	0.00424
184316A	0.85639	0.01590	-0.94297	0.03272	0.13403	0.01620
187093A	0.47394	0.04379	1.35108	0.09242	0.26233	0.02517
187116A	0.88219	0.02627	0.29755	0.02490	0.05368	0.01089
187119A	0.87621	0.02928	-0.39009	0.04563	0.13990	0.02171
187202A	1.42323	0.07057	1.20753	0.02263	0.30688	0.00690
479039	0.67826	0.03796	0.75850	0.05440	0.24684	0.01801
479041	0.75158	0.02027	-1.55121	0.06074	0.08936	0.02992
479043	1.19033	0.05736	1.44069	0.02496	0.18652	0.00642
479045	0.56781	0.03769	0.53107	0.09103	0.27381	0.02658
479047	1.00037	0.05375	1.43273	0.03123	0.28135	0.00636
479049	0.56462	0.05738	2.54075	0.11562	0.21495	0.00937
479051	0.97212	0.03903	0.66997	0.02882	0.20956	0.01146
479053	1.36351	0.05256	1.05998	0.01836	0.17424	0.00651
479055	0.38539	0.01918	-1.37215	0.19955	0.13412	0.05556

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
479057	0.66060	0.02404	-0.89319	0.07770	0.18681	0.02936
479059	0.77050	0.02195	-0.19038	0.03413	0.04550	0.01480
479061	1.04572	0.03408	-0.00671	0.03084	0.17582	0.01484
479063	0.72720	0.03866	1.73679	0.03925	0.06767	0.00791
479065	0.91476	0.04349	1.82365	0.03717	0.08607	0.00433
479067	1.44725	0.08643	1.52114	0.02684	0.32090	0.00614
479069	0.85688	0.02923	-1.06068	0.06289	0.28748	0.02618
479071	0.66294	0.02835	-0.52704	0.08628	0.17531	0.03374
479073	1.01188	0.03380	-1.14544	0.05855	0.17116	0.03419
479075	1.04401	0.03905	-2.08080	0.08275	0.15472	0.05641
479077	1.36532	0.05585	1.08512	0.01985	0.21639	0.00682
479081	0.97932	0.03193	-0.67186	0.04716	0.16448	0.02484
479083	0.69475	0.02520	-0.19941	0.05042	0.18238	0.01821
479087	1.01805	0.06442	1.49931	0.03486	0.30467	0.00837
479095	0.83170	0.01328	1.53227	0.01881	0.00000	0.00000
479097	0.74091	0.01015	0.62736	0.01181	0.00000	0.00000
479099	0.58165	0.01629	1.71730	0.04040	0.00000	0.00000
479101	0.57899	0.02368	3.11400	0.10212	0.00000	0.00000
479133	0.94763	0.02764	2.17236	0.04055	0.00000	0.00000
479146	0.99045	0.02117	1.55212	0.02359	0.00000	0.00000
479148	1.03731	0.02483	1.63077	0.02476	0.00000	0.00000
509462	0.20328	0.04053	1.87301	0.59398	0.00000	0.00000
509941	0.41130	0.05117	-0.28502	0.13920	0.00000	0.00000
510212	0.22009	0.04273	1.96172	0.58683	0.00000	0.00000

Table M-5. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Mathematics Grade 7

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
147366A	1.20159	0.03173	-0.07028	0.02110	0.08906	0.01117
147541A	1.21595	0.04350	-0.71554	0.04563	0.32336	0.02390
147576A	1.04758	0.02681	-0.64064	0.02928	0.15169	0.01483
148009A	0.65056	0.02951	1.04007	0.03538	0.08079	0.01247
148193A	1.04456	0.04212	1.27775	0.02274	0.17102	0.00551
148268A	1.03448	0.04046	1.01467	0.02274	0.15558	0.00805
148330A	0.80603	0.01052	-0.03107	0.01205	0.01299	0.00454
148478A	1.06042	0.04287	1.30510	0.02271	0.16726	0.00534
148524A	0.64082	0.03011	-0.01526	0.07029	0.31693	0.02055
148527A	1.15760	0.02217	0.05628	0.01597	0.28014	0.00689
148704A	0.90689	0.03014	0.05409	0.03421	0.14483	0.01519
148711A	1.21973	0.03427	0.02690	0.02176	0.12400	0.01135
148739A	1.19164	0.03826	-0.19130	0.03067	0.22720	0.01565
148826A	0.76057	0.02025	-1.97631	0.04140	0.00000	0.00000
148912A	1.06987	0.02433	0.55877	0.01588	0.30363	0.00578
148934A	1.25008	0.03678	0.30195	0.01893	0.24270	0.00768
149061A	0.78952	0.02428	-1.09163	0.06105	0.09177	0.03104
149063A	1.01731	0.03075	-0.58962	0.03869	0.14259	0.02032
149081A	0.58688	0.02733	-1.16379	0.14616	0.20409	0.05536
149102A	1.11251	0.05404	1.46814	0.02663	0.23411	0.00534
149204A	0.83937	0.02775	-0.12164	0.04033	0.11006	0.01837
149208A	0.85656	0.02893	0.08526	0.03576	0.12923	0.01553
149256A	0.62150	0.03665	1.10041	0.04623	0.27561	0.01297
149295A	1.37605	0.03649	-0.10046	0.01911	0.12593	0.01048
149298A	0.46684	0.02350	-3.41304	0.24264	0.19999	0.08489
149537A	0.22988	0.01241	-3.05035	0.16863	0.00000	0.00000
149705A	0.76184	0.01978	-0.04145	0.03544	0.32266	0.01178
149708A	1.10391	0.02679	0.47109	0.01774	0.38509	0.00602
149719A	1.75014	0.10609	1.85008	0.02598	0.17762	0.00415
149732A	1.13698	0.05375	0.94132	0.02764	0.33654	0.00906
149759A	1.07073	0.03207	0.16964	0.02330	0.22934	0.00943
150189A	1.01629	0.02905	-0.47656	0.03348	0.10833	0.01744
150199A	1.31811	0.03504	0.14033	0.01717	0.20310	0.00764
150232A	1.73208	0.05645	1.27843	0.01388	0.08838	0.00293
150237A	0.78582	0.07507	2.84556	0.11798	0.08863	0.00530
150618A	0.53391	0.03452	1.01209	0.06112	0.26343	0.01702
150629A	1.01824	0.05525	2.01082	0.04166	0.10822	0.00389
150891A	1.47266	0.04380	1.46644	0.01329	0.26768	0.00304
150897A	0.89952	0.03149	-0.11988	0.04129	0.18948	0.01811
150952A	0.59334	0.03940	1.19290	0.05527	0.20510	0.01778
151733A	0.89729	0.03580	0.36652	0.03681	0.23678	0.01437
151811A	1.31816	0.03761	-0.35742	0.02570	0.16566	0.01493
151849A	0.34870	0.03962	2.35069	0.10237	0.16380	0.02277
151850A	0.79229	0.03487	-0.35367	0.07273	0.29672	0.02765
151879A	1.12412	0.02641	-0.69288	0.02466	0.11194	0.01329
151964A	1.16961	0.03739	-0.53411	0.03622	0.23157	0.01910
151991A	0.88636	0.01201	-1.28085	0.02079	0.02741	0.01075
152007A	0.47795	0.02822	-0.49176	0.16352	0.20756	0.04728
152009A	1.41934	0.05190	0.91348	0.01787	0.20557	0.00678
152029A	1.11600	0.03891	-0.61772	0.04572	0.27726	0.02340
152045A	1.30406	0.04543	-0.16202	0.03065	0.33429	0.01434
152051A	0.84552	0.02614	1.03517	0.02019	0.05133	0.00546
152056A	0.87515	0.01356	-0.43691	0.01902	0.05437	0.00910
152137A	0.95830	0.04344	1.14511	0.02693	0.19471	0.00883
152288A	1.51563	0.03274	1.19428	0.00961	0.16291	0.00279
152745A	0.86568	0.04059	0.57249	0.04080	0.29036	0.01458
152819A	1.98869	0.09613	1.39319	0.01749	0.24148	0.00491
152901A	0.96061	0.03203	-0.01411	0.03256	0.29310	0.01227
152915A	0.68282	0.01816	0.18560	0.03446	0.23869	0.01166
153291A	1.13391	0.02364	0.30637	0.01575	0.30581	0.00620
153294A	0.55552	0.02587	-0.66529	0.11937	0.15577	0.04241
153299A	1.16726	0.03500	0.78085	0.01660	0.14173	0.00564
153452A	1.65166	0.05947	0.56840	0.01754	0.38882	0.00609
153485A	2.44588	0.08815	0.40656	0.01366	0.34924	0.00724
153499A	0.62283	0.05026	1.00690	0.07742	0.43364	0.01834
153504A	0.89387	0.02583	0.58175	0.01995	0.08714	0.00734

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
153922A	0.62063	0.02889	-1.31723	0.15110	0.23364	0.05960
154028A	0.63607	0.00890	-1.81702	0.02128	0.00000	0.00000
155126A	0.90762	0.02098	1.18417	0.01391	0.11889	0.00419
155443A	1.06832	0.02903	0.57432	0.01670	0.10323	0.00619
161470A	0.79301	0.04458	0.86188	0.04518	0.32214	0.01437
163883A	0.74263	0.01719	-1.41623	0.02907	0.00000	0.00000
181941A	0.93692	0.03463	-0.61937	0.05799	0.25285	0.02722
181978A	0.62118	0.02455	0.73966	0.03444	0.09159	0.01197
181984A	1.24334	0.03061	-0.10717	0.01821	0.15791	0.00871
181998A	1.03604	0.05541	0.89036	0.03498	0.41375	0.01034
182005A	3.06064	0.10155	0.36172	0.01012	0.26291	0.00636
182010A	1.02802	0.02184	1.39956	0.01285	0.06602	0.00272
182015A	1.23563	0.04340	1.13037	0.01797	0.15744	0.00482
182026A	0.70846	0.03001	0.58416	0.04560	0.55406	0.00920
182027A	0.67406	0.03866	0.79889	0.05463	0.25261	0.01791
182028A	1.44142	0.03831	0.40248	0.01437	0.09200	0.00692
182033A	1.07482	0.03936	-0.48824	0.04738	0.30709	0.02230
183739A	1.02908	0.02745	0.12219	0.02089	0.13796	0.00895
187098A	0.63239	0.02907	-0.04527	0.07506	0.18109	0.02655
480259	0.64760	0.03857	1.29853	0.04217	0.25855	0.01122
480264	0.87302	0.04599	1.01741	0.03548	0.28518	0.01167
480267	0.98494	0.04546	1.26410	0.02640	0.18329	0.00803
480272	0.31678	0.00900	-0.21760	0.02743	0.00000	0.00000
480274	0.46245	0.03662	1.65275	0.06592	0.12674	0.01978
480287	0.86178	0.03334	0.77076	0.02688	0.21706	0.00893
480293	1.23271	0.05482	1.12033	0.02285	0.25590	0.00741
480295	1.37413	0.05632	1.19561	0.01928	0.24710	0.00498
480297	1.48142	0.05349	1.00735	0.01657	0.17319	0.00608
480299	0.51009	0.01244	-0.06508	0.02107	0.00000	0.00000
480301	0.74308	0.02657	1.48017	0.02802	0.03263	0.00481
480303	1.57496	0.08006	1.63979	0.02283	0.17000	0.00461
480305	1.49378	0.06503	1.81522	0.02420	0.05064	0.00281
480307	1.04827	0.08749	2.24618	0.06425	0.24765	0.00470
480311	1.44988	0.07057	1.71567	0.02451	0.11906	0.00420
480315	0.71918	0.04460	1.34334	0.04207	0.24104	0.01243
480333	1.09113	0.03409	-0.45319	0.03664	0.18069	0.01952
480335	1.33618	0.03741	-0.43064	0.02493	0.15944	0.01446
480339	0.94624	0.03020	0.84923	0.01972	0.11464	0.00648
480343	1.20198	0.04943	1.17312	0.02107	0.17644	0.00683
480350	1.38007	0.04846	0.73811	0.01859	0.21742	0.00762
480358	0.78902	0.02008	2.84134	0.05237	0.00000	0.00000
480360	0.92300	0.02422	1.92913	0.03327	0.00000	0.00000
480371	0.86765	0.01724	0.81111	0.01603	0.00000	0.00000
480373	1.01468	0.01386	1.21955	0.01251	0.00000	0.00000
480375	1.24632	0.02358	1.32108	0.01605	0.00000	0.00000
480378	1.47557	0.02400	1.62340	0.01310	0.00000	0.00000
480380	1.34688	0.02781	1.29429	0.01528	0.00000	0.00000
489119	1.44857	0.04602	1.03373	0.01482	0.14152	0.00425
489176	3.08877	0.10131	0.32594	0.01001	0.25751	0.00642
489216	1.66679	0.05769	0.74910	0.01589	0.23109	0.00672
490048	0.60579	0.03261	0.91108	0.05024	0.14821	0.01723
490454	2.26971	0.10962	1.44286	0.01565	0.23446	0.00364
490609	0.43822	0.02144	-2.91114	0.24552	0.19598	0.08249
492694	0.82066	0.01569	1.99822	0.02667	0.00000	0.00000
509655	1.14579	0.36068	1.12613	0.21734	0.22704	0.02520

Table M-6. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Mathematics Grade 8

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
147999A	1.17515	0.04032	0.95106	0.01855	0.18296	0.00574
148061A	1.58868	0.04402	0.63266	0.01288	0.15984	0.00493
148272A	1.07175	0.04088	-0.73326	0.05553	0.34305	0.02563
148273A	1.05342	0.04228	0.87084	0.02471	0.21343	0.00920
148303A	0.90919	0.01863	0.57554	0.01519	0.15377	0.00598
148310A	0.61689	0.04195	1.57857	0.04891	0.25798	0.01122
148321A	1.49441	0.06186	1.10934	0.01889	0.22640	0.00615
148327A	1.14319	0.02084	0.24824	0.01210	0.08432	0.00540
148368A	0.83119	0.03561	-0.11347	0.05707	0.29067	0.02170
148379A	1.05320	0.01795	-0.45532	0.01924	0.16549	0.00976
148472A	1.69896	0.05552	0.32292	0.01704	0.26502	0.00851
148531A	0.73936	0.01881	-1.72399	0.03611	0.00000	0.00000
148889A	1.20169	0.03050	-0.66208	0.02592	0.17040	0.01419
149067A	1.06194	0.02907	-0.53627	0.03047	0.19101	0.01500
149710A	0.97332	0.01504	-0.34602	0.01651	0.07297	0.00821
150198A	1.12441	0.01610	0.29961	0.00925	0.04983	0.00396
150202A	0.98675	0.03262	0.41948	0.02437	0.21893	0.00922
150215A	0.81113	0.02226	0.72021	0.02223	0.28369	0.00732
150223A	1.24578	0.01914	-0.44330	0.01408	0.13999	0.00783
150226A	1.45154	0.04118	0.07506	0.01769	0.26683	0.00803
150256A	1.97061	0.05744	0.36671	0.01283	0.18683	0.00692
150947A	1.40638	0.05389	0.63346	0.02128	0.31031	0.00863
150961A	0.87140	0.02986	0.34689	0.02992	0.11174	0.01287
151253A	1.19012	0.03590	0.36212	0.01949	0.22393	0.00784
151257A	0.70120	0.02388	-1.71824	0.09300	0.11707	0.04619
151260A	0.63989	0.01442	-0.88266	0.02410	0.00000	0.00000
151271A	0.64510	0.02541	-0.69839	0.08460	0.13143	0.03439
151283A	0.76687	0.01453	-0.08507	0.02309	0.08802	0.00985
151302A	1.54203	0.04710	0.61261	0.01489	0.15012	0.00665
151314A	1.16017	0.03098	-0.16798	0.02293	0.09307	0.01197
151317A	1.41706	0.05617	0.31260	0.02602	0.40366	0.01045
151382A	1.51347	0.05210	0.09675	0.02295	0.33051	0.01100
151455A	1.02811	0.03513	0.47117	0.02468	0.15471	0.01069
151931A	0.98780	0.01625	-0.95222	0.02465	0.09962	0.01393
152213A	1.01509	0.04575	0.81596	0.03012	0.29900	0.01053
152296A	0.51717	0.01643	-1.01493	0.08122	0.07490	0.02914
152336A	0.45542	0.02054	-0.56474	0.11841	0.09822	0.03697
152847A	0.83951	0.03740	0.44932	0.04187	0.26027	0.01539
152854A	0.61066	0.03041	-0.21240	0.09401	0.21460	0.03205
152944A	1.09159	0.02905	0.14486	0.02000	0.06726	0.00944
153249A	1.00058	0.04238	0.90721	0.02688	0.22668	0.00970
153271A	1.09364	0.02188	0.63072	0.01268	0.19467	0.00498
153283A	2.06138	0.05813	0.94613	0.01062	0.05556	0.00321
153423A	1.11372	0.03571	-0.26424	0.03137	0.33004	0.01293
153487A	1.07175	0.03775	0.11443	0.03145	0.24596	0.01387
153516A	0.97626	0.04949	1.09104	0.03116	0.28828	0.00969
153529A	1.50824	0.05104	0.90782	0.01568	0.14975	0.00586
153599A	0.73277	0.04792	1.34968	0.04585	0.30566	0.01252
154134A	0.61150	0.02513	-0.54706	0.08745	0.13096	0.03332
154152A	1.04421	0.03023	0.37872	0.02051	0.08123	0.00915
154156A	0.91638	0.03003	-1.82999	0.07272	0.11795	0.04463
154159A	0.61084	0.02883	-0.32463	0.09423	0.19348	0.03302
154160A	1.17316	0.05335	0.84994	0.02711	0.34575	0.00923
154320A	0.56392	0.02780	0.26915	0.06970	0.20813	0.02141
154367A	0.61888	0.02925	0.75115	0.04633	0.10596	0.01672
161462A	1.99483	0.05077	0.25689	0.01085	0.17944	0.00529
181901A	0.81036	0.03835	1.26363	0.03085	0.15032	0.00969
181903A	0.89014	0.02900	-0.93796	0.05753	0.14003	0.02988
181934A	1.28612	0.05658	1.28582	0.02200	0.19494	0.00619
181973A	0.97316	0.03526	0.43400	0.02850	0.17928	0.01206
183763A	1.37402	0.06603	1.51314	0.02359	0.23196	0.00452
183764A	0.94972	0.03963	0.96856	0.02586	0.25549	0.00775
183778A	1.41677	0.04385	0.48136	0.01703	0.16964	0.00794
183781A	0.75925	0.03145	-0.05170	0.05710	0.21345	0.02203
183795A	0.86821	0.01977	0.67811	0.01702	0.18881	0.00632
183885A	0.63277	0.02756	0.11098	0.05979	0.21741	0.01961

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
484739	0.62904	0.02442	3.10506	0.09316	0.00000	0.00000
484750	0.40810	0.01184	2.04831	0.05895	0.00000	0.00000
484755	0.30372	0.01375	3.04360	0.12934	0.00000	0.00000
484757	0.28668	0.01196	2.13439	0.08637	0.00000	0.00000
484762	0.79074	0.01616	-0.80379	0.01936	0.00000	0.00000
484764	1.19810	0.02417	1.49388	0.01897	0.00000	0.00000
484766	0.34878	0.00728	-0.20956	0.01958	0.00000	0.00000
484768	0.52763	0.02356	-0.92531	0.12978	0.14243	0.04560
484770	0.66934	0.03436	0.66975	0.05184	0.20200	0.01787
484772	0.84897	0.03549	0.79225	0.02975	0.25425	0.00955
484781	0.49849	0.05617	2.10070	0.09206	0.30969	0.01778
484815	1.15215	0.03439	1.46520	0.01603	0.25608	0.00362
484817	1.05027	0.03351	-0.54035	0.04006	0.18745	0.02066
484819	1.41757	0.05159	-0.70173	0.03816	0.37190	0.02038
484821	1.35575	0.04013	0.16793	0.01894	0.27420	0.00810
484823	1.18308	0.03438	-0.40157	0.02800	0.27569	0.01307
484826	0.83624	0.05262	2.05007	0.04865	0.13888	0.00682
484828	0.68990	0.02698	-0.20741	0.05909	0.22480	0.02083
484837	1.27308	0.07208	1.49077	0.02854	0.29652	0.00648
484841	1.50114	0.07659	1.73065	0.02514	0.17397	0.00369
484843	0.65604	0.04109	0.92612	0.05773	0.29104	0.01737
484845	0.85212	0.03647	0.42999	0.04026	0.25165	0.01504
484847	0.59781	0.01614	-0.84685	0.05285	0.05349	0.02072
484849	0.50926	0.03069	-0.16435	0.13489	0.22327	0.03955
484851	0.71135	0.02738	-0.77293	0.08073	0.16087	0.03450
484853	1.05055	0.01921	-0.58489	0.01604	0.01979	0.00704
484860	1.93511	0.09187	1.39656	0.01774	0.26607	0.00406
484862	0.93213	0.03284	0.37607	0.02833	0.25000	0.01035
484866	0.97011	0.02046	0.90996	0.01297	0.13944	0.00456
484871	0.48023	0.01918	0.94355	0.04667	0.17294	0.01394

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
484873	0.64108	0.02492	1.51228	0.02752	0.23700	0.00721
484875	1.10505	0.03721	0.95219	0.01896	0.10187	0.00679
484877	0.89386	0.04088	-0.22733	0.06238	0.39645	0.02190
484879	1.47741	0.08066	1.71481	0.02646	0.22347	0.00406
484881	0.46544	0.01031	-0.85253	0.02338	0.00000	0.00000
484883	1.57005	0.05198	0.35799	0.01822	0.25896	0.00878
484889	1.17443	0.03890	0.88279	0.01820	0.11637	0.00687
484894	0.50399	0.03085	0.22611	0.11070	0.19232	0.03279
484977	0.73084	0.04268	1.11493	0.04427	0.27666	0.01356
484979	1.13684	0.05315	1.35509	0.02526	0.19534	0.00676
484984	0.77784	0.02921	1.26476	0.02548	0.07408	0.00641
490067	1.22963	0.03073	0.27419	0.01539	0.11519	0.00663
490116	1.16583	0.04840	0.71701	0.02495	0.38575	0.00749
490151	1.30296	0.04458	0.88059	0.01758	0.21878	0.00568
490178	0.97416	0.04810	1.56388	0.03052	0.19853	0.00572
490241	1.19461	0.06250	1.24456	0.02747	0.31925	0.00758
490262	1.01647	0.03177	0.19041	0.02624	0.13146	0.01210
490353	1.40020	0.04362	0.65292	0.01603	0.22294	0.00592
490472	0.87601	0.05877	1.99391	0.04806	0.19710	0.00726
490595	1.26962	0.04394	1.38245	0.01886	0.06076	0.00407
492696	0.49045	0.01458	3.35159	0.08393	0.00000	0.00000
499651	0.98077	0.01513	1.59340	0.01709	0.00000	0.00000
509470	2.03930	0.54749	0.72138	0.10402	0.18690	0.01957
509480	2.18647	0.82261	1.02002	0.14198	0.22731	0.01925
509528	0.28359	0.05533	1.30214	0.42367	0.00000	0.00000

Table M-6. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Mathematics Grade 10

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
141996A	1.68277	0.03012	0.36478	0.00912	0.24028	0.00425
142002A	1.21824	0.04657	0.89399	0.02085	0.26080	0.00674
142007A	1.32181	0.04604	0.73012	0.01896	0.19759	0.00733
142018A	1.37651	0.05251	2.06778	0.02216	0.15499	0.00232
142022A	1.81775	0.03245	0.64579	0.00772	0.18603	0.00328
142043A	1.18041	0.04054	0.70720	0.02012	0.22213	0.00724
142046A	1.19340	0.03306	0.07731	0.02041	0.11340	0.00983
142047A	1.18082	0.05821	1.61176	0.02701	0.14563	0.00524
142055A	0.71928	0.02511	0.19724	0.03894	0.11189	0.01506
142062A	0.76843	0.02454	0.12304	0.03422	0.09787	0.01385
142089A	1.64845	0.05270	-0.23530	0.02168	0.29845	0.01171
142092A	1.55390	0.03764	-0.26493	0.01544	0.08269	0.00874
142210A	0.92716	0.02539	-1.04041	0.04174	0.07219	0.02267
142216A	1.24011	0.02058	-1.09197	0.02102	0.12961	0.01391
142344A	1.21321	0.04343	0.82836	0.01993	0.17598	0.00732
142371A	0.59170	0.01343	-0.78466	0.02308	0.00000	0.00000
142418A	0.87093	0.03883	0.40100	0.04173	0.28870	0.01511
142431A	0.98585	0.03048	0.21672	0.02562	0.11618	0.01126
142440A	0.84155	0.04850	1.52339	0.03636	0.26363	0.00791
142456A	1.85112	0.04834	0.18021	0.01251	0.17932	0.00624
142681A	1.27156	0.03771	0.67334	0.01635	0.10088	0.00633
142742A	1.43531	0.02867	0.43941	0.01154	0.29083	0.00479
142792A	0.97398	0.04955	0.63171	0.03930	0.40400	0.01227
142899A	1.32980	0.04534	0.21248	0.02350	0.28028	0.01034
142909A	1.18504	0.03291	-0.04833	0.02198	0.12029	0.01093
143026A	1.02796	0.03918	0.69375	0.02544	0.20124	0.00957
143118A	0.99478	0.03040	0.17536	0.02579	0.16963	0.01088
143621A	0.62555	0.01551	0.23626	0.03230	0.10690	0.01188
143634A	1.22251	0.03858	-0.13714	0.02714	0.30046	0.01195
143934A	0.99030	0.02973	0.20673	0.02475	0.15222	0.01047
144122A	1.32383	0.04096	0.25532	0.02011	0.25929	0.00851
148477A	1.27394	0.04240	-0.82214	0.03987	0.26090	0.02297
148837A	0.54266	0.00716	-0.70018	0.01318	0.00000	0.00000
149745A	0.97170	0.03667	0.02451	0.03877	0.26067	0.01624
150211A	0.89874	0.01690	-0.41499	0.02485	0.15547	0.01162
150860A	0.90525	0.02565	-0.84583	0.04244	0.07710	0.02237
150866A	0.97117	0.02222	-0.81856	0.02590	0.03122	0.01237
152449A	1.94051	0.04109	0.69378	0.00884	0.30567	0.00357
152998A	1.32150	0.04140	-0.16842	0.02566	0.23647	0.01337
155759A	1.83464	0.04540	0.37340	0.01090	0.07599	0.00517
155763A	1.31936	0.04959	1.14343	0.01855	0.18887	0.00524
155844A	0.40069	0.02370	0.70399	0.09582	0.07745	0.02683
156160A	0.92630	0.04361	0.50471	0.04004	0.34582	0.01363
156187A	0.96559	0.02511	-1.34384	0.03954	0.05509	0.02202
157639A	0.82418	0.04120	0.51503	0.04700	0.34047	0.01484
161611A	0.52832	0.02739	1.02110	0.04885	0.09869	0.01601
164397A	1.61030	0.08776	1.50823	0.02282	0.26309	0.00521
164565A	1.62580	0.06850	1.14405	0.01802	0.23472	0.00561
164639A	2.34982	0.09165	0.89486	0.01331	0.31266	0.00484
164644A	0.71240	0.03684	0.40214	0.05910	0.29688	0.01866
164652A	0.96038	0.02591	-0.28409	0.02881	0.10643	0.01374
164693A	0.85082	0.02433	-0.22308	0.03337	0.09676	0.01495
164715A	1.50237	0.04014	-0.87900	0.02431	0.18924	0.01613
164834A	1.11741	0.05570	1.11589	0.02762	0.31003	0.00808
165015A	0.71465	0.03794	0.46538	0.05854	0.29570	0.01887
165187A	1.04441	0.05255	1.63856	0.02815	0.38906	0.00490
165342A	1.68283	0.06413	1.34760	0.01619	0.14192	0.00379
165662A	1.20410	0.03223	0.02690	0.02001	0.15265	0.00941
165761A	1.07963	0.01507	-0.66436	0.01496	0.04154	0.00823
165789A	0.83605	0.03784	-0.41152	0.07201	0.35977	0.02601
165825A	1.12164	0.02344	0.28563	0.01608	0.28496	0.00645
169976A	1.37233	0.03836	0.40140	0.01578	0.11293	0.00741
169985A	1.46112	0.04536	-0.08663	0.02216	0.24801	0.01177
170065A	1.14645	0.04467	0.62184	0.02498	0.32993	0.00841

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
170436A	1.37404	0.03644	-0.28068	0.02054	0.19489	0.01087
170502A	2.25253	0.10596	1.30499	0.01552	0.23970	0.00463
170528A	1.06580	0.03701	0.50998	0.02400	0.17411	0.01019
170551A	0.83513	0.02797	-0.27933	0.04388	0.12190	0.01998
170563A	1.10338	0.03566	0.51303	0.02119	0.13748	0.00919
170746A	0.92907	0.02687	-0.34292	0.03314	0.08907	0.01598
170755A	1.65627	0.08339	0.97356	0.02243	0.43247	0.00686
170780A	0.88565	0.04629	1.52861	0.03250	0.15471	0.00780
170830A	1.50214	0.03774	-0.48173	0.01840	0.09657	0.01112
171427A	1.90747	0.08831	1.07315	0.01791	0.33566	0.00592
171548A	1.62095	0.04349	1.24967	0.01134	0.28048	0.00315
171778A	0.59967	0.03543	0.68197	0.06637	0.23674	0.02038
171913A	1.09196	0.04654	1.03030	0.02404	0.21252	0.00815
172891A	0.99732	0.02290	0.88023	0.01429	0.19625	0.00500
172999A	1.22608	0.05048	1.31791	0.02119	0.13772	0.00549
173288A	0.72621	0.06707	2.33327	0.08251	0.21111	0.00860
173296A	0.56059	0.03390	1.17802	0.05147	0.13071	0.01710
173300A	1.02885	0.03355	0.89913	0.02041	0.28659	0.00682
173318A	1.61458	0.06720	1.09086	0.01804	0.29631	0.00529
173355A	1.00193	0.03594	-0.15621	0.03922	0.24765	0.01746
173587A	1.52321	0.05487	1.38253	0.01691	0.10268	0.00352
173659A	1.17585	0.03913	0.46000	0.02182	0.24918	0.00843
173761A	0.88564	0.01871	0.75111	0.01466	0.12488	0.00550
173804A	1.12442	0.06339	1.50478	0.03023	0.25990	0.00695
173837A	1.46127	0.05398	1.58430	0.01664	0.35944	0.00321
173868A	0.88727	0.03398	1.00548	0.02443	0.10118	0.00819
173938A	1.27545	0.05222	1.26299	0.02046	0.15479	0.00563
173962A	1.58039	0.03449	1.41931	0.00999	0.09293	0.00209
173970A	0.56643	0.02088	1.27401	0.02936	0.16364	0.00930
176233A	0.93877	0.04546	1.99197	0.03215	0.32822	0.00407
179238A	1.18333	0.05538	1.35929	0.02436	0.19507	0.00645
180171A	1.94781	0.06340	1.53164	0.01193	0.28597	0.00269
180260A	2.39750	0.13268	1.80342	0.01871	0.10078	0.00294
181035A	1.35559	0.03805	1.68349	0.01466	0.13668	0.00247
181892A	1.63756	0.07692	0.82248	0.02212	0.43013	0.00733

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
184044A	0.82316	0.05849	1.60911	0.04436	0.30896	0.00948
184049A	0.65213	0.02759	0.12975	0.05752	0.18397	0.01997
480384	0.98801	0.04449	1.69635	0.02984	0.10535	0.00472
480386	1.19124	0.05308	1.66161	0.02603	0.08517	0.00423
480388	0.60458	0.03162	0.33071	0.07153	0.18986	0.02392
480390	0.79946	0.04427	1.50123	0.03577	0.22676	0.00825
480392	0.70570	0.03328	0.39010	0.05303	0.22224	0.01826
480396	1.20160	0.08067	1.94896	0.03988	0.20331	0.00534
480398	0.83015	0.02333	0.15955	0.02617	0.06424	0.01087
480400	1.06529	0.03470	-0.44285	0.03780	0.29431	0.01683
480402	1.73551	0.09976	1.38287	0.02271	0.36278	0.00560
480406	1.18952	0.04874	0.86413	0.02319	0.31597	0.00726
480408	0.57973	0.05520	2.02921	0.07343	0.25777	0.01338
480410	1.69079	0.06188	0.90573	0.01587	0.26792	0.00535
480412	1.21405	0.04743	1.14232	0.02026	0.15352	0.00614
480414	1.70570	0.07546	1.31732	0.01810	0.25074	0.00459
480420	1.35155	0.06773	1.33166	0.02383	0.26957	0.00636
480436	1.32229	0.05880	1.10639	0.02206	0.32125	0.00609
480438	1.25345	0.06388	1.05762	0.02688	0.37373	0.00770
480440	0.61876	0.03620	-0.06166	0.10423	0.33426	0.03024
480442	0.89289	0.01175	0.82264	0.01121	0.00000	0.00000
480444	0.91551	0.01721	1.96871	0.02472	0.00000	0.00000
492698	1.38407	0.01976	1.19384	0.01022	0.00000	0.00000
493410	0.42158	0.05475	2.30889	0.11248	0.33196	0.01933
495899	1.31654	0.03902	-0.35676	0.02615	0.19323	0.01463
496110	2.38878	0.07481	0.91578	0.01039	0.14244	0.00370
496119	2.01541	0.06431	0.87266	0.01223	0.13540	0.00458
496125	1.25864	0.05983	1.49774	0.02446	0.16732	0.00554
496156	1.52170	0.08308	1.84261	0.02723	0.16837	0.00375
496185	1.41205	0.05146	0.52601	0.02097	0.29108	0.00843
496201	0.85231	0.05566	1.50167	0.04021	0.29369	0.00967
496213	1.42032	0.12037	2.13365	0.04597	0.31338	0.00445
496285	1.11955	0.07064	1.63437	0.03399	0.28571	0.00665
500416	0.95976	0.01210	0.66646	0.00983	0.00000	0.00000
500569	1.08506	0.05347	1.02388	0.02858	0.31748	0.00899

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
500575	1.41569	0.01891	1.10197	0.00925	0.00000	0.00000
500579	1.00531	0.01691	0.67898	0.01322	0.00000	0.00000
500595	1.09832	0.01908	-0.29765	0.01177	0.00000	0.00000

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
510478	1.95313	0.78959	1.18259	0.19337	0.21266	0.02140
510482	1.69432	0.36290	-0.03526	0.09820	0.29220	0.03823
510488	0.32300	0.06705	1.72127	0.51367	0.00000	0.00000

Table M-7. 2016–17 OSTP: IRT Parameters for Dichotomous Items
ELA Grade 3

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
146833A	0.46127	0.01997	0.19597	0.07237	0.06620	0.02235
146971A	0.77651	0.01323	-0.48570	0.02511	0.07641	0.01119
146972A	1.18179	0.01941	-0.22557	0.01496	0.22052	0.00720
146994A	1.12462	0.03144	-0.40701	0.02880	0.20073	0.01411
147007A	0.85896	0.01462	-0.53592	0.02406	0.11914	0.01115
147008A	0.49963	0.01327	-1.00256	0.08342	0.11440	0.02866
147010A	0.80020	0.02188	1.14210	0.01739	0.19960	0.00552
147012A	0.67481	0.01045	-1.06781	0.03153	0.03827	0.01396
147016A	0.69403	0.02809	0.40540	0.04255	0.16718	0.01540
147018A	1.22497	0.02998	-0.76640	0.02615	0.11405	0.01499
147341A	0.65254	0.01835	-1.95925	0.07541	0.07978	0.03465
147348A	0.88480	0.02790	-0.76070	0.05102	0.19759	0.02349
147351A	1.13592	0.03147	-1.30710	0.04199	0.14231	0.02598
147358A	0.69310	0.03256	-0.48705	0.08949	0.37171	0.02711
147359A	0.77630	0.02209	-0.82781	0.04920	0.08944	0.02263
147416A	0.65960	0.04473	1.50663	0.04540	0.25435	0.01164
147433A	0.91214	0.01951	0.27758	0.01936	0.26448	0.00731
147436A	1.63584	0.02551	-1.11665	0.01437	0.16212	0.01014
147456A	1.08810	0.01749	0.06372	0.01308	0.15383	0.00602
147768A	0.71706	0.02450	-0.87608	0.07113	0.15660	0.03016
147845A	0.56983	0.02881	0.93380	0.04586	0.12874	0.01551
147861A	0.72736	0.02443	-0.03348	0.04164	0.11047	0.01666
147864A	1.37106	0.04051	-1.11642	0.03549	0.24238	0.02183
147866A	0.89991	0.02902	-0.09167	0.03527	0.19319	0.01488
147870A	0.79301	0.02535	-0.65863	0.05327	0.14835	0.02350
148631A	1.05826	0.02577	-1.50551	0.03757	0.06596	0.02285

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
148632A	1.40915	0.03465	-1.60037	0.02723	0.05511	0.01865
148636A	0.94089	0.02471	-0.97615	0.04013	0.09516	0.02112
155253A	0.77157	0.01733	0.03836	0.02732	0.23564	0.01002
155254A	0.50080	0.00988	-0.22958	0.03599	0.03274	0.01207
155255A	1.01602	0.01880	0.27023	0.01478	0.20525	0.00618
155272A	0.91194	0.03298	0.52462	0.02726	0.20076	0.01061
155274A	1.23016	0.01863	-1.34328	0.02073	0.09102	0.01388
155277A	0.73726	0.02060	1.03105	0.01949	0.20236	0.00647
155278A	0.47792	0.01220	-1.31740	0.09347	0.10128	0.03252
155279A	0.93272	0.01652	-0.41811	0.02246	0.18850	0.01015
155282A	0.68188	0.01581	-0.23584	0.03711	0.19660	0.01352
155283A	0.71301	0.01360	-0.90611	0.03976	0.10250	0.01773
155295A	0.70247	0.02575	0.02165	0.04693	0.14796	0.01773
155348A	0.71402	0.01590	-1.36908	0.03644	0.03135	0.01419
155349A	0.85032	0.03178	-0.04189	0.04373	0.27281	0.01642
155350A	1.39300	0.03864	-1.55203	0.03551	0.11514	0.02619
155352A	1.17059	0.02946	-0.63008	0.02675	0.12701	0.01458
155353A	0.82694	0.02156	-0.76572	0.03975	0.06817	0.01882
155427A	1.06353	0.02867	-1.19249	0.04161	0.12194	0.02449
155965A	0.96444	0.02395	-1.23088	0.03985	0.07274	0.02227
155966A	0.88558	0.03381	0.49841	0.03045	0.23094	0.01147
155968A	1.47200	0.03801	-0.79491	0.02383	0.17618	0.01468
156102A	0.58713	0.03831	1.11966	0.05532	0.27837	0.01596
156120A	1.55051	0.04461	-0.57311	0.02379	0.29554	0.01308
156121A	0.82792	0.02397	-0.58136	0.04244	0.11043	0.01933
156123A	1.07041	0.03432	0.17852	0.02613	0.24568	0.01087

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
156124A	0.71043	0.01438	-1.44974	0.02524	0.00000	0.00000
156125A	0.84386	0.03401	0.46509	0.03504	0.26374	0.01240
156126A	1.20549	0.03163	-0.07219	0.02073	0.15971	0.01006
156336A	1.25787	0.03101	-1.24708	0.03015	0.08646	0.01936
156355A	0.37198	0.01949	-1.24205	0.22120	0.15361	0.05730
156356A	0.97900	0.02865	-0.50445	0.03691	0.18369	0.01743
156357A	0.66444	0.02857	-0.22177	0.07190	0.24773	0.02427
156360A	0.66351	0.02500	0.27021	0.04350	0.11548	0.01618
156362A	0.26951	0.00954	-0.56083	0.03899	0.00000	0.00000
184195A	0.93628	0.03817	0.26056	0.03772	0.36391	0.01269
184197A	0.63703	0.02123	-1.05933	0.08030	0.11148	0.03320
184210A	0.75044	0.03061	0.09267	0.05030	0.25906	0.01759
184212A	0.54133	0.01997	-0.81125	0.09185	0.10212	0.03279
184214A	0.66766	0.02137	-0.43670	0.05344	0.08708	0.02136
184225A	0.77980	0.05189	1.71922	0.04441	0.26788	0.00864
184852A	1.68846	0.04862	-1.39714	0.02819	0.15287	0.02174
481996	0.69648	0.05400	1.82649	0.05498	0.28567	0.00978
482165	0.93036	0.03783	1.03149	0.02437	0.18853	0.00802
482170	0.41683	0.04141	2.03063	0.08157	0.19106	0.02011
482183	0.97235	0.04420	1.17478	0.02594	0.23683	0.00767
482190	1.17218	0.08705	2.23329	0.05589	0.15048	0.00416
482316	0.29821	0.00992	-1.03242	0.04425	0.00000	0.00000
482320	0.44749	0.01692	-2.14009	0.16187	0.12880	0.05522
482322	0.55072	0.03976	1.97298	0.05891	0.13127	0.01132
482324	0.63395	0.04553	1.19432	0.05418	0.35525	0.01436
482326	0.66181	0.02007	-1.13187	0.07012	0.09154	0.03036
482328	0.49511	0.01140	-1.08119	0.02859	0.00000	0.00000
482502	1.01793	0.04185	0.98857	0.02398	0.24144	0.00800
482851	0.99610	0.07434	1.98275	0.05127	0.25978	0.00608
482860	0.47076	0.05532	2.50180	0.11557	0.25579	0.01498
482867	0.68032	0.02986	1.02610	0.03115	0.10817	0.01086
482898	0.99038	0.02905	-0.25569	0.03196	0.18224	0.01458
482911	0.86791	0.03777	1.17818	0.02638	0.17261	0.00805
484468	0.97003	0.03275	0.50424	0.02452	0.19167	0.00967
484474	1.06064	0.03062	-0.89605	0.04096	0.19461	0.02161

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
484476	1.39103	0.03409	-0.59654	0.02159	0.14352	0.01254
484478	1.35182	0.03557	0.22575	0.01637	0.15897	0.00782
484490	0.97622	0.02935	-0.12712	0.03071	0.18229	0.01368
484494	0.91621	0.02836	-0.52736	0.04242	0.19237	0.01926
484541	1.49348	0.04196	-1.57031	0.03249	0.11221	0.02457
484543	0.61930	0.03151	1.27033	0.03679	0.12304	0.01172
484545	0.96876	0.02848	-0.77098	0.04296	0.18147	0.02120
484549	0.63012	0.01814	-0.38107	0.04471	0.04919	0.01715
484551	0.53007	0.02620	0.43565	0.06557	0.12286	0.02150
484553	0.89427	0.02907	-0.05009	0.03489	0.19229	0.01461
484559	1.00549	0.03240	0.51270	0.02206	0.16354	0.00907
484563	0.94872	0.03659	1.00207	0.02254	0.15906	0.00772
484565	0.93988	0.02699	-0.11638	0.02926	0.13935	0.01304
484567	1.19311	0.05062	1.32471	0.02164	0.18873	0.00560
484569	0.49969	0.02029	-0.92587	0.11609	0.11840	0.03891
484571	1.23876	0.06371	1.72390	0.02878	0.16370	0.00459
484575	0.64354	0.02265	-0.40013	0.06106	0.11026	0.02341
484579	0.99339	0.03032	0.28632	0.02402	0.16485	0.01012
484581	0.25355	0.01913	1.19111	0.16763	0.07782	0.03238
484584	0.59092	0.02774	0.32719	0.06112	0.17444	0.02016
484590	1.11722	0.03371	0.40747	0.02035	0.18028	0.00860
484592	0.55187	0.03056	0.39722	0.07607	0.21910	0.02304
484594	0.62140	0.01536	-0.83563	0.04202	0.03729	0.01589
484596	0.79492	0.03096	0.87923	0.02635	0.12762	0.00960
484598	0.99694	0.04989	1.40524	0.02829	0.24523	0.00705
484600	0.45573	0.01093	-0.93100	0.02847	0.00000	0.00000
484602	0.96390	0.02664	-0.29763	0.03055	0.13100	0.01429
484617	0.75454	0.02736	-0.18028	0.05064	0.19778	0.01946

Table M-8. 2016–17 OSTP: IRT Parameters for Dichotomous Items

ELA Grade 4

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
146846A	0.86958	0.02687	-0.40223	0.04057	0.15689	0.01817
146863A	0.60736	0.02063	-0.81683	0.07372	0.09631	0.02841
146864A	0.41319	0.01731	-0.70162	0.11697	0.08480	0.03342
146865A	0.51163	0.03522	0.93590	0.07266	0.24097	0.02089
146866A	0.53703	0.02063	-0.74086	0.09172	0.10521	0.03193
146867A	1.03447	0.03356	-0.28726	0.03564	0.27754	0.01529
146878A	1.03608	0.03602	0.43510	0.02515	0.23551	0.01008
146880A	1.35225	0.03461	-1.13860	0.02828	0.11849	0.01788
146887A	0.74144	0.02450	-0.48446	0.05198	0.13670	0.02129
146893A	0.70926	0.02588	-0.42671	0.06021	0.17552	0.02322
146896A	0.84636	0.02686	-1.16284	0.06286	0.17162	0.03038
146904A	0.57893	0.01831	-1.12953	0.07731	0.07970	0.03014
148588A	0.54186	0.03305	0.23299	0.09779	0.29440	0.02663
148597A	1.08020	0.02746	-1.12858	0.03518	0.08955	0.02037
148613A	1.10248	0.03161	-0.14005	0.02619	0.18634	0.01250
148685A	1.25355	0.01873	0.00177	0.01086	0.14252	0.00537
148686A	0.53910	0.01382	-0.64590	0.06194	0.11838	0.02147
148719A	0.83251	0.03279	1.42685	0.02385	0.36807	0.00545
148754A	0.48672	0.01121	-0.94766	0.02707	0.00000	0.00000
148877A	1.11941	0.03170	-0.39209	0.02918	0.20144	0.01421
148938A	1.33725	0.04018	-1.28387	0.03870	0.22445	0.02379
149114A	0.71491	0.01438	-1.42088	0.02512	0.00000	0.00000
149115A	0.66227	0.02819	0.38486	0.04643	0.17238	0.01631
149116A	1.36748	0.03734	-1.14995	0.03119	0.16616	0.01945
149122A	1.02499	0.02846	-0.51913	0.03248	0.15775	0.01586
149136A	1.00139	0.03031	0.09973	0.02617	0.17967	0.01132
155473A	0.63934	0.02502	-0.65519	0.08058	0.17344	0.02968
155490A	1.18846	0.03261	0.12033	0.01990	0.16550	0.00926
155569A	0.69718	0.02583	-0.15510	0.05265	0.16175	0.01974
155571A	0.79847	0.01983	-1.38267	0.04668	0.05859	0.02264
155572A	0.79704	0.02143	-1.52128	0.05740	0.08008	0.02917
155580A	0.92325	0.02644	-0.98900	0.04625	0.13391	0.02323
155636A	0.95705	0.03673	0.64859	0.02644	0.22670	0.01003
155638A	1.29505	0.03674	-1.65843	0.04010	0.10822	0.02815
158547A	0.41511	0.02973	0.44026	0.13253	0.18499	0.03422
158548A	1.40366	0.03982	-1.62541	0.03585	0.10671	0.02593
158553A	1.33085	0.03645	-1.66623	0.03609	0.08696	0.02523
158554A	0.83437	0.02595	-0.30961	0.03995	0.13846	0.01750
158557A	0.75086	0.02273	-1.08803	0.06166	0.10536	0.02875
158559A	0.51238	0.02644	-0.40256	0.11986	0.19569	0.03633
158564A	1.33791	0.03764	-1.37107	0.03591	0.14548	0.02422
158566A	0.75749	0.03333	0.72439	0.03505	0.19988	0.01256
158587A	1.00728	0.02879	-0.46300	0.03308	0.17350	0.01558
158589A	1.24034	0.03114	-0.76213	0.02616	0.12937	0.01455
158602A	0.46156	0.01396	-0.25027	0.06937	0.10264	0.02114
158603A	0.56586	0.02623	1.39777	0.03470	0.30925	0.00923
158604A	0.37799	0.00659	-1.94226	0.03330	0.00000	0.00000
158611A	0.43385	0.00671	-1.64415	0.02534	0.00000	0.00000
158691A	0.78729	0.01054	-2.05285	0.02022	0.00000	0.00000
158692A	0.70981	0.01477	-0.21308	0.02998	0.13924	0.01176
184821A	0.87567	0.01460	-0.30793	0.01980	0.10726	0.00896
184822A	1.33124	0.03785	1.31673	0.01330	0.28917	0.00346
184823A	0.58540	0.00976	-1.21670	0.03959	0.03991	0.01589
184824A	0.91750	0.01456	-1.89269	0.03399	0.05735	0.02085
184827A	0.96318	0.02092	1.02825	0.01256	0.13693	0.00422
184829A	1.09939	0.03018	-0.63646	0.03198	0.16522	0.01680
185497A	0.71158	0.02213	-0.96030	0.06274	0.10517	0.02730
185498A	0.90934	0.03002	-0.70082	0.05047	0.24555	0.02209
185508A	0.60060	0.03289	1.08929	0.04296	0.16221	0.01417
185590A	0.96325	0.04367	1.17108	0.02581	0.21101	0.00789
185616A	1.02400	0.02333	-1.66309	0.03194	0.03682	0.01570
185625A	1.13033	0.02808	-0.99971	0.03094	0.09457	0.01750
185806A	0.53318	0.01623	0.32801	0.04379	0.15591	0.01392
186016A	0.42658	0.00820	-2.11174	0.06682	0.04692	0.02157

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
186018A	0.95982	0.02459	1.25993	0.01459	0.17598	0.00417
186065A	0.74291	0.01758	0.37074	0.02372	0.20155	0.00865
483076	0.58491	0.02224	-0.61970	0.08051	0.11783	0.02914
483078	0.28600	0.03217	1.55228	0.18156	0.14975	0.04002
483084	0.56676	0.02077	-0.79751	0.08542	0.10420	0.03107
483086	0.48873	0.03007	0.12813	0.11487	0.23136	0.03153
483088	0.60593	0.03067	0.71584	0.04974	0.17174	0.01685
483100	1.24610	0.03667	-2.46227	0.06636	0.19870	0.05480
483104	0.34110	0.01598	-1.12725	0.17592	0.10145	0.04334
483106	0.98000	0.02761	-0.54826	0.03491	0.15224	0.01679
483108	0.62957	0.02057	-1.34321	0.08698	0.10814	0.03654
483111	0.82769	0.02567	-1.34018	0.06672	0.13928	0.03406
483119	0.32989	0.02855	1.49562	0.11094	0.10112	0.02888
483121	0.44626	0.03670	0.48074	0.14222	0.33814	0.03159
483123	1.27601	0.03405	-1.38109	0.03455	0.11311	0.02238
484623	0.48443	0.01096	-0.28857	0.02084	0.00000	0.00000
484626	0.74799	0.02396	-1.10820	0.06822	0.13250	0.03082
484628	1.11815	0.03045	-0.92824	0.03518	0.15615	0.01910
484632	1.67794	0.04530	-0.29663	0.01792	0.24802	0.01002
484636	0.20577	0.00926	-0.49615	0.04932	0.00000	0.00000
484638	1.06664	0.03026	-0.68610	0.03495	0.18724	0.01740
484646	0.91905	0.03111	0.04827	0.03366	0.23137	0.01351
484648	0.95557	0.03081	-0.23474	0.03618	0.23757	0.01525
484652	0.84036	0.03724	0.98917	0.02886	0.21270	0.00961
484654	0.73217	0.03106	0.54069	0.03875	0.20592	0.01370

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
484658	1.04391	0.03031	-0.49680	0.03349	0.20045	0.01585
484660	1.06537	0.03768	0.61752	0.02261	0.21538	0.00897
484668	1.36079	0.03898	-0.25400	0.02340	0.26105	0.01171
484672	1.30451	0.03536	0.04478	0.01913	0.18273	0.00935
484674	0.93709	0.03562	0.49151	0.02923	0.24924	0.01103
484676	0.48275	0.05874	2.41913	0.11627	0.27556	0.01532
484678	0.61932	0.03911	1.70834	0.04623	0.13610	0.01062
484682	1.08832	0.03135	-0.63608	0.03468	0.19987	0.01771
484684	0.58682	0.01808	-0.65248	0.05885	0.06102	0.02213
484686	0.76436	0.04876	1.62771	0.04200	0.22805	0.00910
484688	1.42836	0.03920	-0.24004	0.02093	0.23021	0.01117
484690	0.51185	0.02794	0.09581	0.09594	0.19508	0.02825
484701	0.80589	0.02893	-0.15527	0.04581	0.21983	0.01779
485165	0.70220	0.03122	0.53610	0.04265	0.21578	0.01466
485331	1.25174	0.04105	0.68294	0.01786	0.19782	0.00723
485333	0.49413	0.03187	1.08096	0.06194	0.15693	0.01940
485335	0.34994	0.02529	0.84189	0.12396	0.10367	0.03127
485354	1.56848	0.03962	0.09825	0.01455	0.15930	0.00756
485357	0.90305	0.02475	-1.10885	0.04625	0.10351	0.02384
487992	1.05246	0.03203	-0.48141	0.03575	0.23242	0.01698

Table M-9. 2016–17 OSTP: IRT Parameters for Dichotomous Items
ELA Grade 5

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
147920A	0.84778	0.01755	-1.87045	0.05833	0.15072	0.03412
147921A	0.68648	0.01219	-1.25499	0.04138	0.06070	0.01928
147923A	0.89471	0.01903	-0.28269	0.02725	0.28489	0.01080
147924A	0.65566	0.01091	-1.44708	0.04020	0.04695	0.01834
147926A	0.54420	0.01508	-0.52510	0.06446	0.15374	0.02166
147969A	0.99626	0.01419	-1.76214	0.02269	0.03066	0.01271
147974A	0.61225	0.03135	-0.31994	0.10039	0.30937	0.03005
148003A	0.48717	0.01765	-0.71128	0.08512	0.07300	0.02792
148005A	0.51095	0.03067	0.22982	0.09968	0.23800	0.02787
148007A	0.35796	0.01093	-1.53468	0.04921	0.00000	0.00000
148008A	0.52888	0.02832	0.71791	0.05949	0.13281	0.01933
148019A	1.26806	0.03452	-1.05689	0.03188	0.15464	0.01930
148026A	1.05731	0.03192	0.02502	0.02588	0.18570	0.01164
148834A	0.76589	0.02083	-2.14597	0.05839	0.06088	0.02742
148839A	0.91825	0.02841	-1.32001	0.05893	0.15777	0.03132
148841A	1.35045	0.03962	-1.05743	0.03341	0.22560	0.02009
148893A	0.63300	0.01943	-0.90203	0.06355	0.07297	0.02606
148904A	1.05514	0.03266	-0.93454	0.04510	0.20861	0.02397
148906A	0.98636	0.02898	-1.61984	0.05688	0.11320	0.03496
148925A	0.46291	0.01738	-1.03281	0.10834	0.08718	0.03502
148930A	1.01102	0.03123	-0.38880	0.03568	0.20829	0.01664
148933A	1.13660	0.03019	-0.71186	0.03019	0.12943	0.01658
148961A	0.99886	0.03413	0.02281	0.03288	0.25685	0.01367
148963A	1.23388	0.03646	-1.07669	0.03834	0.20146	0.02279
148967A	1.52728	0.04268	-0.93182	0.02638	0.19482	0.01700
148971A	0.70487	0.02012	-0.98132	0.05489	0.07049	0.02425
149152A	0.97329	0.02145	-1.41810	0.04646	0.31177	0.02305
149158A	0.75135	0.01831	0.66854	0.02026	0.17261	0.00740
149196A	0.63209	0.01703	-1.28530	0.05617	0.05461	0.02283
149318A	0.92089	0.01666	-0.72842	0.02694	0.17141	0.01301
149321A	0.60683	0.01216	-1.21954	0.05340	0.07251	0.02262
149334A	0.75921	0.02704	-0.48333	0.05630	0.18752	0.02269
149338A	1.20368	0.03325	-0.38224	0.02567	0.18766	0.01315
149339A	0.37065	0.01809	-0.10387	0.11672	0.07667	0.03016
158697A	0.96423	0.03616	-0.38422	0.04831	0.35006	0.01876
158749A	1.13491	0.03933	0.45854	0.02352	0.25160	0.00956
158753A	1.00580	0.03977	0.72113	0.02623	0.24834	0.00959
158832A	0.73918	0.01846	-1.41561	0.04592	0.04802	0.02067
158887A	0.53825	0.01776	0.01796	0.04781	0.04371	0.01619
158889A	0.70064	0.02905	0.13282	0.05210	0.19931	0.01875
158900A	1.27006	0.03745	0.17545	0.02039	0.20360	0.00961
158903A	0.79608	0.02367	-1.08594	0.05603	0.10571	0.02683
159151A	1.02969	0.03221	-0.18772	0.03204	0.21722	0.01451
159157A	0.65563	0.02607	0.06230	0.05408	0.13665	0.02003
159164A	0.80810	0.01995	-0.93452	0.03785	0.04863	0.01756
159165A	0.51969	0.01181	-0.70869	0.02358	0.00000	0.00000
159364A	1.55249	0.04168	-1.26311	0.02640	0.10343	0.01886
159367A	0.57879	0.02845	-0.31855	0.09972	0.22815	0.03183
159368A	0.98427	0.03488	0.12617	0.03284	0.26696	0.01320
159398A	1.01372	0.03121	-0.42822	0.03622	0.20337	0.01725
159408A	1.01082	0.03032	-0.10753	0.02918	0.17215	0.01337
159467A	0.94172	0.03103	-0.49912	0.04401	0.23169	0.01964
159475A	0.96442	0.02897	-0.96458	0.04747	0.16002	0.02469
159477A	0.59972	0.02057	-0.42993	0.06195	0.07622	0.02340
159544A	0.28486	0.01517	-0.35940	0.16984	0.07970	0.03503
159546A	0.71108	0.01751	-1.43977	0.04547	0.04472	0.01934
159592A	0.92399	0.01755	-0.79366	0.02980	0.21162	0.01410
159600A	0.95770	0.01866	-1.42049	0.03985	0.19214	0.02220
160270A	1.01019	0.02930	-0.60244	0.03633	0.15621	0.01840
160276A	1.00807	0.03013	-0.95413	0.04500	0.16486	0.02415
160288A	0.89738	0.03100	0.11564	0.03424	0.20045	0.01410
160514A	0.57492	0.01637	-1.32480	0.06532	0.05808	0.02522
160563A	0.99880	0.02527	0.47527	0.01877	0.22190	0.00747
160565A	0.23382	0.01002	1.20194	0.06292	0.00000	0.00000
160568A	1.14913	0.03385	-0.65650	0.03411	0.21060	0.01803
160573A	1.11327	0.03034	-0.64014	0.03092	0.14095	0.01672

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
160579A	0.79393	0.03000	0.70932	0.02884	0.12731	0.01090
160682A	0.55770	0.02172	-0.73293	0.09225	0.11150	0.03344
160718A	0.95732	0.02925	-1.28165	0.05484	0.16226	0.02961
186097A	0.89780	0.01808	0.65231	0.01414	0.13282	0.00553
186107A	1.09096	0.01833	-0.68885	0.02049	0.18285	0.01072
186115A	0.86100	0.01753	0.16008	0.02014	0.18837	0.00815
186121A	1.02677	0.01820	-0.27718	0.01887	0.20217	0.00877
186131A	0.37025	0.00610	-0.43451	0.01639	0.00000	0.00000
186469A	1.32113	0.03720	0.23581	0.01764	0.17368	0.00829
186471A	1.25211	0.03749	-1.48077	0.04304	0.16575	0.02806
186474A	0.78853	0.03113	0.07811	0.04523	0.24323	0.01659
186476A	0.76193	0.02646	-0.12210	0.04377	0.15076	0.01753
186488A	1.05045	0.04452	0.92103	0.02471	0.25857	0.00827
186505A	0.83839	0.03163	0.41173	0.03267	0.19559	0.01248
186777A	1.41385	0.02418	-1.07114	0.01894	0.21793	0.01198
483126	0.61118	0.02069	-1.06728	0.08076	0.10047	0.03225
483130	0.58637	0.03560	1.13689	0.05079	0.20297	0.01584
483134	0.51526	0.02399	-0.15021	0.08880	0.12653	0.02843
483136	0.48452	0.05756	2.41450	0.11171	0.28148	0.01529
483138	0.83934	0.03760	0.13637	0.05052	0.36763	0.01645
483140	0.86494	0.02180	-1.82695	0.04577	0.05352	0.02305
483142	0.15534	0.00947	-1.66478	0.11634	0.00000	0.00000
483144	0.81332	0.02492	-1.26304	0.06372	0.11652	0.03250
483146	0.77069	0.02996	0.26303	0.04081	0.19418	0.01538
483148	0.69334	0.02751	-0.29578	0.06455	0.19121	0.02426

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
483150	0.80938	0.03047	-0.24686	0.05182	0.24773	0.02003
483154	1.23396	0.08526	1.81389	0.03769	0.31442	0.00566
483160	0.37344	0.03732	3.42357	0.18529	0.03838	0.01079
483162	1.49400	0.04845	-1.59878	0.04103	0.17682	0.03105
483166	0.77652	0.03153	-1.49959	0.10838	0.29931	0.04616
483172	0.85659	0.02461	-0.71997	0.04230	0.10659	0.02000
483179	0.58834	0.03058	-0.87692	0.14095	0.32276	0.04283
485372	0.29195	0.01014	-0.85507	0.04294	0.00000	0.00000
485377	0.82145	0.03063	0.23890	0.03740	0.20159	0.01447
485379	1.13819	0.03089	-0.23881	0.02465	0.14750	0.01236
485386	0.47905	0.02053	0.06203	0.07344	0.07290	0.02311
485397	0.52754	0.07293	3.13318	0.19835	0.21170	0.01062
485399	0.23963	0.02328	1.53786	0.21572	0.10202	0.03976
485401	0.55071	0.02937	-0.00267	0.09598	0.22559	0.02902
485403	0.67942	0.02387	-0.43533	0.05947	0.11488	0.02392
485405	0.88732	0.02209	-0.69108	0.03255	0.05460	0.01559
485407	0.58382	0.02867	0.77159	0.04849	0.13029	0.01658
485417	0.84771	0.03790	0.48765	0.03994	0.31357	0.01347
485429	0.81254	0.03188	0.33269	0.03714	0.22009	0.01381
485431	1.70880	0.04972	-0.88728	0.02383	0.25287	0.01535
488027	0.90226	0.02813	-1.11101	0.05667	0.15311	0.02951

Table M-10. 2016-17 OK OSTP: IRT Parameters for Polytomous Items – ELA Grade 5

Item Number	*Parameters and Measures of Standard Error*															
	a	*SE (a)*	*b*	*SE (b)*	*D0*	*SE (D0)*	*D1*	*SE (D1)*	*D2*	*SE (D2)*	*D3*	*SE (D3)*	*D4*	*SE (D4)*	*D5*	*SE (D5)*
140927A	0.61596	0.00280	0.21400	0.00874	4.45243	0.03111	1.58935	0.01111	1.27211	0.01045	-1.93895	0.01362	-5.37495	0.06459	0.00000	0.00000

Table M-11. 2016–17 OSTP: IRT Parameters for Dichotomous Items

ELA Grade 6

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
147159A	0.78485	0.03658	0.63461	0.04001	0.25830	0.01370
147165A	0.78884	0.03842	0.37135	0.05018	0.34347	0.01595
147252A	0.34834	0.04083	1.31869	0.17311	0.27520	0.03718
147260A	0.36235	0.03124	0.59276	0.17516	0.18552	0.04075
147261A	0.80337	0.02277	-1.73817	0.06113	0.07791	0.03148
147283A	0.70534	0.01445	-1.29351	0.05082	0.10781	0.02367
147289A	0.58461	0.01875	-0.96203	0.09071	0.33331	0.02725
147290A	0.86598	0.01854	-0.74037	0.03548	0.26889	0.01499
149396A	0.97414	0.03333	-0.23923	0.03823	0.27254	0.01589
149400A	0.71769	0.02706	-0.74322	0.07259	0.20273	0.02861
149414A	0.55662	0.01234	-0.98322	0.02515	0.00000	0.00000
149458A	0.69636	0.03286	0.37685	0.05232	0.26688	0.01701
149466A	1.00097	0.03450	0.14675	0.03032	0.25103	0.01235
149499A	0.73531	0.02189	-2.12650	0.07197	0.07966	0.03500
149526A	0.54168	0.02087	-1.45814	0.12220	0.12553	0.04598
149536A	0.77463	0.02925	0.46967	0.03339	0.13470	0.01306
149538A	0.53667	0.02567	-0.44316	0.10564	0.16163	0.03450
149570A	0.85791	0.03028	-0.23290	0.04392	0.23385	0.01764
149571A	1.09277	0.02949	-0.62591	0.02993	0.13607	0.01554
149592A	0.63760	0.02502	-1.07710	0.09817	0.15799	0.03918
149718A	1.18109	0.03895	-1.47251	0.05327	0.20224	0.03286
149724A	0.42426	0.01218	-1.54677	0.04552	0.00000	0.00000
149726A	1.04454	0.02975	-1.02376	0.04025	0.12116	0.02226
149737A	0.47751	0.01914	-0.70501	0.10073	0.09087	0.03225
158700A	1.12079	0.03151	-0.70982	0.03246	0.17137	0.01704
158702A	1.59782	0.02346	0.11113	0.00809	0.13332	0.00429
158705A	1.43803	0.02434	-1.40628	0.01986	0.12393	0.01390
158723A	0.93709	0.02675	-1.48562	0.05331	0.10444	0.02984
158739A	0.89491	0.02746	-1.28181	0.05806	0.14161	0.03018
158740A	0.35538	0.01072	-1.25407	0.04317	0.00000	0.00000
158756A	0.13896	0.00922	0.88470	0.08950	0.00000	0.00000
158760A	0.60079	0.02437	-0.50047	0.08009	0.13088	0.02933

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
158774A	1.27994	0.03569	-0.59762	0.02699	0.20259	0.01461
158775A	1.08141	0.03066	-1.69537	0.04765	0.08681	0.02967
158782A	0.90312	0.03254	-0.66486	0.05491	0.26754	0.02368
158786A	0.80311	0.01232	-1.49161	0.02996	0.04015	0.01524
158811A	0.71143	0.02446	0.12798	0.03847	0.09795	0.01502
158827A	0.53617	0.02348	-0.99884	0.12320	0.14888	0.04290
158830A	0.63430	0.00946	-1.49220	0.02961	0.02599	0.01162
158858A	0.94898	0.02730	-1.28456	0.04977	0.11663	0.02705
158860A	0.94409	0.03161	-0.30622	0.03967	0.21952	0.01754
158877A	1.32720	0.03706	-1.12956	0.03200	0.13259	0.02016
158886A	0.91813	0.02544	-1.66744	0.05388	0.08722	0.03041
158893A	0.62590	0.02818	-1.31596	0.13414	0.26511	0.04844
158897A	0.71190	0.01609	-0.75224	0.04481	0.18937	0.01805
158935A	0.66247	0.01495	-0.26153	0.03587	0.13080	0.01375
158937A	0.62977	0.01510	0.02776	0.03393	0.12302	0.01245
158943A	1.24778	0.02908	0.84407	0.01259	0.27926	0.00447
158947A	1.26736	0.02481	0.08699	0.01477	0.31302	0.00647
158954A	0.81758	0.01736	-1.09060	0.02709	0.02299	0.01012
158978A	0.44849	0.02567	0.76648	0.07418	0.09771	0.02241
158996A	1.37973	0.04079	0.43341	0.01654	0.16463	0.00756
158998A	0.62770	0.02141	-0.71948	0.06739	0.08815	0.02669
159011A	0.63716	0.04131	1.07938	0.05361	0.29289	0.01544
159016A	0.62779	0.01983	-1.27274	0.07527	0.08357	0.03153
159018A	0.75771	0.03150	0.13672	0.04863	0.23022	0.01778
159031A	0.88644	0.02743	-0.70796	0.04564	0.14058	0.02191
159058A	0.79848	0.02664	-0.33236	0.04514	0.15908	0.01881
159272A	1.31687	0.03811	-1.28453	0.03600	0.13663	0.02324
159273A	0.79181	0.02437	-0.88411	0.05330	0.10126	0.02485
159297A	0.88114	0.02968	-0.58819	0.04884	0.22406	0.02108
159346A	1.35740	0.03865	0.44144	0.01594	0.13921	0.00731
159418A	0.43089	0.02492	0.13755	0.11606	0.12076	0.03274
159424A	0.84531	0.03115	-0.06949	0.04312	0.22201	0.01730

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
159432A	0.79482	0.02719	-0.42265	0.04960	0.15697	0.02121
159451A	0.54122	0.01124	-1.52961	0.06599	0.06928	0.02631
159453A	0.62869	0.01555	-1.30973	0.07269	0.16809	0.02964
159454A	0.61197	0.01441	-0.13556	0.03727	0.10500	0.01376
159455A	0.56375	0.01576	0.25203	0.03944	0.13141	0.01333
159457A	0.74605	0.01738	-1.27983	0.05832	0.22538	0.02542
159458A	0.71216	0.01756	-0.57009	0.04584	0.26136	0.01670
181821A	0.65275	0.02456	-0.54471	0.06958	0.12833	0.02714
181824A	0.58184	0.01427	-1.61912	0.03643	0.00000	0.00000
181832A	0.77986	0.02853	-0.29080	0.05137	0.18849	0.02082
181867A	0.29981	0.01075	-1.30256	0.05420	0.00000	0.00000
181880A	0.74454	0.02397	-0.78076	0.05703	0.10673	0.02530
181882A	1.29470	0.04077	-1.24642	0.04127	0.21429	0.02565
181883A	0.98273	0.03022	-0.53836	0.03833	0.17631	0.01860
181886A	1.11999	0.03299	-0.52722	0.03204	0.18933	0.01653
181888A	0.79131	0.03116	-0.58122	0.06625	0.26860	0.02587
181889A	0.51964	0.01650	-1.14574	0.07593	0.06291	0.02675
181893A	0.38129	0.02698	0.07731	0.17474	0.16431	0.04270
181904A	0.85042	0.02609	-0.65686	0.04525	0.12064	0.02126
485437	0.52354	0.01725	-1.11493	0.08097	0.06951	0.02880
485439	0.80159	0.02316	-1.43620	0.05907	0.08508	0.02993
485443	0.85701	0.03199	0.78541	0.02584	0.14138	0.00945
485688	1.18123	0.03443	-0.85377	0.03478	0.20698	0.01880
485690	1.03584	0.03136	-0.55822	0.03615	0.18432	0.01799
485692	0.91105	0.05038	1.44685	0.03349	0.23581	0.00814
485694	0.20970	0.01984	0.69394	0.33844	0.12360	0.05113
485696	0.77017	0.02708	-0.98436	0.07039	0.16862	0.03157

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
485700	0.31886	0.03217	2.23472	0.10521	0.09355	0.02514
485702	1.26870	0.03998	-0.99918	0.03843	0.27771	0.02088
485704	0.60461	0.01797	-0.24578	0.04186	0.04060	0.01526
485708	0.82578	0.03424	0.15548	0.04493	0.27678	0.01639
485710	0.86920	0.02561	-1.71137	0.06294	0.09547	0.03484
485986	0.82263	0.03572	1.00393	0.02905	0.17740	0.00965
486350	0.49958	0.03194	0.72912	0.07996	0.21010	0.02300
486369	0.79159	0.02704	-0.26136	0.04515	0.16771	0.01844
486371	0.98946	0.03576	-0.14652	0.03864	0.31815	0.01518
486376	1.21284	0.03537	-0.76390	0.03265	0.22003	0.01746
486378	0.31925	0.02807	0.66836	0.19713	0.15544	0.04268
486474	0.39117	0.01835	-1.52027	0.19146	0.13298	0.05392
486482	0.30751	0.03812	1.85964	0.15706	0.18075	0.03684
486494	0.53492	0.02048	-0.79115	0.09166	0.09606	0.03244
486504	0.85490	0.05222	1.40564	0.03796	0.29782	0.00935
486517	0.64618	0.08372	2.72672	0.14650	0.29816	0.00933
486523	0.41530	0.02168	0.45979	0.08695	0.07383	0.02482
486538	1.00677	0.06154	1.73924	0.03773	0.20815	0.00650
486553	0.75795	0.02138	-1.69858	0.06193	0.07344	0.03029
486562	0.31884	0.01061	-0.13940	0.03121	0.00000	0.00000
486565	0.73299	0.02443	-0.24351	0.04520	0.10000	0.01874
486567	1.11891	0.03854	0.80714	0.01961	0.14796	0.00748

Table M-12. 2016–17 OSTP: IRT Parameters for Dichotomous Items
ELA Grade 7

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
148104A	0.87955	0.01452	-0.96266	0.02699	0.07977	0.01376
148117A	0.74917	0.01597	-0.46268	0.03426	0.18025	0.01379
148190A	0.28853	0.01866	-0.52436	0.24656	0.12204	0.05001
148194A	0.73373	0.02963	-0.01722	0.05264	0.21108	0.01945
148205A	0.95813	0.03340	-1.25551	0.06747	0.24916	0.03406
148759A	0.46282	0.02777	-0.25817	0.14308	0.21204	0.03871
148760A	0.71106	0.01974	-1.03368	0.05297	0.06696	0.02334
148762A	0.67270	0.02522	-1.04227	0.08862	0.17123	0.03590
148765A	0.54027	0.02492	-0.99954	0.13267	0.18349	0.04482
148772A	0.87555	0.03095	0.00213	0.03800	0.21050	0.01548
148777A	0.45064	0.01861	-0.86222	0.11625	0.09432	0.03597
148780A	0.54465	0.02375	-0.69929	0.10547	0.14406	0.03605
148785A	0.87825	0.04188	1.18845	0.02924	0.21973	0.00858
148795A	0.66249	0.01861	-1.53840	0.06444	0.06708	0.02802
148796A	1.04441	0.03649	0.45331	0.02499	0.22054	0.01024
148797A	1.23859	0.03640	0.57703	0.01655	0.13073	0.00705
148801A	1.22244	0.03918	0.10699	0.02424	0.26286	0.01092
148806A	0.91031	0.03194	-0.33979	0.04479	0.24999	0.01871
148812A	0.62608	0.02336	-0.72207	0.07903	0.12150	0.03061
148823A	0.71055	0.01387	-1.08684	0.04347	0.09450	0.01982
148831A	1.05925	0.02470	-2.13814	0.06122	0.23868	0.04116
148859A	1.04843	0.03196	-1.51999	0.05587	0.16189	0.03360
148866A	0.84588	0.03168	-0.44037	0.05414	0.28913	0.02069
148935A	0.52576	0.01858	-0.03209	0.05464	0.05248	0.01830
148944A	0.69134	0.02686	-0.45052	0.06676	0.19263	0.02494
148946A	0.51304	0.01172	-1.02123	0.02694	0.00000	0.00000
148948A	0.77845	0.02490	-0.52394	0.04830	0.12743	0.02067
148950A	0.96853	0.02991	-0.21985	0.03281	0.19018	0.01450
148952A	0.87281	0.02790	-1.23166	0.06326	0.16901	0.03173
154639A	0.66005	0.03037	0.49392	0.04768	0.19672	0.01624
154710A	0.29039	0.01073	-1.71083	0.06778	0.00000	0.00000
154730A	0.82095	0.02393	-0.71781	0.04511	0.09091	0.02101
158719A	1.06466	0.03649	0.57274	0.02219	0.20277	0.00878
158724A	1.15236	0.03617	-0.37613	0.03179	0.28144	0.01452
158765A	1.01455	0.03165	-0.16350	0.03138	0.20241	0.01427
158766A	0.70989	0.02918	-0.45870	0.07136	0.24283	0.02605
158769A	0.13249	0.00952	-2.21133	0.17202	0.00000	0.00000
158819A	1.06005	0.03358	-0.31653	0.03372	0.24127	0.01553
158826A	1.03408	0.03498	-2.05104	0.07820	0.17905	0.05208
158833A	1.42182	0.04376	0.09408	0.02047	0.27249	0.00990
158845A	0.37716	0.01791	-0.64320	0.14396	0.09551	0.03782
158847A	0.55384	0.01895	-1.64996	0.10631	0.10370	0.04172
158849A	0.40184	0.00787	-1.22688	0.02708	0.00000	0.00000
158871A	1.00710	0.02848	-0.44301	0.03166	0.13691	0.01552
158888A	0.65725	0.01466	-1.50296	0.03013	0.00000	0.00000
158892A	0.78964	0.03045	-1.17178	0.08643	0.25844	0.03689
158896A	0.69025	0.02440	-1.75734	0.10652	0.15196	0.05000
158906A	0.64090	0.02091	-1.44280	0.08602	0.10291	0.03716
159033A	0.76381	0.02992	-2.39118	0.14205	0.22545	0.07695
159046A	0.22478	0.01337	-2.57027	0.34429	0.12760	0.05774
159102A	0.43710	0.02080	-0.54016	0.12688	0.11117	0.03699
159111A	0.66693	0.02528	-0.92299	0.08529	0.17125	0.03373
159114A	1.37606	0.03331	-0.89130	0.02304	0.09774	0.01380
159118A	1.38837	0.04412	-0.93447	0.03489	0.31872	0.01878
159120A	1.15517	0.01689	-0.56738	0.01470	0.09782	0.00787
159122A	0.77165	0.01812	0.64414	0.01895	0.16228	0.00708
159133A	0.73988	0.02229	0.88567	0.02326	0.26659	0.00748
159137A	0.89589	0.02198	0.74033	0.01729	0.24423	0.00616
159393A	0.22249	0.00576	0.91902	0.03337	0.00000	0.00000
159394A	0.60253	0.02311	0.85248	0.03736	0.32352	0.01042
159646A	0.60490	0.01221	-0.19971	0.03116	0.04818	0.01179
160457A	0.29713	0.01450	0.16360	0.14890	0.09574	0.03184
160475A	0.45327	0.00645	-0.30014	0.01317	0.00000	0.00000
160498A	0.72571	0.01633	-0.53425	0.03936	0.20355	0.01531
160508A	0.76301	0.01368	-0.76720	0.03088	0.07905	0.01409
160511A	0.43120	0.00656	-1.11943	0.01978	0.00000	0.00000

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
160522A	1.05381	0.03451	-1.30664	0.05759	0.22013	0.03210
160526A	0.61656	0.05238	1.15087	0.07120	0.45721	0.01589
160594A	0.97185	0.02984	-1.04223	0.05033	0.16608	0.02637
160692A	1.01809	0.03093	-0.44599	0.03510	0.19460	0.01673
160706A	0.92701	0.02651	-0.90267	0.04309	0.11317	0.02182
160835A	0.78710	0.02408	-0.68887	0.04867	0.10295	0.02188
160937A	0.83972	0.01143	-1.31033	0.02213	0.02682	0.01068
160940A	1.17590	0.01948	-1.50263	0.02574	0.09934	0.01711
160974A	0.26764	0.01013	0.29704	0.03712	0.00000	0.00000
161015A	1.06451	0.03250	-1.46361	0.05426	0.15351	0.03303
161017A	0.62367	0.02000	-0.30756	0.04976	0.05929	0.01891
182584A	0.43067	0.01074	-0.43488	0.02432	0.00000	0.00000
182596A	1.15642	0.03259	-1.07400	0.03770	0.16463	0.02157
182597A	0.48207	0.02342	-0.53309	0.12200	0.14201	0.03735
485445	0.35504	0.03227	0.41878	0.21087	0.22177	0.04568
485447	0.73539	0.02714	-1.14943	0.08568	0.20272	0.03656
485451	0.97486	0.03352	0.32488	0.02732	0.21607	0.01098
485453	0.83816	0.02698	-0.18615	0.03795	0.15125	0.01597
485457	0.96901	0.02765	-0.39156	0.03243	0.12390	0.01553
485459	0.59329	0.03361	0.22481	0.08308	0.29396	0.02402
485461	0.69697	0.03693	0.77906	0.04605	0.26455	0.01482
485463	0.77409	0.03304	0.16027	0.04875	0.26831	0.01720
485465	0.82528	0.02360	-1.15749	0.05361	0.09009	0.02681
485467	0.77208	0.03963	0.95962	0.03727	0.26059	0.01200
486284	0.58322	0.02163	-0.04397	0.05541	0.07173	0.01996
486286	0.46771	0.04811	2.32711	0.09633	0.19548	0.01511

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
486288	0.52509	0.03501	1.02656	0.06476	0.20422	0.01976
486290	0.84632	0.02447	-1.11206	0.05158	0.09677	0.02571
486292	0.49839	0.02792	-0.07280	0.11221	0.19487	0.03270
486294	0.83479	0.03536	0.97320	0.02777	0.17545	0.00936
486298	0.32648	0.01046	0.14652	0.02988	0.00000	0.00000
486300	1.31802	0.03956	-0.93643	0.03405	0.23617	0.01952
486302	0.58506	0.02887	-0.01283	0.08113	0.21360	0.02590
486304	0.27803	0.03365	2.06151	0.15964	0.13184	0.03664
486317	0.24334	0.00965	0.36675	0.04116	0.00000	0.00000
486333	1.16828	0.03506	-0.23993	0.02746	0.24216	0.01282
486444	0.36358	0.03412	1.64606	0.09788	0.12957	0.02729
486448	0.61725	0.03924	1.19756	0.04871	0.23651	0.01476
486477	1.12051	0.05709	1.44917	0.02731	0.22646	0.00645
486519	0.87122	0.08675	2.53687	0.09852	0.19390	0.00596
486529	0.72640	0.02443	-0.04572	0.04126	0.09476	0.01667
486595	0.68440	0.01966	-1.13255	0.05838	0.06855	0.02528
486597	0.60308	0.02483	0.27591	0.05093	0.10043	0.01830
486607	0.27834	0.01977	-0.47642	0.28117	0.13676	0.05431
486613	0.58363	0.02495	-0.91494	0.10932	0.17234	0.03928
486661	1.15417	0.03677	-0.27737	0.03103	0.27632	0.01441
486665	0.78192	0.04702	1.36190	0.03866	0.27173	0.01029

Table M-13. 2016–17 OSTP: IRT Parameters for Dichotomous Items
ELA Grade 8

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
148071A	0.82412	0.02805	-0.95190	0.06312	0.19488	0.02818
148080A	1.50202	0.05074	-1.20314	0.03812	0.31707	0.02248
148085A	1.26312	0.03768	-0.87025	0.03429	0.23492	0.01883
148088A	0.85332	0.04101	0.49129	0.04232	0.36191	0.01358
148133A	0.92698	0.03114	-0.60117	0.04721	0.24048	0.02078
148134A	0.72005	0.02834	-0.64699	0.07292	0.22900	0.02770
148141A	0.41538	0.01751	-1.17978	0.13866	0.10008	0.04052
148177A	0.79822	0.01225	-1.12707	0.02683	0.04225	0.01280
148187A	0.47078	0.00954	-1.59148	0.06640	0.05493	0.02317
148189A	0.48770	0.01249	-0.41996	0.05686	0.07037	0.01862
148191A	0.59292	0.01237	-0.82155	0.04611	0.07049	0.01788
149371A	1.42798	0.02147	-0.24821	0.01096	0.17041	0.00603
149373A	1.84135	0.03450	-1.37765	0.01671	0.21657	0.01214
149374A	1.14716	0.01889	-1.18175	0.02301	0.14322	0.01337
149416A	0.44655	0.01248	-1.83925	0.05022	0.00000	0.00000
149426A	0.48100	0.02092	-0.55805	0.10504	0.10501	0.03311
149431A	1.17792	0.03221	-1.60009	0.04035	0.08574	0.02490
149500A	0.59732	0.03119	0.66675	0.05242	0.19218	0.01714
149507A	0.58418	0.02577	-0.37721	0.08337	0.17747	0.02796
149583A	0.65546	0.03706	1.30388	0.03931	0.17299	0.01152
149591A	0.91699	0.02339	-0.06860	0.02253	0.05635	0.00984
149597A	0.78194	0.02929	-0.73646	0.06580	0.25861	0.02564
149600A	0.28743	0.01009	-1.22162	0.05044	0.00000	0.00000
149619A	0.59929	0.02519	-0.01778	0.06406	0.13475	0.02243
149623A	0.82419	0.02270	-0.86062	0.04316	0.07567	0.02005
149626A	1.39409	0.04711	0.58706	0.01834	0.25291	0.00786
149650A	1.25969	0.03450	0.08709	0.01872	0.16734	0.00905
149653A	0.68946	0.02740	-0.46184	0.06753	0.21557	0.02456
149688A	1.48503	0.04682	-0.91490	0.03130	0.32734	0.01709
149689A	0.65139	0.03272	0.61699	0.04844	0.22621	0.01591
149700A	0.89599	0.03287	0.52590	0.02732	0.18836	0.01059
149744A	1.37707	0.03803	-0.26041	0.02112	0.22316	0.01101
149771A	0.64693	0.02421	-0.69682	0.07564	0.14270	0.02906
149772A	0.74043	0.02479	-0.75932	0.06054	0.13677	0.02571
160000A	1.09340	0.04005	0.34007	0.02680	0.30370	0.01044
160461A	0.63930	0.03868	1.31809	0.04305	0.19513	0.01287
160464A	1.22922	0.04026	-0.19664	0.02928	0.31563	0.01332
160467A	0.44615	0.00698	-1.65515	0.02567	0.00000	0.00000
160469A	0.21637	0.03602	2.90541	0.25279	0.16005	0.04550
160472A	0.52849	0.02493	-1.10529	0.14471	0.19787	0.04751
160477A	1.07836	0.04921	1.19060	0.02485	0.23788	0.00752
160584A	2.20242	0.08411	-1.31063	0.02786	0.32436	0.02001
160726A	0.57769	0.01695	-0.68664	0.05301	0.04842	0.01909
160742A	0.87359	0.02545	-0.90212	0.04609	0.11134	0.02229
160745A	0.55219	0.01847	-1.03601	0.07997	0.07770	0.02925
160767A	0.74118	0.02368	-1.59369	0.07988	0.11902	0.03844
160770A	1.62802	0.05327	-1.99560	0.03693	0.10846	0.02915
160771A	0.78288	0.02442	-0.41479	0.04228	0.11674	0.01795
160780A	0.92355	0.02177	1.18700	0.01397	0.12443	0.00419
160782A	0.57270	0.01295	-0.74288	0.05102	0.08586	0.01900
160783A	0.63889	0.01078	-0.54053	0.02698	0.03271	0.01056
160784A	1.40684	0.02816	-1.96197	0.03022	0.14590	0.02315
160785A	1.00391	0.01878	-2.04645	0.04276	0.10430	0.02831
160787A	0.53206	0.00917	-0.82224	0.03471	0.02964	0.01215
160788A	0.38682	0.00667	-1.74448	0.03039	0.00000	0.00000
160789A	0.96794	0.02253	0.70892	0.01555	0.24135	0.00576
160790A	0.39422	0.00765	-2.71635	0.04857	0.00000	0.00000
160791A	0.98719	0.04035	-1.75242	0.09645	0.35658	0.04677
160795A	0.56753	0.02163	-1.81291	0.13388	0.14813	0.05319
160800A	0.72811	0.02022	-0.77333	0.04476	0.05900	0.01905
160802A	0.65649	0.02621	-0.87872	0.08923	0.19107	0.03392
160836A	0.74958	0.04291	0.23463	0.06980	0.48166	0.01755
160872A	1.33573	0.04012	0.54170	0.01615	0.16973	0.00695
160875A	0.18849	0.03514	2.38123	0.45629	0.23990	0.06167
160877A	1.33777	0.04206	0.69464	0.01602	0.16540	0.00644
160920A	0.72696	0.02025	-2.16492	0.06302	0.06138	0.02769

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
160930A	0.90461	0.03366	-0.22789	0.04529	0.29604	0.01769
160935A	0.69885	0.02684	-0.31367	0.05986	0.17653	0.02270
160938A	0.62641	0.02900	0.13643	0.06361	0.20034	0.02141
160946A	1.12487	0.02939	-0.27552	0.02373	0.11856	0.01195
160956A	0.39588	0.01145	-1.46695	0.04582	0.00000	0.00000
160989A	0.25773	0.01007	-0.13291	0.03766	0.00000	0.00000
160992A	0.41557	0.00672	-1.55475	0.02588	0.00000	0.00000
160993A	0.22404	0.00998	-1.15262	0.06542	0.00000	0.00000
485469	1.10544	0.03805	0.55546	0.02164	0.21416	0.00869
485471	0.53302	0.02845	-0.36527	0.11793	0.24273	0.03459
485473	0.74843	0.02896	-0.58380	0.06559	0.25398	0.02450
485477	0.86445	0.03525	0.65724	0.03101	0.22083	0.01151
485479	0.61220	0.01626	-1.05912	0.04999	0.04557	0.01891
485481	0.88508	0.02788	-0.83003	0.04988	0.16678	0.02340
485485	0.24524	0.01713	0.57613	0.19275	0.08144	0.03504
485487	1.29983	0.04307	0.51254	0.01920	0.23089	0.00833
485491	0.47854	0.02386	-0.57361	0.12761	0.14935	0.03867
485493	0.54768	0.02753	-0.62056	0.12220	0.23570	0.03764
485495	0.69340	0.02299	-0.88258	0.06610	0.11225	0.02769
485497	0.50628	0.02928	1.10551	0.05352	0.11054	0.01738
485504	0.18933	0.04081	3.46462	0.38346	0.25542	0.05279

IREF	Parameters and Measures of Standard Error					
	a	SE (*a*)	*b*	SE (*b*)	*c*	SE (*c*)
485506	0.95551	0.06951	2.17942	0.06119	0.14440	0.00515
485510	0.47700	0.01964	-0.15956	0.07641	0.07236	0.02398
486340	0.39212	0.03257	0.74898	0.13972	0.20948	0.03405
486392	1.17902	0.03244	-0.40798	0.02654	0.17013	0.01371
486394	0.67385	0.04201	1.15654	0.04684	0.28994	0.01366
486398	0.32059	0.02561	0.50628	0.18920	0.13447	0.04171
486404	0.25332	0.05105	3.71065	0.28781	0.21335	0.03368
486744	0.55283	0.02626	0.03921	0.07473	0.15852	0.02417
486757	0.62677	0.03697	1.10172	0.04509	0.22062	0.01394
486763	0.49157	0.01677	-2.02280	0.11925	0.09924	0.04284
486998	0.48534	0.04948	2.53753	0.11436	0.14354	0.01256
487006	0.76258	0.02118	-1.51499	0.05954	0.08007	0.02867
487037	1.02191	0.03643	0.97363	0.02028	0.11820	0.00702
487053	0.25652	0.04687	3.68081	0.26635	0.15490	0.03149
487071	0.23564	0.02750	1.97535	0.21487	0.11476	0.04084
487144	0.43463	0.03103	0.11679	0.15124	0.24285	0.03735
487170	0.91703	0.02981	-2.40689	0.07859	0.11611	0.04753
487254	0.35826	0.03193	1.80227	0.08849	0.09982	0.02414

Table M-14. 2016-17 OK OSTP: IRT Parameters for Polytomous Items – ELA Grade 8

Item Number	*Parameters and Measures of Standard Error*																	
	a	*SE (a)*	*b*	*SE (b)*	*D0*	*SE (D0)*	*D1*	*SE (D1)*	*D2*	*SE (D2)*	*D3*	*SE (D3)*	*D4*	*SE (D4)*	*D5*	*SE (D5)*	*D6*	*SE (D6)*
141500A	0.86947	0.00395	-0.12716	0.00609	3.80126	0.03123	1.53892	0.01017	1.29291	0.00935	-0.81572	0.00747	-2.72097	0.01567	-3.09640	0.01972	0.00000	0.00000

Table M-15. 2016–17 OSTP: IRT Parameters for Dichotomous Items
ELA Grade 10

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
141069A	0.39457	0.00000	-0.63497	0.00000	0.00000	0.00000
141079A	0.99124	0.00000	0.48931	0.00000	0.13174	0.00000
141082A	0.69754	0.00000	-0.33925	0.00000	0.24289	0.00000
144222A	0.68592	0.00000	0.22118	0.00000	0.17809	0.00000
144223A	0.71636	0.00000	-0.04680	0.00000	0.21249	0.00000
144225A	1.22012	0.00000	-0.00106	0.00000	0.29504	0.00000
144226A	1.12664	0.00000	-0.59318	0.00000	0.15474	0.00000
144273A	0.57882	0.00000	0.69878	0.00000	0.26010	0.00000
144279A	0.76585	0.00000	0.22855	0.00000	0.20477	0.00000
144283A	0.92396	0.00000	0.52009	0.00000	0.36119	0.00000
144284A	0.85342	0.00000	-1.14987	0.00000	0.10350	0.00000
144285A	1.06771	0.00000	0.80272	0.00000	0.25659	0.00000
144286A	0.87924	0.00000	0.07242	0.00000	0.18707	0.00000
156932A	0.74944	0.00000	-1.52923	0.00000	0.11040	0.00000
156951A	1.68565	0.00000	0.56798	0.00000	0.19701	0.00000
156953A	1.24713	0.00000	0.39860	0.00000	0.29087	0.00000
156955A	1.44660	0.00000	0.83304	0.00000	0.30858	0.00000
156956A	1.54132	0.00000	1.75668	0.00000	0.04309	0.00000
157488A	0.61507	0.00000	-0.01505	0.00000	0.14654	0.00000
157489A	1.03932	0.00000	0.68493	0.00000	0.26701	0.00000
157490A	1.54569	0.00000	1.86866	0.00000	0.03751	0.00000
166485A	0.90253	0.00000	1.92261	0.00000	0.14145	0.00000
166884A	0.30271	0.00000	1.54820	0.00000	0.06179	0.00000
166890A	1.47534	0.00000	1.13062	0.00000	0.24238	0.00000
166896A	0.94446	0.00000	0.71704	0.00000	0.26090	0.00000
167402A	0.23676	0.00000	0.68747	0.00000	0.00000	0.00000
167409A	0.88235	0.00000	1.31440	0.00000	0.20346	0.00000
167520A	0.73215	0.00000	0.20872	0.00000	0.13752	0.00000
167522A	1.24619	0.00000	-0.93517	0.00000	0.17947	0.00000
167523A	0.44883	0.00000	-0.32249	0.00000	0.00000	0.00000
171238A	0.24081	0.00000	1.78974	0.00000	0.10489	0.00000
171245A	1.16852	0.00000	-0.03468	0.00000	0.18251	0.00000
171285A	0.77049	0.00000	-0.60283	0.00000	0.20220	0.00000
171325A	0.63644	0.00000	-0.71330	0.00000	0.13765	0.00000
171390A	0.21308	0.00000	-1.48058	0.00000	0.00000	0.00000
171418A	0.80952	0.00000	0.35405	0.00000	0.27650	0.00000
171435A	0.86824	0.00000	0.35925	0.00000	0.12566	0.00000
171476A	1.05782	0.00000	0.12355	0.00000	0.33134	0.00000
171586A	0.59450	0.00000	0.76521	0.00000	0.18506	0.00000
171648A	1.00978	0.00000	-0.17206	0.00000	0.27719	0.00000
171661A	0.74037	0.00000	0.48762	0.00000	0.26792	0.00000
171711A	0.46144	0.00000	2.13702	0.00000	0.28274	0.00000
171726A	1.08662	0.00000	1.83386	0.00000	0.31230	0.00000
171754A	0.61218	0.00000	2.54176	0.00000	0.40188	0.00000
171757A	0.28072	0.00000	0.19025	0.00000	0.00000	0.00000
171763A	0.63435	0.00000	0.80535	0.00000	0.18423	0.00000
171766A	0.70821	0.00000	-0.20683	0.00000	0.27142	0.00000
171817A	0.31310	0.00000	-0.50175	0.00000	0.00000	0.00000
171911A	0.87144	0.00000	0.43584	0.00000	0.22173	0.00000
171923A	1.14890	0.00000	-0.64547	0.00000	0.21093	0.00000
171974A	0.19569	0.00000	0.83530	0.00000	0.00000	0.00000
171988A	0.75470	0.00000	-0.34994	0.00000	0.13777	0.00000
171996A	1.07863	0.00000	0.56463	0.00000	0.09285	0.00000
172025A	0.47148	0.00000	0.89520	0.00000	0.08844	0.00000
172397A	1.11536	0.00000	1.63981	0.00000	0.25726	0.00000
172406A	1.24057	0.00000	1.27135	0.00000	0.23198	0.00000
172606A	1.21781	0.00000	0.05817	0.00000	0.15701	0.00000
173001A	0.45470	0.00000	0.37756	0.00000	0.18971	0.00000
173012A	1.14868	0.00000	0.00640	0.00000	0.26143	0.00000
173016A	0.71363	0.00000	0.67616	0.00000	0.17669	0.00000
173024A	0.92363	0.00000	1.65808	0.00000	0.18621	0.00000
173042A	1.01801	0.00000	-0.00980	0.00000	0.34706	0.00000
173049A	0.76919	0.00000	0.80595	0.00000	0.39004	0.00000
173106A	1.04056	0.00000	0.45717	0.00000	0.36560	0.00000
173131A	0.19384	0.00000	0.65744	0.00000	0.00000	0.00000
173168A	0.40250	0.00000	2.20971	0.00000	0.31351	0.00000

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
173320A	0.97702	0.00000	-1.12424	0.00000	0.08044	0.00000
174109A	0.48231	0.00000	-0.90996	0.00000	0.00000	0.00000
174113A	0.87277	0.00000	-0.69650	0.00000	0.24435	0.00000
174533A	0.70116	0.00000	0.70569	0.00000	0.29826	0.00000
174825A	1.17549	0.00000	1.62064	0.00000	0.21583	0.00000
174944A	0.34018	0.00000	-0.69976	0.00000	0.00000	0.00000
174953A	1.01326	0.00000	-1.32256	0.00000	0.10321	0.00000
174954A	0.69876	0.00000	0.41354	0.00000	0.10028	0.00000
174955A	1.23774	0.00000	-0.50742	0.00000	0.19793	0.00000
175003A	0.35312	0.00000	-0.45499	0.00000	0.00000	0.00000
175033A	0.88920	0.00000	-0.27692	0.00000	0.20839	0.00000
175211A	0.26249	0.00000	1.25991	0.00000	0.22956	0.00000
175441A	0.78582	0.00000	0.88270	0.00000	0.31681	0.00000
175456A	0.52991	0.00000	0.83105	0.00000	0.07547	0.00000
175466A	0.83670	0.00000	-1.41483	0.00000	0.05949	0.00000
175735A	1.64386	0.00000	1.30892	0.00000	0.23887	0.00000
179051A	1.11521	0.00000	0.38621	0.00000	0.24314	0.00000
179057A	1.02012	0.00000	-1.85682	0.00000	0.11387	0.00000
179099A	1.13698	0.00000	-0.02141	0.00000	0.27108	0.00000
179264A	0.45592	0.00000	-1.48631	0.00000	0.00000	0.00000
179265A	0.91448	0.00000	-0.26049	0.00000	0.09467	0.00000
179267A	0.75456	0.00000	-0.82834	0.00000	0.08050	0.00000
179269A	0.71046	0.00000	-0.19301	0.00000	0.25306	0.00000
179270A	1.10316	0.00000	0.10831	0.00000	0.13800	0.00000
179273A	0.41876	0.00000	-0.66472	0.00000	0.00000	0.00000
179303A	1.07941	0.00000	-0.17415	0.00000	0.26355	0.00000
179336A	0.74011	0.00000	-0.95769	0.00000	0.01676	0.00000
180486A	0.57743	0.00000	-0.49747	0.00000	0.13303	0.00000
180512A	0.63467	0.00000	1.45572	0.00000	0.23766	0.00000
180515A	0.84179	0.00000	0.31487	0.00000	0.18225	0.00000
180730A	1.12346	0.00000	1.19978	0.00000	0.22624	0.00000
180738A	0.35881	0.00000	-1.05594	0.00000	0.00000	0.00000

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
180741A	0.38500	0.00000	0.34430	0.00000	0.13695	0.00000
180744A	0.60971	0.00000	0.79681	0.00000	0.20777	0.00000
180756A	0.76549	0.00000	-0.13995	0.00000	0.16794	0.00000
180758A	0.82982	0.00000	-0.84039	0.00000	0.10451	0.00000
180762A	0.66034	0.00000	0.10227	0.00000	0.18845	0.00000
180769A	1.54628	0.00000	-0.51821	0.00000	0.16274	0.00000
180774A	0.39091	0.00000	-1.92395	0.00000	0.09025	0.00000
180776A	0.95982	0.00000	0.70773	0.00000	0.11376	0.00000
180794A	1.06570	0.00000	0.25399	0.00000	0.27790	0.00000
180972A	1.28727	0.00000	1.00960	0.00000	0.15946	0.00000
180974A	1.52948	0.00000	1.23086	0.00000	0.15252	0.00000
180975A	0.77112	0.00000	-0.22700	0.00000	0.25520	0.00000
180978A	1.15038	0.00000	0.65032	0.00000	0.23573	0.00000
181087A	0.43618	0.00000	-1.42264	0.00000	0.00000	0.00000
181096A	1.23606	0.00000	-0.21479	0.00000	0.22971	0.00000
181310A	0.38385	0.00000	-0.23015	0.00000	0.00000	0.00000
485515	0.63115	0.00000	0.83134	0.00000	0.29416	0.00000
485518	0.79023	0.00000	0.28786	0.00000	0.28405	0.00000
485520	0.99912	0.00000	-0.35947	0.00000	0.16538	0.00000
485522	0.80507	0.00000	0.72056	0.00000	0.16071	0.00000
485533	0.50479	0.00000	-0.44357	0.00000	0.00000	0.00000
485547	0.24364	0.00000	-0.97173	0.00000	0.00000	0.00000
485554	0.40177	0.00000	1.91717	0.00000	0.20075	0.00000
485556	0.58047	0.00000	-1.16816	0.00000	0.00000	0.00000
494974	0.63410	0.00000	0.03410	0.00000	0.13108	0.00000
504439	1.42133	0.00000	0.59163	0.00000	0.18397	0.00000

Table M-16. 2016-17 OK OSTP: IRT Parameters for Polytomous Items – ELA Grade 10

Item Number	Parameters and Measures of Standard Error															
	a	*SE (a)*	*b*	*SE (b)*	*D0*	*SE (D0)*	*D1*	*SE (D1)*	*D2*	*SE (D2)*	*D3*	*SE (D3)*	*D4*	*SE (D4)*	*D5*	*SE (D5)*
489583	0.81604	0.00000	0.00786	0.00000	3.98014	0.00000	1.99332	0.00000	1.78458	0.00000	1.69382	0.00000	-0.30399	0.00000	-0.78532	0.00000
499622	0.76452	0.01135	-0.00943	0.01327	0.21182	0.01422	-0.21182	0.01408	0.00000	0.00000						
499624	0.59353	0.00655	0.14214	0.01532	0.95373	0.01834	-0.95373	0.01878	0.00000	0.00000						
499627	0.34268	0.00541	0.35837	0.02717	0.69558	0.02900	-0.69558	0.02998	0.00000	0.00000						
499629	0.31883	0.00603	2.35069	0.04655	0.72047	0.03352	-0.72047	0.04063	0.00000	0.00000						
499638	0.53415	0.00990	0.22870	0.01888	0.17803	0.01943	-0.17803	0.01957	0.00000	0.00000						
499647	0.21650	0.00439	2.85640	0.06533	0.90554	0.04764	-0.90554	0.05525	0.00000	0.00000						

Item Number	Parameters and Measures of Standard Error							
	D6	*SE (D6)*	*D7*	*SE (D7)*	*D8*	*SE (D8)*	*D9*	*SE (D9)*
489583	-2.60075	0.00000	-2.77297	0.00000	-2.98883	0.00000	0.00000	0.00000
499622								
499624								
499627								
499629								
499638								
499647								

Table M-17. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Science Grade 5

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
184387A	1.05097	0.02034	-0.00887	0.01828	0.25907	0.00777
184423A	0.92923	0.02226	0.66304	0.01751	0.26193	0.00622
184525A	0.67792	0.05831	1.00495	0.06877	0.32136	0.01897
184530A	0.92817	0.04459	0.51274	0.03515	0.15367	0.01347
184534A	0.82905	0.04953	0.63014	0.04720	0.23512	0.01618
185413A	1.12378	0.02370	0.91601	0.01171	0.18039	0.00412
186452A	0.48326	0.03416	-0.13602	0.14538	0.16249	0.04246
186458A	0.89961	0.08320	1.85884	0.06456	0.22129	0.00925
186464A	1.05672	0.05759	0.70023	0.03441	0.24837	0.01209
186473A	0.73926	0.01571	-0.04001	0.02767	0.14504	0.01100
186475A	0.51673	0.01408	-0.61817	0.07043	0.11242	0.02412
186478A	0.83952	0.02116	0.33749	0.02488	0.30993	0.00848
186483A	0.43178	0.04368	0.35127	0.19980	0.25337	0.04826
186489A	0.38927	0.05235	1.33361	0.16991	0.25143	0.04056
186490A	0.57449	0.05143	1.11827	0.07831	0.23040	0.02347
186506A	0.69281	0.04048	0.27502	0.06850	0.17932	0.02464
186508A	0.45781	0.02891	-0.42722	0.15600	0.13195	0.04624
186510A	0.76635	0.04550	0.32982	0.06262	0.23828	0.02222
187286A	0.75715	0.01739	0.56766	0.02014	0.14857	0.00758
187288A	0.83001	0.03216	1.83044	0.02634	0.22901	0.00445
187289A	0.79873	0.02894	1.64987	0.02342	0.23168	0.00496
187487A	0.65083	0.02052	0.99562	0.02555	0.20492	0.00834
187491A	0.80771	0.02732	1.47893	0.02112	0.24024	0.00522
187497A	1.31152	0.03243	1.30586	0.01195	0.19980	0.00318
187503A	0.58758	0.01959	0.63470	0.03834	0.23661	0.01177
187505A	0.70643	0.01584	-1.37288	0.06337	0.16388	0.02968
187510A	1.23857	0.02764	-1.28223	0.03505	0.39722	0.01833
188304A	0.73956	0.01771	0.42930	0.02390	0.18200	0.00878
188318A	0.37757	0.00639	-1.28357	0.02419	0.00000	0.00000
188323A	1.00981	0.01989	0.72867	0.01242	0.14539	0.00476
188334A	0.53386	0.01801	0.22459	0.05582	0.21922	0.01651
188338A	1.13222	0.02273	0.19723	0.01603	0.29311	0.00653
188340A	1.13573	0.02209	0.15217	0.01574	0.27517	0.00660
188377A	0.95106	0.01877	0.20208	0.01780	0.20503	0.00733
188378A	0.64279	0.02760	1.81267	0.03070	0.21854	0.00638
188380A	0.24589	0.01901	0.71171	0.25225	0.14893	0.04367
188387A	0.51850	0.02705	0.06916	0.07934	0.07312	0.02566
188389A	0.48556	0.03788	0.19036	0.13615	0.18243	0.03873
188390A	0.51877	0.02846	-0.53669	0.12008	0.11713	0.03942
188432A	0.74406	0.01667	0.13942	0.02642	0.17151	0.01010
188433A	0.47243	0.01953	1.20868	0.04009	0.14584	0.01256
188439A	0.95595	0.01944	-1.26448	0.04065	0.23781	0.02163
188452A	0.35066	0.00652	-1.74921	0.03314	0.00000	0.00000
188453A	0.87232	0.02697	1.19499	0.01906	0.28822	0.00545
188456A	0.88429	0.01660	-0.42319	0.02552	0.17342	0.01157
188717A	1.02325	0.01784	-0.54840	0.02175	0.18457	0.01086
188718A	1.25355	0.02305	-1.11854	0.02491	0.24852	0.01507
188720A	0.83529	0.01161	-1.42328	0.02374	0.02962	0.01223
188728A	0.80751	0.04526	-1.35916	0.14141	0.31494	0.06177
188729A	0.66190	0.03243	-0.60768	0.09459	0.13289	0.03774
188731A	0.37928	0.04685	1.31607	0.16153	0.18931	0.04073
188904A	0.54567	0.02725	-0.88211	0.12283	0.11864	0.04391
188907A	1.00270	0.04783	0.81072	0.02906	0.12526	0.01073
188908A	0.68448	0.02882	-1.10625	0.09022	0.10825	0.03953
189235A	0.65634	0.00961	-1.32202	0.02887	0.02849	0.01241
189237A	0.92199	0.01890	0.23605	0.01878	0.21420	0.00753
189238A	0.56907	0.01977	0.69796	0.03965	0.23306	0.01202
189340A	1.17491	0.01998	-0.46974	0.01781	0.21665	0.00917
189341A	0.67725	0.01576	-0.14126	0.03573	0.15944	0.01346
189345A	0.94564	0.02482	1.14278	0.01546	0.21775	0.00475
189348A	1.13692	0.01952	-1.08540	0.02468	0.17007	0.01493
189349A	0.89207	0.01403	-0.99835	0.02573	0.06146	0.01393
189352A	1.11385	0.02048	-0.90168	0.02574	0.24505	0.01382
189356A	0.71960	0.01532	0.16131	0.02473	0.11656	0.00972
189358A	1.18601	0.02424	0.33069	0.01464	0.30216	0.00584
189361A	0.96645	0.02060	-1.21303	0.04188	0.29222	0.02089

Table M-18. 2016–17 OSTP: IRT Parameters for Dichotomous Items
Science Grade 8

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
185793A	1.06768	0.03327	1.24913	0.01688	0.33961	0.00442
185805A	0.72351	0.01771	0.29773	0.02742	0.19152	0.00996
185826A	1.03696	0.02219	0.57475	0.01480	0.23759	0.00563
185899A	1.26296	0.02216	-0.07579	0.01426	0.24467	0.00674
185901A	1.05633	0.03214	1.55090	0.01703	0.21376	0.00363
185916A	0.94306	0.01935	0.06128	0.02070	0.23972	0.00837
186154A	0.99171	0.02846	1.37036	0.01611	0.22150	0.00416
186293A	0.45566	0.02006	0.90466	0.05623	0.18562	0.01605
186309A	0.76440	0.01858	0.52877	0.02220	0.18981	0.00811
186997A	0.70106	0.03626	0.21504	0.05496	0.19225	0.01853
186999A	1.19916	0.08569	1.50683	0.03870	0.25620	0.00626
187000A	0.85627	0.05412	1.40130	0.04139	0.16591	0.00802
187032A	0.83019	0.01796	-0.05201	0.02637	0.22040	0.01037
187038A	0.57114	0.01136	-0.25301	0.03457	0.03999	0.01285
187047A	0.72931	0.02282	0.97565	0.02360	0.26106	0.00745
187676A	0.63564	0.01565	0.96711	0.01907	0.05815	0.00680
187681A	0.27832	0.00591	-1.08702	0.02912	0.00000	0.00000
187688A	0.66537	0.01271	-2.19843	0.06397	0.08144	0.03450
188149A	0.50818	0.01910	0.40029	0.05957	0.22509	0.01689
188150A	1.06838	0.02206	0.45016	0.01492	0.24590	0.00585
188153A	0.76703	0.02086	1.20002	0.01756	0.14604	0.00556
188158A	1.00463	0.01771	-0.39947	0.02087	0.17645	0.01006
188160A	1.07579	0.02053	-0.13492	0.01897	0.26043	0.00830
188176A	0.99409	0.02464	1.06023	0.01437	0.21377	0.00462
188250A	1.16126	0.04514	0.28164	0.02530	0.18917	0.00939
188251A	0.70967	0.03388	0.17079	0.05019	0.15169	0.01775
188253A	0.82841	0.03676	-0.01135	0.04533	0.20004	0.01674
188317A	0.92028	0.01770	-0.66015	0.02934	0.20327	0.01389
188320A	0.74079	0.03776	2.34673	0.04686	0.19460	0.00433
188328A	1.01575	0.01502	-0.27304	0.01466	0.06480	0.00723
188332A	1.21138	0.02304	0.26502	0.01360	0.25756	0.00576
188838A	1.27437	0.05756	0.40549	0.02704	0.29807	0.00902
188841A	1.19785	0.06216	0.95130	0.02760	0.23804	0.00724
188843A	0.84071	0.05448	1.01999	0.04207	0.28102	0.01070
188846A	0.38130	0.00611	-0.01236	0.01477	0.00000	0.00000
188847A	0.83633	0.01678	0.10417	0.02130	0.15484	0.00875
188849A	0.59599	0.01726	0.51766	0.03405	0.15300	0.01157
188863A	1.12171	0.02153	0.11236	0.01599	0.25863	0.00679
188866A	1.30075	0.02104	-0.20755	0.01328	0.19428	0.00681
188868A	1.49607	0.05528	1.80847	0.01753	0.25238	0.00272
189061A	0.95014	0.02012	0.71417	0.01422	0.16887	0.00537
189076A	0.84330	0.02093	0.26910	0.02543	0.30326	0.00879
189080A	0.51587	0.01519	-0.24196	0.06404	0.12388	0.02097
189087A	1.07797	0.02329	0.39524	0.01627	0.29481	0.00617
189090A	0.93997	0.01578	-0.49387	0.02155	0.11228	0.01069
189095A	0.77934	0.04585	-0.08852	0.08016	0.19366	0.03201
189099A	0.89432	0.05358	0.40996	0.05364	0.21858	0.02117
189100A	1.46845	0.10346	1.29046	0.03144	0.25577	0.00929
189438A	0.63982	0.06603	0.96797	0.09668	0.34414	0.02662
189440A	0.31891	0.02923	-0.48402	0.32295	0.17111	0.06812
189442A	0.98972	0.04351	-1.00059	0.06801	0.12864	0.03793
300070A	0.73449	0.01964	0.57211	0.02520	0.22780	0.00868
300072A	0.60650	0.01039	-0.65521	0.03260	0.03492	0.01304
300074A	0.49190	0.01861	1.00634	0.03962	0.13405	0.01269
300078A	0.35591	0.01206	0.12108	0.08463	0.05886	0.02179
300080A	0.59006	0.02919	1.84626	0.03531	0.25373	0.00755
300081A	0.64354	0.01797	0.46077	0.03188	0.18756	0.01087
300093A	1.03571	0.05038	-0.23823	0.05328	0.19312	0.02548
300095A	1.08432	0.06497	0.89872	0.03541	0.20512	0.01307
300097A	1.18646	0.05226	-0.24367	0.04111	0.16269	0.02144
300109A	0.44122	0.06361	1.78505	0.12759	0.21846	0.03312
300111A	0.95700	0.08670	1.43876	0.05228	0.30306	0.01317

Table M-19. 2016-17 OK OSTP: IRT Parameters for Polytomous Items – Science Grade 8

Item Number	*Parameters and Measures of Standard Error*									
	a	*SE (a)*	*b*	*SE (b)*	*D0*	*SE (D0)*	*D1*	*SE (D1)*	*D2*	*SE (D2)*
494074	1.04785	0.00863	-1.11091	0.00756	0.29982	0.00829	-0.29982	0.00697	0.00000	0.00000
494236	0.68720	0.00787	-1.75429	0.01652	0.16992	0.01225	-0.16992	0.01107	0.00000	0.00000
494991	0.63530	0.00474	-0.90332	0.00946	0.63025	0.01138	-0.63025	0.00946	0.00000	0.00000

Table M-20. 2016–17 OSTP: IRT Parameters for Dichotomous Items Science Grade 10

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
186821A	0.77384	0.02119	0.96610	0.01852	0.07187	0.00644
186828A	1.15598	0.03085	0.83143	0.01507	0.20556	0.00549
186834A	0.38792	0.01835	0.76553	0.07642	0.07225	0.02139
186972A	0.48935	0.01486	0.38707	0.04335	0.04256	0.01411
186989A	0.80526	0.02618	0.58662	0.02827	0.25252	0.00979
186992A	0.84846	0.01344	-1.04761	0.02091	0.02186	0.00934
187525A	1.68025	0.05288	1.11986	0.01293	0.29369	0.00407
187933A	1.32663	0.05729	0.03370	0.02738	0.16090	0.01240
187934A	0.70784	0.05474	0.84080	0.05810	0.19353	0.01838
187938A	0.84865	0.05287	0.51213	0.04728	0.19508	0.01659
187974A	1.18929	0.07498	0.14383	0.05003	0.23925	0.02264
187978A	0.75837	0.08803	1.66631	0.07851	0.18098	0.01776
187985A	0.66844	0.05682	0.60357	0.08665	0.15572	0.03052
187996A	1.28229	0.02788	-0.24924	0.01900	0.24431	0.00947
187999A	0.98677	0.02966	1.07017	0.01734	0.17859	0.00565
188011A	0.58791	0.02935	1.60135	0.03472	0.16423	0.00959

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
188070A	1.20825	0.08256	0.56566	0.04352	0.23786	0.01781
188072A	0.96954	0.08620	0.97499	0.05660	0.26531	0.01883
188075A	1.04850	0.07242	0.82819	0.04232	0.15262	0.01598
188474A	0.29519	0.00758	-1.12008	0.03563	0.00000	0.00000
188475A	0.91835	0.02981	0.81142	0.02232	0.26897	0.00756
188478A	0.63978	0.01311	-1.40003	0.04781	0.05090	0.02135
188500A	1.71984	0.05581	1.21577	0.01292	0.27740	0.00384
188502A	0.28121	0.02345	1.45974	0.15013	0.11279	0.03337
188503A	1.11966	0.05517	1.91842	0.02991	0.22132	0.00399
188544A	1.01388	0.03137	1.06619	0.01764	0.20675	0.00571
188545A	0.56224	0.01859	-0.07074	0.05853	0.11555	0.02024
188546A	0.91622	0.02824	0.79776	0.02111	0.23366	0.00741
188647A	1.15168	0.02659	0.15185	0.01823	0.22690	0.00800
188649A	1.54186	0.04543	1.13484	0.01278	0.23320	0.00401
188653A	0.48606	0.02095	1.37010	0.03585	0.06004	0.01162
188657A	0.76726	0.04904	1.73280	0.04057	0.39787	0.00716

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
188658A	0.60153	0.03530	1.68018	0.04023	0.25586	0.00983
188659A	0.39305	0.01995	0.59419	0.09185	0.10042	0.02505
188833A	0.99267	0.05281	1.93802	0.03433	0.25081	0.00461
188834A	1.10745	0.02694	0.48188	0.01658	0.20190	0.00675
188835A	1.16991	0.02885	0.45526	0.01652	0.23513	0.00671
188964A	0.89608	0.02478	0.55621	0.02163	0.19534	0.00823
188965A	0.48582	0.02973	1.24688	0.05826	0.24995	0.01641
188970A	0.53860	0.01201	-0.98843	0.05204	0.04651	0.01945
189104A	1.06317	0.05935	0.06507	0.04542	0.28745	0.01736
189106A	0.76739	0.07758	1.53736	0.06894	0.22246	0.01304
189220A	0.91197	0.09402	1.60463	0.06665	0.25056	0.01058
189223A	0.46953	0.02647	0.26755	0.07638	0.05480	0.02231
189224A	1.08770	0.05839	0.50695	0.03350	0.18354	0.01219
189383A	1.12389	0.12409	1.69764	0.06187	0.21422	0.01183
189384A	1.08535	0.14606	1.83877	0.07906	0.28772	0.01263
189387A	0.73031	0.08849	1.39986	0.08252	0.26631	0.02242

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
189393A	1.24176	0.04337	1.17788	0.01731	0.30825	0.00495
189394A	1.28125	0.02853	0.30836	0.01465	0.20969	0.00649
189403A	1.17967	0.06855	0.20135	0.04372	0.17243	0.02006
189407A	0.86825	0.07404	0.74216	0.06533	0.24388	0.02302
189408A	1.03301	0.07714	0.92903	0.04448	0.17445	0.01602
189414A	1.00914	0.05297	2.00422	0.03525	0.21695	0.00428
189415A	0.91773	0.03246	0.95689	0.02284	0.29444	0.00722
189421A	0.30215	0.02238	2.13607	0.08164	0.06605	0.02108
189423A	0.37928	0.03117	1.78690	0.07465	0.18961	0.02104
189425A	0.82586	0.04129	1.67296	0.03109	0.27466	0.00628
189597A	0.34055	0.03102	2.01818	0.08405	0.15984	0.02353
300014A	0.80158	0.04003	1.56732	0.03063	0.29971	0.00686
300028A	0.50634	0.03832	1.99851	0.05639	0.26042	0.01205

Table M-21. 2016-17 OK OSTP: IRT Parameters for Polytomous Items – Science Grade 10

Item Number	*Parameters and Measures of Standard Error*									
	a	*SE (a)*	*b*	*SE (b)*	*D0*	*SE (D0)*	*D1*	*SE (D1)*	*D2*	*SE (D2)*
493046	0.45617	0.00437	0.98875	0.01573	0.85642	0.01594	-0.85642	0.01892	0.00000	0.00000
493306	0.67225	0.00848	3.33875	0.01264	2.77830	0.01178	-2.77830	0.12444	0.00000	0.00000
493561	0.53709	0.00577	-0.90821	0.01454	0.49918	0.01573	-0.49918	0.01396	0.00000	0.00000

Table M-22. 2016–17 OSTP: IRT Parameters for Dichotomous Items
U.S. History Grade 10

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
140941A	1.01529	0.04876	0.64190	0.03275	0.35066	0.01068
141054A	0.75638	0.00000	-0.73749	0.00000	0.09200	0.00000
141057A	0.41869	0.02516	-0.21840	0.14089	0.14145	0.03750
141113A	0.76528	0.03701	0.01191	0.05941	0.34317	0.01863
141140A	0.84272	0.01592	-1.47984	0.02829	0.02831	0.01186
141143A	0.90825	0.02608	-1.03618	0.04240	0.08976	0.02038
141225A	0.98422	0.02076	-1.59982	0.03317	0.05385	0.01773
141227A	1.06906	0.00000	-0.10950	0.00000	0.41340	0.00000
143190A	0.96479	0.00000	0.17569	0.00000	0.23890	0.00000
143250A	1.01912	0.00000	-1.66941	0.00000	0.20000	0.00000
143252A	0.41759	0.02140	-1.26126	0.18241	0.14716	0.05114
143254A	0.40008	0.00000	-0.08136	0.00000	0.20000	0.00000
143255A	0.51203	0.00000	-1.09198	0.00000	0.20000	0.00000
143257A	1.01748	0.02305	-0.27021	0.02312	0.13326	0.01096
143261A	0.45994	0.01217	-1.09993	0.03321	0.00000	0.00000
143262A	0.94890	0.03225	0.71755	0.02288	0.23882	0.00791
143264A	0.42313	0.00000	-0.93934	0.00000	0.20000	0.00000
143276A	0.77929	0.02689	-0.59303	0.05791	0.14584	0.02576
143278A	0.43685	0.01975	-1.85054	0.19042	0.15094	0.06114
143281A	0.56965	0.00000	-1.24937	0.00000	0.20000	0.00000
143285A	0.36934	0.00000	-0.31085	0.00000	0.20000	0.00000
143289A	0.55264	0.01427	-1.65119	0.07871	0.07615	0.03167
143291A	0.74863	0.02631	-0.21993	0.04928	0.29604	0.01635
143292A	1.11137	0.03105	-0.77234	0.03466	0.31705	0.01529
143295A	0.55088	0.01887	-1.23505	0.09882	0.13998	0.03510
143297A	1.30340	0.00000	0.24666	0.00000	0.19170	0.00000
143298A	1.20077	0.06585	0.57621	0.03754	0.55824	0.00990
143301A	0.87959	0.02092	0.08834	0.02334	0.22752	0.00890
143305A	1.31218	0.00000	-0.43649	0.00000	0.31640	0.00000
143307A	0.31281	0.00658	0.06359	0.01969	0.00000	0.00000
143314A	0.74198	0.00000	0.24250	0.00000	0.28990	0.00000

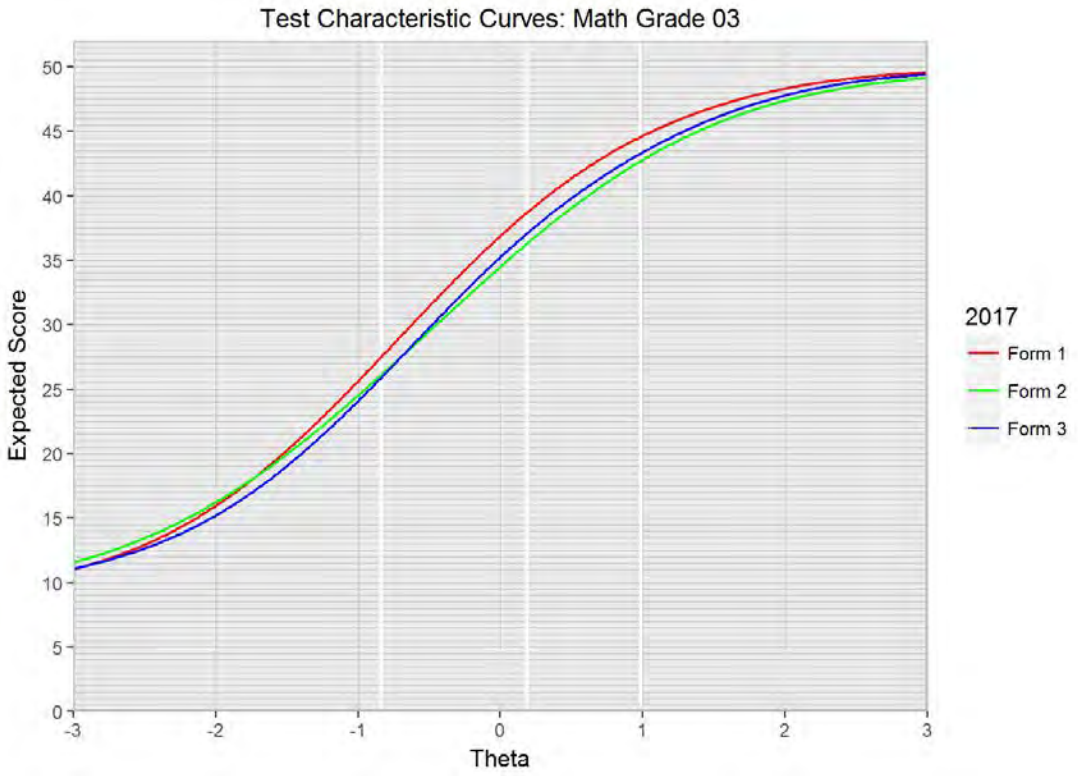
IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
143323A	0.77929	0.00000	-1.09198	0.00000	0.20000	0.00000
143326A	0.70795	0.02195	0.58988	0.02695	0.09963	0.01011
143327A	0.64100	0.00000	0.03755	0.00000	0.14230	0.00000
143331A	0.63698	0.01179	-1.75268	0.04566	0.04782	0.01947
143337A	1.12119	0.02784	-1.41658	0.03031	0.04447	0.01522
143340A	0.37758	0.03183	-0.76782	0.33448	0.33001	0.06865
143344A	0.81203	0.02211	-0.61325	0.04030	0.16307	0.01676
143345A	1.30891	0.03720	-1.55577	0.03410	0.08545	0.02074
143348A	0.90552	0.00000	-0.41214	0.00000	0.20880	0.00000
143358A	0.72716	0.00000	-0.47288	0.00000	0.20000	0.00000
143360A	0.43904	0.01920	-2.17785	0.19277	0.15165	0.06367
143361A	0.88703	0.02968	-0.02220	0.03266	0.14433	0.01357
143363A	0.34519	0.00000	-1.46011	0.00000	0.20000	0.00000
143364A	0.66990	0.02088	-0.47753	0.05226	0.15251	0.01927
143365A	0.64759	0.00000	-0.96180	0.00000	0.02440	0.00000
143366A	1.19309	0.00000	-0.63804	0.00000	0.21780	0.00000
143368A	0.87698	0.00000	0.37980	0.00000	0.25160	0.00000
143370A	1.00540	0.02799	0.29392	0.02192	0.21337	0.00893
143374A	0.70646	0.01236	-1.54634	0.02241	0.00000	0.00000
143377A	1.46420	0.00000	0.54619	0.00000	0.14950	0.00000
143381A	0.60313	0.00000	0.53149	0.00000	0.28480	0.00000
143393A	0.39239	0.00000	-0.10940	0.00000	0.20000	0.00000
143402A	0.39584	0.00903	-1.30269	0.03237	0.00000	0.00000
143416A	0.65269	0.03596	-1.00601	0.13496	0.42825	0.03709
143417A	1.24063	0.02669	-0.59777	0.01986	0.13081	0.01024
143439A	1.14260	0.00000	-2.52160	0.00000	0.20000	0.00000
143440A	0.81551	0.00000	-0.01351	0.00000	0.14520	0.00000
143441A	0.68326	0.00000	-1.29751	0.00000	0.20000	0.00000
143442A	0.71674	0.02415	-0.55954	0.06106	0.24943	0.02242
143443A	0.75844	0.02030	-0.39460	0.03903	0.11611	0.01644
143445A	0.98216	0.02291	-0.14734	0.02160	0.11371	0.00946

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
143446A	0.61873	0.02431	-0.29784	0.06883	0.26133	0.02123
143447A	0.58173	0.00000	-0.98378	0.00000	0.20000	0.00000
143513A	0.36989	0.01756	-1.12008	0.17288	0.10927	0.04590
143516A	0.17946	0.00988	-0.52258	0.06305	0.00000	0.00000
143521A	0.97340	0.01899	-1.52244	0.02782	0.03612	0.01354
143524A	0.92967	0.00000	-0.18405	0.00000	0.15790	0.00000
143526A	0.89796	0.03143	0.50752	0.02770	0.28381	0.00945
143528A	1.56366	0.04013	-0.28297	0.01808	0.30540	0.00889
143531A	0.13391	0.00000	-1.12339	0.00000	0.20000	0.00000
156292A	1.25181	0.04116	0.22964	0.02405	0.43795	0.00838
156328A	0.47910	0.02360	1.14474	0.04625	0.09317	0.01501
156331A	0.32983	0.00000	-0.86381	0.00000	0.20000	0.00000
156439A	0.71069	0.02250	-0.23209	0.04665	0.17692	0.01766
156440A	0.58118	0.00988	-0.36086	0.01507	0.00000	0.00000
156491A	0.35718	0.03120	1.16244	0.13029	0.39998	0.02339
156499A	0.42258	0.02030	-0.46648	0.12582	0.09718	0.03643
156545A	1.00871	0.05417	0.21785	0.04767	0.29189	0.01897
157469A	0.56107	0.03033	-0.54848	0.11121	0.12252	0.03850
158335A	1.36157	0.04116	-0.34478	0.02743	0.46310	0.01081
158336A	0.46341	0.02401	-1.08404	0.16336	0.17005	0.04820
158642A	1.00316	0.05317	0.00022	0.05340	0.31162	0.02153
158648A	0.37614	0.02218	-2.19571	0.22342	0.13170	0.05836
164738A	1.25785	0.00000	-0.43594	0.00000	0.30840	0.00000

IREF	Parameters and Measures of Standard Error					
	a	*SE (a)*	*b*	*SE (b)*	*c*	*SE (c)*
164749A	0.85503	0.00000	0.73521	0.00000	0.32660	0.00000
164760A	0.28828	0.01673	-1.03622	0.23016	0.11015	0.04713
165128A	0.82551	0.00000	-1.10747	0.00000	0.07270	0.00000
165131A	1.17961	0.00000	-0.33509	0.00000	0.21684	0.00000
166128A	0.21709	0.00846	-2.76753	0.10640	0.00000	0.00000
167589A	0.85426	0.00000	0.01312	0.00000	0.08850	0.00000
167661A	0.93708	0.00000	-0.05989	0.00000	0.36190	0.00000
167663A	0.77908	0.05480	1.89151	0.05453	0.16227	0.00790
167679A	0.58228	0.00000	-1.65134	0.00000	0.20000	0.00000
167686A	1.48615	0.00000	0.06481	0.00000	0.47640	0.00000
167708A	0.30733	0.00000	-1.22796	0.00000	0.20000	0.00000
167763A	0.57020	0.00000	-1.99436	0.00000	0.20000	0.00000
167777A	1.02784	0.03840	-0.71542	0.04924	0.33392	0.02038
167780A	0.94022	0.03961	0.37312	0.03663	0.47365	0.00997
167785A	1.23151	0.00000	-0.31981	0.00000	0.32310	0.00000
167788A	1.38705	0.04308	-0.23515	0.02528	0.44579	0.00976
167806A	1.28328	0.04087	0.41835	0.02003	0.34980	0.00742
167818A	1.13068	0.03333	-0.79468	0.03694	0.36882	0.01552
167819A	1.01308	0.00000	-0.39186	0.00000	0.22980	0.00000
167823A	0.63678	0.02151	0.55833	0.03181	0.09526	0.01116

APPENDIX N—TEST CHARACTERISTIC CURVES AND TEST INFORMATION FUNCTIONS

Figure N-1. 2016–17 OSTP: Mathematics Grade 3
Top: Test Characteristic Curve Bottom: Test Information Function



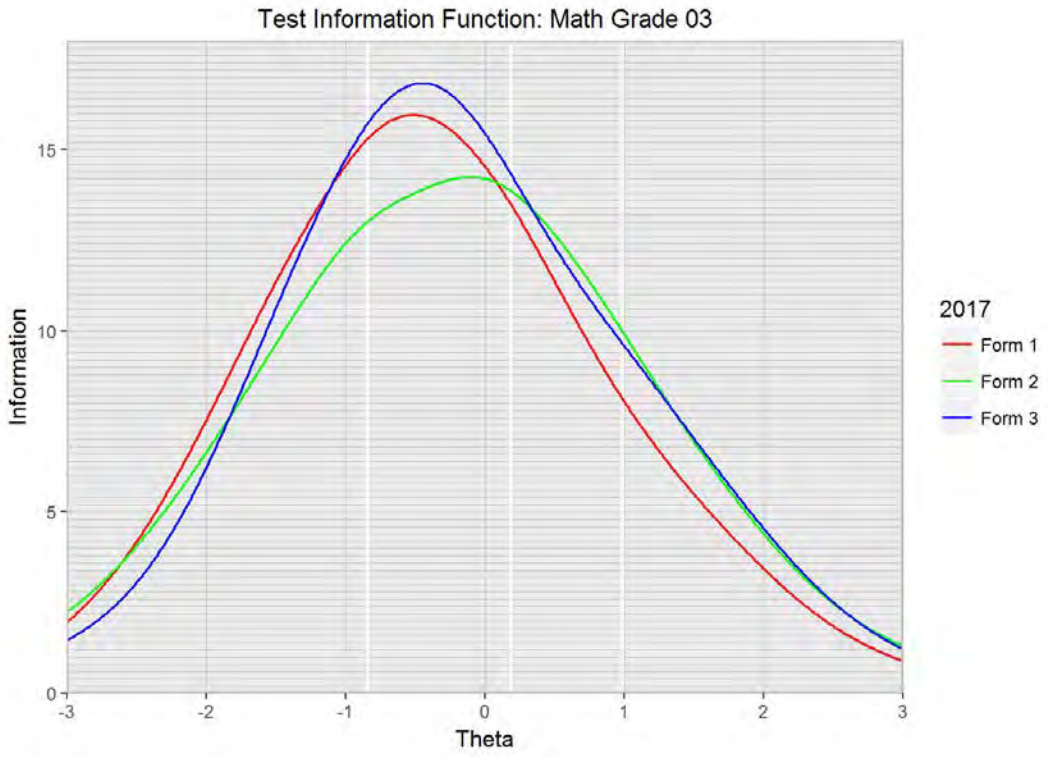
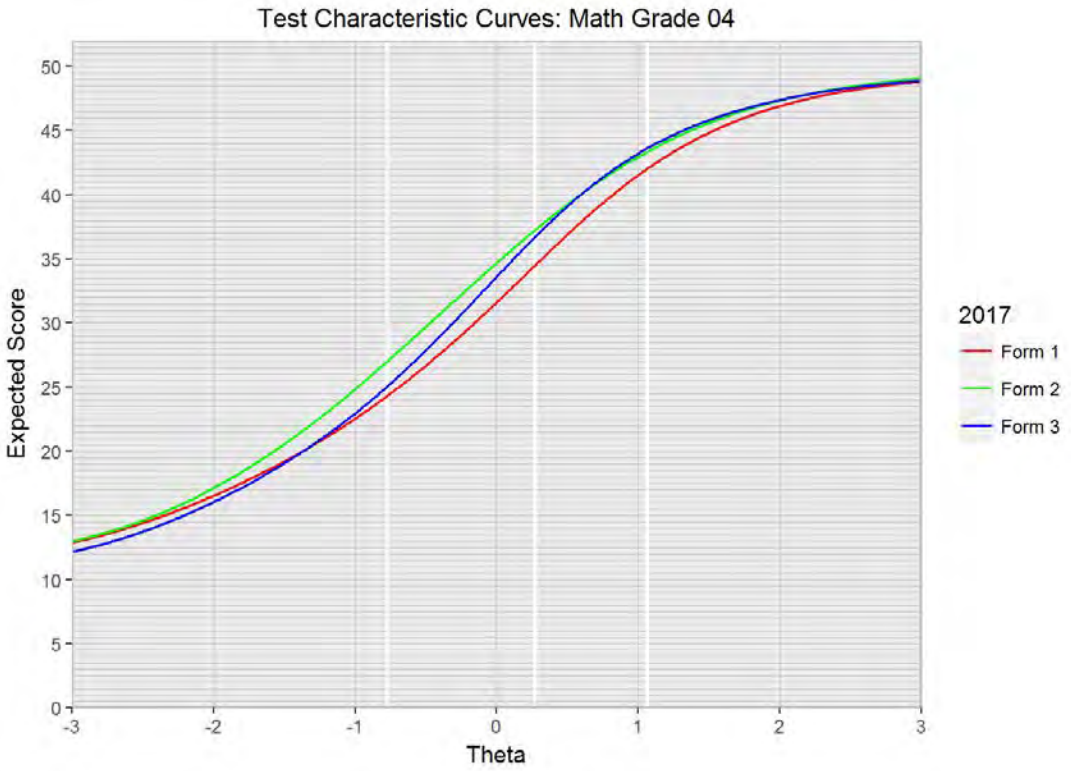


Figure N-2. 2016–17 OSTP: Mathematics Grade 4
Top: Test Characteristic Curve Bottom: Test Information Function



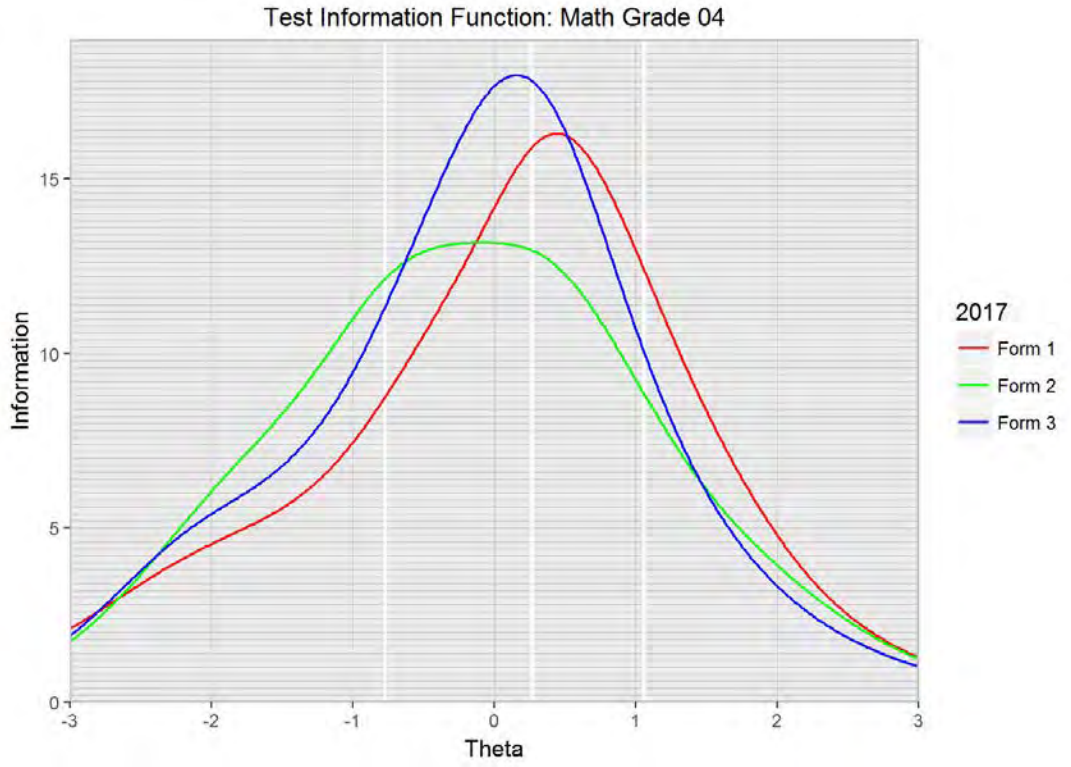
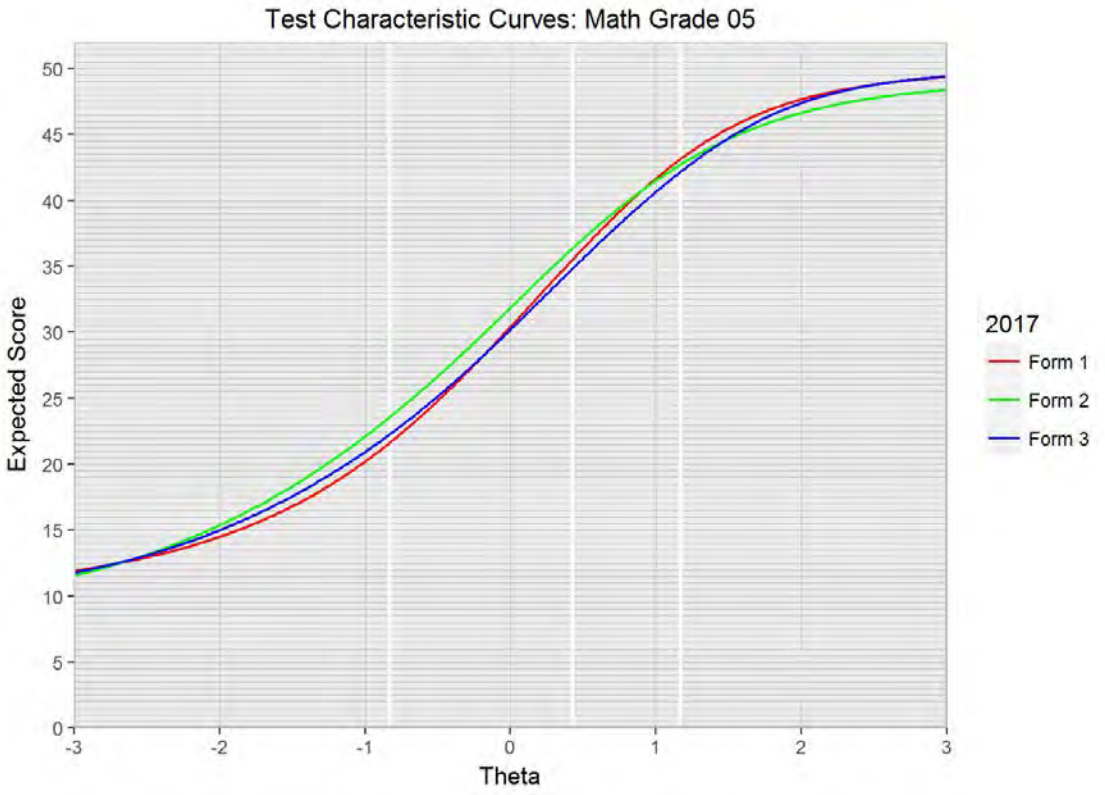


Figure N-3. 2016–17 OSTP: Mathematics Grade 5
Top: Test Characteristic Curve Bottom: Test Information Function



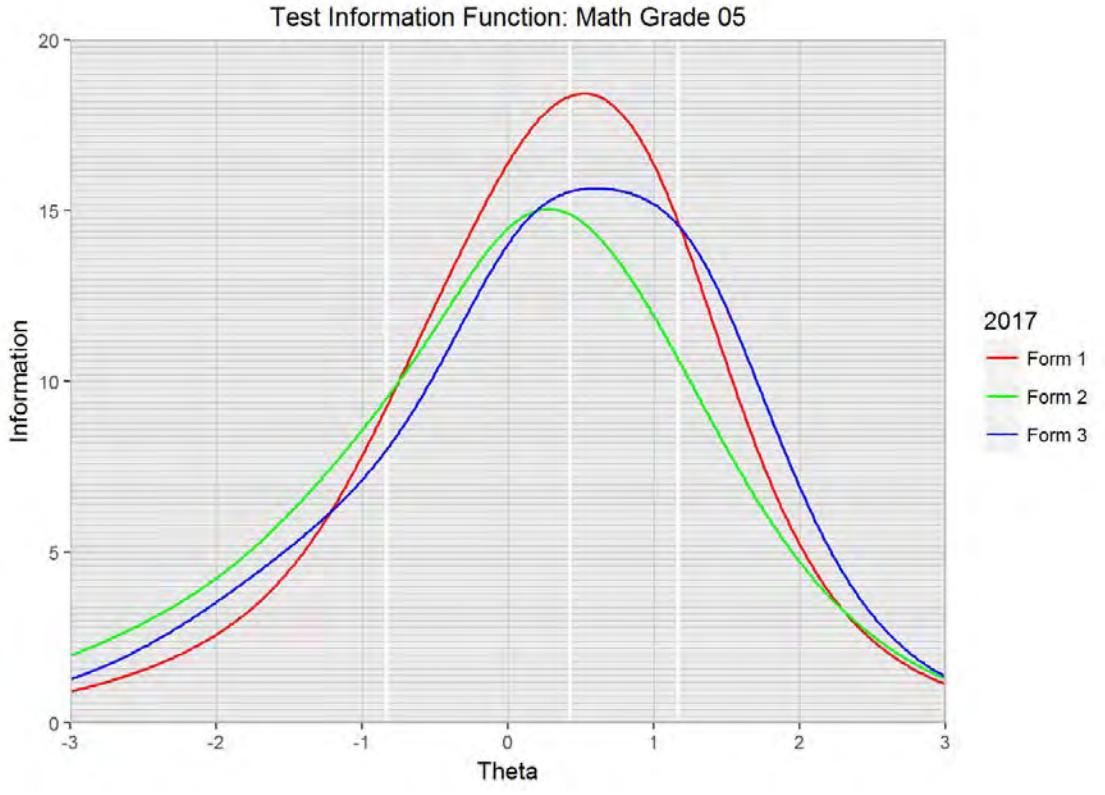
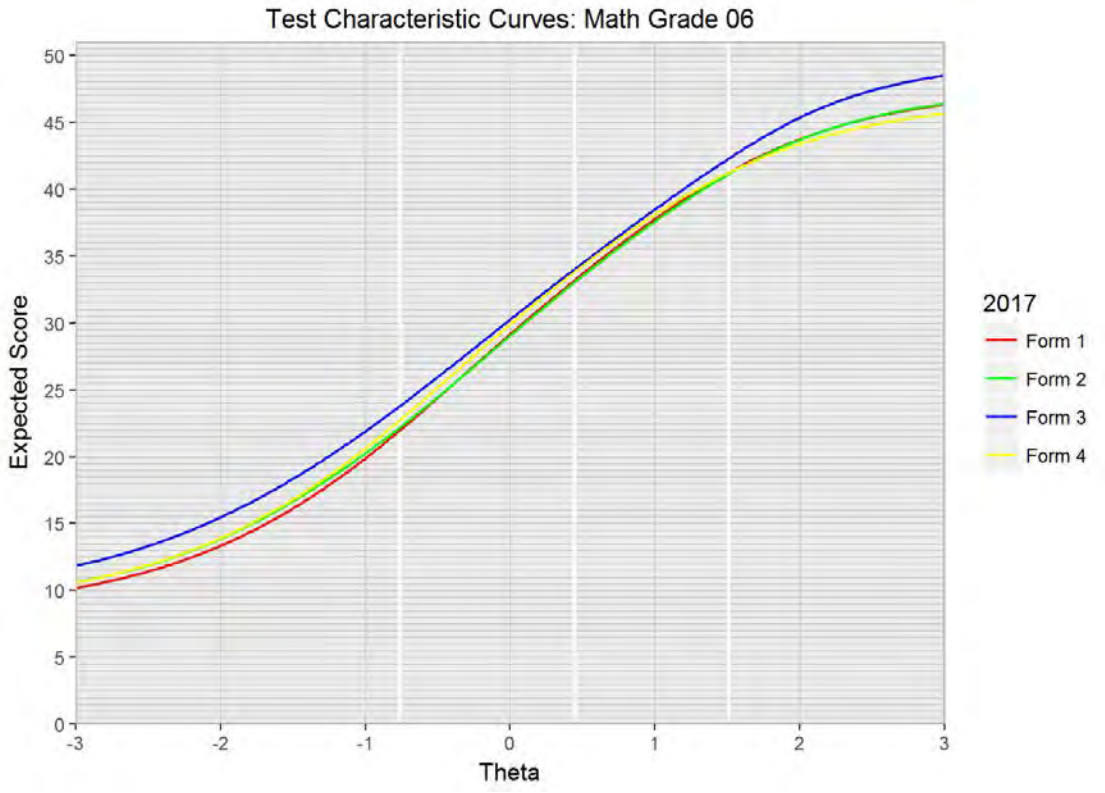


Figure N-4. 2016–17 OSTP: Mathematics Grade 6
Top: Test Characteristic Curve Bottom: Test Information Function



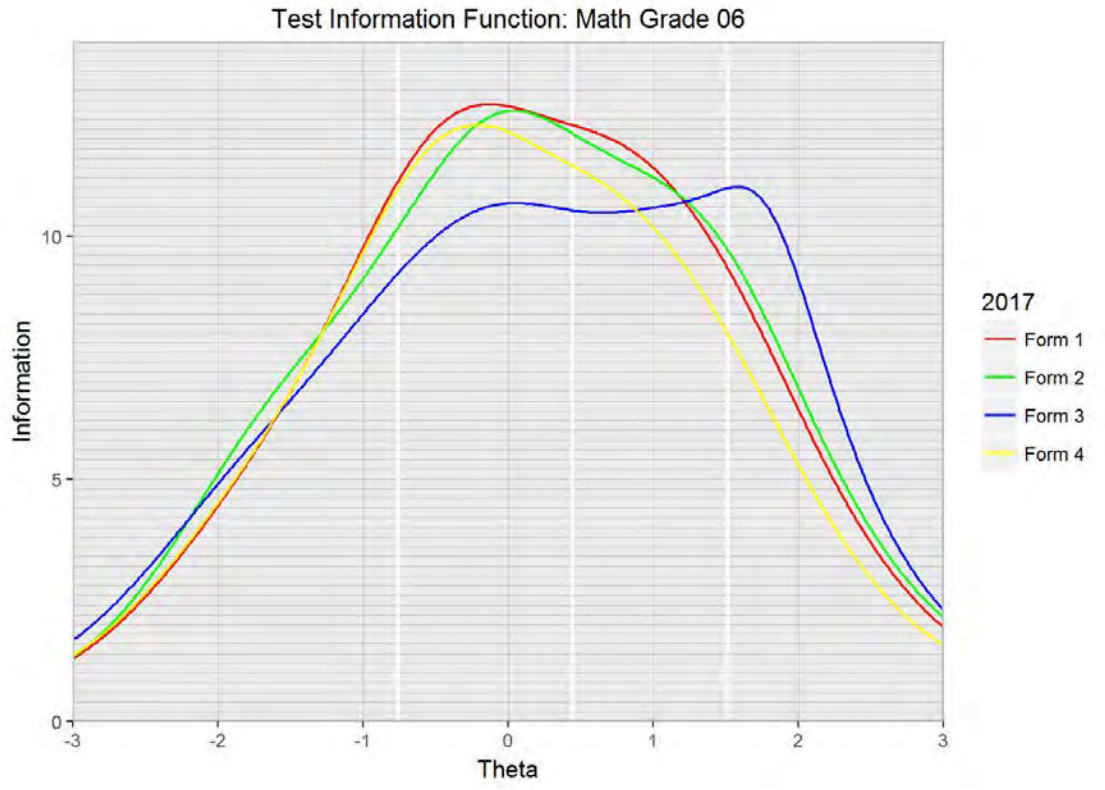
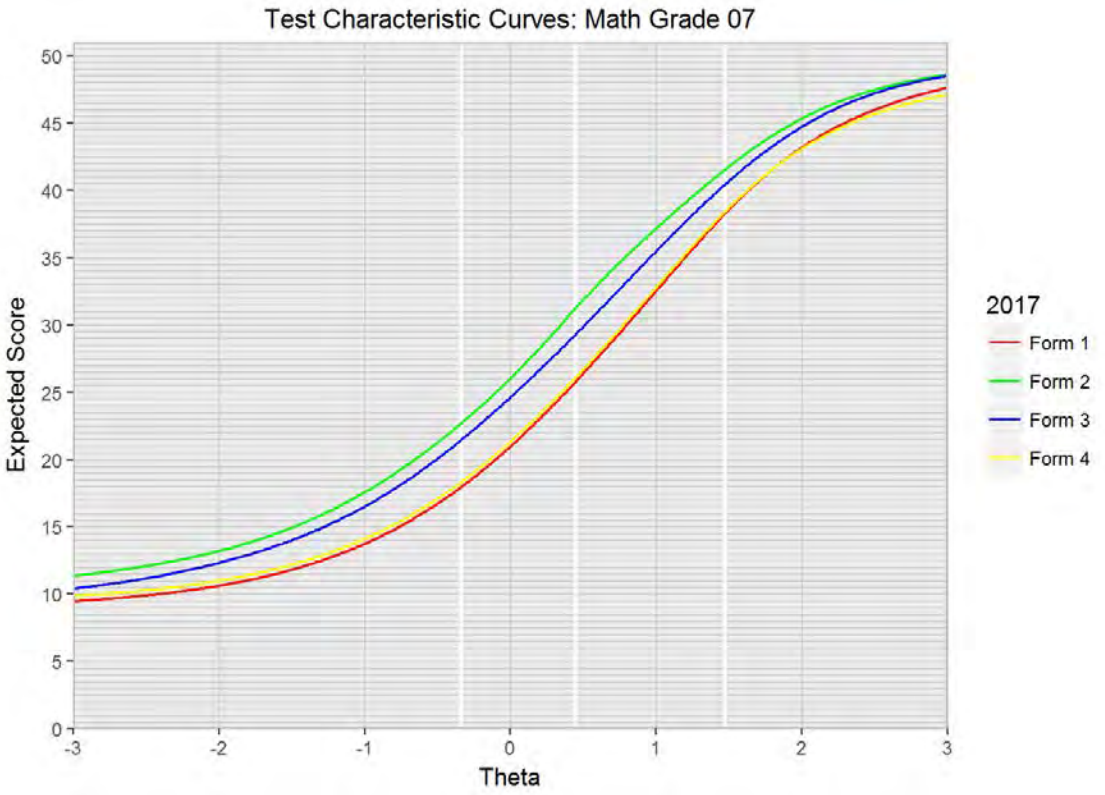


Figure N-5. 2016–17 OSTP: Mathematics Grade 7
Top: Test Characteristic Curve Bottom: Test Information Function



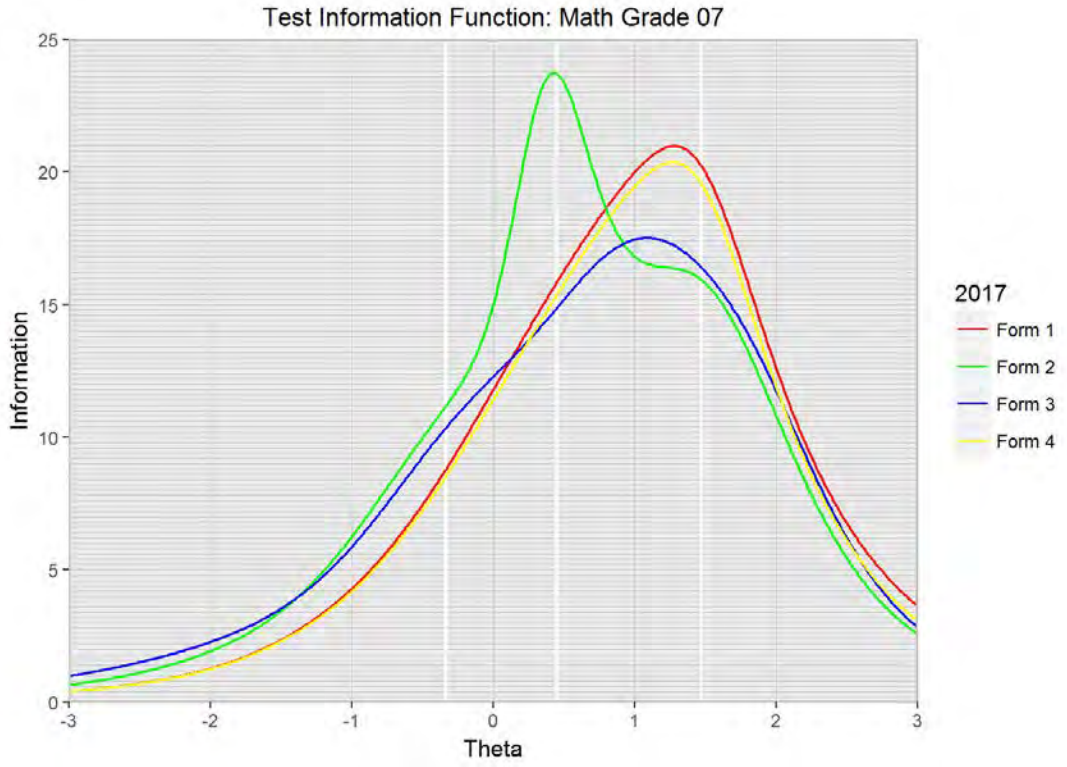
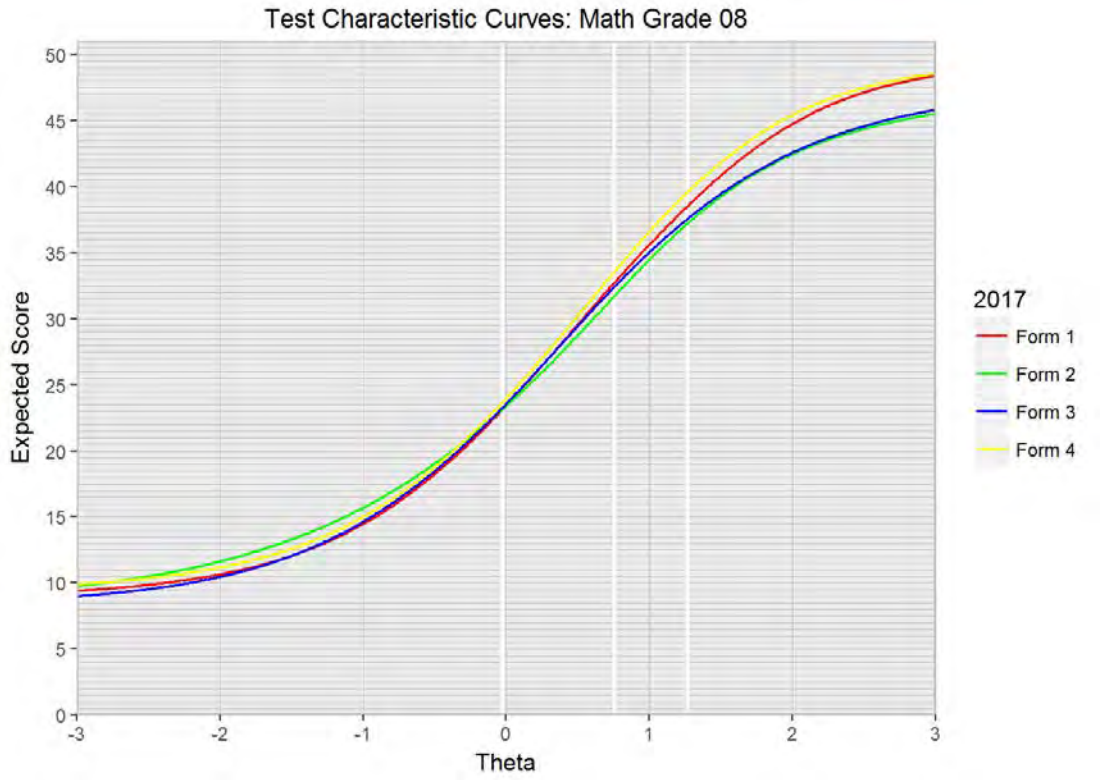


Figure N-6. 2016–17 OSTP: Mathematics Grade 8
Top: Test Characteristic Curve Bottom: Test Information Function



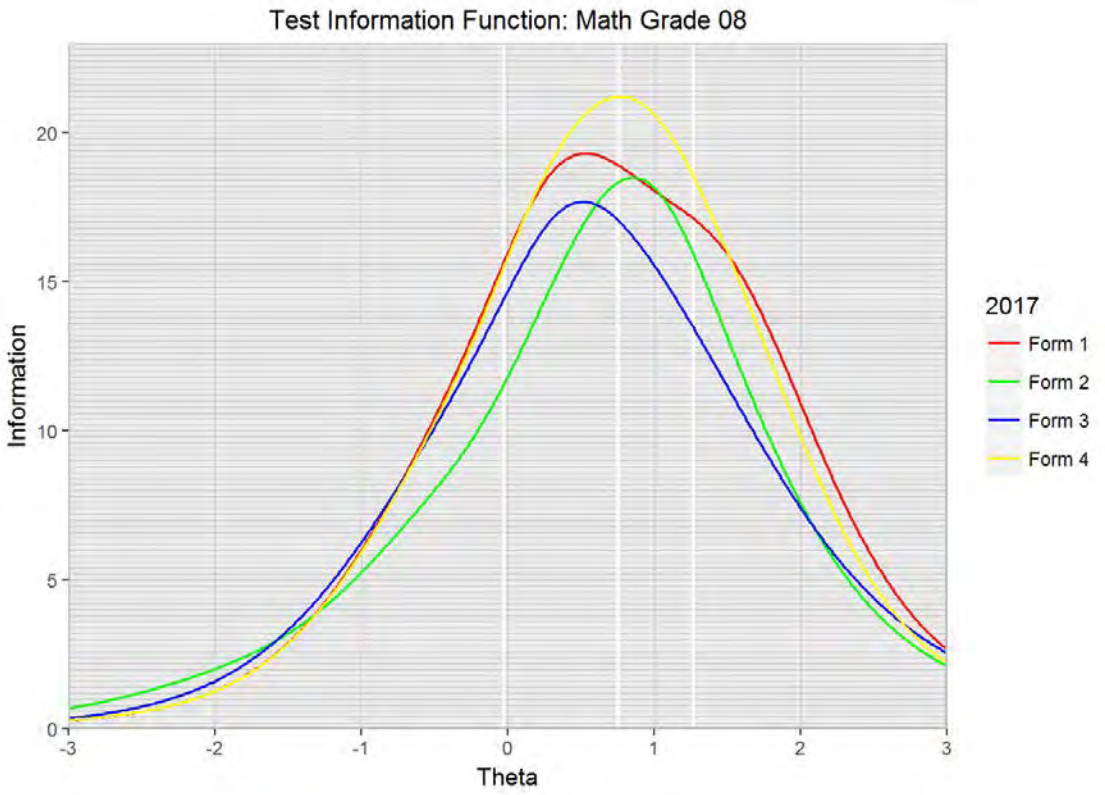
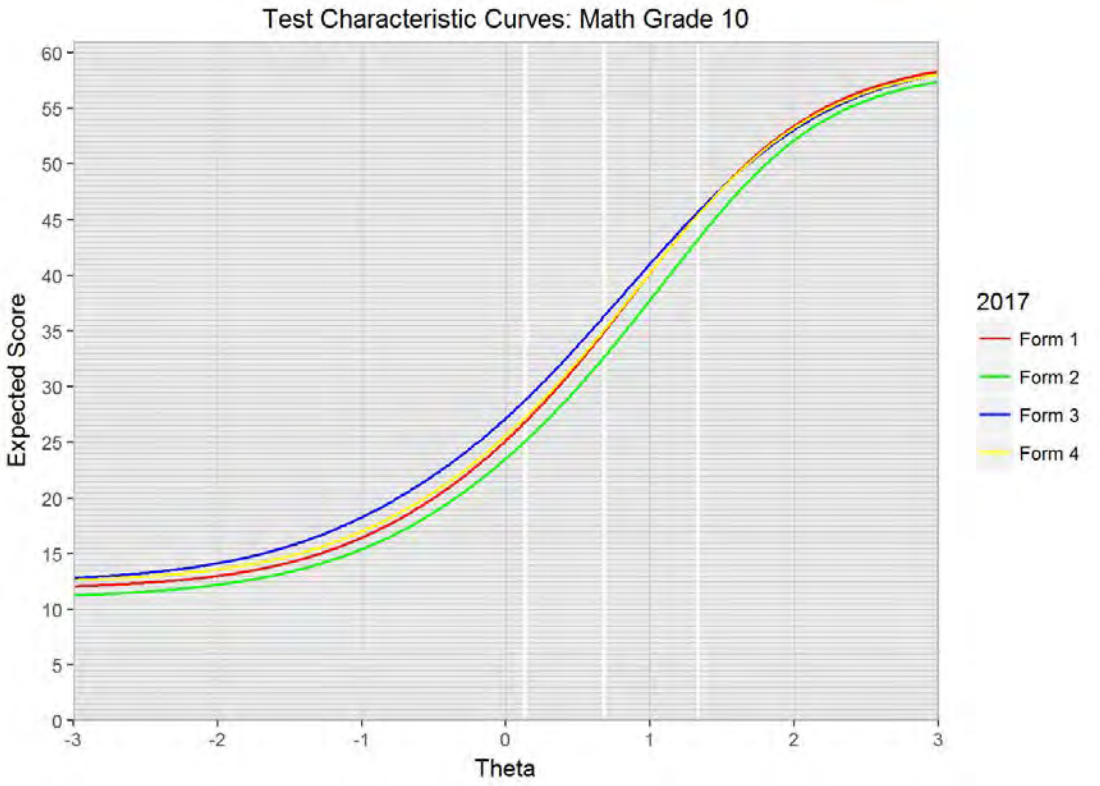


Figure N-7. 2016–17 OSTP: Mathematics Grade 10
Top: Test Characteristic Curve Bottom: Test Information Function



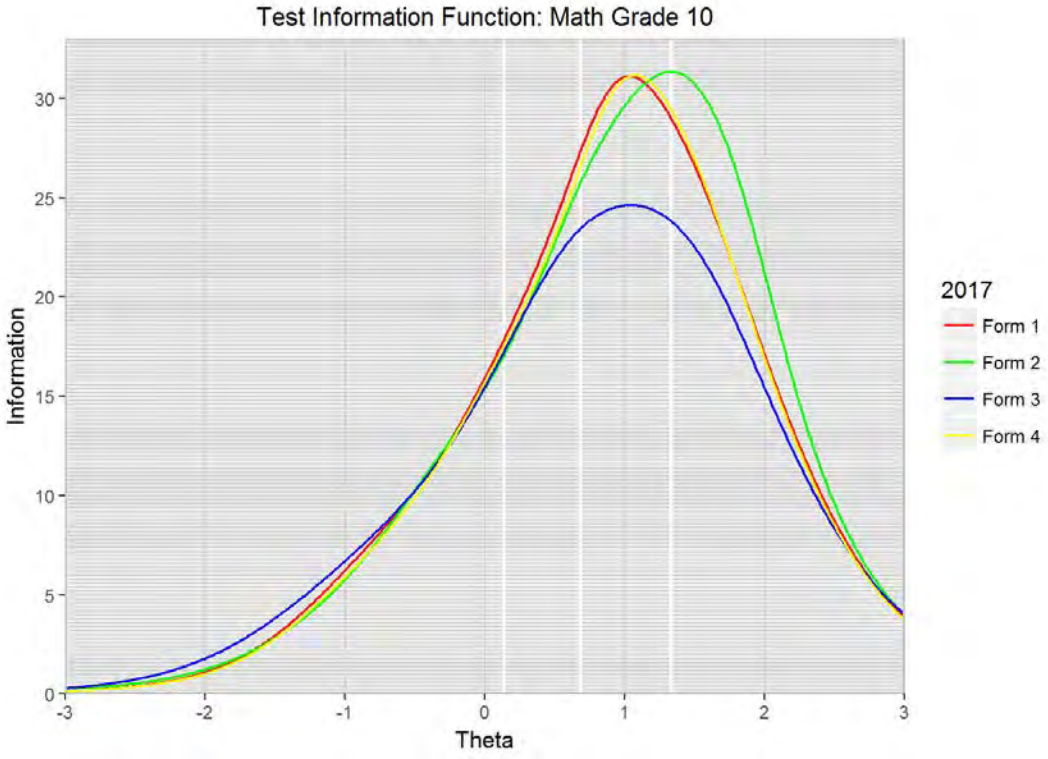


Figure N-8. 2016–17 OSTP: ELA Grade 3
Top: Test Characteristic Curve Bottom: Test Information Function

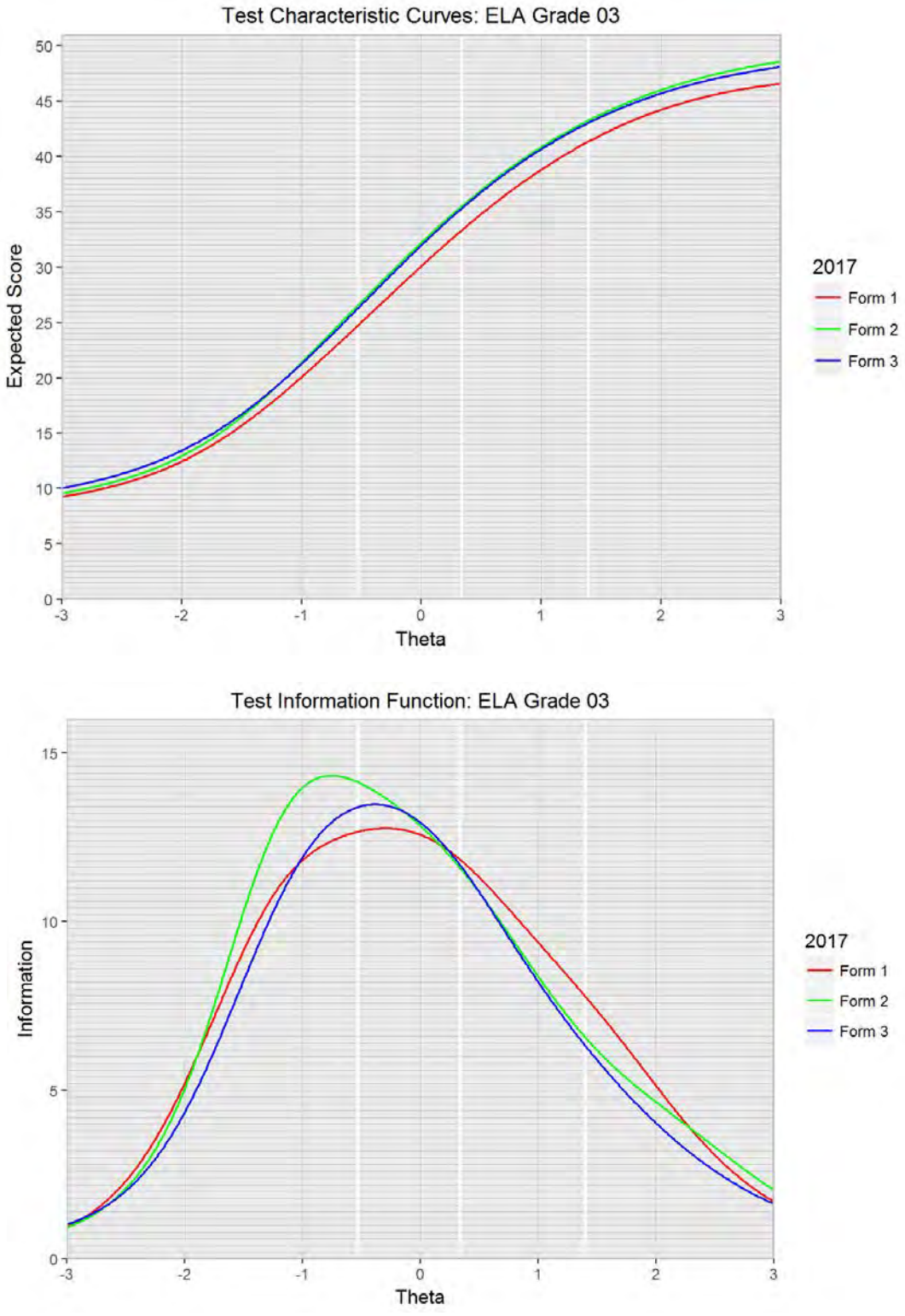
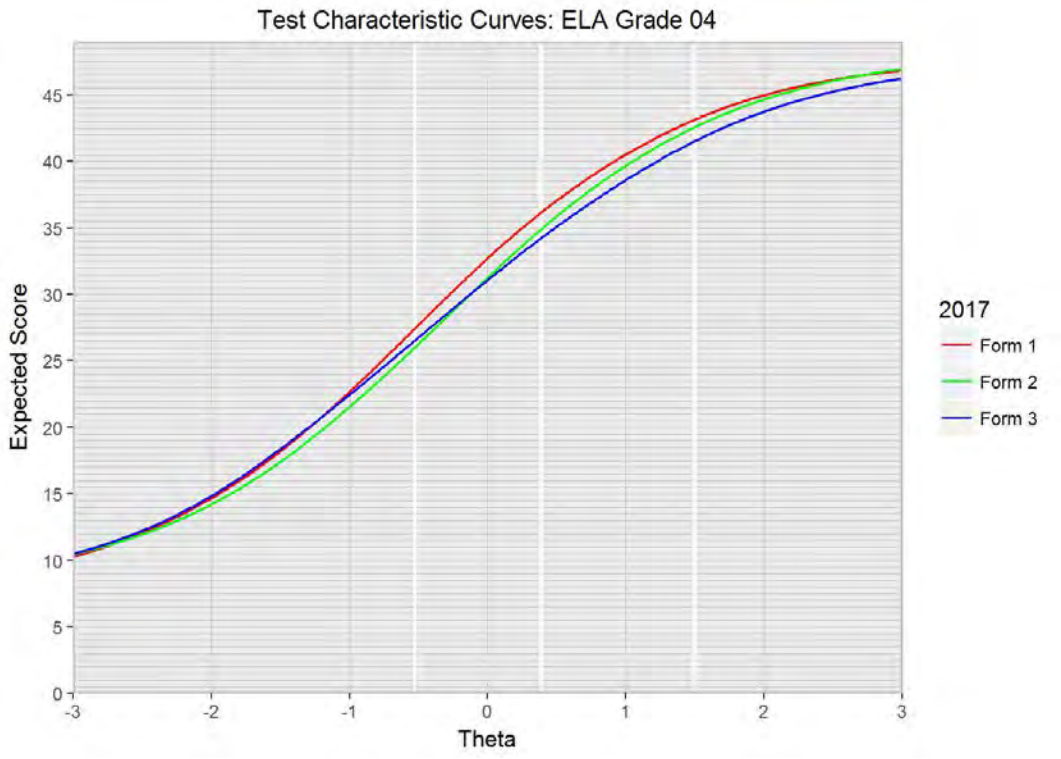


Figure N-9. 2016–17 OSTP: ELA Grade 4
Top: Test Characteristic Curve Bottom: Test Information Function



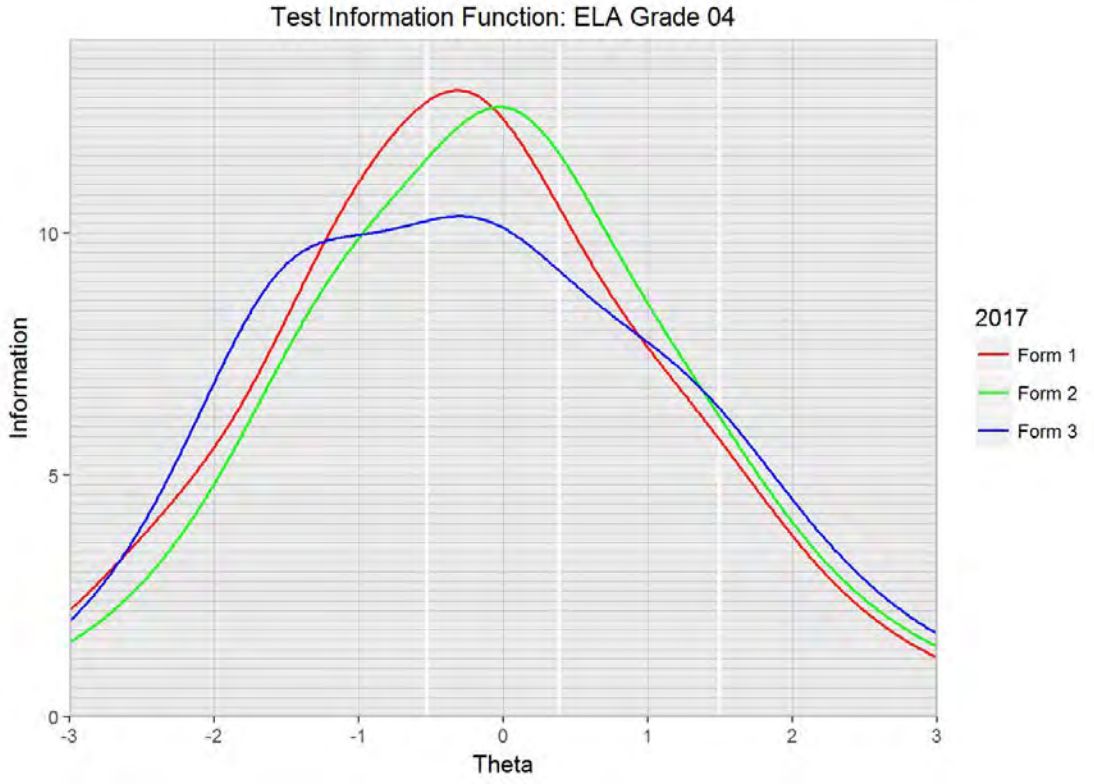


Figure N-10. 2016–17 OSTP: ELA Grade 5
Top: Test Characteristic Curve Bottom: Test Information Function

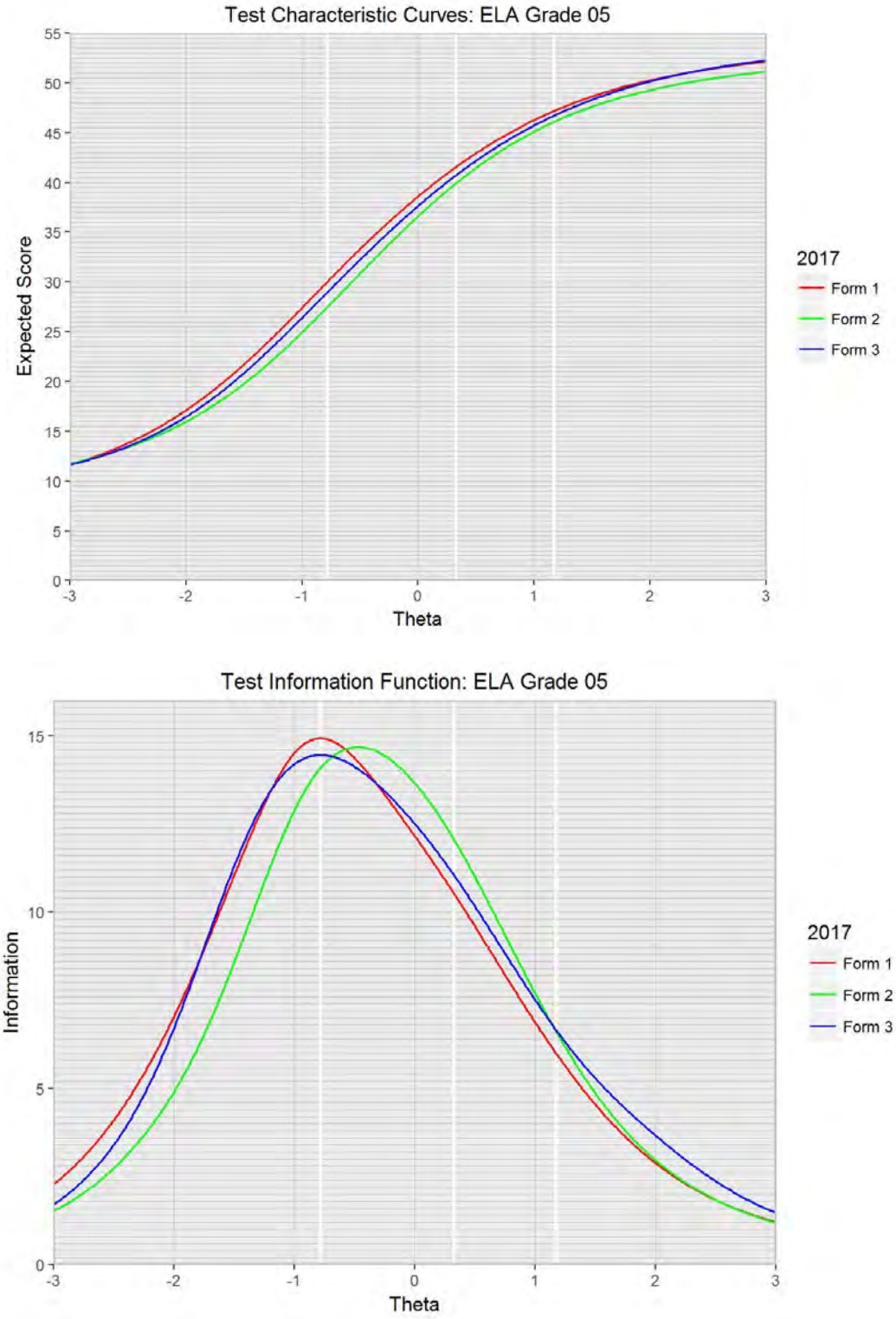
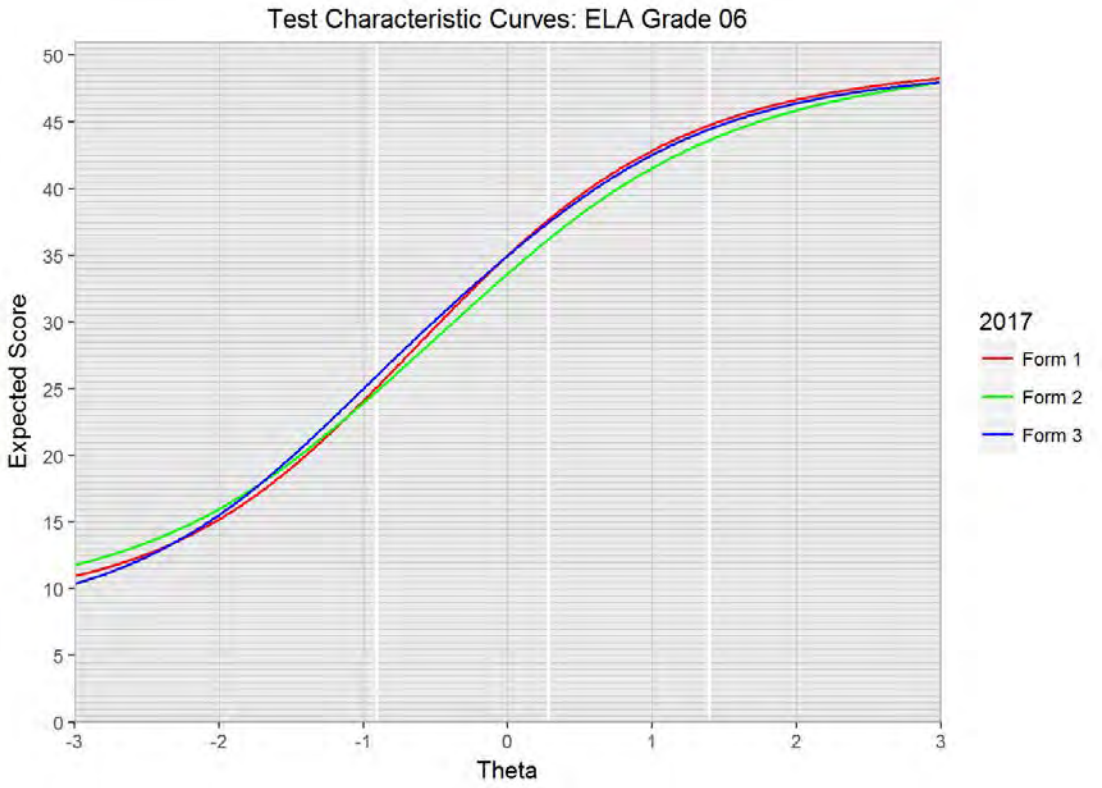


Figure N-11. 2016–17 OSTP: ELA Grade 6
Top: Test Characteristic Curve Bottom: Test Information Function



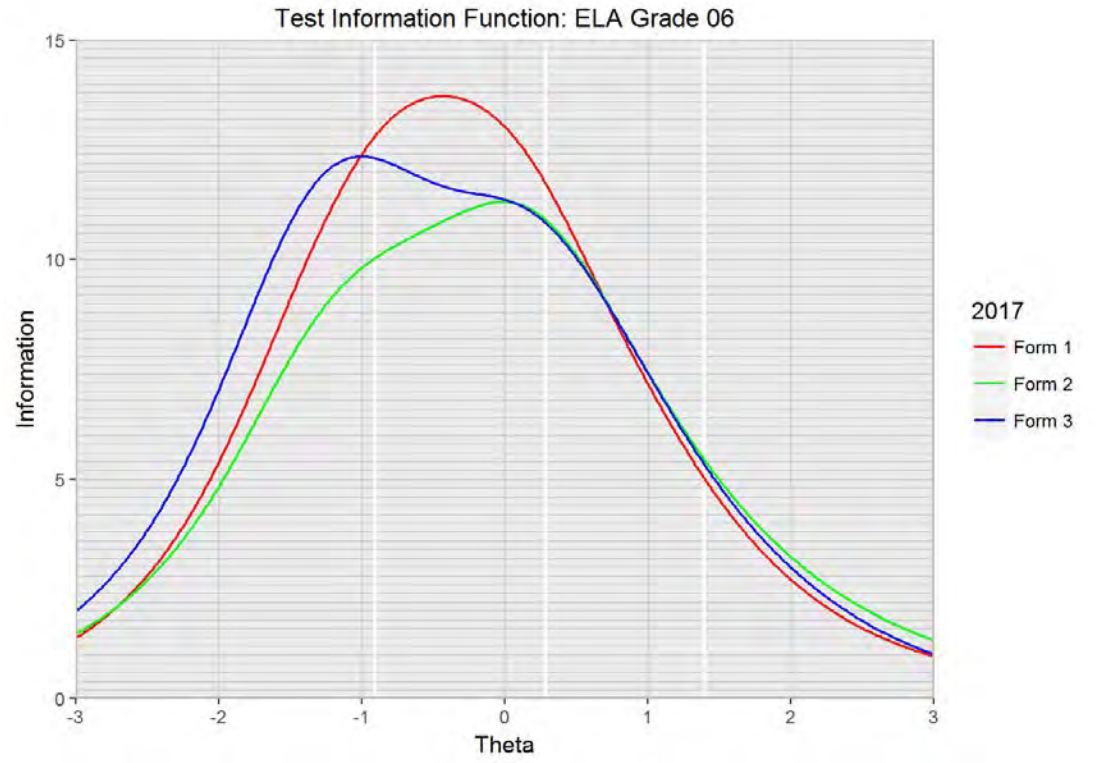


Figure N-12. 2016–17 OSTP: ELA Grade 7
Top: Test Characteristic Curve Bottom: Test Information Function

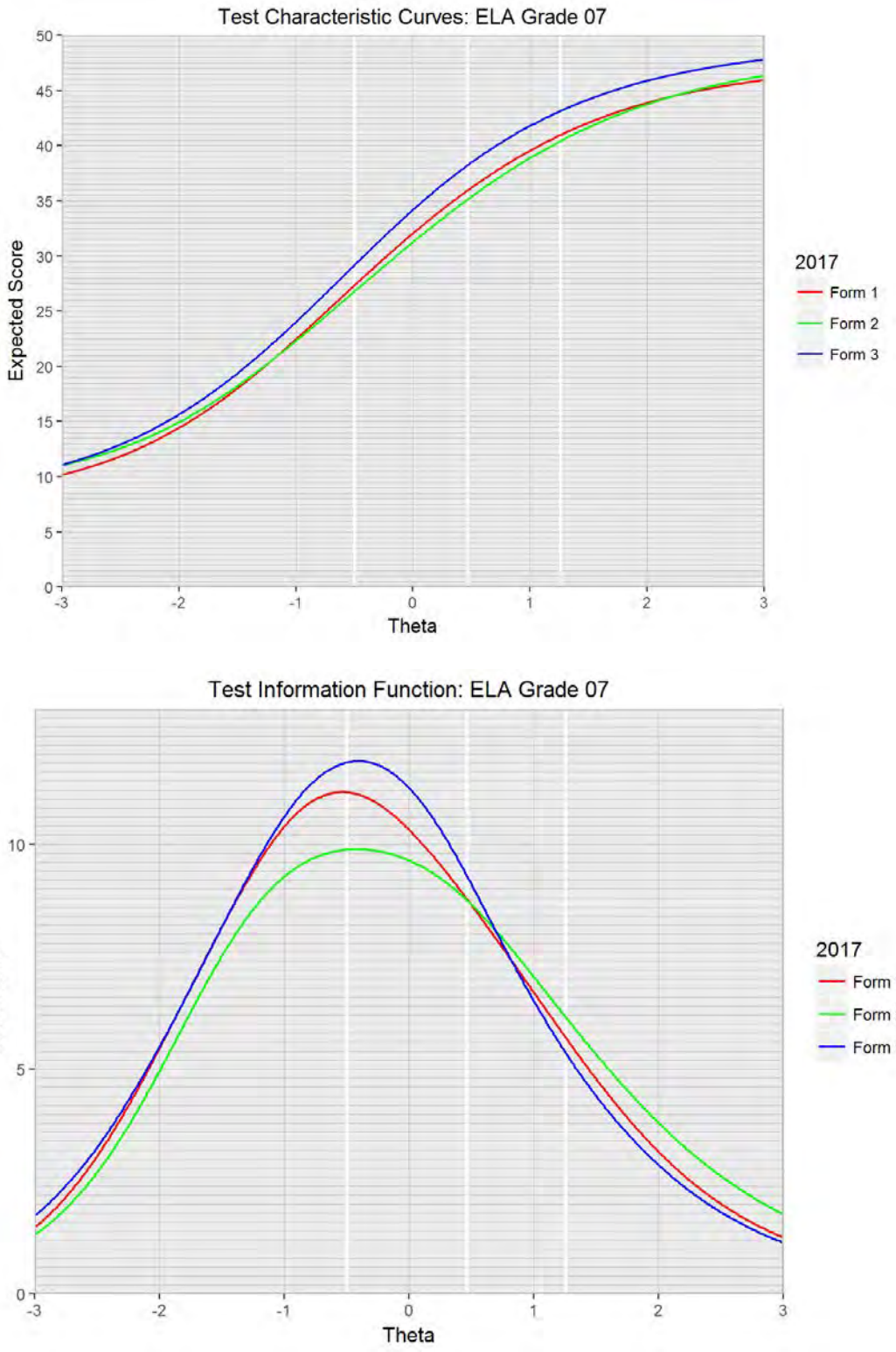
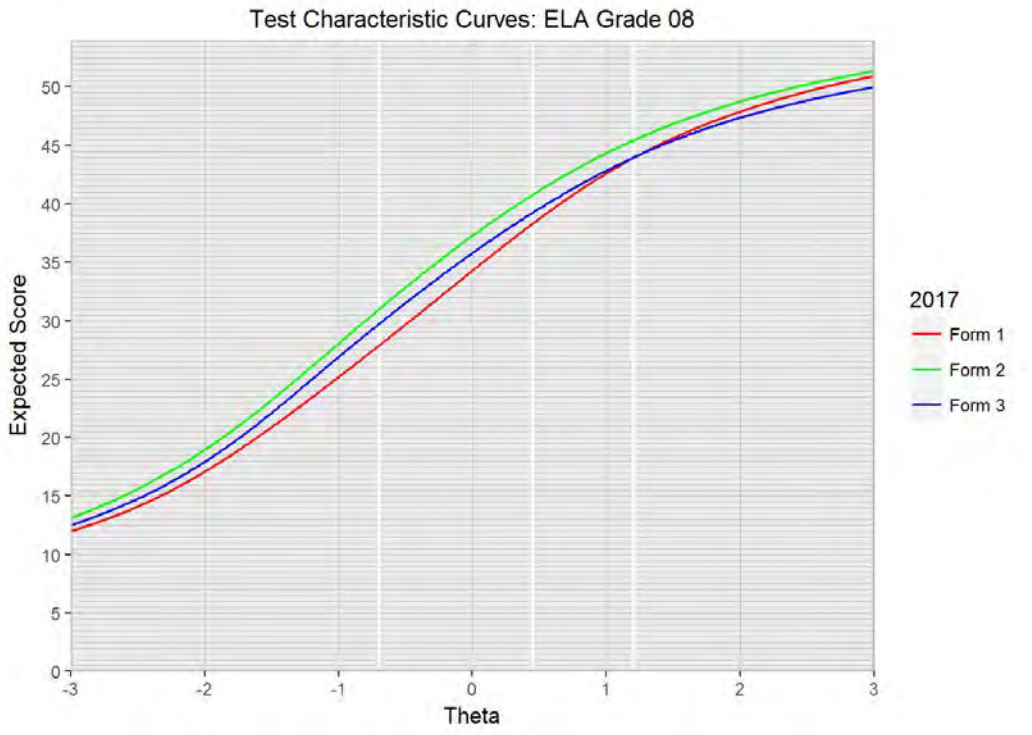


Figure N-13. 2016–17 OSTP: ELA Grade 8
Top: Test Characteristic Curve Bottom: Test Information Function



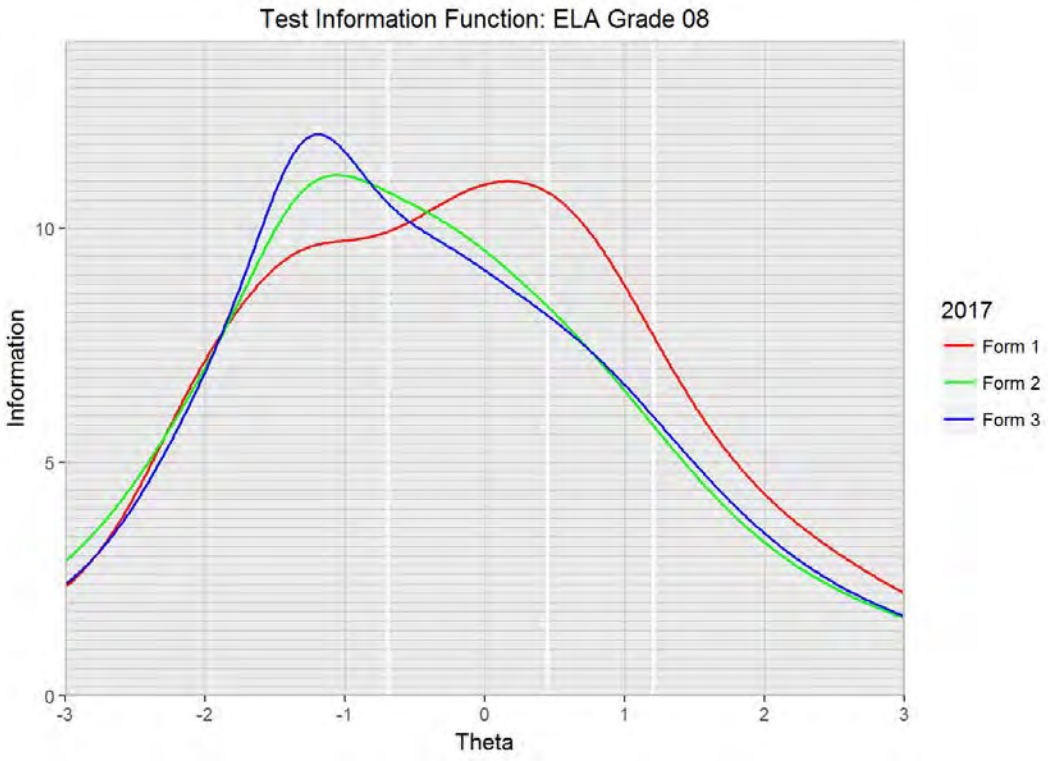


Figure N-14. 2016–17 OSTP: ELA Grade 10
Top: Test Characteristic Curve Bottom: Test Information Function

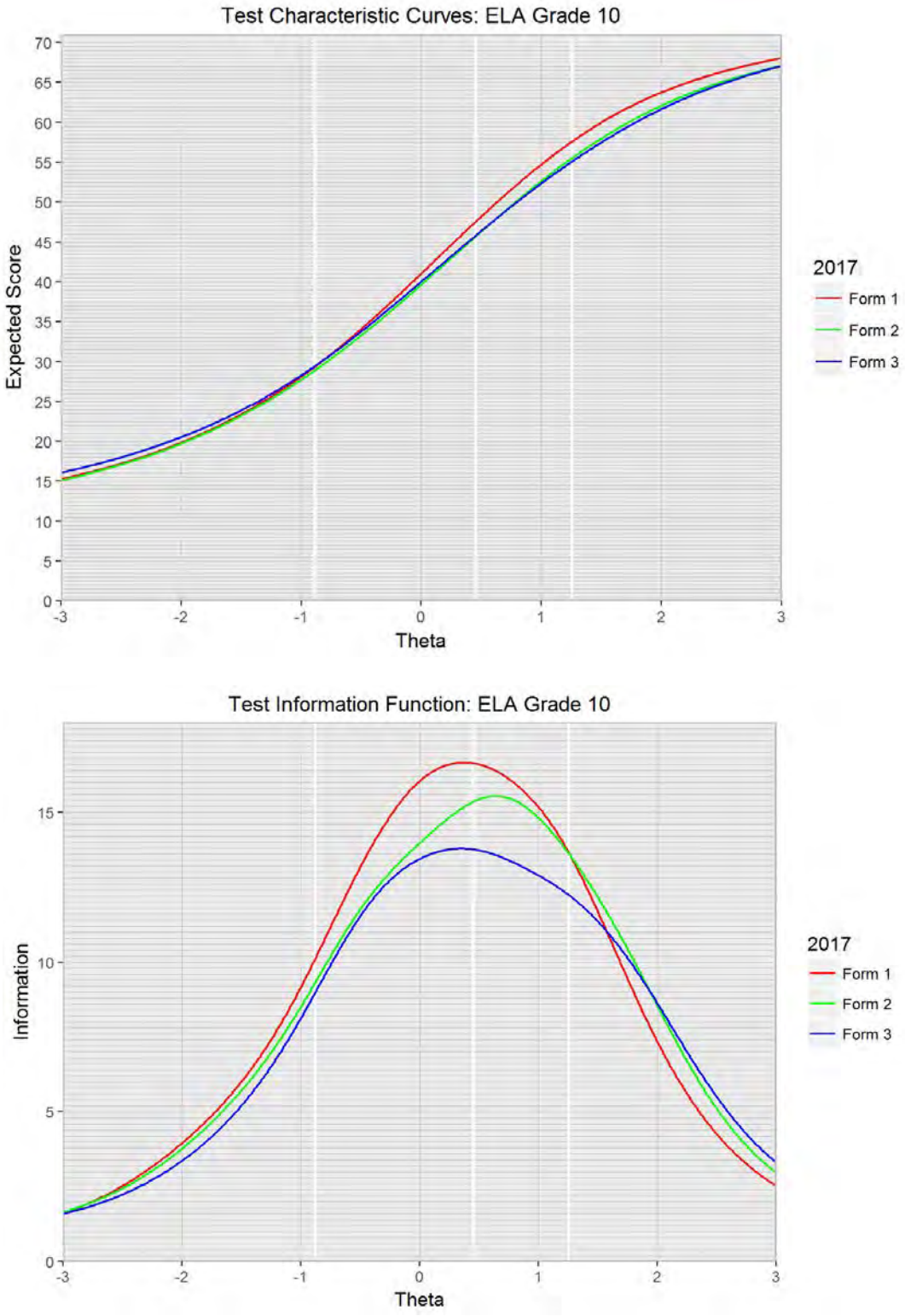
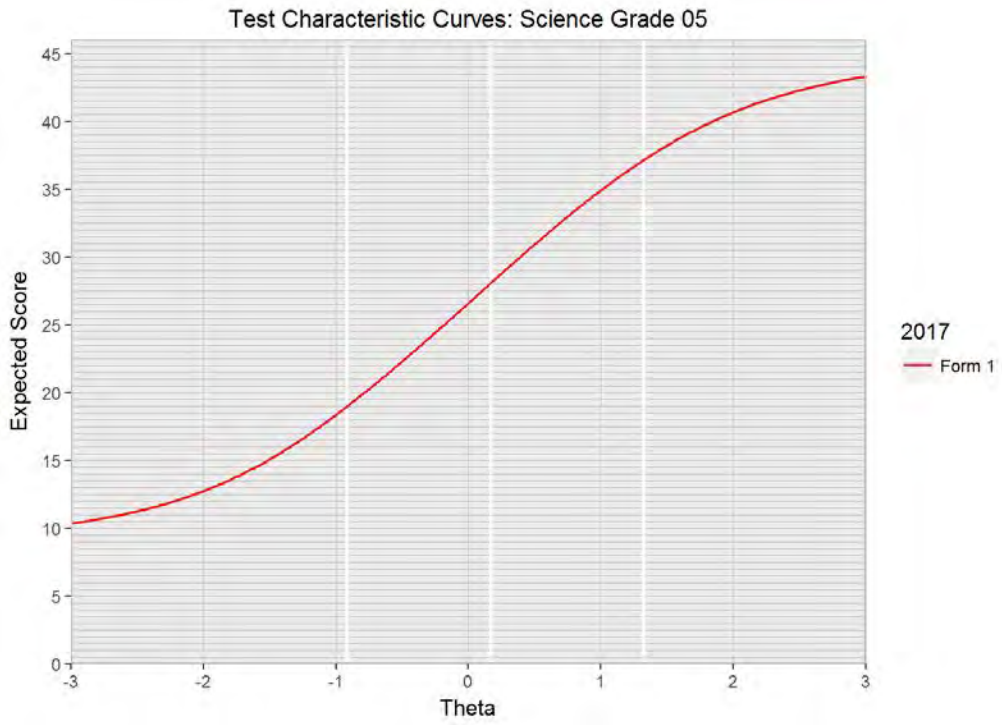


Figure N-15. 2016–17 OSTP: Science Grade 5
Top: Test Characteristic Curve Bottom: Test Information Function



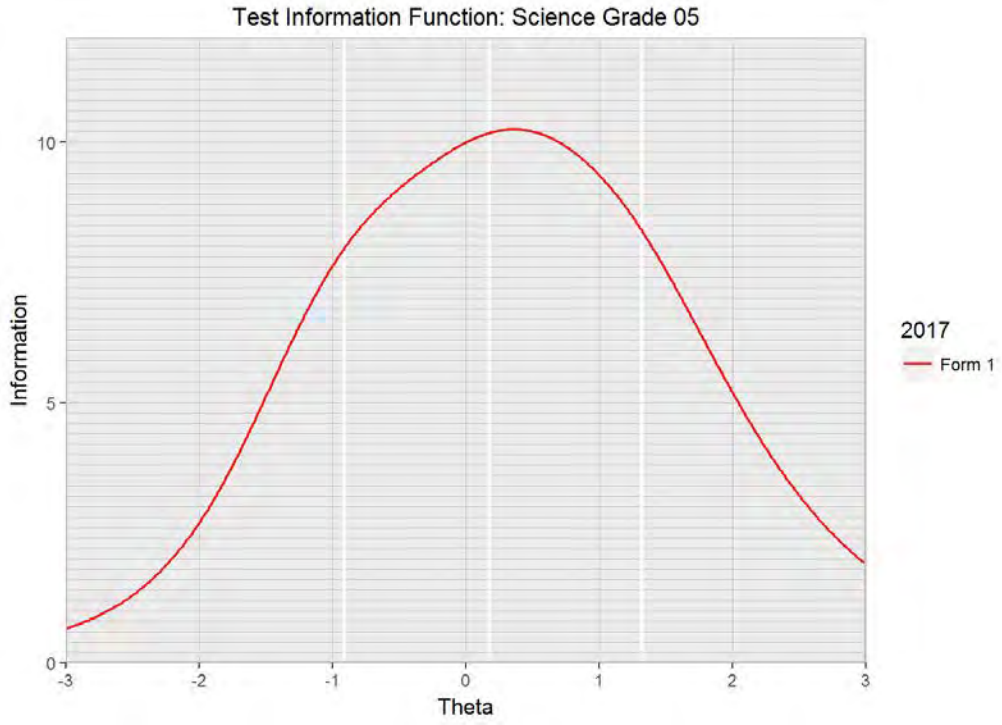
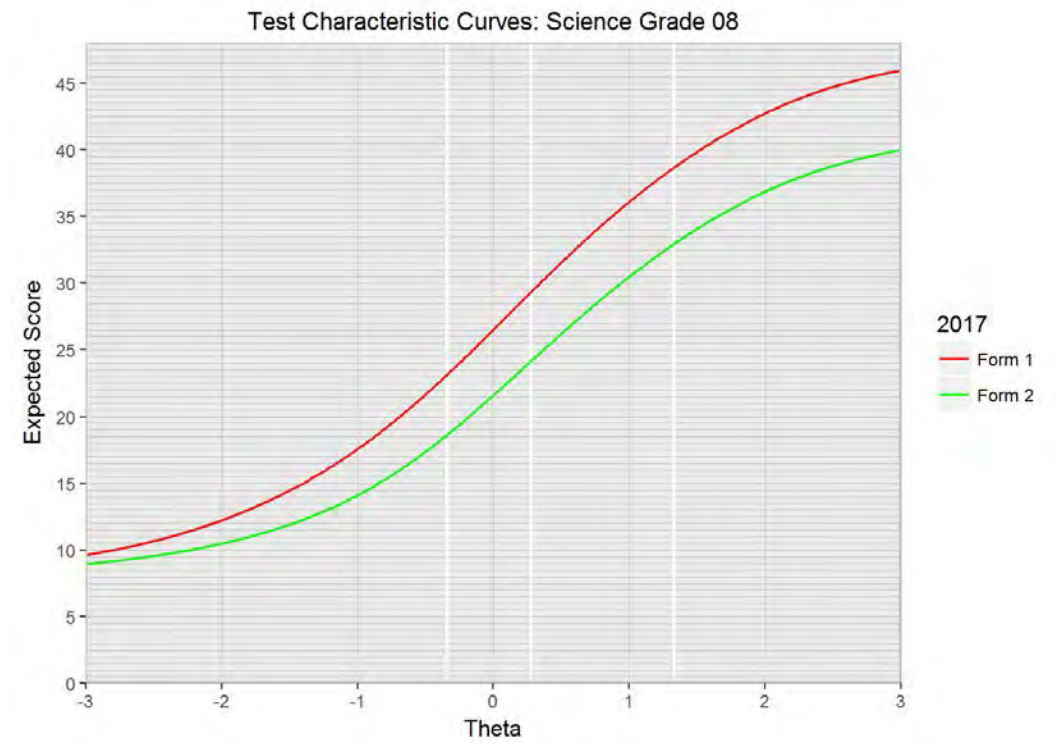


Figure N-16. 2016–17 OSTP: Science Grade 8
Top: Test Characteristic Curve Bottom: Test Information Function



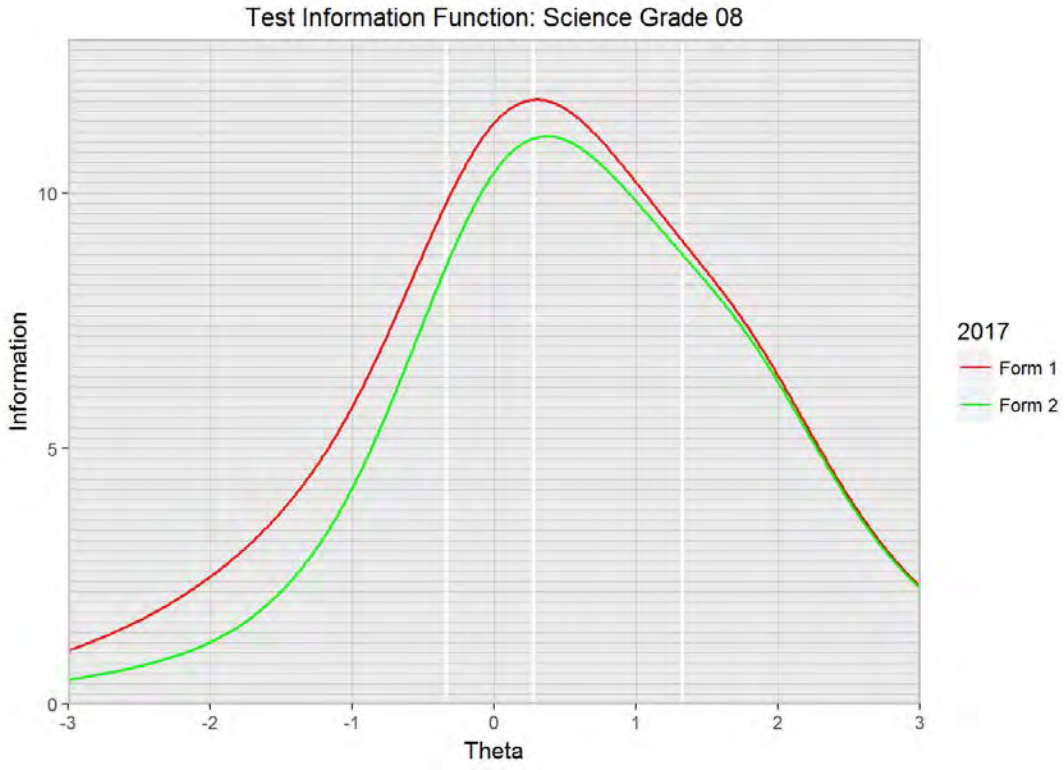
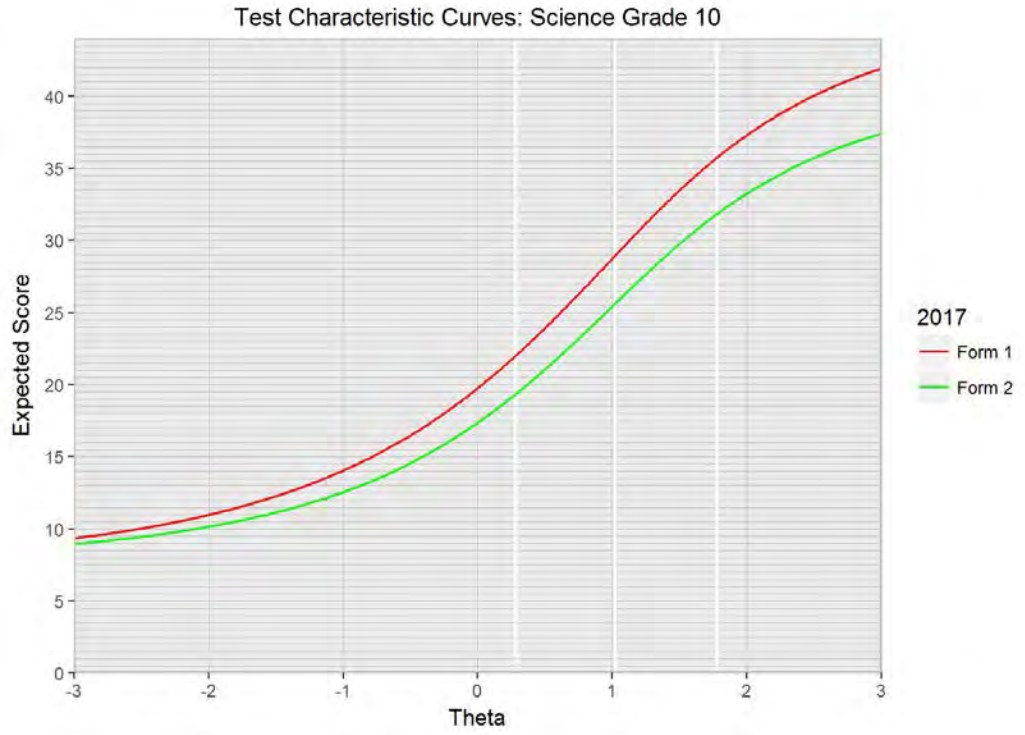


Figure N-17. 2016–17 OSTP: Science Grade 10
Top: Test Characteristic Curve Bottom: Test Information Function



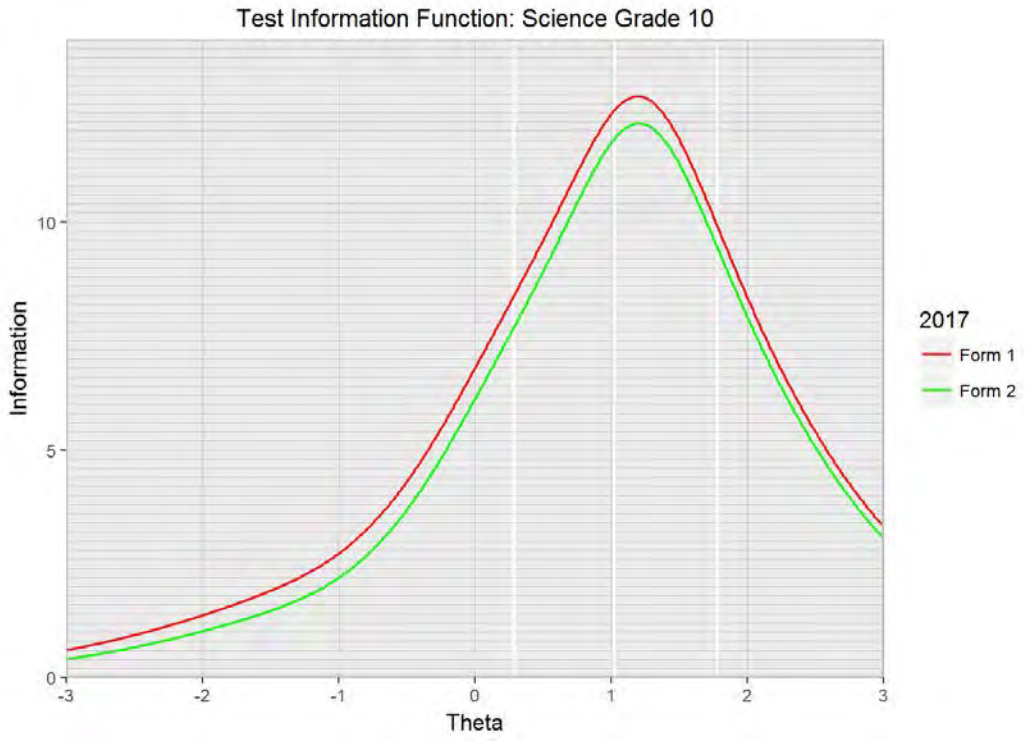
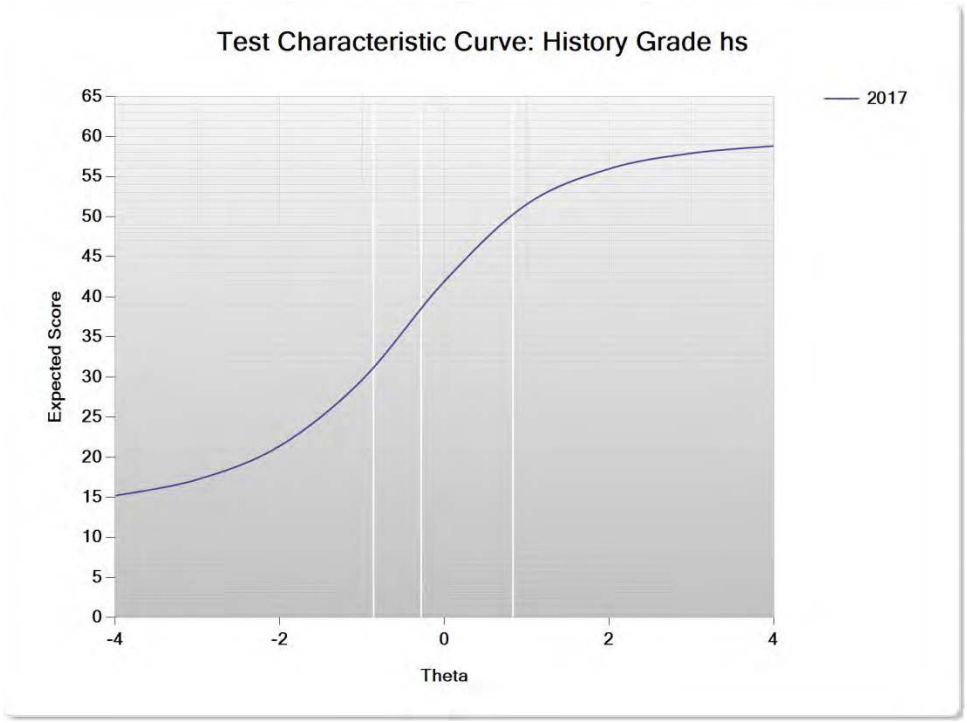
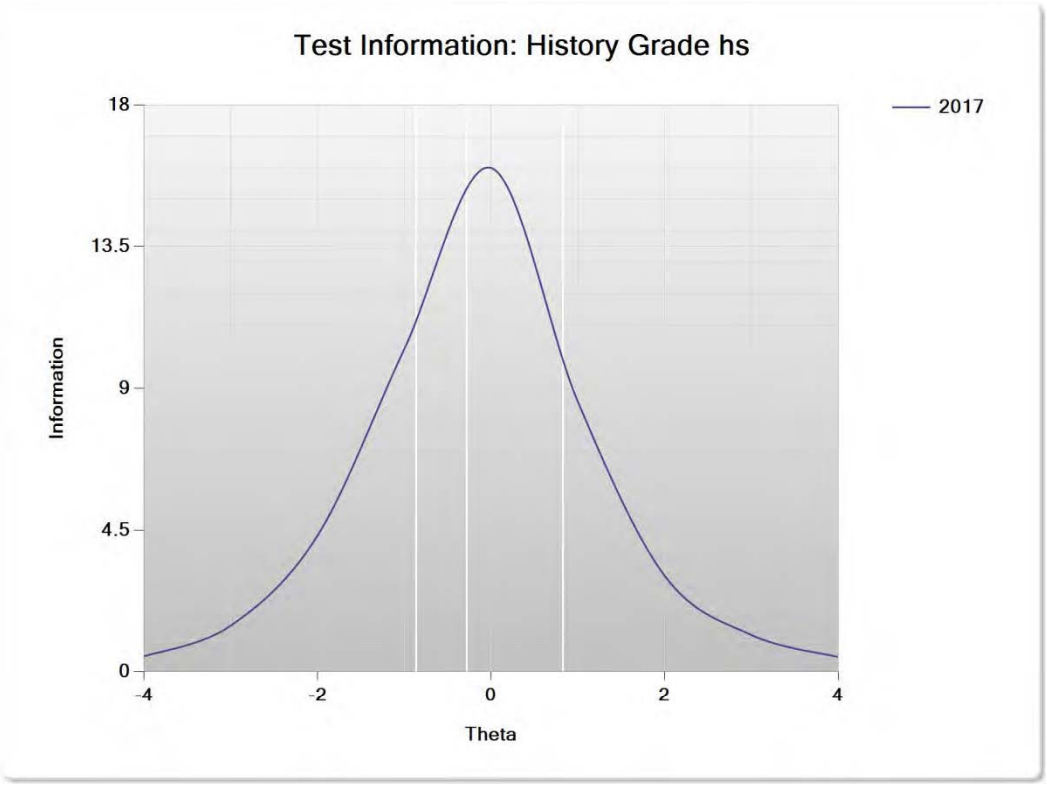


Figure N-18. 2016–17 OSTP: U.S. History Grade 10
Top: Test Characteristic Curve Bottom: Test Information Function





APPENDIX O—RAW TO SCALED SCORE LOOK-UP TABLES

Table O-1. 2016–17 OSTP: Raw to Scaled Score Correspondence—
Mathematics Grade 3

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	201	10.0	1
1	2	201	10.0	1
1	3	202	10.0	1
1	4	202	10.0	1
1	5	203	10.0	1
1	6	203	10.0	1
1	7	204	10.0	1
1	8	204	10.0	1
1	9	205	10.0	1
1	10	205	10.0	1
1	11	217	10.0	1
1	12	225	10.0	1
1	13	231	10.0	1
1	14	236	10.0	1
1	15	240	10.0	1
1	16	243	9.4	1
1	17	247	8.9	1
1	18	250	8.4	1
1	19	253	8.1	1
1	20	256	7.8	1
1	21	258	7.5	1
1	22	261	7.3	1
1	23	263	7.2	1
1	24	265	7.0	1
1	25	268	6.9	1
1	26	270	6.8	1
1	27	272	6.7	1
1	28	275	6.6	2
1	29	277	6.5	2
1	30	279	6.5	2
1	31	281	6.5	2
1	32	283	6.5	2
1	33	286	6.5	2
1	34	288	6.6	2
1	35	290	6.6	2
1	36	293	6.7	2
1	37	295	6.8	2
1	38	298	7.0	2
1	39	301	7.1	3
1	40	304	7.3	3
1	41	307	7.6	3
1	42	310	7.9	3
1	43	314	8.3	3
1	44	318	8.8	3
1	45	323	9.4	4
1	46	328	10.0	4
1	47	335	10.0	4
1	48	344	10.0	4
1	49	357	10.0	4
1	50	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	202	10.0	1
2	3	203	10.0	1
2	4	204	10.0	1
2	5	205	10.0	1
2	6	207	10.0	1
2	7	208	10.0	1
2	8	209	10.0	1
2	9	210	10.0	1
2	10	211	10.0	1
2	11	212	10.0	1
2	12	221	10.0	1
2	13	228	10.0	1
2	14	233	10.0	1
2	15	238	10.0	1
2	16	242	10.0	1
2	17	246	9.6	1
2	18	250	9.1	1
2	19	253	8.7	1
2	20	256	8.3	1
2	21	259	8.1	1
2	22	262	7.8	1
2	23	265	7.6	1
2	24	268	7.4	1
2	25	271	7.3	1
2	26	273	7.2	1
2	27	276	7.1	2
2	28	278	7.1	2
2	29	281	7.0	2
2	30	283	7.0	2
2	31	286	6.9	2
2	32	289	6.9	2
2	33	291	6.9	2
2	34	294	6.9	2
2	35	297	6.9	2
2	36	299	7.0	2
2	37	302	7.0	3
2	38	305	7.1	3
2	39	308	7.3	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	40	311	7.5	3
2	41	314	7.7	3
2	42	318	8.0	3
2	43	322	8.3	4
2	44	326	8.8	4
2	45	331	9.4	4
2	46	337	10.0	4
2	47	344	10.0	4
2	48	353	10.0	4
2	49	369	10.0	4
2	50	399	10.0	4
3	0	200	10.0	1
3	1	200	10.0	1
3	2	200	10.0	1
3	3	200	10.0	1
3	4	201	10.0	1
3	5	201	10.0	1
3	6	201	10.0	1
3	7	201	10.0	1
3	8	201	10.0	1
3	9	201	10.0	1
3	10	202	10.0	1
3	11	216	10.0	1
3	12	226	10.0	1
3	13	232	10.0	1
3	14	238	10.0	1
3	15	242	10.0	1
3	16	246	9.7	1
3	17	250	9.0	1
3	18	253	8.4	1
3	19	256	8.0	1
3	20	259	7.6	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	21	262	7.4	1
3	22	264	7.1	1
3	23	267	6.9	1
3	24	269	6.8	1
3	25	271	6.6	1
3	26	274	6.5	2
3	27	276	6.4	2
3	28	278	6.4	2
3	29	280	6.3	2
3	30	283	6.3	2
3	31	285	6.3	2
3	32	287	6.4	2
3	33	290	6.4	2
3	34	292	6.5	2
3	35	295	6.6	2
3	36	297	6.7	2
3	37	299	6.9	2
3	38	303	7.0	3
3	39	306	7.2	3
3	40	309	7.4	3
3	41	312	7.7	3
3	42	316	7.9	3
3	43	320	8.3	3
3	44	324	8.6	4
3	45	329	9.1	4
3	46	334	9.8	4
3	47	341	10.0	4
3	48	349	10.0	4
3	49	363	10.0	4
3	50	399	10.0	4

Table O-2. 2016–17 OSTP: Raw to Scaled Score Correspondence—Mathematics Grade 4

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	200	10.0	1
1	3	201	10.0	1
1	4	201	10.0	1
1	5	201	10.0	1
1	6	201	10.0	1
1	7	201	10.0	1
1	8	202	10.0	1
1	9	202	10.0	1
1	10	202	10.0	1
1	11	202	10.0	1
1	12	202	10.0	1
1	13	215	10.0	1
1	14	223	10.0	1
1	15	231	10.0	1
1	16	237	10.0	1
1	17	242	10.0	1
1	18	247	10.0	1
1	19	252	10.0	1
1	20	256	10.0	1
1	21	261	10.0	1
1	22	264	10.0	1
1	23	268	9.5	1
1	24	271	9.1	1
1	25	275	8.7	2
1	26	278	8.4	2
1	27	281	8.1	2
1	28	283	7.8	2
1	29	286	7.6	2
1	30	289	7.4	2
1	31	291	7.2	2
1	32	294	7.0	2
1	33	296	6.8	2
1	34	299	6.7	2
1	35	301	6.6	3
1	36	304	6.6	3
1	37	306	6.6	3
1	38	309	6.7	3
1	39	312	6.8	3
1	40	315	7.0	3
1	41	318	7.2	3
1	42	321	7.5	3
1	43	325	8.0	4
1	44	329	8.6	4
1	45	333	9.3	4
1	46	339	10.0	4
1	47	347	10.0	4
1	48	357	10.0	4
1	49	377	10.0	4
1	50	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	202	10.0	1
2	3	203	10.0	1
2	4	204	10.0	1
2	5	205	10.0	1
2	6	206	10.0	1
2	7	207	10.0	1
2	8	208	10.0	1
2	9	209	10.0	1
2	10	210	10.0	1
2	11	211	10.0	1
2	12	212	10.0	1
2	13	213	10.0	1
2	14	222	10.0	1
2	15	229	10.0	1
2	16	234	10.0	1
2	17	239	10.0	1
2	18	244	10.0	1
2	19	247	9.8	1
2	20	251	9.4	1
2	21	255	9.1	1
2	22	258	8.8	1
2	23	261	8.5	1
2	24	264	8.2	1
2	25	267	8.0	1
2	26	270	7.8	1
2	27	272	7.6	1
2	28	275	7.5	2
2	29	278	7.4	2
2	30	280	7.4	2
2	31	283	7.3	2
2	32	286	7.3	2
2	33	288	7.3	2
2	34	291	7.3	2
2	35	294	7.3	2
2	36	297	7.3	2
2	37	299	7.4	2
2	38	302	7.4	3
2	39	305	7.5	3
2	40	308	7.7	3
2	41	312	8.0	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	42	316	8.3	3
2	43	320	8.7	3
2	44	324	9.4	4
2	45	329	10.0	4
2	46	335	10.0	4
2	47	343	10.0	4
2	48	353	10.0	4
2	49	371	10.0	4
2	50	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	202	10.0	1
3	3	203	10.0	1
3	4	204	10.0	1
3	5	205	10.0	1
3	6	206	10.0	1
3	7	207	10.0	1
3	8	208	10.0	1
3	9	208	10.0	1
3	10	209	10.0	1
3	11	210	10.0	1
3	12	211	10.0	1
3	13	221	10.0	1
3	14	228	10.0	1
3	15	234	10.0	1
3	16	240	10.0	1
3	17	244	10.0	1
3	18	249	10.0	1
3	19	253	10.0	1
3	20	257	9.8	1
3	21	260	9.4	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	22	263	9.0	1
3	23	266	8.6	1
3	24	269	8.2	1
3	25	272	7.9	1
3	26	275	7.6	2
3	27	277	7.3	2
3	28	280	7.1	2
3	29	282	6.9	2
3	30	285	6.7	2
3	31	287	6.6	2
3	32	289	6.4	2
3	33	291	6.4	2
3	34	294	6.3	2
3	35	296	6.3	2
3	36	298	6.3	2
3	37	301	6.3	3
3	38	303	6.4	3
3	39	306	6.5	3
3	40	309	6.8	3
3	41	312	7.0	3
3	42	315	7.4	3
3	43	319	8.0	3
3	44	323	8.7	4
3	45	328	9.7	4
3	46	334	10.0	4
3	47	342	10.0	4
3	48	354	10.0	4
3	49	376	10.0	4
3	50	399	10.0	4

Table O-3. 2016–17 OSTP: Raw to Scaled Score Correspondence—Mathematics Grade 5

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	201	10.0	1
1	2	201	10.0	1
1	3	202	10.0	1
1	4	202	10.0	1
1	5	203	10.0	1
1	6	203	10.0	1
1	7	204	10.0	1
1	8	204	10.0	1
1	9	205	10.0	1
1	10	205	10.0	1
1	11	206	10.0	1
1	12	206	10.0	1
1	13	219	10.0	1
1	14	229	10.0	1
1	15	236	10.0	1
1	16	242	10.0	1
1	17	248	10.0	1
1	18	252	10.0	1
1	19	256	10.0	1
1	20	260	10.0	1
1	21	263	9.4	1
1	22	266	8.9	2
1	23	269	8.5	2
1	24	272	8.2	2
1	25	275	7.9	2
1	26	277	7.6	2
1	27	280	7.4	2
1	28	282	7.2	2
1	29	285	7.0	2
1	30	287	6.9	2
1	31	290	6.8	2
1	32	292	6.7	2
1	33	294	6.6	2
1	34	296	6.5	2
1	35	299	6.5	2
1	36	301	6.5	3
1	37	304	6.5	3
1	38	306	6.5	3
1	39	309	6.5	3
1	40	311	6.6	3
1	41	314	6.7	3
1	42	317	6.9	3
1	43	320	7.2	3
1	44	324	7.6	4
1	45	328	8.2	4
1	46	332	9.1	4
1	47	338	10.0	4
1	48	347	10.0	4
1	49	362	10.0	4
1	50	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	202	10.0	1
2	3	202	10.0	1
2	4	203	10.0	1
2	5	204	10.0	1
2	6	205	10.0	1
2	7	205	10.0	1
2	8	206	10.0	1
2	9	207	10.0	1
2	10	208	10.0	1
2	11	209	10.0	1
2	12	209	10.0	1
2	13	218	10.0	1
2	14	225	10.0	1
2	15	231	10.0	1
2	16	236	10.0	1
2	17	241	10.0	1
2	18	245	10.0	1
2	19	249	10.0	1
2	20	253	10.0	1
2	21	257	9.9	1
2	22	260	9.5	1
2	23	263	9.2	1
2	24	267	8.9	2
2	25	270	8.6	2
2	26	272	8.3	2
2	27	275	8.1	2
2	28	278	7.9	2
2	29	281	7.7	2
2	30	283	7.5	2
2	31	286	7.4	2
2	32	289	7.3	2
2	33	291	7.2	2
2	34	294	7.2	2
2	35	296	7.1	2
2	36	299	7.2	2
2	37	302	7.2	3
2	38	305	7.3	3
2	39	308	7.4	3
2	40	311	7.6	3
2	41	314	7.9	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	42	318	8.2	3
2	43	322	8.6	4
2	44	326	9.2	4
2	45	332	10.0	4
2	46	338	10.0	4
2	47	347	10.0	4
2	48	362	10.0	4
2	49	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	201	10.0	1
3	3	202	10.0	1
3	4	203	10.0	1
3	5	203	10.0	1
3	6	204	10.0	1
3	7	205	10.0	1
3	8	205	10.0	1
3	9	206	10.0	1
3	10	206	10.0	1
3	11	207	10.0	1
3	12	208	10.0	1
3	13	218	10.0	1
3	14	226	10.0	1
3	15	233	10.0	1
3	16	239	10.0	1
3	17	244	10.0	1
3	18	249	10.0	1
3	19	253	10.0	1
3	20	257	10.0	1
3	21	261	10.0	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	22	264	9.9	1
3	23	268	9.5	2
3	24	271	9.1	2
3	25	274	8.7	2
3	26	277	8.4	2
3	27	280	8.1	2
3	28	282	7.8	2
3	29	285	7.6	2
3	30	288	7.4	2
3	31	290	7.3	2
3	32	293	7.2	2
3	33	295	7.1	2
3	34	298	7.1	2
3	35	300	7.0	3
3	36	303	7.0	3
3	37	306	7.0	3
3	38	308	7.0	3
3	39	311	7.0	3
3	40	314	7.1	3
3	41	317	7.1	3
3	42	320	7.2	3
3	43	323	7.4	4
3	44	327	7.7	4
3	45	331	8.1	4
3	46	335	8.7	4
3	47	341	9.9	4
3	48	348	10.0	4
3	49	361	10.0	4
3	50	399	10.0	4

Table O-4. 2016–17 OSTP: Raw to Scaled Score Correspondence—Mathematics Grade 6

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	200	10.0	1
1	3	200	10.0	1
1	4	201	10.0	1
1	5	201	10.0	1
1	6	201	10.0	1
1	7	201	10.0	1
1	8	201	10.0	1
1	9	201	10.0	1
1	10	201	10.0	1
1	11	214	10.0	1
1	12	223	10.0	1
1	13	230	10.0	1
1	14	236	10.0	1
1	15	241	10.0	1
1	16	245	10.0	1
1	17	250	10.0	1
1	18	253	9.6	1
1	19	257	9.2	1
1	20	260	8.9	1
1	21	264	8.6	1
1	22	267	8.3	2
1	23	270	8.1	2
1	24	273	8.0	2
1	25	276	7.9	2
1	26	279	7.8	2
1	27	281	7.8	2
1	28	284	7.8	2
1	29	287	7.8	2
1	30	290	7.8	2
1	31	293	7.9	2
1	32	296	7.9	2
1	33	299	7.9	2
1	34	303	8.0	3
1	35	306	8.0	3
1	36	309	8.1	3
1	37	313	8.1	3
1	38	316	8.3	3
1	39	320	8.4	3
1	40	324	8.7	3
1	41	329	9.0	3
1	42	333	9.5	4
1	43	339	10.0	4
1	44	345	10.0	4
1	45	354	10.0	4
1	46	366	10.0	4
1	47	390	10.0	4
1	48	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	202	10.0	1
2	3	202	10.0	1
2	4	203	10.0	1
2	5	204	10.0	1
2	6	205	10.0	1
2	7	206	10.0	1
2	8	207	10.0	1
2	9	207	10.0	1
2	10	208	10.0	1
2	11	209	10.0	1
2	12	219	10.0	1
2	13	227	10.0	1
2	14	233	10.0	1
2	15	238	10.0	1
2	16	243	10.0	1
2	17	247	10.0	1
2	18	252	9.9	1
2	19	255	9.6	1
2	20	259	9.3	1
2	21	263	9.0	1
2	22	266	8.8	1
2	23	269	8.5	2
2	24	272	8.3	2
2	25	276	8.2	2
2	26	279	8.0	2
2	27	282	7.9	2
2	28	285	7.9	2
2	29	288	7.8	2
2	30	291	7.8	2
2	31	294	7.9	2
2	32	297	7.9	2
2	33	300	8.0	3
2	34	303	8.1	3
2	35	307	8.1	3
2	36	310	8.2	3
2	37	313	8.3	3
2	38	317	8.3	3
2	39	321	8.5	3
2	40	325	8.6	3
2	41	329	8.9	3
2	42	334	9.3	4
2	43	339	9.9	4

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	44	345	10.0	4
2	45	353	10.0	4
2	46	365	10.0	4
2	47	386	10.0	4
2	48	399	10.0	4
3	0	200	10.0	1
3	1	200	10.0	1
3	2	201	10.0	1
3	3	201	10.0	1
3	4	202	10.0	1
3	5	202	10.0	1
3	6	203	10.0	1
3	7	203	10.0	1
3	8	204	10.0	1
3	9	204	10.0	1
3	10	205	10.0	1
3	11	205	10.0	1
3	12	206	10.0	1
3	13	216	10.0	1
3	14	223	10.0	1
3	15	229	10.0	1
3	16	235	10.0	1
3	17	240	10.0	1
3	18	245	10.0	1
3	19	249	10.0	1
3	20	253	10.0	1
3	21	257	9.9	1
3	22	260	9.6	1
3	23	264	9.3	1
3	24	267	9.1	2
3	25	271	8.9	2
3	26	274	8.8	2
3	27	277	8.7	2
3	28	280	8.6	2
3	29	284	8.5	2
3	30	287	8.5	2
3	31	290	8.5	2
3	32	293	8.5	2
3	33	297	8.5	2
3	34	300	8.6	3
3	35	303	8.6	3
3	36	307	8.6	3
3	37	310	8.6	3
3	38	314	8.6	3
3	39	317	8.5	3
3	40	321	8.5	3
3	41	325	8.5	3
3	42	329	8.4	3
3	43	333	8.4	4
3	44	337	8.5	4
3	45	342	9.0	4
3	46	347	9.9	4
3	47	354	10.0	4
3	48	364	10.0	4
3	49	382	10.0	4
3	50	399	10.0	4
4	0	200	10.0	1
4	1	201	10.0	1
4	2	202	10.0	1
4	3	203	10.0	1
4	4	203	10.0	1
4	5	204	10.0	1
4	6	205	10.0	1
4	7	206	10.0	1
4	8	207	10.0	1
4	9	208	10.0	1
4	10	208	10.0	1
4	11	209	10.0	1
4	12	219	10.0	1
4	13	226	10.0	1
4	14	233	10.0	1
4	15	238	10.0	1
4	16	243	10.0	1
4	17	247	10.0	1
4	18	251	10.0	1
4	19	254	9.5	1
4	20	258	9.1	1
4	21	261	8.8	1
4	22	264	8.6	1
4	23	267	8.3	2
4	24	270	8.2	2
4	25	273	8.1	2
4	26	276	8.0	2
4	27	279	7.9	2
4	28	282	7.9	2
4	29	285	7.9	2
4	30	288	8.0	2
4	31	291	8.0	2
4	32	294	8.1	2
4	33	297	8.2	2
4	34	301	8.2	3
4	35	304	8.3	3
4	36	308	8.4	3
4	37	311	8.5	3
4	38	315	8.7	3
4	39	319	8.9	3
4	40	324	9.2	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
4	41	329	9.7	3
4	42	334	10.0	4
4	43	340	10.0	4
4	44	349	10.0	4

Form	Raw Score	Scaled Score	Standard Error	Perf Level
4	45	360	10.0	4
4	46	379	10.0	4
4	47	399	10.0	4
4	48	399	10.0	4

Table O-5. 2016–17 OSTP: Raw to Scaled Score Correspondence—Mathematics Grade 7

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	202	10.0	1
1	2	204	10.0	1
1	3	206	10.0	1
1	4	208	10.0	1
1	5	210	10.0	1
1	6	212	10.0	1
1	7	214	10.0	1
1	8	216	10.0	1
1	9	218	10.0	1
1	10	220	10.0	1
1	11	237	10.0	1
1	12	247	10.0	1
1	13	255	10.0	1
1	14	261	10.0	1
1	15	266	10.0	1
1	16	271	10.0	1
1	17	275	10.0	1
1	18	279	9.4	2
1	19	282	8.9	2
1	20	285	8.5	2
1	21	288	8.1	2
1	22	290	7.8	2
1	23	293	7.6	2
1	24	296	7.3	2
1	25	298	7.1	2
1	26	301	7.0	3
1	27	303	6.8	3
1	28	305	6.7	3
1	29	308	6.6	3
1	30	310	6.5	3
1	31	312	6.4	3
1	32	314	6.3	3
1	33	316	6.2	3
1	34	319	6.1	3
1	35	321	6.1	3
1	36	323	6.1	3
1	37	325	6.1	3
1	38	328	6.2	3
1	39	330	6.3	4
1	40	333	6.5	4
1	41	336	6.8	4
1	42	339	7.2	4
1	43	343	7.7	4
1	44	347	8.5	4
1	45	351	9.4	4
1	46	357	10.0	4
1	47	365	10.0	4
1	48	376	10.0	4
1	49	395	10.0	4
1	50	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	203	10.0	1
2	3	204	10.0	1
2	4	205	10.0	1
2	5	207	10.0	1
2	6	208	10.0	1
2	7	209	10.0	1
2	8	211	10.0	1
2	9	212	10.0	1
2	10	214	10.0	1
2	11	215	10.0	1
2	12	216	10.0	1
2	13	230	10.0	1
2	14	239	10.0	1
2	15	246	10.0	1
2	16	252	10.0	1
2	17	257	10.0	1
2	18	262	10.0	1
2	19	266	10.0	1
2	20	269	9.4	1
2	21	273	8.9	1
2	22	276	8.6	1
2	23	279	8.3	2
2	24	282	7.9	2
2	25	285	7.6	2
2	26	287	7.2	2
2	27	290	6.8	2
2	28	292	6.3	2
2	29	295	6.0	2
2	30	297	5.8	2
2	31	299	5.7	2
2	32	302	5.8	3
2	33	304	5.9	3
2	34	307	6.2	3
2	35	309	6.4	3
2	36	312	6.6	3
2	37	315	6.8	3
2	38	318	6.9	3
2	39	321	6.9	3
2	40	324	6.9	3
2	41	327	6.9	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	42	330	7.0	4
2	43	334	7.3	4
2	44	337	7.6	4
2	45	342	8.2	4
2	46	347	9.2	4
2	47	353	10.0	4
2	48	363	10.0	4
2	49	379	10.0	4
2	50	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	203	10.0	1
3	3	204	10.0	1
3	4	205	10.0	1
3	5	207	10.0	1
3	6	208	10.0	1
3	7	209	10.0	1
3	8	211	10.0	1
3	9	212	10.0	1
3	10	214	10.0	1
3	11	215	10.0	1
3	12	228	10.0	1
3	13	238	10.0	1
3	14	246	10.0	1
3	15	252	10.0	1
3	16	257	10.0	1
3	17	262	10.0	1
3	18	266	10.0	1
3	19	270	9.7	1
3	20	273	9.2	1
3	21	277	8.8	1
3	22	280	8.5	2
3	23	283	8.3	2
3	24	286	8.1	2
3	25	289	7.9	2
3	26	291	7.7	2
3	27	294	7.6	2
3	28	297	7.4	2
3	29	299	7.3	2
3	30	302	7.1	3
3	31	304	7.0	3
3	32	307	6.9	3
3	33	309	6.8	3
3	34	312	6.7	3
3	35	314	6.7	3
3	36	317	6.7	3
3	37	319	6.7	3
3	38	322	6.7	3
3	39	325	6.7	3
3	40	327	6.8	3
3	41	330	7.0	4
3	42	333	7.1	4
3	43	337	7.4	4
3	44	340	7.8	4
3	45	344	8.3	4
3	46	349	9.2	4
3	47	356	10.0	4
3	48	364	10.0	4
3	49	380	10.0	4
3	50	399	10.0	4
4	0	200	10.0	1
4	1	201	10.0	1
4	2	202	10.0	1
4	3	203	10.0	1
4	4	203	10.0	1
4	5	204	10.0	1
4	6	205	10.0	1
4	7	206	10.0	1
4	8	207	10.0	1
4	9	208	10.0	1
4	10	209	10.0	1
4	11	231	10.0	1
4	12	244	10.0	1
4	13	252	10.0	1
4	14	259	10.0	1
4	15	264	10.0	1
4	16	269	10.0	1
4	17	273	10.0	1
4	18	277	9.7	1
4	19	280	9.2	2
4	20	284	8.7	2
4	21	287	8.4	2
4	22	289	8.0	2
4	23	292	7.8	2
4	24	295	7.5	2
4	25	297	7.3	2
4	26	299	7.1	2
4	27	302	7.0	3
4	28	305	6.8	3
4	29	307	6.7	3
4	30	309	6.6	3
4	31	311	6.5	3
4	32	314	6.4	3
4	33	316	6.3	3
4	34	318	6.2	3
4	35	320	6.2	3
4	36	323	6.2	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
4	37	325	6.2	3
4	38	328	6.3	3
4	39	330	6.4	4
4	40	333	6.6	4
4	41	336	6.9	4
4	42	339	7.4	4
4	43	343	8.0	4
4	44	347	8.9	4
4	45	353	10.0	4
4	46	360	10.0	4
4	47	370	10.0	4
4	48	388	10.0	4
4	49	399	10.0	4

Table O-6. 2016–17 OSTP: Raw to Scaled Score Correspondence—Mathematics Grade 8

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	201	10.0	1
1	3	201	10.0	1
1	4	202	10.0	1
1	5	202	10.0	1
1	6	202	10.0	1
1	7	203	10.0	1
1	8	203	10.0	1
1	9	203	10.0	1
1	10	204	10.0	1
1	11	220	10.0	1
1	12	231	10.0	1
1	13	238	10.0	1
1	14	244	10.0	1
1	15	249	10.0	1
1	16	253	10.0	1
1	17	257	10.0	1
1	18	261	9.6	1
1	19	264	9.1	1
1	20	267	8.7	1
1	21	270	8.3	1
1	22	273	8.0	1
1	23	276	7.7	1
1	24	278	7.5	2
1	25	281	7.3	2
1	26	283	7.2	2
1	27	286	7.1	2
1	28	288	7.0	2
1	29	291	7.0	2
1	30	293	6.9	2
1	31	296	7.0	2
1	32	298	7.0	2
1	33	301	7.0	3
1	34	303	7.1	3
1	35	306	7.1	3
1	36	309	7.2	3
1	37	311	7.3	3
1	38	314	7.3	3
1	39	317	7.4	4
1	40	320	7.5	4
1	41	323	7.7	4
1	42	327	7.9	4
1	43	330	8.2	4
1	44	334	8.7	4
1	45	339	9.4	4
1	46	345	10.0	4
1	47	352	10.0	4
1	48	362	10.0	4
1	49	382	10.0	4
1	50	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	201	10.0	1
2	3	202	10.0	1
2	4	203	10.0	1
2	5	204	10.0	1
2	6	204	10.0	1
2	7	205	10.0	1
2	8	206	10.0	1
2	9	207	10.0	1
2	10	207	10.0	1
2	11	208	10.0	1
2	12	220	10.0	1
2	13	229	10.0	1
2	14	236	10.0	1
2	15	242	10.0	1
2	16	248	10.0	1
2	17	253	10.0	1
2	18	257	10.0	1
2	19	262	10.0	1
2	20	265	10.0	1
2	21	269	9.9	1
2	22	272	9.4	1
2	23	276	9.0	1
2	24	279	8.7	2
2	25	282	8.3	2
2	26	285	8.0	2
2	27	287	7.8	2
2	28	290	7.6	2
2	29	293	7.4	2
2	30	295	7.3	2
2	31	298	7.2	2
2	32	301	7.1	3
2	33	303	7.1	3
2	34	306	7.1	3
2	35	309	7.2	3
2	36	312	7.4	3
2	37	315	7.6	3
2	38	318	7.9	4
2	39	322	8.3	4
2	40	326	8.8	4
2	41	330	9.5	4

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	42	335	10.0	4
2	43	341	10.0	4
2	44	349	10.0	4
2	45	361	10.0	4
2	46	378	10.0	4
2	47	399	10.0	4
2	48	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	202	10.0	1
3	3	203	10.0	1
3	4	204	10.0	1
3	5	205	10.0	1
3	6	206	10.0	1
3	7	206	10.0	1
3	8	207	10.0	1
3	9	208	10.0	1
3	10	209	10.0	1
3	11	222	10.0	1
3	12	231	10.0	1
3	13	238	10.0	1
3	14	243	10.0	1
3	15	248	10.0	1
3	16	252	10.0	1
3	17	256	10.0	1
3	18	260	9.8	1
3	19	263	9.4	1
3	20	267	9.0	1
3	21	270	8.7	1
3	22	273	8.4	1
3	23	275	8.1	1
3	24	278	7.9	2
3	25	281	7.7	2
3	26	283	7.5	2
3	27	286	7.4	2
3	28	288	7.3	2
3	29	291	7.3	2
3	30	294	7.3	2
3	31	296	7.3	2
3	32	299	7.4	2
3	33	302	7.5	3
3	34	304	7.6	3
3	35	307	7.7	3
3	36	310	7.9	3
3	37	314	8.2	3
3	38	317	8.5	4
3	39	321	8.8	4
3	40	325	9.3	4
3	41	329	9.8	4

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	42	335	10.0	4
3	43	341	10.0	4
3	44	348	10.0	4
3	45	358	10.0	4
3	46	371	10.0	4
3	47	396	10.0	4
3	48	399	10.0	4
4	0	200	10.0	1
4	1	201	10.0	1
4	2	202	10.0	1
4	3	204	10.0	1
4	4	205	10.0	1
4	5	206	10.0	1
4	6	207	10.0	1
4	7	208	10.0	1
4	8	210	10.0	1
4	9	211	10.0	1
4	10	212	10.0	1
4	11	213	10.0	1
4	12	226	10.0	1
4	13	234	10.0	1
4	14	241	10.0	1
4	15	246	10.0	1
4	16	251	10.0	1
4	17	255	10.0	1
4	18	259	9.9	1
4	19	262	9.4	1
4	20	266	9.0	1
4	21	269	8.6	1
4	22	272	8.2	1
4	23	274	7.9	1
4	24	277	7.7	2
4	25	280	7.4	2
4	26	282	7.2	2
4	27	285	7.1	2
4	28	287	7.0	2
4	29	289	6.8	2
4	30	292	6.8	2
4	31	294	6.7	2
4	32	296	6.7	2
4	33	299	6.6	2
4	34	301	6.6	3
4	35	303	6.6	3
4	36	306	6.7	3
4	37	309	6.8	3
4	38	311	6.9	3
4	39	314	7.0	3
4	40	317	7.2	4

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
4	41	320	7.4	4
4	42	323	7.7	4
4	43	327	8.1	4
4	44	331	8.6	4
4	45	336	9.3	4
4	46	341	10.0	4

Form	Raw Score	Scaled Score	Standard Error	Perf Level
4	47	349	10.0	4
4	48	359	10.0	4
4	49	379	10.0	4
4	50	399	10.0	4

Table O-7. 2016–17 OSTP: Raw to Scaled Score Correspondence—Mathematics Grade 10

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	202	10.0	1
1	2	203	10.0	1
1	3	205	10.0	1
1	4	206	10.0	1
1	5	208	10.0	1
1	6	209	10.0	1
1	7	211	10.0	1
1	8	212	10.0	1
1	9	214	10.0	1
1	10	215	10.0	1
1	11	217	10.0	1
1	12	218	10.0	1
1	13	220	10.0	1
1	14	233	10.0	1
1	15	241	10.0	1
1	16	247	10.0	1
1	17	252	10.0	1
1	18	257	10.0	1
1	19	261	9.9	1
1	20	265	9.3	1
1	21	268	8.9	1
1	22	271	8.5	1
1	23	274	8.1	1
1	24	277	7.8	1
1	25	279	7.5	1
1	26	282	7.3	1
1	27	284	7.0	2
1	28	286	6.8	2
1	29	288	6.6	2
1	30	290	6.5	2
1	31	292	6.3	2
1	32	294	6.1	2
1	33	296	6.0	2
1	34	298	5.8	2
1	35	300	5.7	3
1	36	302	5.6	3
1	37	304	5.5	3
1	38	305	5.4	3
1	39	307	5.4	3
1	40	309	5.4	3
1	41	311	5.4	3
1	42	313	5.4	3
1	43	315	5.4	3
1	44	316	5.4	3
1	45	318	5.5	3
1	46	320	5.6	4
1	47	322	5.7	4
1	48	325	5.8	4
1	49	327	6.0	4
1	50	329	6.1	4
1	51	332	6.4	4
1	52	335	6.7	4
1	53	338	7.0	4
1	54	341	7.5	4
1	55	345	8.2	4
1	56	350	9.1	4
1	57	356	10.0	4
1	58	365	10.0	4
1	59	381	10.0	4
1	60	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	203	10.0	1
2	3	204	10.0	1
2	4	205	10.0	1
2	5	206	10.0	1
2	6	208	10.0	1
2	7	209	10.0	1
2	8	210	10.0	1
2	9	212	10.0	1
2	10	213	10.0	1
2	11	214	10.0	1
2	12	216	10.0	1
2	13	231	10.0	1
2	14	240	10.0	1
2	15	247	10.0	1
2	16	253	10.0	1
2	17	258	10.0	1
2	18	262	9.8	1
2	19	266	9.2	1
2	20	269	8.7	1
2	21	272	8.3	1
2	22	275	8.0	1
2	23	278	7.8	1
2	24	281	7.5	1
2	25	283	7.3	1
2	26	286	7.0	2
2	27	288	6.8	2
2	28	290	6.6	2
2	29	292	6.4	2
2	30	295	6.3	2
2	31	297	6.1	2

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	32	299	6.0	2
2	33	301	5.9	3
2	34	302	5.8	3
2	35	304	5.7	3
2	36	306	5.6	3
2	37	308	5.5	3
2	38	310	5.5	3
2	39	312	5.4	3
2	40	313	5.4	3
2	41	315	5.4	3
2	42	317	5.3	3
2	43	319	5.3	3
2	44	321	5.3	4
2	45	323	5.4	4
2	46	325	5.4	4
2	47	327	5.5	4
2	48	329	5.5	4
2	49	331	5.7	4
2	50	333	5.8	4
2	51	336	6.1	4
2	52	339	6.4	4
2	53	342	6.9	4
2	54	346	7.6	4
2	55	350	8.6	4
2	56	356	10.0	4
2	57	364	10.0	4
2	58	379	10.0	4
2	59	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	203	10.0	1
3	3	204	10.0	1
3	4	205	10.0	1
3	5	206	10.0	1
3	6	208	10.0	1
3	7	209	10.0	1
3	8	210	10.0	1
3	9	212	10.0	1
3	10	213	10.0	1
3	11	214	10.0	1
3	12	215	10.0	1
3	13	217	10.0	1
3	14	218	10.0	1
3	15	229	10.0	1
3	16	237	10.0	1
3	17	243	10.0	1
3	18	248	10.0	1
3	19	253	10.0	1
3	20	257	10.0	1
3	21	261	9.8	1
3	22	264	9.4	1
3	23	268	8.9	1
3	24	271	8.6	1
3	25	274	8.2	1
3	26	277	7.9	1
3	27	279	7.6	1
3	28	282	7.4	1
3	29	284	7.1	2
3	30	286	6.9	2
3	31	289	6.8	2
3	32	291	6.6	2
3	33	293	6.5	2
3	34	295	6.4	2
3	35	297	6.3	2
3	36	299	6.2	2
3	37	301	6.1	3
3	38	303	6.1	3
3	39	305	6.1	3
3	40	307	6.0	3
3	41	309	6.0	3
3	42	311	6.0	3
3	43	314	6.0	3
3	44	316	6.0	3
3	45	318	6.1	3
3	46	320	6.1	4
3	47	322	6.2	4
3	48	325	6.3	4
3	49	327	6.4	4
3	50	330	6.6	4
3	51	333	6.8	4
3	52	336	7.2	4
3	53	339	7.6	4
3	54	343	8.1	4
3	55	347	8.8	4
3	56	352	9.9	4
3	57	359	10.0	4
3	58	368	10.0	4
3	59	384	10.0	4
3	60	399	10.0	4
4	0	200	10.0	1
4	1	200	10.0	1
4	2	201	10.0	1
4	3	201	10.0	1
4	4	202	10.0	1
4	5	202	10.0	1
4	6	203	10.0	1
4	7	203	10.0	1

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
4	8	204	10.0	1
4	9	204	10.0	1
4	10	204	10.0	1
4	11	205	10.0	1
4	12	205	10.0	1
4	13	206	10.0	1
4	14	226	10.0	1
4	15	236	10.0	1
4	16	244	10.0	1
4	17	250	10.0	1
4	18	255	10.0	1
4	19	259	10.0	1
4	20	263	9.8	1
4	21	266	9.3	1
4	22	269	8.8	1
4	23	273	8.4	1
4	24	275	8.0	1
4	25	278	7.7	1
4	26	281	7.4	1
4	27	283	7.2	1
4	28	285	7.0	2
4	29	288	6.8	2
4	30	290	6.6	2
4	31	292	6.4	2
4	32	294	6.3	2
4	33	296	6.1	2
4	34	298	6.0	2
4	35	299	5.8	2
4	36	302	5.7	3
4	37	303	5.6	3
4	38	305	5.5	3
4	39	307	5.4	3
4	40	309	5.4	3
4	41	311	5.3	3
4	42	313	5.4	3
4	43	315	5.4	3
4	44	316	5.4	3
4	45	318	5.5	3
4	46	320	5.5	4
4	47	323	5.7	4
4	48	325	5.8	4
4	49	327	5.9	4
4	50	330	6.1	4
4	51	332	6.4	4
4	52	335	6.7	4
4	53	338	7.1	4
4	54	342	7.7	4
4	55	346	8.4	4
4	56	351	9.5	4
4	57	358	10.0	4
4	58	368	10.0	4
4	59	387	10.0	4
4	60	399	10.0	4

Table O-8. 2016–17 OSTP: Raw to Scaled Score Correspondence—ELA Grade 3

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	201	10.0	1
1	2	201	10.0	1
1	3	202	10.0	1
1	4	202	10.0	1
1	5	203	10.0	1
1	6	203	10.0	1
1	7	204	10.0	1
1	8	204	10.0	1
1	9	205	10.0	1
1	10	219	10.0	1
1	11	228	10.0	1
1	12	234	10.0	1
1	13	239	10.0	1
1	14	244	10.0	1
1	15	248	9.3	1
1	16	251	8.8	1
1	17	255	8.5	1
1	18	258	8.2	1
1	19	261	8.0	1
1	20	264	7.9	1
1	21	266	7.8	1
1	22	269	7.7	1
1	23	272	7.7	1
1	24	275	7.6	1
1	25	277	7.6	2
1	26	280	7.6	2
1	27	282	7.6	2
1	28	285	7.6	2
1	29	288	7.6	2
1	30	291	7.6	2
1	31	293	7.7	2
1	32	296	7.7	2
1	33	299	7.8	2
1	34	302	7.9	3
1	35	305	8.1	3
1	36	308	8.2	3
1	37	311	8.4	3
1	38	315	8.6	3
1	39	319	8.9	3
1	40	323	9.2	3
1	41	327	9.5	3
1	42	332	10.0	4
1	43	337	10.0	4
1	44	343	10.0	4
1	45	351	10.0	4
1	46	362	10.0	4
1	47	382	10.0	4
1	48	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	203	10.0	1
2	3	204	10.0	1
2	4	206	10.0	1
2	5	207	10.0	1
2	6	209	10.0	1
2	7	210	10.0	1
2	8	212	10.0	1
2	9	213	10.0	1
2	10	215	10.0	1
2	11	225	10.0	1
2	12	232	10.0	1
2	13	237	10.0	1
2	14	241	10.0	1
2	15	245	9.4	1
2	16	249	8.7	1
2	17	252	8.2	1
2	18	255	7.8	1
2	19	258	7.6	1
2	20	260	7.4	1
2	21	263	7.3	1
2	22	265	7.2	1
2	23	268	7.2	1
2	24	270	7.1	1
2	25	273	7.2	1
2	26	275	7.2	1
2	27	278	7.2	2
2	28	280	7.3	2
2	29	283	7.3	2
2	30	285	7.4	2
2	31	288	7.5	2
2	32	290	7.5	2
2	33	293	7.6	2
2	34	296	7.7	2
2	35	298	7.9	2
2	36	301	8.0	3
2	37	304	8.2	3
2	38	308	8.4	3
2	39	311	8.7	3
2	40	315	9.0	3
2	41	318	9.4	3
2	42	323	9.9	3
2	43	327	10.0	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	44	332	10.0	4
2	45	338	10.0	4
2	46	345	10.0	4
2	47	353	10.0	4
2	48	364	10.0	4
2	49	381	10.0	4
2	50	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	202	10.0	1
3	3	203	10.0	1
3	4	204	10.0	1
3	5	204	10.0	1
3	6	205	10.0	1
3	7	206	10.0	1
3	8	207	10.0	1
3	9	208	10.0	1
3	10	209	10.0	1
3	11	220	10.0	1
3	12	228	10.0	1
3	13	234	10.0	1
3	14	239	10.0	1
3	15	244	10.0	1
3	16	248	9.9	1
3	17	251	9.3	1
3	18	254	8.8	1
3	19	257	8.4	1
3	20	260	8.1	1
3	21	263	7.9	1
3	22	266	7.7	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	23	268	7.6	1
3	24	271	7.5	1
3	25	273	7.4	1
3	26	276	7.4	1
3	27	278	7.4	2
3	28	281	7.4	2
3	29	283	7.4	2
3	30	286	7.4	2
3	31	288	7.5	2
3	32	291	7.5	2
3	33	294	7.6	2
3	34	296	7.7	2
3	35	299	7.9	2
3	36	302	8.0	3
3	37	305	8.3	3
3	38	308	8.5	3
3	39	312	8.8	3
3	40	315	9.2	3
3	41	319	9.6	3
3	42	324	10.0	3
3	43	328	10.0	3
3	44	334	10.0	4
3	45	340	10.0	4
3	46	347	10.0	4
3	47	357	10.0	4
3	48	370	10.0	4
3	49	394	10.0	4
3	50	399	10.0	4

Table O-9. 2016–17 OSTP: Raw to Scaled Score Correspondence—
ELA Grade 4

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	201	10.0	1
1	3	201	10.0	1
1	4	202	10.0	1
1	5	202	10.0	1
1	6	203	10.0	1
1	7	203	10.0	1
1	8	204	10.0	1
1	9	204	10.0	1
1	10	204	10.0	1
1	11	213	10.0	1
1	12	220	10.0	1
1	13	226	10.0	1
1	14	231	10.0	1
1	15	236	10.0	1
1	16	240	10.0	1
1	17	244	10.0	1
1	18	248	9.6	1
1	19	251	9.2	1
1	20	254	8.9	1
1	21	257	8.6	1
1	22	260	8.4	1
1	23	263	8.2	1
1	24	266	8.0	1
1	25	269	7.9	1
1	26	271	7.8	1
1	27	274	7.7	1
1	28	277	7.7	2
1	29	279	7.6	2
1	30	282	7.6	2
1	31	285	7.6	2
1	32	287	7.7	2
1	33	290	7.8	2
1	34	293	8.0	2
1	35	296	8.2	2
1	36	299	8.4	2
1	37	303	8.7	3
1	38	307	9.0	3
1	39	310	9.3	3
1	40	314	9.7	3
1	41	319	10.0	3
1	42	324	10.0	3
1	43	330	10.0	3
1	44	336	10.0	4
1	45	344	10.0	4
1	46	356	10.0	4
1	47	376	10.0	4
1	48	399	10.0	4
2	0	200	10.0	1
2	1	200	10.0	1
2	2	200	10.0	1
2	3	200	10.0	1
2	4	201	10.0	1
2	5	201	10.0	1
2	6	201	10.0	1
2	7	201	10.0	1
2	8	201	10.0	1
2	9	201	10.0	1
2	10	201	10.0	1
2	11	213	10.0	1
2	12	221	10.0	1
2	13	228	10.0	1
2	14	234	10.0	1
2	15	238	10.0	1
2	16	243	10.0	1
2	17	247	10.0	1
2	18	250	9.7	1
2	19	254	9.3	1
2	20	257	9.0	1
2	21	260	8.8	1
2	22	263	8.6	1
2	23	266	8.5	1
2	24	269	8.3	1
2	25	272	8.2	1
2	26	275	8.1	2
2	27	278	8.0	2
2	28	280	7.9	2
2	29	283	7.8	2
2	30	286	7.7	2
2	31	289	7.7	2
2	32	292	7.7	2
2	33	294	7.8	2
2	34	297	7.9	2
2	35	300	8.0	3
2	36	304	8.2	3
2	37	307	8.5	3
2	38	310	8.8	3
2	39	314	9.1	3
2	40	318	9.5	3
2	41	323	10.0	3
2	42	327	10.0	3
2	43	333	10.0	4

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	44	339	10.0	4
2	45	347	10.0	4
2	46	357	10.0	4
2	47	372	10.0	4
2	48	399	10.0	4
2	49	399	10.0	4
3	0	200	10.0	1
3	1	200	10.0	1
3	2	200	10.0	1
3	3	200	10.0	1
3	4	201	10.0	1
3	5	201	10.0	1
3	6	201	10.0	1
3	7	201	10.0	1
3	8	201	10.0	1
3	9	201	10.0	1
3	10	202	10.0	1
3	11	212	10.0	1
3	12	219	10.0	1
3	13	226	10.0	1
3	14	231	10.0	1
3	15	235	10.0	1
3	16	240	9.7	1
3	17	243	9.3	1
3	18	247	9.0	1
3	19	251	8.9	1
3	20	254	8.8	1
3	21	257	8.7	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	22	261	8.7	1
3	23	264	8.7	1
3	24	267	8.6	1
3	25	270	8.6	1
3	26	273	8.6	1
3	27	276	8.5	2
3	28	280	8.5	2
3	29	283	8.5	2
3	30	286	8.5	2
3	31	289	8.6	2
3	32	292	8.7	2
3	33	296	8.8	2
3	34	299	9.0	2
3	35	303	9.2	3
3	36	306	9.3	3
3	37	310	9.5	3
3	38	314	9.7	3
3	39	318	9.9	3
3	40	323	10.0	3
3	41	328	10.0	3
3	42	333	10.0	4
3	43	339	10.0	4
3	44	346	10.0	4
3	45	355	10.0	4
3	46	368	10.0	4
3	47	389	10.0	4
3	48	399	10.0	4

Table O-10. 2016–17 OSTP: Raw to Scaled Score Correspondence—ELA Grade 5

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	201	10.0	1
1	3	201	10.0	1
1	4	202	10.0	1
1	5	202	10.0	1
1	6	203	10.0	1
1	7	203	10.0	1
1	8	204	10.0	1
1	9	204	10.0	1
1	10	205	10.0	1
1	11	205	10.0	1
1	12	213	10.0	1
1	13	220	10.0	1
1	14	225	10.0	1
1	15	229	10.0	1
1	16	233	10.0	1
1	17	237	10.0	1
1	18	240	9.6	1
1	19	243	9.1	1
1	20	246	8.7	1
1	21	249	8.3	1
1	22	252	8.0	1
1	23	254	7.8	1
1	24	256	7.5	1
1	25	259	7.4	1
1	26	261	7.2	1
1	27	263	7.1	1
1	28	266	7.0	1
1	29	268	7.0	1
1	30	271	7.0	2
1	31	272	7.0	2
1	32	275	7.0	2
1	33	277	7.1	2
1	34	279	7.2	2
1	35	282	7.3	2
1	36	284	7.4	2
1	37	287	7.5	2
1	38	290	7.6	2
1	39	292	7.8	2
1	40	295	8.0	2
1	41	298	8.2	2
1	42	301	8.4	3
1	43	305	8.7	3
1	44	309	9.1	3
1	45	312	9.5	3
1	46	317	10.0	3
1	47	322	10.0	3
1	48	327	10.0	4
1	49	334	10.0	4
1	50	342	10.0	4
1	51	353	10.0	4
1	52	369	10.0	4
1	53	394	10.0	4
1	54	399	10.0	4
1	55	399	10.0	4
2	0	200	10.0	1
2	1	200	10.0	1
2	2	200	10.0	1
2	3	200	10.0	1
2	4	201	10.0	1
2	5	201	10.0	1
2	6	201	10.0	1
2	7	201	10.0	1
2	8	201	10.0	1
2	9	201	10.0	1
2	10	202	10.0	1
2	11	202	10.0	1
2	12	213	10.0	1
2	13	221	10.0	1
2	14	228	10.0	1
2	15	233	10.0	1
2	16	237	10.0	1
2	17	242	10.0	1
2	18	245	10.0	1
2	19	248	9.6	1
2	20	251	9.1	1
2	21	254	8.6	1
2	22	257	8.2	1
2	23	260	7.9	1
2	24	262	7.7	1
2	25	264	7.5	1
2	26	267	7.3	1
2	27	269	7.2	1
2	28	271	7.1	2
2	29	274	7.1	2
2	30	276	7.0	2
2	31	278	7.0	2
2	32	280	7.0	2
2	33	283	7.1	2
2	34	285	7.1	2
2	35	287	7.2	2
2	36	290	7.2	2

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	37	292	7.3	2
2	38	295	7.4	2
2	39	297	7.6	2
2	40	300	7.8	3
2	41	303	8.0	3
2	42	306	8.3	3
2	43	310	8.6	3
2	44	314	9.1	3
2	45	318	9.6	3
2	46	322	10.0	3
2	47	328	10.0	4
2	48	334	10.0	4
2	49	342	10.0	4
2	50	353	10.0	4
2	51	369	10.0	4
2	52	395	10.0	4
2	53	399	10.0	4
2	54	399	10.0	4
3	0	200	10.0	1
3	1	200	10.0	1
3	2	201	10.0	1
3	3	201	10.0	1
3	4	201	10.0	1
3	5	202	10.0	1
3	6	202	10.0	1
3	7	202	10.0	1
3	8	203	10.0	1
3	9	203	10.0	1
3	10	203	10.0	1
3	11	204	10.0	1
3	12	214	10.0	1
3	13	221	10.0	1
3	14	227	10.0	1
3	15	232	10.0	1
3	16	236	10.0	1
3	17	239	9.9	1
3	18	243	9.3	1
3	19	246	8.7	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	20	249	8.3	1
3	21	251	8.0	1
3	22	254	7.7	1
3	23	256	7.5	1
3	24	259	7.4	1
3	25	261	7.3	1
3	26	263	7.2	1
3	27	266	7.1	1
3	28	268	7.1	1
3	29	271	7.1	2
3	30	273	7.1	2
3	31	275	7.1	2
3	32	277	7.2	2
3	33	280	7.2	2
3	34	282	7.3	2
3	35	284	7.3	2
3	36	287	7.4	2
3	37	290	7.5	2
3	38	292	7.7	2
3	39	295	7.8	2
3	40	298	8.0	2
3	41	301	8.2	3
3	42	304	8.4	3
3	43	307	8.7	3
3	44	311	9.0	3
3	45	315	9.5	3
3	46	319	10.0	3
3	47	324	10.0	4
3	48	330	10.0	4
3	49	336	10.0	4
3	50	344	10.0	4
3	51	353	10.0	4
3	52	367	10.0	4
3	53	390	10.0	4
3	54	399	10.0	4
3	55	399	10.0	4

Table O-11. 2016–17 OSTP: Raw to Scaled Score Correspondence—ELA Grade 6

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	201	10.0	1
1	2	202	10.0	1
1	3	203	10.0	1
1	4	205	10.0	1
1	5	206	10.0	1
1	6	207	10.0	1
1	7	208	10.0	1
1	8	209	10.0	1
1	9	210	10.0	1
1	10	212	10.0	1
1	11	213	10.0	1
1	12	222	10.0	1
1	13	228	10.0	1
1	14	234	10.0	1
1	15	238	10.0	1
1	16	242	10.0	1
1	17	246	9.9	1
1	18	249	9.3	1
1	19	252	8.9	1
1	20	255	8.5	1
1	21	258	8.2	1
1	22	261	7.9	1
1	23	263	7.7	1
1	24	266	7.6	1
1	25	268	7.5	1
1	26	270	7.4	2
1	27	273	7.3	2
1	28	275	7.2	2
1	29	278	7.2	2
1	30	280	7.2	2
1	31	282	7.2	2
1	32	285	7.2	2
1	33	287	7.2	2
1	34	290	7.3	2
1	35	292	7.4	2
1	36	295	7.5	2
1	37	298	7.6	2
1	38	301	7.8	3
1	39	304	8.1	3
1	40	307	8.4	3
1	41	311	8.9	3
1	42	315	9.4	3
1	43	320	10.0	3
1	44	325	10.0	3
1	45	331	10.0	4
1	46	339	10.0	4
1	47	350	10.0	4
1	48	366	10.0	4
1	49	399	10.0	4
1	50	399	10.0	4
2	0	200	10.0	1
2	1	200	10.0	1
2	2	201	10.0	1
2	3	201	10.0	1
2	4	201	10.0	1
2	5	202	10.0	1
2	6	202	10.0	1
2	7	202	10.0	1
2	8	202	10.0	1
2	9	203	10.0	1
2	10	203	10.0	1
2	11	203	10.0	1
2	12	214	10.0	1
2	13	223	10.0	1
2	14	229	10.0	1
2	15	234	10.0	1
2	16	239	10.0	1
2	17	243	10.0	1
2	18	247	10.0	1
2	19	251	9.8	1
2	20	254	9.4	1
2	21	257	9.1	1
2	22	260	8.8	1
2	23	263	8.6	1
2	24	266	8.5	1
2	25	269	8.4	2
2	26	272	8.3	2
2	27	274	8.2	2
2	28	277	8.2	2
2	29	280	8.1	2
2	30	282	8.0	2
2	31	285	8.0	2
2	32	288	7.9	2
2	33	291	7.9	2
2	34	293	7.9	2
2	35	296	8.0	2
2	36	299	8.0	2
2	37	302	8.2	3
2	38	306	8.4	3
2	39	309	8.6	3
2	40	313	9.0	3
2	41	317	9.5	3

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	42	321	10.0	3
2	43	326	10.0	3
2	44	332	10.0	4
2	45	339	10.0	4
2	46	347	10.0	4
2	47	358	10.0	4
2	48	374	10.0	4
2	49	399	10.0	4
2	50	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	202	10.0	1
3	3	203	10.0	1
3	4	204	10.0	1
3	5	205	10.0	1
3	6	205	10.0	1
3	7	206	10.0	1
3	8	207	10.0	1
3	9	208	10.0	1
3	10	209	10.0	1
3	11	217	10.0	1
3	12	223	10.0	1
3	13	229	10.0	1
3	14	233	10.0	1
3	15	237	10.0	1
3	16	241	9.7	1
3	17	244	9.1	1
3	18	247	8.7	1
3	19	250	8.3	1
3	20	253	8.1	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	21	255	7.9	1
3	22	258	7.7	1
3	23	261	7.6	1
3	24	263	7.6	1
3	25	266	7.6	1
3	26	269	7.6	2
3	27	271	7.6	2
3	28	273	7.7	2
3	29	276	7.7	2
3	30	279	7.8	2
3	31	281	7.8	2
3	32	284	7.8	2
3	33	287	7.9	2
3	34	290	7.9	2
3	35	292	7.9	2
3	36	295	8.0	2
3	37	298	8.0	2
3	38	302	8.2	3
3	39	305	8.4	3
3	40	309	8.6	3
3	41	312	9.0	3
3	42	317	9.5	3
3	43	321	10.0	3
3	44	327	10.0	3
3	45	333	10.0	4
3	46	342	10.0	4
3	47	353	10.0	4
3	48	373	10.0	4
3	49	399	10.0	4

Table O-12. 2016–17 OSTP: Raw to Scaled Score Correspondence—ELA Grade 7

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	200	10.0	1
1	3	200	10.0	1
1	4	200	10.0	1
1	5	200	10.0	1
1	6	201	10.0	1
1	7	201	10.0	1
1	8	201	10.0	1
1	9	201	10.0	1
1	10	201	10.0	1
1	11	210	10.0	1
1	12	218	10.0	1
1	13	224	10.0	1
1	14	229	10.0	1
1	15	233	10.0	1
1	16	238	10.0	1
1	17	241	10.0	1
1	18	245	9.8	1
1	19	248	9.5	1
1	20	251	9.2	1
1	21	255	8.9	1
1	22	258	8.8	1
1	23	260	8.6	1
1	24	263	8.5	1
1	25	266	8.4	1
1	26	269	8.4	1
1	27	272	8.4	1
1	28	275	8.4	2
1	29	278	8.4	2
1	30	281	8.5	2
1	31	284	8.6	2
1	32	287	8.7	2
1	33	290	8.9	2
1	34	293	9.0	2
1	35	297	9.2	2
1	36	300	9.5	3
1	37	304	9.8	3
1	38	308	10.0	3
1	39	312	10.0	3
1	40	317	10.0	3
1	41	323	10.0	4
1	42	328	10.0	4
1	43	335	10.0	4
1	44	344	10.0	4
1	45	355	10.0	4
1	46	372	10.0	4
1	47	399	10.0	4
1	48	399	10.0	4
2	0	200	10.0	1
2	1	200	10.0	1
2	2	200	10.0	1
2	3	201	10.0	1
2	4	201	10.0	1
2	5	201	10.0	1
2	6	201	10.0	1
2	7	202	10.0	1
2	8	202	10.0	1
2	9	202	10.0	1
2	10	202	10.0	1
2	11	202	10.0	1
2	12	212	10.0	1
2	13	220	10.0	1
2	14	226	10.0	1
2	15	231	10.0	1
2	16	236	10.0	1
2	17	240	10.0	1
2	18	244	10.0	1
2	19	248	9.9	1
2	20	251	9.6	1
2	21	255	9.4	1
2	22	258	9.2	1
2	23	261	9.1	1
2	24	264	9.0	1
2	25	267	9.0	1
2	26	270	8.9	1
2	27	274	8.9	2
2	28	277	8.9	2
2	29	280	8.9	2
2	30	283	9.0	2
2	31	286	9.0	2
2	32	289	9.1	2
2	33	293	9.2	2
2	34	296	9.3	2
2	35	299	9.4	2
2	36	303	9.6	3
2	37	307	9.9	3
2	38	311	10.0	3
2	39	315	10.0	3
2	40	320	10.0	3
2	41	325	10.0	4
2	42	331	10.0	4
2	43	337	10.0	4

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	44	345	10.0	4
2	45	354	10.0	4
2	46	366	10.0	4
2	47	383	10.0	4
2	48	399	10.0	4
2	49	399	10.0	4
3	0	200	10.0	1
3	1	200	10.0	1
3	2	200	10.0	1
3	3	201	10.0	1
3	4	201	10.0	1
3	5	201	10.0	1
3	6	201	10.0	1
3	7	201	10.0	1
3	8	202	10.0	1
3	9	202	10.0	1
3	10	202	10.0	1
3	11	202	10.0	1
3	12	211	10.0	1
3	13	217	10.0	1
3	14	223	10.0	1
3	15	228	10.0	1
3	16	232	10.0	1
3	17	236	10.0	1
3	18	240	10.0	1
3	19	244	10.0	1
3	20	247	9.6	1
3	21	250	9.3	1
3	22	253	9.0	1

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	23	256	8.8	1
3	24	259	8.6	1
3	25	262	8.5	1
3	26	264	8.3	1
3	27	267	8.3	1
3	28	270	8.2	1
3	29	272	8.2	1
3	30	275	8.1	2
3	31	278	8.1	2
3	32	281	8.2	2
3	33	283	8.2	2
3	34	286	8.3	2
3	35	289	8.5	2
3	36	292	8.6	2
3	37	296	8.8	2
3	38	299	9.1	2
3	39	303	9.5	3
3	40	307	9.9	3
3	41	311	10.0	3
3	42	316	10.0	3
3	43	321	10.0	3
3	44	328	10.0	4
3	45	335	10.0	4
3	46	344	10.0	4
3	47	357	10.0	4
3	48	376	10.0	4
3	49	399	10.0	4
3	50	399	10.0	4

Table O-13. 2016–17 OSTP: Raw to Scaled Score Correspondence—ELA Grade 8

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	201	10.0	1
1	3	201	10.0	1
1	4	201	10.0	1
1	5	202	10.0	1
1	6	202	10.0	1
1	7	202	10.0	1
1	8	203	10.0	1
1	9	203	10.0	1
1	10	203	10.0	1
1	11	203	10.0	1
1	12	204	10.0	1
1	13	211	10.0	1
1	14	217	10.0	1
1	15	222	10.0	1
1	16	227	10.0	1
1	17	231	10.0	1
1	18	235	10.0	1
1	19	239	9.7	1
1	20	243	9.4	1
1	21	246	9.2	1
1	22	249	9.1	1
1	23	253	9.0	1
1	24	256	9.0	1
1	25	259	8.9	1
1	26	262	8.9	1
1	27	265	8.9	1
1	28	269	8.9	2
1	29	271	8.8	2
1	30	274	8.7	2
1	31	278	8.6	2
1	32	281	8.6	2
1	33	284	8.5	2
1	34	287	8.4	2
1	35	290	8.4	2
1	36	293	8.4	2
1	37	296	8.4	2
1	38	299	8.5	2
1	39	302	8.6	3
1	40	306	8.7	3
1	41	309	8.9	3
1	42	313	9.2	3
1	43	317	9.6	3
1	44	322	10.0	4
1	45	326	10.0	4
1	46	331	10.0	4
1	47	337	10.0	4
1	48	344	10.0	4
1	49	352	10.0	4
1	50	361	10.0	4
1	51	372	10.0	4
1	52	387	10.0	4
1	53	399	10.0	4
1	54	399	10.0	4
2	0	200	10.0	1
2	1	200	10.0	1
2	2	200	10.0	1
2	3	201	10.0	1
2	4	201	10.0	1
2	5	201	10.0	1
2	6	201	10.0	1
2	7	202	10.0	1
2	8	202	10.0	1
2	9	202	10.0	1
2	10	202	10.0	1
2	11	202	10.0	1
2	12	203	10.0	1
2	13	203	10.0	1
2	14	209	10.0	1
2	15	215	10.0	1
2	16	220	10.0	1
2	17	224	10.0	1
2	18	228	10.0	1
2	19	232	10.0	1
2	20	235	10.0	1
2	21	239	9.6	1
2	22	242	9.2	1
2	23	245	8.9	1
2	24	248	8.7	1
2	25	251	8.5	1
2	26	254	8.4	1
2	27	257	8.4	1
2	28	259	8.4	1
2	29	262	8.4	1
2	30	265	8.4	1
2	31	268	8.5	1
2	32	271	8.6	2
2	33	274	8.6	2
2	34	277	8.7	2
2	35	280	8.8	2
2	36	283	8.9	2
2	37	286	9.0	2

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	38	290	9.1	2
2	39	293	9.3	2
2	40	297	9.5	2
2	41	301	9.7	3
2	42	305	10.0	3
2	43	309	10.0	3
2	44	314	10.0	3
2	45	319	10.0	3
2	46	324	10.0	4
2	47	330	10.0	4
2	48	337	10.0	4
2	49	345	10.0	4
2	50	355	10.0	4
2	51	366	10.0	4
2	52	380	10.0	4
2	53	399	10.0	4
2	54	399	10.0	4
2	55	399	10.0	4
3	0	200	10.0	1
3	1	201	10.0	1
3	2	201	10.0	1
3	3	202	10.0	1
3	4	202	10.0	1
3	5	203	10.0	1
3	6	203	10.0	1
3	7	204	10.0	1
3	8	204	10.0	1
3	9	205	10.0	1
3	10	205	10.0	1
3	11	206	10.0	1
3	12	207	10.0	1
3	13	207	10.0	1
3	14	213	10.0	1
3	15	219	10.0	1
3	16	224	10.0	1
3	17	228	10.0	1
3	18	232	10.0	1
3	19	236	9.9	1
3	20	239	9.4	1
3	21	242	8.9	1
3	22	245	8.5	1
3	23	248	8.3	1
3	24	251	8.1	1
3	25	254	8.0	1
3	26	257	8.1	1
3	27	260	8.2	1
3	28	263	8.3	1
3	29	266	8.5	1
3	30	269	8.6	2
3	31	272	8.7	2
3	32	275	8.8	2
3	33	278	8.9	2
3	34	281	9.0	2
3	35	285	9.1	2
3	36	288	9.3	2
3	37	292	9.4	2
3	38	295	9.6	2
3	39	299	9.7	2
3	40	303	9.9	3
3	41	307	10.0	3
3	42	311	10.0	3
3	43	316	10.0	3
3	44	321	10.0	3
3	45	327	10.0	4
3	46	333	10.0	4
3	47	340	10.0	4
3	48	349	10.0	4
3	49	359	10.0	4
3	50	371	10.0	4
3	51	389	10.0	4
3	52	399	10.0	4
3	53	399	10.0	4

Table O-14. 2016–17 OSTP: Raw to Scaled Score Correspondence—ELA Grade 10

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	200	10.0	1
1	3	200	10.0	1
1	4	200	10.0	1
1	5	200	10.0	1
1	6	200	10.0	1
1	7	200	10.0	1
1	8	201	10.0	1
1	9	201	10.0	1
1	10	201	10.0	1
1	11	201	10.0	1
1	12	201	10.0	1
1	13	201	10.0	1
1	14	201	10.0	1
1	15	201	10.0	1
1	16	209	10.0	1
1	17	216	10.0	1
1	18	222	10.0	1
1	19	227	10.0	1
1	20	232	10.0	1
1	21	236	10.0	1
1	22	240	10.0	1
1	23	244	10.0	1
1	24	247	10.0	1
1	25	250	10.0	1
1	26	253	10.0	1
1	27	256	9.7	1
1	28	259	9.3	1
1	29	262	8.9	1
1	30	264	8.6	2
1	31	266	8.3	2
1	32	269	8.1	2
1	33	271	7.9	2
1	34	273	7.7	2
1	35	275	7.6	2
1	36	277	7.4	2
1	37	279	7.3	2
1	38	281	7.2	2
1	39	283	7.1	2
1	40	285	7.0	2
1	41	287	7.0	2
1	42	289	6.9	2
1	43	291	6.9	2
1	44	293	6.9	2
1	45	295	6.9	2
1	46	297	6.8	2
1	47	299	6.8	2
1	48	301	6.9	3
1	49	303	6.9	3
1	50	305	6.9	3
1	51	307	6.9	3
1	52	309	7.0	3
1	53	311	7.0	3
1	54	313	7.1	3
1	55	316	7.2	3
1	56	318	7.3	3
1	57	321	7.5	3
1	58	323	7.6	4
1	59	326	7.9	4
1	60	329	8.2	4
1	61	332	8.6	4
1	62	336	9.1	4
1	63	340	9.7	4
1	64	344	10.0	4
1	65	349	10.0	4
1	66	355	10.0	4
1	67	362	10.0	4
1	68	370	10.0	4
1	69	381	10.0	4
1	70	396	10.0	4
1	71	399	10.0	4
1	72	399	10.0	4
2	0	200	10.0	1
2	1	200	10.0	1
2	2	200	10.0	1
2	3	201	10.0	1
2	4	201	10.0	1
2	5	201	10.0	1
2	6	201	10.0	1
2	7	201	10.0	1
2	8	201	10.0	1
2	9	202	10.0	1
2	10	202	10.0	1
2	11	202	10.0	1
2	12	202	10.0	1
2	13	202	10.0	1
2	14	202	10.0	1
2	15	203	10.0	1
2	16	210	10.0	1
2	17	217	10.0	1
2	18	223	10.0	1
2	19	228	10.0	1

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
2	20	233	10.0	1
2	21	237	10.0	1
2	22	241	10.0	1
2	23	245	10.0	1
2	24	248	10.0	1
2	25	251	10.0	1
2	26	254	10.0	1
2	27	257	9.9	1
2	28	260	9.5	1
2	29	263	9.1	2
2	30	265	8.9	2
2	31	268	8.6	2
2	32	270	8.4	2
2	33	273	8.2	2
2	34	275	8.0	2
2	35	277	7.9	2
2	36	279	7.8	2
2	37	282	7.7	2
2	38	284	7.6	2
2	39	286	7.5	2
2	40	288	7.4	2
2	41	290	7.4	2
2	42	292	7.3	2
2	43	294	7.3	2
2	44	296	7.2	2
2	45	298	7.2	2
2	46	301	7.1	3
2	47	303	7.1	3
2	48	305	7.1	3
2	49	307	7.1	3
2	50	309	7.1	3
2	51	311	7.2	3
2	52	314	7.2	3
2	53	316	7.3	3
2	54	318	7.4	3
2	55	321	7.5	3
2	56	324	7.6	4
2	57	326	7.8	4
2	58	329	8.0	4
2	59	332	8.3	4
2	60	335	8.6	4
2	61	339	9.0	4
2	62	343	9.5	4
2	63	347	10.0	4
2	64	351	10.0	4
2	65	357	10.0	4
2	66	363	10.0	4
2	67	370	10.0	4
2	68	379	10.0	4
2	69	390	10.0	4
2	70	399	10.0	4
2	71	399	10.0	4
2	72	399	10.0	4
3	0	200	10.0	1
3	1	200	10.0	1
3	2	200	10.0	1
3	3	201	10.0	1
3	4	201	10.0	1
3	5	201	10.0	1
3	6	201	10.0	1
3	7	201	10.0	1
3	8	201	10.0	1
3	9	202	10.0	1
3	10	202	10.0	1
3	11	202	10.0	1
3	12	202	10.0	1
3	13	202	10.0	1
3	14	202	10.0	1
3	15	203	10.0	1
3	16	203	10.0	1
3	17	211	10.0	1
3	18	217	10.0	1
3	19	223	10.0	1
3	20	229	10.0	1
3	21	234	10.0	1
3	22	238	10.0	1
3	23	242	10.0	1
3	24	246	10.0	1
3	25	249	10.0	1
3	26	252	10.0	1
3	27	256	10.0	1
3	28	259	9.9	1
3	29	261	9.5	1
3	30	264	9.2	2
3	31	267	8.9	2
3	32	269	8.6	2
3	33	271	8.4	2
3	34	274	8.2	2
3	35	276	8.0	2
3	36	278	7.9	2
3	37	281	7.8	2
3	38	283	7.7	2
3	39	285	7.7	2
3	40	287	7.6	2
3	41	289	7.6	2
3	42	292	7.6	2
3	43	294	7.5	2

continued

Form	Raw Score	Scaled Score	Standard Error	Perf Level
3	44	296	7.5	2
3	45	298	7.5	2
3	46	300	7.5	3
3	47	303	7.6	3
3	48	305	7.6	3
3	49	307	7.6	3
3	50	309	7.7	3
3	51	312	7.7	3
3	52	314	7.8	3
3	53	317	7.8	3
3	54	319	7.9	3
3	55	322	8.0	3
3	56	325	8.1	4
3	57	328	8.2	4
3	58	331	8.4	4
3	59	334	8.6	4
3	60	337	8.9	4
3	61	341	9.2	4
3	62	344	9.7	4
3	63	348	10.0	4
3	64	353	10.0	4
3	65	358	10.0	4
3	66	364	10.0	4
3	67	370	10.0	4
3	68	378	10.0	4
3	69	388	10.0	4
3	70	399	10.0	4
3	71	399	10.0	4
3	72	399	10.0	4
3	73	399	10.0	4

Table O-15. 2016–17 OSTP: Raw to Scaled Score Correspondence—Science Grade 5

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	201	10.0	1
1	2	202	10.0	1
1	3	203	10.0	1
1	4	204	10.0	1
1	5	205	10.0	1
1	6	206	10.0	1
1	7	207	10.0	1
1	8	208	10.0	1
1	9	209	10.0	1
1	10	210	10.0	1
1	11	228	10.0	1
1	12	238	10.0	1
1	13	245	10.0	1
1	14	251	10.0	1
1	15	256	10.0	1
1	16	261	10.0	1
1	17	265	10.0	1
1	18	268	9.5	1
1	19	271	9.2	1
1	20	275	8.9	2
1	21	278	8.8	2
1	22	282	8.6	2
1	23	285	8.5	2
1	24	288	8.4	2
1	25	291	8.3	2
1	26	294	8.2	2
1	27	297	8.2	2
1	28	299	8.1	2
1	29	303	8.1	3
1	30	306	8.1	3
1	31	309	8.1	3
1	32	312	8.1	3
1	33	315	8.2	3
1	34	318	8.3	3
1	35	322	8.5	3
1	36	325	8.7	3
1	37	329	8.9	3
1	38	333	9.3	4
1	39	338	9.9	4
1	40	343	10.0	4
1	41	349	10.0	4
1	42	357	10.0	4
1	43	368	10.0	4
1	44	388	10.0	4
1	45	399	10.0	4

Table O-16. 2016–17 OSTP: Raw to Scaled Score Correspondence—Science Grade 8

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	200	10.0	1
1	2	200	10.0	1
1	3	200	10.0	1
1	4	200	10.0	1
1	5	200	10.0	1
1	6	201	10.0	1
1	7	201	10.0	1
1	8	201	10.0	1
1	9	201	10.0	1
1	10	218	10.0	1
1	11	229	10.0	1
1	12	238	10.0	1
1	13	244	10.0	1
1	14	250	10.0	1
1	15	255	10.0	1
1	16	260	10.0	1
1	17	264	10.0	1
1	18	268	10.0	1
1	19	271	10.0	1
1	20	274	9.6	1
1	21	277	9.2	1
1	22	280	8.8	1
1	23	283	8.5	1
1	24	286	8.3	2
1	25	289	8.1	2
1	26	291	8.0	2
1	27	294	7.8	2
1	28	296	7.8	2
1	29	299	7.7	2
1	30	302	7.7	3
1	31	304	7.8	3
1	32	307	7.8	3
1	33	310	7.9	3
1	34	313	8.0	3
1	35	316	8.2	3
1	36	319	8.3	3
1	37	322	8.5	3
1	38	326	8.7	3
1	39	329	8.9	4
1	40	333	9.2	4
1	41	337	9.5	4
1	42	342	10.0	4
1	43	347	10.0	4
1	44	354	10.0	4
1	45	362	10.0	4
1	46	373	10.0	4
1	47	393	10.0	4
1	48	399	10.0	4
2	0	200	10.0	1
2	1	202	10.0	1
2	2	203	10.0	1
2	3	205	10.0	1
2	4	206	10.0	1
2	5	208	10.0	1
2	6	209	10.0	1
2	7	211	10.0	1
2	8	212	10.0	1
2	9	214	10.0	1
2	10	233	10.0	1
2	11	245	10.0	1
2	12	253	10.0	1
2	13	260	10.0	1
2	14	265	10.0	1
2	15	270	10.0	1
2	16	274	10.0	1
2	17	278	10.0	1
2	18	281	9.4	1
2	19	285	8.9	2
2	20	288	8.6	2
2	21	291	8.4	2
2	22	294	8.2	2
2	23	297	8.1	2
2	24	299	8.0	2
2	25	302	8.0	3
2	26	305	8.0	3
2	27	308	8.1	3
2	28	311	8.1	3
2	29	314	8.3	3
2	30	318	8.4	3
2	31	321	8.6	3
2	32	324	8.8	3
2	33	328	9.0	4
2	34	332	9.2	4
2	35	336	9.6	4
2	36	341	10.0	4
2	37	347	10.0	4
2	38	353	10.0	4
2	39	361	10.0	4
2	40	372	10.0	4
2	41	393	10.0	4
2	42	399	10.0	4

Table O-17. 2016–17 OSTP: Raw to Scaled Score Correspondence—Science Grade 10

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	200	10.0	1
1	1	201	10.0	1
1	2	202	10.0	1
1	3	203	10.0	1
1	4	204	10.0	1
1	5	205	10.0	1
1	6	207	10.0	1
1	7	208	10.0	1
1	8	209	10.0	1
1	9	210	10.0	1
1	10	211	10.0	1
1	11	212	10.0	1
1	12	213	10.0	1
1	13	224	10.0	1
1	14	232	10.0	1
1	15	240	10.0	1
1	16	246	10.0	1
1	17	252	10.0	1
1	18	258	10.0	1
1	19	263	10.0	1
1	20	267	10.0	1
1	21	271	10.0	1
1	22	275	10.0	1
1	23	279	10.0	2
1	24	283	10.0	2
1	25	286	10.0	2
1	26	290	10.0	2
1	27	293	9.8	2
1	28	297	9.6	2
1	29	300	9.4	3
1	30	303	9.3	3
1	31	307	9.3	3
1	32	310	9.4	3
1	33	314	9.6	3
1	34	318	9.8	3
1	35	322	10.0	3
1	36	326	10.0	4
1	37	331	10.0	4
1	38	336	10.0	4
1	39	342	10.0	4
1	40	349	10.0	4
1	41	357	10.0	4
1	42	366	10.0	4
1	43	379	10.0	4
1	44	397	10.0	4
1	45	399	10.0	4
1	46	399	10.0	4
1	47	399	10.0	4
2	0	200	10.0	1
2	1	201	10.0	1
2	2	203	10.0	1
2	3	204	10.0	1
2	4	205	10.0	1
2	5	206	10.0	1
2	6	208	10.0	1
2	7	209	10.0	1
2	8	210	10.0	1
2	9	211	10.0	1
2	10	213	10.0	1
2	11	214	10.0	1
2	12	227	10.0	1
2	13	237	10.0	1
2	14	245	10.0	1
2	15	252	10.0	1
2	16	259	10.0	1
2	17	264	10.0	1
2	18	269	10.0	1
2	19	274	10.0	1
2	20	278	10.0	2
2	21	282	10.0	2
2	22	286	10.0	2
2	23	290	10.0	2
2	24	294	10.0	2
2	25	298	9.8	2
2	26	301	9.6	3
2	27	305	9.5	3
2	28	309	9.6	3
2	29	313	9.7	3
2	30	317	10.0	3
2	31	321	10.0	3
2	32	326	10.0	4
2	33	331	10.0	4
2	34	337	10.0	4
2	35	343	10.0	4
2	36	351	10.0	4
2	37	361	10.0	4
2	38	374	10.0	4
2	39	393	10.0	4
2	40	399	10.0	4
2	41	399	10.0	4

Table O-18. 2016–17 OSTP: Raw to Scaled Score Correspondence—U.S. History Grade 10

Form	Raw Score	Scaled Score	Standard Error	Perf Level
1	0	440	59.0	1
1	1	440	59.0	1
1	2	440	59.0	1
1	3	440	59.0	1
1	4	440	59.0	1
1	5	440	59.0	1
1	6	440	59.0	1
1	7	440	59.0	1
1	8	440	59.0	1
1	9	440	59.0	1
1	10	440	59.0	1
1	11	440	59.0	1
1	12	440	59.0	1
1	13	440	59.0	1
1	14	463	59.0	1
1	15	490	59.0	1
1	16	522	59.0	1
1	17	546	47.5	1
1	18	564	39.2	1
1	19	579	33.8	1
1	20	591	30.0	1
1	21	602	27.3	1
1	22	611	25.2	1
1	23	619	23.6	1
1	24	627	22.2	1
1	25	634	21.0	1
1	26	640	20.0	1
1	27	646	19.1	1
1	28	652	18.3	1
1	29	657	17.6	1
1	30	662	16.9	1
1	31	667	16.3	1
1	32	672	15.8	2
1	33	676	15.4	2
1	34	681	15.0	2
1	35	685	14.6	2
1	36	690	14.3	2
1	37	694	14.1	2
1	38	698	13.9	2
1	39	702	13.8	3
1	40	707	13.7	3
1	41	711	13.7	3
1	42	716	13.7	3
1	43	720	13.8	3
1	44	725	14.0	3
1	45	730	14.2	3
1	46	735	14.5	3
1	47	740	14.9	3
1	48	746	15.4	3
1	49	752	16.1	3
1	50	758	16.9	3
1	51	766	18.0	4
1	52	774	19.4	4
1	53	784	21.2	4
1	54	795	23.6	4
1	55	808	26.9	4
1	56	826	31.6	4
1	57	849	38.8	4
1	58	884	52.4	4
1	59	935	59.0	4
1	60	999	59.0	4

APPENDIX P—PERFORMANCE LEVEL DISTRIBUTIONS

Table P-1. 2016–17 OSTP: Performance Level Distributions by Grade—Mathematics

Grade	Performance Level	% in Level *2016-17*
3	1	20.57
	2	35.24
	3	27.20
	4	16.99
4	1	23.57
	2	35.90
	3	26.57
	4	13.96
5	1	21.72
	2	43.20
	3	22.97
	4	12.11
6	1	22.34
	2	42.26
	3	29.27
	4	6.12
7	1	35.41
	2	30.81
	3	26.79
	4	6.99
8	1	49.41
	2	27.61
	3	12.46
	4	10.51
10	1	54.20
	2	19.88
	3	16.59
	4	9.34

Table P-2. 2016–17 OSTP: Performance Level Distributions by Grade—ELA

Grade	Performance Level	% in Level *2016-17*
3	1	29.59
	2	31.80
	3	31.01
	4	7.60
4	1	28.94
	2	34.01
	3	30.41
	4	6.64
5	1	21.19
	2	38.98
	3	27.65
	4	12.18

continued

Grade	Performance Level	% in Level *2016-17*
6	1	18.15
	2	41.48
	3	30.99
	4	9.38
7	1	29.60
	2	36.72
	3	22.52
	4	11.17
8	1	23.12
	2	42.35
	3	23.34
	4	11.19
10	1	20.10
	2	44.24
	3	25.99
	4	9.67

Table P-3. 2016–17 OSTP: Performance Level Distributions by Grade—Science

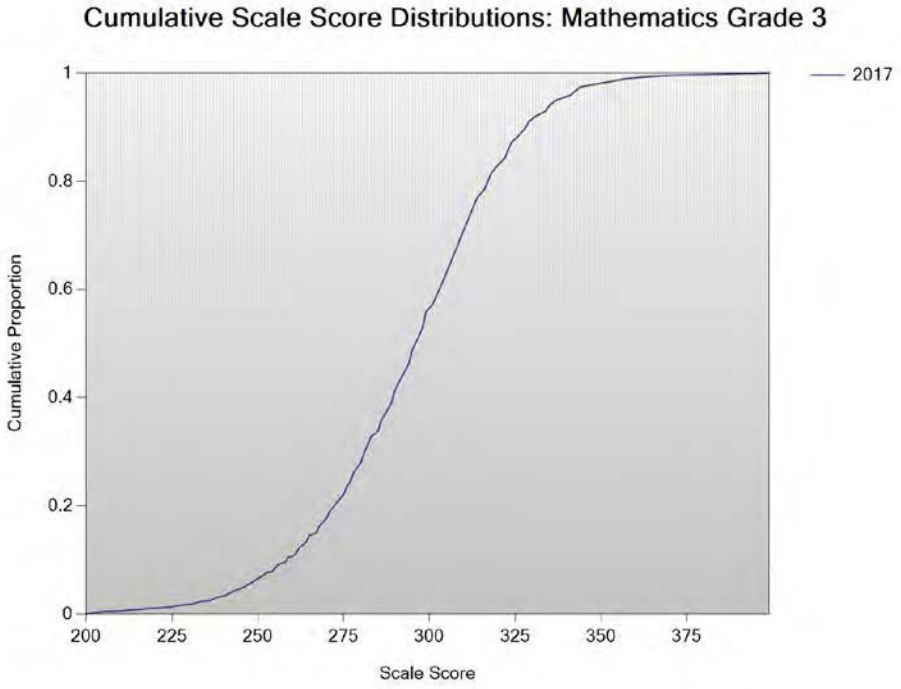
Grade	Performance Level	% in Level *2016-17*
5	1	21.55
	2	35.46
	3	33.62
	4	9.37
8	1	38.12
	2	21.26
	3	29.89
	4	10.73
10	1	60.27
	2	20.89
	3	14.52
	4	4.32

Table P-4. 2016–17 OSTP: Performance Level Distributions by Grade—U.S. History

Grade	Performance Level	% in Level *2016-17*
10	1	31.78
	2	17.57
	3	36.66
	4	13.99

APPENDIX Q—CUMULATIVE SCORE DISTRIBUTIONS

Figure Q-1. 2016–17 OSTP: Cumulative Score Distribution Plots
Top: Mathematics Grade 3 Bottom: Mathematics Grade 4



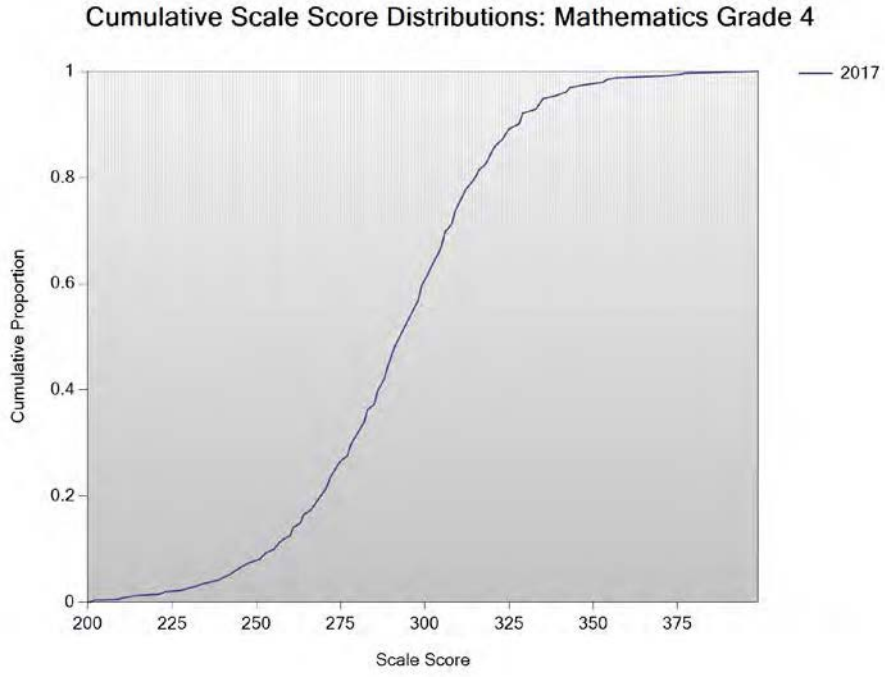
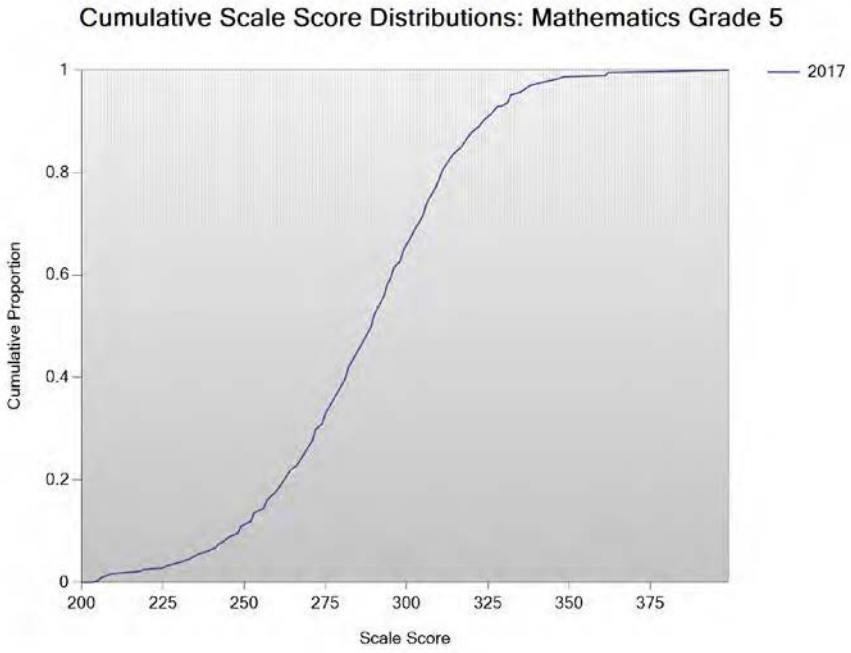


Figure Q-2. 2016–17 OSTP: Cumulative Score Distribution Plots
Top: Mathematics Grade 5 Bottom: Mathematics Grade 6



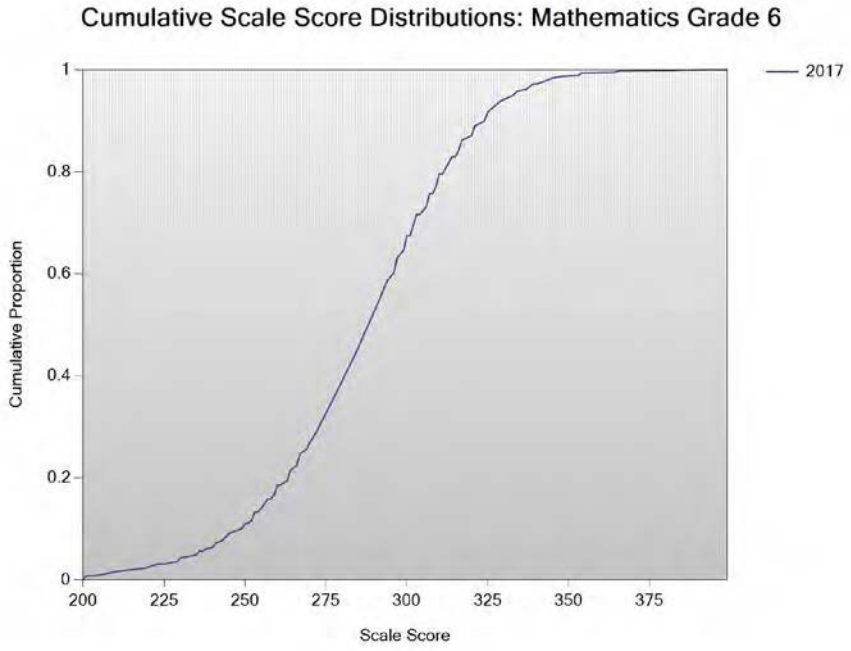
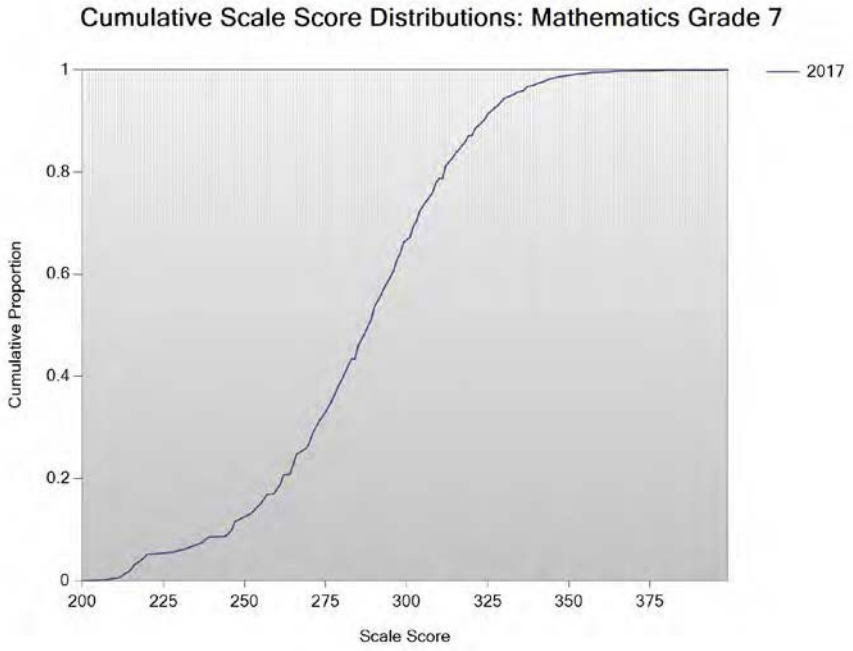


Figure Q-3. 2016–17 OSTP: Cumulative Score Distribution Plots
Top: Mathematics Grade 7 Bottom: Mathematics Grade 8



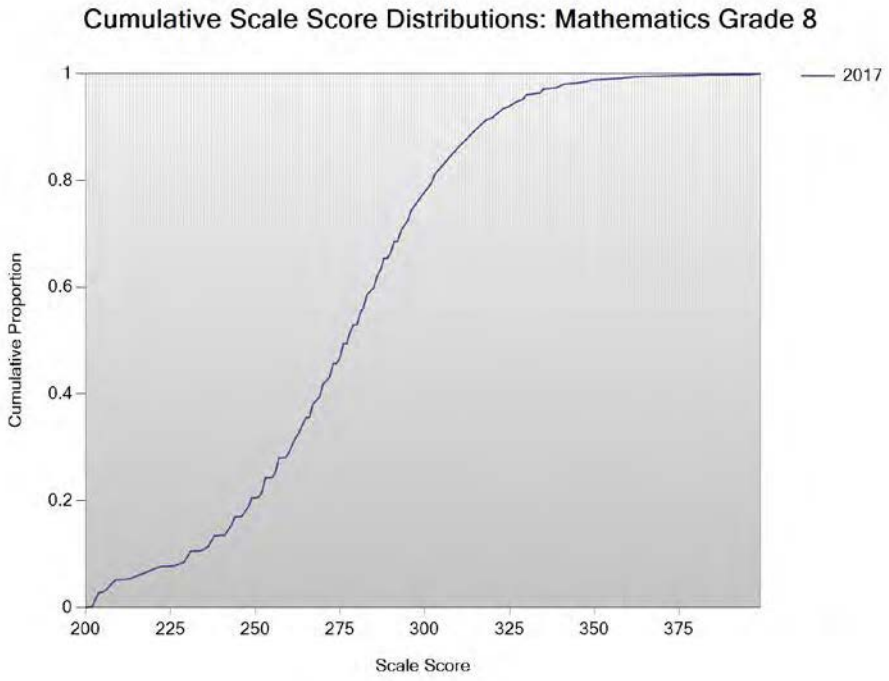


Figure Q-4. 2016–17 OSTP: Cumulative Score Distribution Plots
Mathematics Grade 10

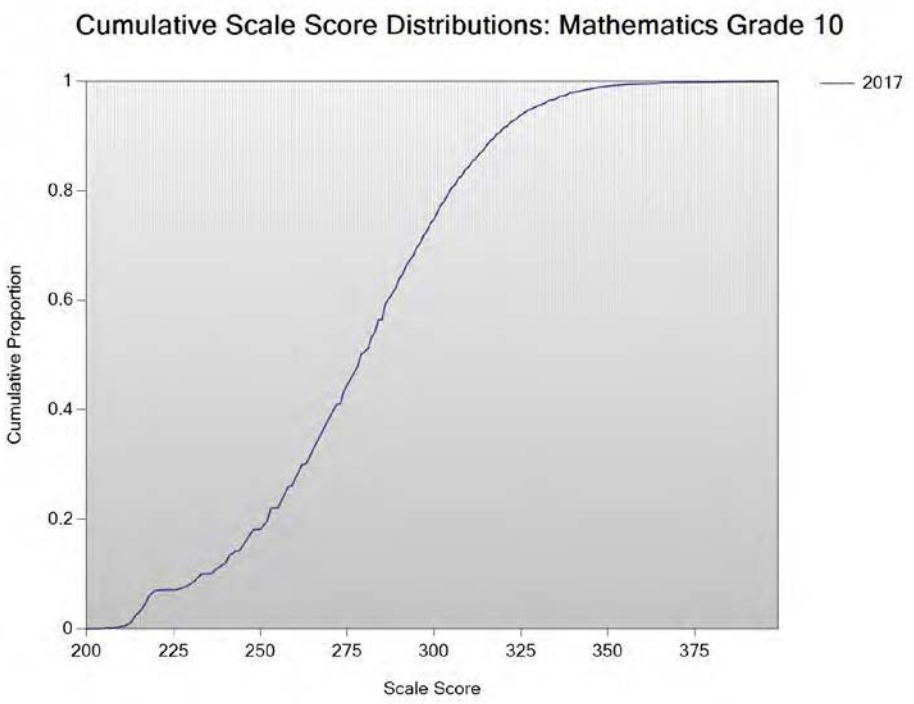
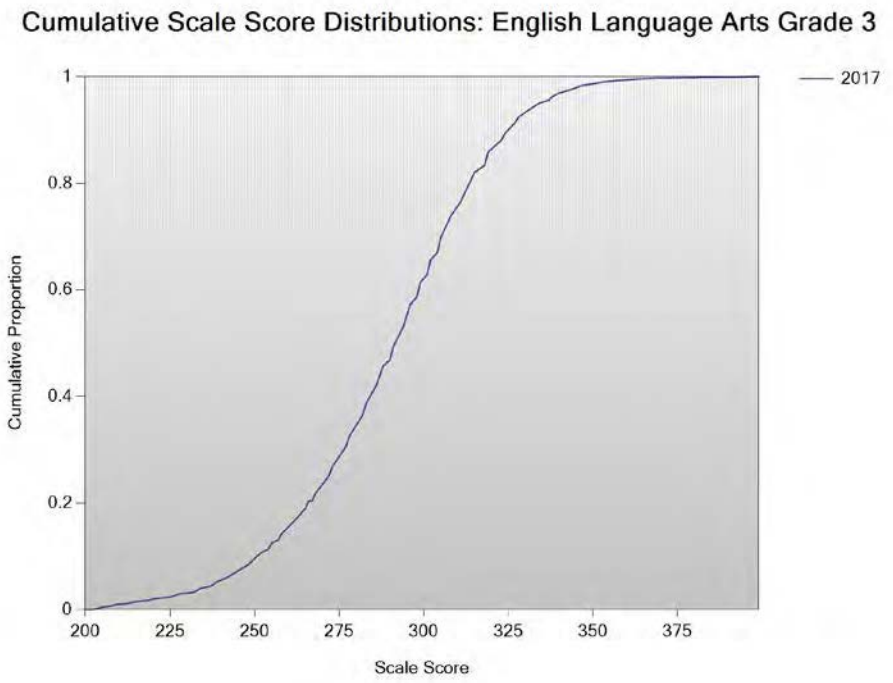


Figure Q-5. 2016–17 OSTP: Cumulative Score Distribution Plots
Top: ELA Grade 3 Bottom: ELA Grade 4



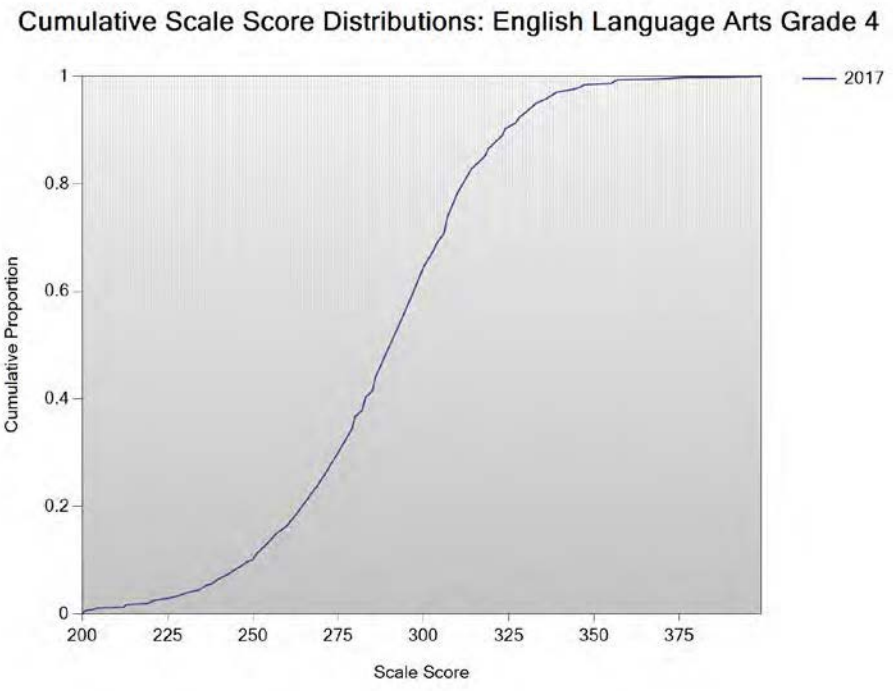
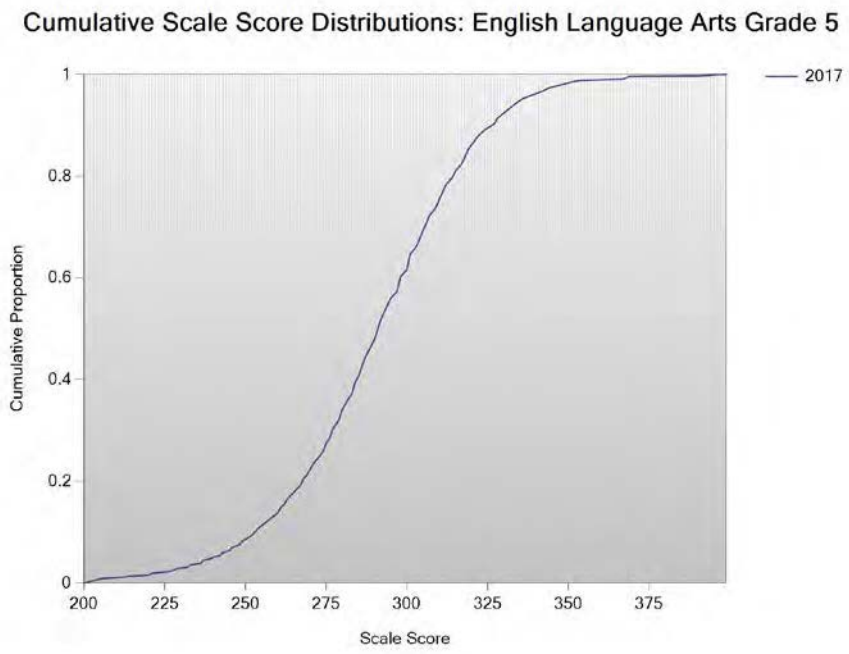


Figure Q-6. 2016–17 OSTP: Cumulative Score Distribution Plots
Top: ELA Grade 5 Bottom: ELA Grade 6



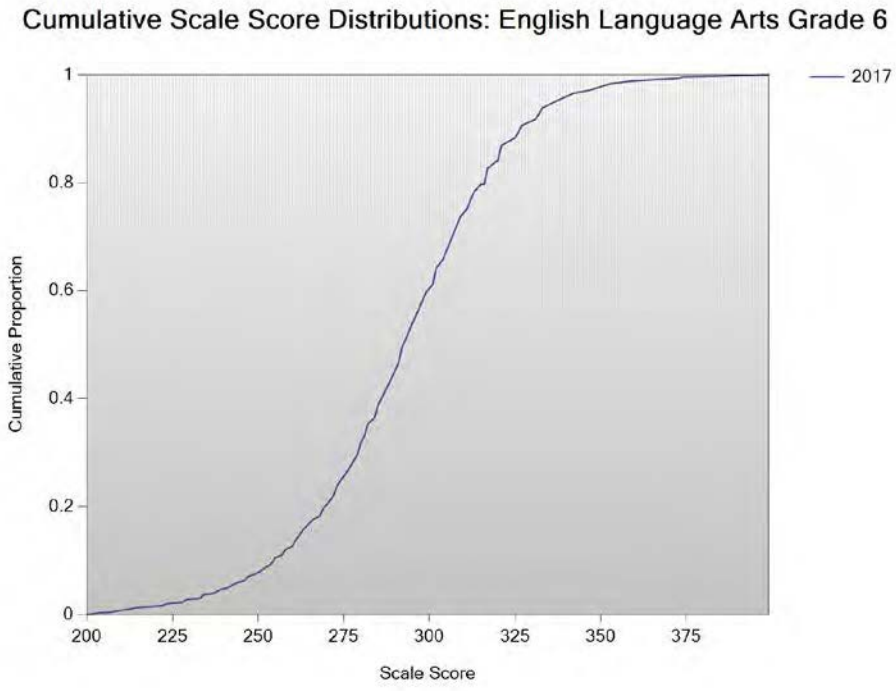
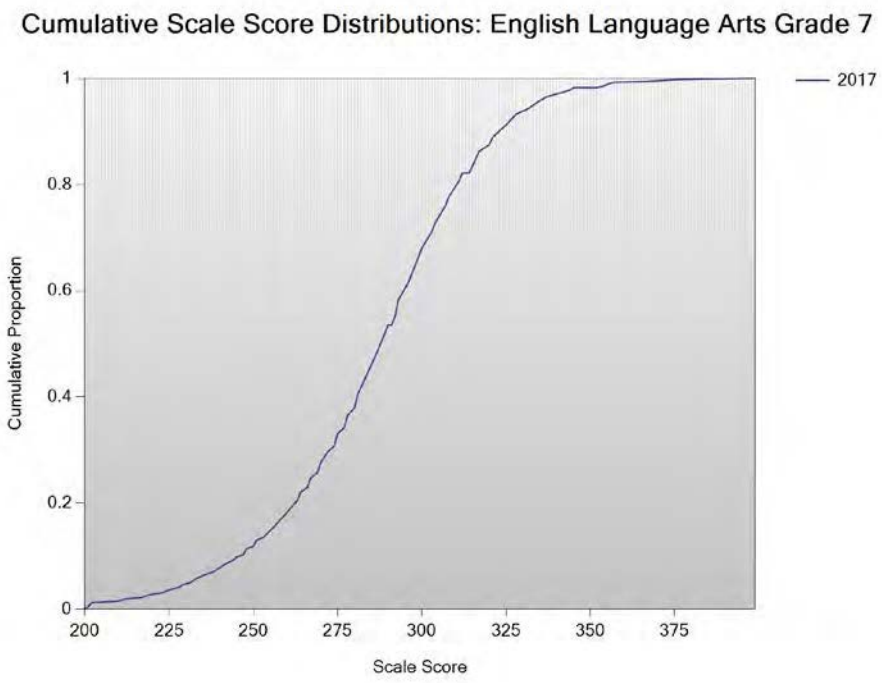


Figure Q-7. 2016–17 OSTP: Cumulative Score Distribution Plots
Top: ELA Grade 7 Bottom: ELA Grade 8



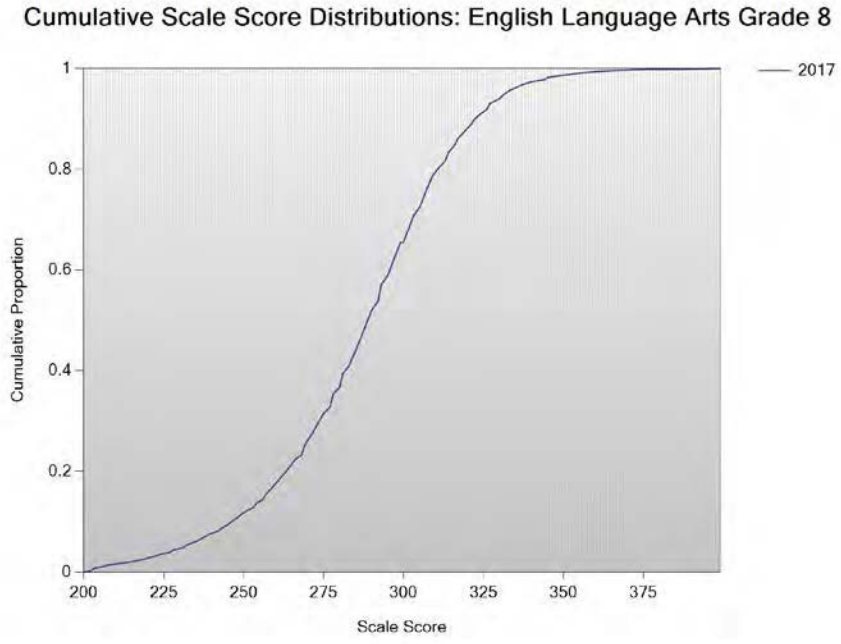


Figure Q-8. 2016–17 OSTP: Cumulative Score Distribution Plots
ELA Grade 10

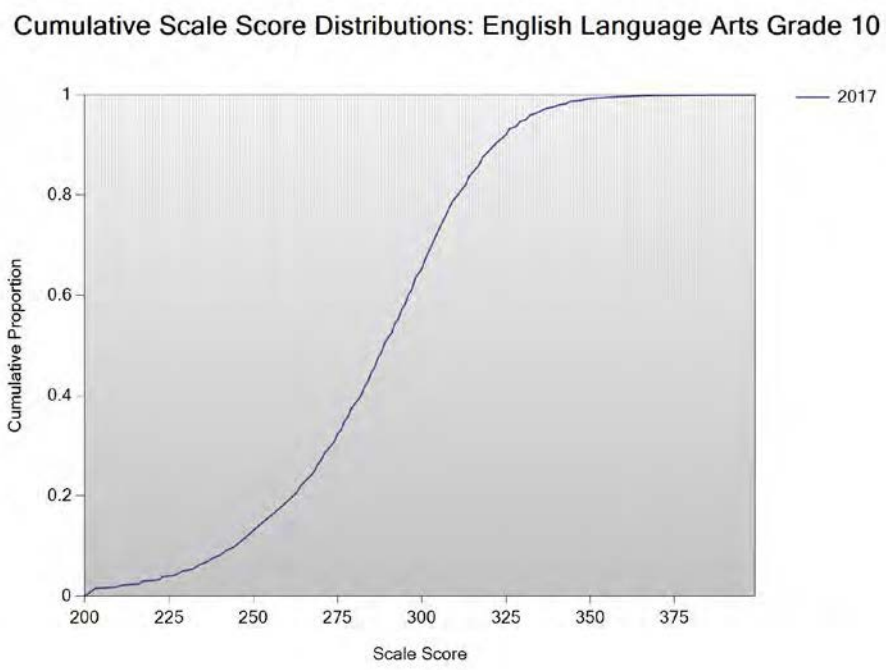
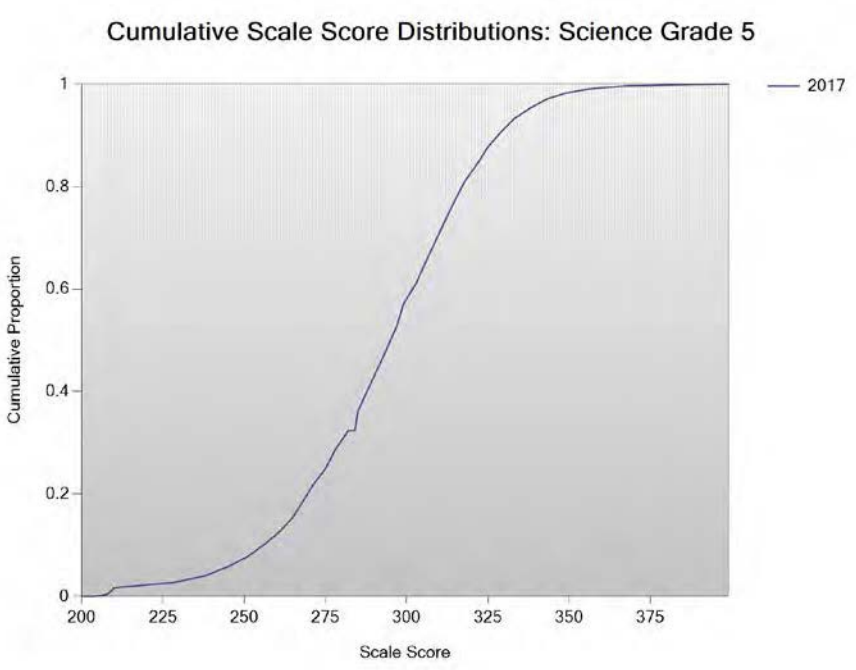


Figure Q-9. 2016–17 OSTP: Cumulative Score Distribution Plots
Top: Science Grade 5 Bottom: Science Grade 8



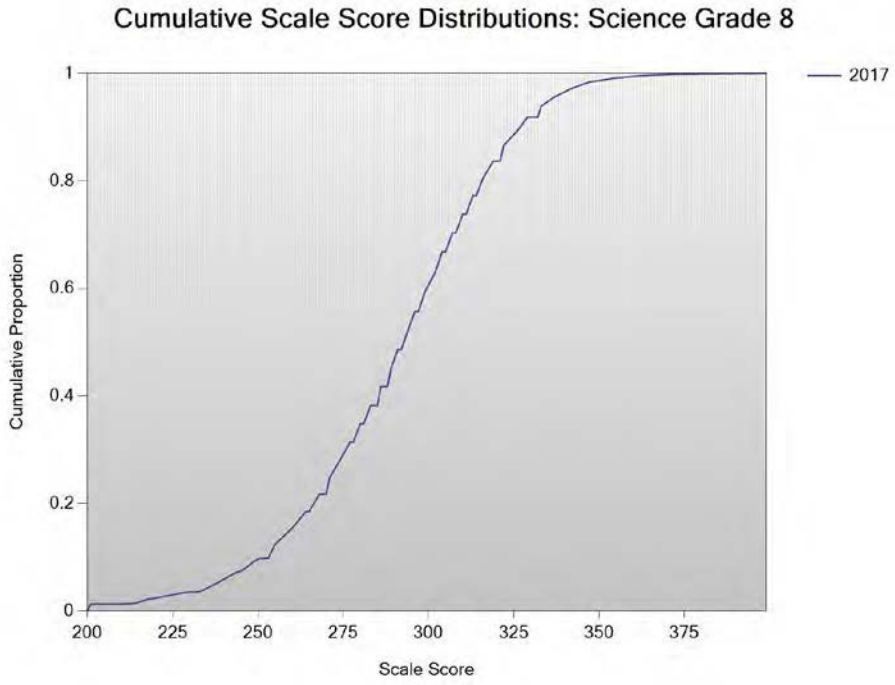


Figure Q-10. 2016–17 OSTP: Cumulative Score Distribution Plots
Science Grade 10

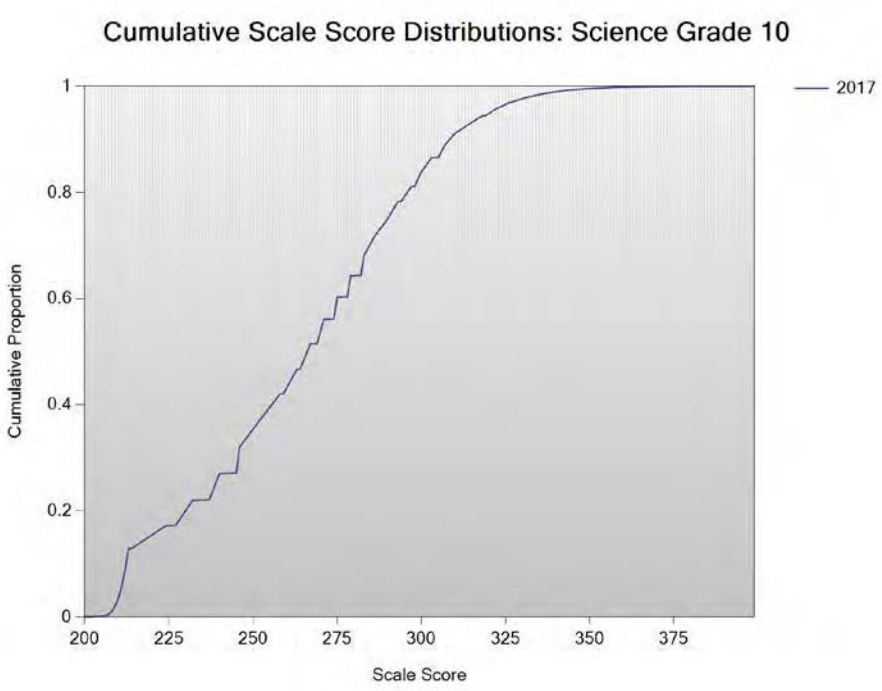
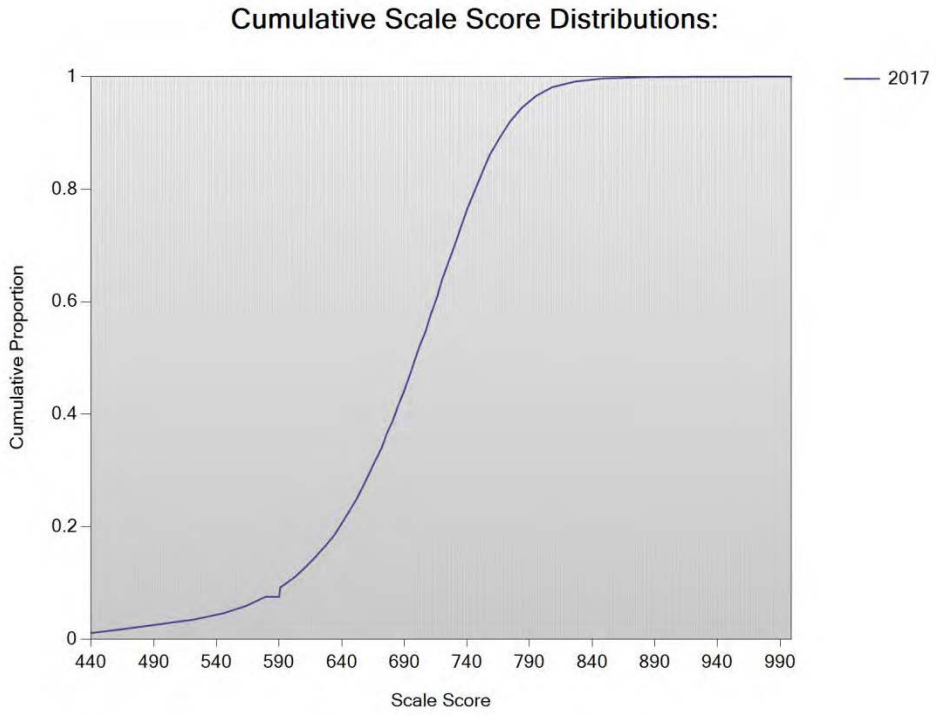


Figure Q-11. 2016–17 OSTP: Cumulative Score Distribution Plots
U.S. History Grade 10



APPENDIX R—CLASSICAL RELIABILTY

Table R-1. 2016–17 OSTP: Subgroup Reliabilities
Grade 3—Mathematics

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	11,363	50	33.52	9.60	0.92	2.79
	Black/African American	1,542	50	29.01	10.27	0.92	2.94
	American Indian/Alaskan Native	2,277	50	35.35	8.92	0.91	2.72
	Hispanic or Latino	3,334	50	32.11	9.55	0.91	2.86
	Asian	308	50	39.49	8.76	0.92	2.41
	Pacific Islander	70	50	31.74	8.20	0.87	2.90
	White/Caucasian	8,237	50	37.64	8.55	0.91	2.58
	Two or More Races	1,761	50	35.17	9.49	0.92	2.71
	Female	8,476	50	34.89	9.47	0.92	2.72
	Male	9,049	50	35.67	9.52	0.92	2.68
	All Students	17,529	50	35.29	9.50	0.92	2.70
	English Language Learners (ELL)	2,177	50	30.05	9.47	0.90	2.94
	Individual Education Program (IEP)	3,363	50	29.57	10.37	0.92	2.95
	Plan 504	328	50	35.20	8.52	0.90	2.76
2	Economically Disadvantaged	11,297	50	32.10	8.72	0.89	2.84
	Black/African American	1,565	50	28.65	9.08	0.90	2.94
	American Indian/Alaskan Native	2,264	50	33.48	8.55	0.89	2.78
	Hispanic or Latino	3,087	50	30.80	8.82	0.89	2.88
	Asian	316	50	38.36	7.88	0.90	2.52
	Pacific Islander	53	50	30.96	7.39	0.85	2.87
	White/Caucasian	8,443	50	35.79	8.17	0.89	2.67
	Two or More Races	1,829	50	34.04	8.45	0.89	2.76
	Female	8,733	50	33.41	8.86	0.90	2.78
	Male	8,823	50	34.25	8.73	0.90	2.73
	All Students	17,557	50	33.83	8.80	0.90	2.76
	English Language Learners (ELL)	1,846	50	28.68	8.43	0.88	2.95
	Individual Education Program (IEP)	2,957	50	28.79	9.33	0.90	2.98
	Plan 504	348	50	32.87	7.95	0.87	2.81
3	Economically Disadvantaged	11,180	50	32.45	9.31	0.91	2.81
	Black/African American	1,474	50	28.67	10.00	0.91	2.93
	American Indian/Alaskan Native	2,238	50	34.28	8.77	0.90	2.74
	Hispanic or Latino	3,278	50	31.45	9.37	0.91	2.85
	Asian	351	50	37.85	8.33	0.91	2.52
	Pacific Islander	56	50	29.00	9.34	0.91	2.88
	White/Caucasian	8,266	50	36.15	8.66	0.91	2.63
	Two or More Races	1,780	50	34.50	9.03	0.91	2.71
	Female	8,533	50	33.95	9.31	0.91	2.74
	Male	8,904	50	34.52	9.28	0.91	2.71
	All Students	17,443	50	34.24	9.30	0.91	2.73
	English Language Learners (ELL)	2,059	50	29.25	9.17	0.90	2.93
	Individual Education Program (IEP)	2,949	50	28.71	10.22	0.92	2.94
	Plan 504	301	50	33.49	8.52	0.89	2.80

Table R-2. 2016–17 OSTP: Subgroup Reliabilities
Grade 4—Mathematics

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	10,871	50	29.74	8.67	0.88	3.00
	Black/African American	1,442	50	26.70	8.76	0.88	3.06
	American Indian/Alaskan Native	2,277	50	31.33	8.48	0.88	2.96
	Hispanic or Latino	3,168	50	29.02	8.56	0.88	3.01
	Asian	325	50	36.60	8.81	0.91	2.68
	Pacific Islander	57	50	30.14	9.19	0.89	3.00
	White/Caucasian	8,122	50	33.26	8.90	0.90	2.87
	Two or More Races	1,713	50	32.07	8.83	0.89	2.93
	Female	8,341	50	31.16	8.80	0.89	2.94
	Male	8,755	50	32.02	9.26	0.90	2.92
	All Students	17,104	50	31.60	9.05	0.90	2.93
	English Language Learners (ELL)	1,486	50	25.36	7.69	0.84	3.10
	Individual Education Program (IEP)	3,325	50	25.97	8.63	0.87	3.10
	Plan 504	381	50	30.96	8.31	0.87	2.99
2	Economically Disadvantaged	10,841	50	32.56	8.58	0.89	2.89
	Black/African American	1,504	50	28.82	8.85	0.89	3.00
	American Indian/Alaskan Native	2,237	50	33.92	8.30	0.88	2.84
	Hispanic or Latino	3,037	50	32.00	8.64	0.89	2.91
	Asian	348	50	39.68	7.95	0.90	2.46
	Pacific Islander	59	50	30.78	9.71	0.91	2.97
	White/Caucasian	8,308	50	35.88	8.20	0.89	2.73
	Two or More Races	1,600	50	34.35	8.26	0.88	2.82
	Female	8,449	50	33.84	8.48	0.89	2.82
	Male	8,639	50	34.61	8.85	0.90	2.80
	All Students	17,093	50	34.23	8.68	0.90	2.81
	English Language Learners (ELL)	1,263	50	28.58	8.40	0.87	3.03
	Individual Education Program (IEP)	2,780	50	29.15	9.05	0.89	3.00
	Plan 504	305	50	33.55	8.48	0.89	2.87
3	Economically Disadvantaged	10,678	50	31.02	9.05	0.89	2.97
	Black/African American	1,465	50	27.54	9.32	0.89	3.04
	American Indian/Alaskan Native	2,251	50	32.46	8.82	0.89	2.91
	Hispanic or Latino	3,116	50	30.31	9.14	0.89	2.97
	Asian	319	50	38.94	8.24	0.90	2.55
	Pacific Islander	50	50	28.82	9.75	0.90	3.01
	White/Caucasian	8,160	50	34.92	8.83	0.90	2.81
	Two or More Races	1,642	50	33.21	8.88	0.89	2.89
	Female	8,326	50	32.56	9.16	0.90	2.90
	Male	8,674	50	33.43	9.37	0.91	2.86
	All Students	17,003	50	33.00	9.28	0.90	2.88
	English Language Learners (ELL)	1,317	50	26.51	8.54	0.87	3.06
	Individual Education Program (IEP)	2,772	50	26.96	9.37	0.89	3.06
	Plan 504	327	50	32.92	8.51	0.88	2.94

Table R-3. 2016–17 OSTP: Subgroup Reliabilities
Grade 5—Mathematics

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	10,235	50	28.16	9.42	0.90	3.02
	Black/African American	1,442	50	24.97	9.36	0.89	3.06
	American Indian/Alaskan Native	2,195	50	29.43	9.37	0.90	2.98
	Hispanic or Latino	2,927	50	27.81	9.52	0.90	3.02
	Asian	318	50	36.75	9.42	0.92	2.66
	Pacific Islander	48	50	29.33	9.89	0.91	3.02
	White/Caucasian	7,987	50	31.97	9.70	0.91	2.90
	Two or More Races	1,491	50	30.68	9.70	0.91	2.94
	Female	8,011	50	29.98	9.66	0.91	2.95
	Male	8,388	50	30.50	10.10	0.92	2.94
	All Students	16,408	50	30.24	9.89	0.91	2.95
	English Language Learners (ELL)	884	50	22.47	8.11	0.85	3.11
	Individual Education Program (IEP)	3,451	50	23.83	8.81	0.88	3.09
	Plan 504	396	50	29.04	9.27	0.89	3.02
2	Economically Disadvantaged	10,246	49	29.93	8.87	0.89	2.90
	Black/African American	1,461	49	27.27	8.92	0.89	2.96
	American Indian/Alaskan Native	2,276	49	31.18	8.72	0.89	2.86
	Hispanic or Latino	2,957	49	29.68	8.86	0.89	2.91
	Asian	315	49	36.18	9.54	0.93	2.57
	Pacific Islander	59	49	29.83	10.55	0.93	2.83
	White/Caucasian	7,838	49	33.26	8.94	0.90	2.77
	Two or More Races	1,509	49	32.10	8.83	0.90	2.82
	Female	8,144	49	31.58	8.98	0.90	2.83
	Male	8,264	49	31.89	9.27	0.91	2.83
	All Students	16,415	49	31.73	9.13	0.90	2.83
	English Language Learners (ELL)	837	49	24.65	8.08	0.86	3.03
	Individual Education Program (IEP)	2,549	49	25.23	8.72	0.88	3.00
	Plan 504	358	49	30.66	8.98	0.90	2.91
3	Economically Disadvantaged	10,138	50	28.93	8.83	0.89	2.97
	Black/African American	1,404	50	26.18	8.98	0.89	3.01
	American Indian/Alaskan Native	2,348	50	30.05	8.88	0.89	2.93
	Hispanic or Latino	2,972	50	28.75	8.91	0.89	2.97
	Asian	326	50	37.72	9.06	0.92	2.59
	Pacific Islander	58	50	28.40	8.47	0.87	2.99
	White/Caucasian	7,884	50	32.50	8.97	0.90	2.86
	Two or More Races	1,423	50	30.71	9.06	0.90	2.91
	Female	8,129	50	30.86	8.94	0.90	2.89
	Male	8,278	50	30.88	9.51	0.91	2.90
	All Students	16,415	50	30.86	9.23	0.90	2.90
	English Language Learners (ELL)	757	50	23.67	7.91	0.85	3.09
	Individual Education Program (IEP)	2,393	50	24.22	8.62	0.87	3.07
	Plan 504	353	50	30.44	9.09	0.90	2.94

Table R-4. 2016–17 OSTP: Subgroup Reliabilities
Grade 6—Mathematics

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	11,463	48	25.85	8.60	0.88	2.92
	Black/African American	1,560	48	22.96	8.21	0.87	2.97
	American Indian/Alaskan Native	2,695	48	26.96	8.64	0.89	2.90
	Hispanic or Latino	2,919	48	25.71	8.49	0.88	2.92
	Asian	342	48	32.57	9.51	0.92	2.65
	Pacific Islander	75	48	22.15	9.18	0.89	2.99
	White/Caucasian	9,038	48	29.15	8.71	0.89	2.83
	Two or More Races	1,524	48	28.19	8.56	0.89	2.85
	Female	8,631	48	27.51	8.66	0.89	2.87
	Male	9,510	48	27.86	9.06	0.90	2.86
	All Students	18,153	48	27.69	8.87	0.90	2.87
	English Language Learners (ELL)	875	48	19.93	7.18	0.82	3.03
	Individual Education Program (IEP)	4,832	48	20.58	7.74	0.85	3.03
	Plan 504	431	48	28.15	7.95	0.87	2.87
2	Economically Disadvantaged	8,269	48	28.08	7.82	0.87	2.86
	Black/African American	1,105	48	25.10	7.73	0.86	2.94
	American Indian/Alaskan Native	1,960	48	29.26	7.49	0.86	2.82
	Hispanic or Latino	2,295	48	27.45	8.06	0.87	2.88
	Asian	262	48	35.43	7.76	0.89	2.52
	Pacific Islander	35	48	26.17	8.27	0.87	2.95
	White/Caucasian	7,087	48	31.30	7.68	0.87	2.73
	Two or More Races	1,183	48	30.33	7.80	0.87	2.77
	Female	6,893	48	29.31	7.90	0.87	2.81
	Male	7,026	48	30.42	8.10	0.88	2.76
	All Students	13,927	48	29.87	8.02	0.88	2.79
	English Language Learners (ELL)	350	48	21.42	7.64	0.84	3.03
	Individual Education Program (IEP)	944	48	24.27	9.01	0.89	2.96
	Plan 504	309	48	29.68	8.08	0.88	2.79
3	Economically Disadvantaged	8,232	50	29.31	7.60	0.85	2.91
	Black/African American	1,114	50	26.63	7.63	0.85	2.97
	American Indian/Alaskan Native	1,965	50	30.56	7.37	0.85	2.88
	Hispanic or Latino	2,328	50	29.21	7.62	0.85	2.92
	Asian	283	50	36.43	7.61	0.88	2.62
	Pacific Islander	34	50	26.44	9.44	0.90	2.96
	White/Caucasian	7,005	50	32.54	7.51	0.86	2.80
	Two or More Races	1,155	50	31.08	8.00	0.87	2.85
	Female	6,972	50	30.55	7.73	0.86	2.87
	Male	6,901	50	31.79	7.86	0.87	2.82
	All Students	13,884	50	31.17	7.82	0.87	2.85
	English Language Learners (ELL)	386	50	23.44	7.04	0.81	3.06
	Individual Education Program (IEP)	960	50	25.08	8.45	0.87	3.02
	Plan 504	330	50	30.11	7.63	0.86	2.90
4	Economically Disadvantaged	495	48	21.17	8.14	0.86	3.08
	Black/African American	56	48	17.07	6.10	0.75	3.05
	American Indian/Alaskan Native	128	48	23.62	8.74	0.88	3.05

continued

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
4	Hispanic or Latino	153	48	18.84	6.28	0.75	3.12
	White/Caucasian	269	48	22.42	8.51	0.87	3.08
	Two or More Races	47	48	22.55	8.17	0.86	3.09
	Female	269	48	21.35	7.91	0.85	3.08
	Male	395	48	21.36	8.28	0.86	3.08
	All Students	664	48	21.36	8.13	0.86	3.08
	English Language Learners (ELL)	121	48	17.91	5.83	0.72	3.10
	Individual Education Program (IEP)	517	48	21.45	8.22	0.86	3.08
	Plan 504	15	48	28.27	7.99	0.86	3.03

Table R-5. 2016–17 OSTP: Subgroup Reliabilities
Grade 7—Mathematics

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	12,293	50	19.30	8.11	0.86	3.04
	Black/African American	1,723	50	17.12	7.37	0.83	3.00
	American Indian/Alaskan Native	2,810	50	20.93	8.70	0.88	3.05
	Hispanic or Latino	3,296	50	19.49	8.09	0.86	3.04
	Asian	382	50	28.06	10.38	0.92	2.94
	Pacific Islander	79	50	18.62	8.05	0.86	2.97
	White/Caucasian	9,245	50	23.04	9.42	0.90	3.03
	Two or More Races	1,592	50	21.59	9.17	0.89	3.03
	Female	8,958	50	21.82	8.94	0.89	3.03
	Male	10,156	50	21.30	9.36	0.90	3.03
	All Students	19,127	50	21.55	9.17	0.89	3.03
	English Language Learners (ELL)	1,119	50	15.11	5.81	0.74	2.99
	Individual Education Program (IEP)	5,608	50	15.22	6.27	0.77	2.99
	Plan 504	383	50	21.93	8.52	0.87	3.05
2	Economically Disadvantaged	8,490	50	25.81	8.37	0.87	2.99
	Black/African American	1,232	50	23.31	8.15	0.86	3.03
	American Indian/Alaskan Native	2,017	50	27.27	8.57	0.88	2.95
	Hispanic or Latino	2,326	50	25.64	8.38	0.87	3.00
	Asian	317	50	34.39	9.47	0.92	2.67
	Pacific Islander	38	50	21.53	5.48	0.68	3.10
	White/Caucasian	7,166	50	29.79	8.83	0.89	2.89
	Two or More Races	1,134	50	28.20	9.00	0.89	2.92
	Female	7,136	50	27.92	8.77	0.89	2.94
	Male	7,083	50	28.38	9.22	0.90	2.91
	All Students	14,230	50	28.14	9.00	0.89	2.93
	English Language Learners (ELL)	538	50	20.92	7.33	0.82	3.08
	Individual Education Program (IEP)	963	50	21.68	8.45	0.87	3.06
	Plan 504	324	50	27.83	8.67	0.88	2.96
3	Economically Disadvantaged	8,502	50	24.24	8.39	0.87	3.03
	Black/African American	1,224	50	21.27	7.98	0.85	3.04
	American Indian/Alaskan Native	2,087	50	25.70	8.51	0.87	3.01
	Hispanic or Latino	2,409	50	24.07	8.49	0.87	3.03
	Asian	323	50	33.35	9.42	0.91	2.78
	Pacific Islander	34	50	25.79	9.88	0.91	3.03
	White/Caucasian	7,028	50	28.24	8.94	0.89	2.97
	Two or More Races	1,127	50	26.84	8.90	0.89	2.99
	Female	7,124	50	26.28	8.80	0.88	2.99
	Male	7,094	50	26.84	9.33	0.90	2.98
	All Students	14,232	50	26.56	9.07	0.89	2.99
	English Language Learners (ELL)	504	50	18.93	7.01	0.81	3.06
	Individual Education Program (IEP)	1,014	50	20.04	8.55	0.87	3.05
	Plan 504	300	50	25.87	9.59	0.90	2.99
4	Economically Disadvantaged	460	49	16.08	6.50	0.78	3.06
	Black/African American	28	49	13.04	4.31	0.52	2.99

continued

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
4	American Indian/Alaskan Native	111	49	16.81	6.80	0.79	3.09
	Hispanic or Latino	166	49	14.82	6.08	0.75	3.02
	White/Caucasian	253	49	16.89	6.36	0.77	3.08
	Two or More Races	35	49	18.83	7.54	0.83	3.14
	Female	222	49	15.88	5.56	0.69	3.08
	Male	374	49	16.50	7.01	0.81	3.06
	All Students	597	49	16.26	6.50	0.78	3.07
	English Language Learners (ELL)	132	49	14.28	5.44	0.69	3.01
	Individual Education Program (IEP)	416	49	16.37	6.53	0.78	3.07
	Plan 504	15	49	18.20	5.51	0.69	3.08

Table R-6. 2016–17 OSTP: Subgroup Reliabilities
Grade 8—Mathematics

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	11,957	50	21.12	8.98	0.88	3.11
	Black/African American	1,753	50	19.61	8.40	0.86	3.11
	American Indian/Alaskan Native	2,748	50	22.11	9.19	0.89	3.10
	Hispanic or Latino	3,119	50	21.22	9.10	0.88	3.10
	Asian	379	50	30.83	10.92	0.93	2.88
	Pacific Islander	76	50	19.36	7.87	0.84	3.15
	White/Caucasian	9,262	50	25.08	10.12	0.91	3.06
	Two or More Races	1,466	50	23.73	9.91	0.90	3.07
	Female	8,908	50	24.33	9.68	0.90	3.08
	Male	9,877	50	22.71	10.06	0.91	3.07
	All Students	18,803	50	23.48	9.91	0.90	3.08
	English Language Learners (ELL)	1,097	50	16.62	6.90	0.80	3.10
	Individual Education Program (IEP)	5,211	50	15.87	6.52	0.78	3.08
	Plan 504	360	50	24.41	9.30	0.89	3.10
2	Economically Disadvantaged	8,367	48	23.00	8.06	0.86	3.06
	Black/African American	1,197	48	21.58	7.88	0.85	3.06
	American Indian/Alaskan Native	2,084	48	24.23	8.17	0.86	3.04
	Hispanic or Latino	2,372	48	22.78	8.14	0.86	3.06
	Asian	279	48	32.98	9.31	0.91	2.73
	Pacific Islander	41	48	23.54	7.58	0.83	3.08
	White/Caucasian	7,238	48	26.65	8.81	0.88	2.99
	Two or More Races	1,064	48	24.88	8.40	0.87	3.03
	Female	7,157	48	25.40	8.61	0.88	3.02
	Male	7,103	48	25.03	8.93	0.89	3.01
	All Students	14,275	48	25.21	8.77	0.88	3.02
	English Language Learners (ELL)	511	48	17.80	6.76	0.79	3.07
	Individual Education Program (IEP)	956	48	18.81	7.58	0.84	3.07
	Plan 504	314	48	24.84	8.32	0.87	3.05
3	Economically Disadvantaged	8,363	48	23.19	8.87	0.88	3.04
	Black/African American	1,218	48	20.74	8.69	0.88	3.04
	American Indian/Alaskan Native	2,000	48	24.53	9.08	0.89	3.02
	Hispanic or Latino	2,259	48	23.11	8.93	0.88	3.03
	Asian	307	48	32.69	9.24	0.91	2.71
	Pacific Islander	48	48	24.71	8.42	0.87	3.06
	White/Caucasian	7,292	48	27.02	9.26	0.90	2.96
	Two or More Races	1,136	48	25.96	9.11	0.89	2.99
	Female	7,247	48	25.72	9.12	0.89	2.99
	Male	6,996	48	25.37	9.69	0.91	2.98
	All Students	14,260	48	25.54	9.40	0.90	2.99
	English Language Learners (ELL)	491	48	17.53	7.25	0.82	3.05
	Individual Education Program (IEP)	1,010	48	18.03	8.16	0.86	3.04
	Plan 504	288	48	24.29	9.13	0.89	3.02
4	Economically Disadvantaged	461	50	17.76	7.07	0.80	3.19
	Black/African American	29	50	16.14	5.38	0.64	3.21
	American Indian/Alaskan Native	124	50	18.96	7.70	0.83	3.19

continued

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
4	Hispanic or Latino	155	50	16.00	5.57	0.67	3.18
	White/Caucasian	252	50	18.05	7.22	0.81	3.18
	Two or More Races	34	50	20.24	7.95	0.84	3.21
	Female	237	50	18.38	7.29	0.81	3.20
	Male	361	50	17.40	6.88	0.79	3.18
	All Students	598	50	17.79	7.06	0.80	3.19
	English Language Learners (ELL)	121	50	15.53	5.55	0.68	3.15
	Individual Education Program (IEP)	404	50	18.12	7.18	0.80	3.19
	Plan 504	13	50	23.31	8.94	0.88	3.10

Table R-7. 2016–17 OSTP: Subgroup Reliabilities
Grade 10—Mathematics

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	9,696	60	23.93	10.08	0.88	3.43
	Black/African American	1,467	60	21.65	8.93	0.85	3.42
	American Indian/Alaskan Native	2,552	60	25.11	10.50	0.89	3.43
	Hispanic or Latino	2,626	60	24.29	9.97	0.88	3.44
	Asian	427	60	35.19	14.56	0.95	3.16
	Pacific Islander	61	60	22.07	8.12	0.82	3.46
	White/Caucasian	8,656	60	28.85	11.94	0.92	3.38
	Two or More Races	1,189	60	27.08	11.73	0.92	3.39
	Female	8,180	60	27.56	11.28	0.91	3.39
	Male	8,797	60	26.42	11.85	0.92	3.40
	All Students	16,978	60	26.97	11.59	0.91	3.40
	English Language Learners (ELL)	840	60	18.50	6.70	0.74	3.40
	Individual Education Program (IEP)	3,778	60	17.97	6.50	0.73	3.39
	Plan 504	305	60	27.32	11.14	0.91	3.42
2	Economically Disadvantaged	7,558	59	23.41	9.95	0.89	3.34
	Black/African American	1,227	59	21.33	9.27	0.87	3.34
	American Indian/Alaskan Native	2,137	59	25.02	10.43	0.90	3.34
	Hispanic or Latino	2,104	59	23.50	9.94	0.89	3.34
	Asian	330	59	35.76	13.27	0.94	3.13
	Pacific Islander	46	59	23.61	9.17	0.86	3.39
	White/Caucasian	7,373	59	27.74	11.44	0.92	3.31
	Two or More Races	946	59	26.36	11.29	0.91	3.31
	Female	6,968	59	26.52	10.79	0.91	3.31
	Male	7,195	59	25.94	11.64	0.92	3.32
	All Students	14,163	59	26.22	11.23	0.91	3.32
	English Language Learners (ELL)	379	59	17.77	7.60	0.81	3.30
	Individual Education Program (IEP)	1,350	59	17.24	7.03	0.78	3.28
	Plan 504	270	59	25.32	11.25	0.91	3.33
3	Economically Disadvantaged	7,564	60	26.92	9.88	0.88	3.41
	Black/African American	1,244	60	24.54	9.54	0.87	3.42
	American Indian/Alaskan Native	2,010	60	28.28	9.92	0.88	3.40
	Hispanic or Latino	2,209	60	27.36	10.05	0.89	3.40
	Asian	339	60	37.03	12.22	0.93	3.18
	Pacific Islander	48	60	32.10	13.55	0.94	3.20
	White/Caucasian	7,321	60	31.36	10.93	0.91	3.34
	Two or More Races	1,045	60	29.52	10.93	0.91	3.36
	Female	7,198	60	30.02	10.49	0.90	3.36
	Male	7,016	60	29.40	11.25	0.91	3.36
	All Students	14,216	60	29.71	10.87	0.90	3.36
	English Language Learners (ELL)	363	60	21.36	8.60	0.84	3.42
	Individual Education Program (IEP)	1,335	60	20.58	7.74	0.81	3.41
	Plan 504	295	60	27.94	10.06	0.89	3.40
4	Economically Disadvantaged	325	60	19.74	6.76	0.74	3.48
	Black/African American	39	60	15.26	3.97	0.30	3.33
	American Indian/Alaskan Native	82	60	20.74	7.90	0.81	3.48

continued

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
4	Hispanic or Latino	98	60	21.09	7.36	0.78	3.48
	White/Caucasian	209	60	20.13	7.32	0.78	3.46
	Two or More Races	30	60	18.77	6.79	0.74	3.43
	Female	180	60	21.03	8.26	0.83	3.44
	Male	280	60	19.22	6.55	0.72	3.47
	All Students	460	60	19.93	7.31	0.78	3.46
	English Language Learners (ELL)	72	60	20.76	7.35	0.78	3.48
	Individual Education Program (IEP)	306	60	19.41	6.40	0.71	3.47

Table R-8. 2016–17 OSTP: Subgroup Reliabilities
Grade 3—ELA

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	11,307	48	27.49	9.01	0.89	2.99
	Black/African American	1,577	48	24.76	8.90	0.88	3.06
	American Indian/Alaskan Native	2,287	48	29.18	8.83	0.89	2.93
	Hispanic or Latino	3,199	48	26.00	8.88	0.88	3.04
	Asian	313	48	33.11	8.84	0.90	2.75
	Pacific Islander	64	48	25.67	8.23	0.86	3.09
	White/Caucasian	8,312	48	31.51	8.67	0.89	2.84
	Two or More Races	1,768	48	29.61	8.98	0.90	2.90
	Female	8,601	48	30.36	8.96	0.90	2.88
	Male	8,917	48	28.48	9.23	0.90	2.95
	All Students	17,520	48	29.41	9.14	0.90	2.92
	English Language Learners (ELL)	2,038	48	23.46	8.19	0.86	3.11
	Individual Education Program (IEP)	3,227	48	22.19	9.27	0.89	3.09
	Plan 504	333	48	28.77	7.93	0.86	2.97
2	Economically Disadvantaged	11,226	50	29.49	9.37	0.89	3.04
	Black/African American	1,512	50	26.71	9.39	0.89	3.12
	American Indian/Alaskan Native	2,240	50	30.94	9.04	0.89	3.00
	Hispanic or Latino	3,190	50	28.19	9.46	0.89	3.07
	Asian	310	50	34.17	9.06	0.90	2.85
	Pacific Islander	51	50	29.04	8.28	0.86	3.09
	White/Caucasian	8,353	50	33.28	8.95	0.90	2.89
	Two or More Races	1,807	50	32.00	9.23	0.90	2.95
	Female	8,668	50	32.30	9.04	0.89	2.94
	Male	8,793	50	30.42	9.70	0.90	3.00
	All Students	17,463	50	31.35	9.43	0.90	2.97
	English Language Learners (ELL)	1,933	50	25.03	8.73	0.87	3.16
	Individual Education Program (IEP)	3,046	50	23.88	10.15	0.90	3.13
	Plan 504	317	50	30.06	8.79	0.88	3.01
3	Economically Disadvantaged	11,232	50	29.34	9.30	0.89	3.08
	Black/African American	1,493	50	26.29	9.44	0.89	3.15
	American Indian/Alaskan Native	2,255	50	31.11	9.02	0.89	3.02
	Hispanic or Latino	3,221	50	27.97	9.45	0.89	3.12
	Asian	326	50	34.17	8.99	0.90	2.91
	Pacific Islander	60	50	25.73	8.44	0.85	3.22
	White/Caucasian	8,281	50	33.40	8.85	0.89	2.93
	Two or More Races	1,790	50	31.85	8.97	0.89	3.00
	Female	8,404	50	32.21	9.14	0.89	2.97
	Male	9,018	50	30.49	9.57	0.90	3.04
	All Students	17,426	50	31.32	9.40	0.90	3.01
	English Language Learners (ELL)	1,978	50	24.57	8.46	0.86	3.22
	Individual Education Program (IEP)	3,010	50	23.54	9.84	0.90	3.17
	Plan 504	329	50	31.09	8.06	0.86	3.04

Table R-9. 2016–17 OSTP: Subgroup Reliabilities
Grade 4—ELA

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	10,835	48	29.91	8.85	0.89	2.95
	Black/African American	1,432	48	27.67	8.95	0.89	3.03
	American Indian/Alaskan Native	2,309	48	31.35	8.65	0.89	2.89
	Hispanic or Latino	3,139	48	28.73	8.81	0.88	2.99
	Asian	311	48	35.17	8.45	0.90	2.68
	Pacific Islander	55	48	31.64	6.63	0.81	2.92
	White/Caucasian	8,303	48	33.51	8.50	0.89	2.79
	Two or More Races	1,611	48	32.40	8.53	0.89	2.85
	Female	8,300	48	32.52	8.51	0.89	2.84
	Male	8,854	48	31.08	9.17	0.90	2.89
	All Students	17,160	48	31.78	8.89	0.90	2.87
	English Language Learners (ELL)	1,437	48	24.06	7.97	0.85	3.11
	Individual Education Program (IEP)	3,226	48	23.89	9.34	0.89	3.09
	Plan 504	380	48	32.06	7.91	0.87	2.90
2	Economically Disadvantaged	10,759	49	28.90	8.74	0.88	3.05
	Black/African American	1,516	49	26.39	8.74	0.87	3.11
	American Indian/Alaskan Native	2,171	49	29.99	8.60	0.88	3.02
	Hispanic or Latino	3,000	49	27.94	8.68	0.87	3.07
	Asian	309	49	33.30	9.19	0.90	2.85
	Pacific Islander	59	49	26.00	9.60	0.90	3.08
	White/Caucasian	8,178	49	32.63	8.48	0.88	2.91
	Two or More Races	1,714	49	31.16	8.59	0.88	2.97
	Female	8,392	49	31.54	8.57	0.88	2.95
	Male	8,549	49	29.97	9.10	0.89	3.01
	All Students	16,947	49	30.74	8.87	0.89	2.98
	English Language Learners (ELL)	1,215	49	22.52	7.60	0.82	3.18
	Individual Education Program (IEP)	2,897	49	22.92	9.05	0.88	3.16
	Plan 504	303	49	30.41	8.30	0.87	3.01
3	Economically Disadvantaged	10,730	48	28.93	7.90	0.86	2.96
	Black/African American	1,453	48	26.90	8.14	0.86	3.02
	American Indian/Alaskan Native	2,289	48	30.30	7.71	0.86	2.92
	Hispanic or Latino	3,105	48	27.86	7.93	0.86	2.98
	Asian	344	48	33.61	8.02	0.88	2.76
	Pacific Islander	50	48	26.26	8.77	0.88	2.99
	White/Caucasian	8,131	48	32.20	7.65	0.86	2.83
	Two or More Races	1,628	48	31.05	7.83	0.86	2.88
	Female	8,382	48	31.15	7.82	0.86	2.88
	Male	8,614	48	30.07	8.20	0.87	2.91
	All Students	17,000	48	30.60	8.03	0.87	2.90
	English Language Learners (ELL)	1,290	48	23.38	7.02	0.81	3.09
	Individual Education Program (IEP)	2,765	48	23.71	8.54	0.87	3.08
	Plan 504	333	48	30.70	7.27	0.84	2.91

Table R-10. 2016–17 OSTP: Subgroup Reliabilities
Grade 5—ELA

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	10,359	55	34.76	9.68	0.90	3.09
	Black/African American	1,462	55	32.15	10.04	0.90	3.18
	American Indian/Alaskan Native	2,325	55	36.79	9.08	0.89	3.01
	Hispanic or Latino	2,951	55	34.13	9.74	0.90	3.11
	Asian	314	55	40.70	9.13	0.91	2.74
	Pacific Islander	53	55	31.45	11.45	0.93	3.13
	White/Caucasian	7,905	55	38.49	9.15	0.90	2.91
	Two or More Races	1,489	55	37.54	9.23	0.90	2.96
	Female	8,095	55	37.88	9.06	0.90	2.93
	Male	8,396	55	35.85	10.00	0.91	3.02
	All Students	16,499	55	36.84	9.60	0.90	2.99
	English Language Learners (ELL)	866	55	26.41	8.97	0.86	3.34
	Individual Education Program (IEP)	3,112	55	27.73	10.28	0.90	3.28
	Plan 504	406	55	37.14	8.64	0.88	3.02
2	Economically Disadvantaged	10,168	54	33.49	9.73	0.90	3.14
	Black/African American	1,418	54	31.12	9.94	0.89	3.22
	American Indian/Alaskan Native	2,301	54	35.00	9.62	0.90	3.07
	Hispanic or Latino	2,944	54	32.88	9.65	0.89	3.16
	Asian	286	54	38.08	9.62	0.91	2.86
	Pacific Islander	53	54	32.28	9.41	0.89	3.13
	White/Caucasian	7,908	54	37.36	9.28	0.90	2.95
	Two or More Races	1,466	54	35.70	9.58	0.90	3.05
	Female	8,092	54	36.36	9.25	0.89	3.00
	Male	8,273	54	34.72	10.11	0.91	3.06
	All Students	16,376	54	35.53	9.73	0.90	3.04
	English Language Learners (ELL)	736	54	24.69	8.71	0.85	3.35
	Individual Education Program (IEP)	2,662	54	25.81	10.30	0.90	3.29
	Plan 504	343	54	34.85	9.14	0.89	3.08
3	Economically Disadvantaged	10,039	55	34.32	9.59	0.89	3.12
	Black/African American	1,434	55	32.00	9.59	0.89	3.21
	American Indian/Alaskan Native	2,209	55	35.64	9.29	0.89	3.07
	Hispanic or Latino	2,874	55	33.60	9.61	0.89	3.15
	Asian	327	55	40.01	9.20	0.91	2.82
	Pacific Islander	53	55	32.89	9.71	0.90	3.15
	White/Caucasian	7,905	55	38.26	9.07	0.90	2.93
	Two or More Races	1,474	55	37.08	9.41	0.90	2.99
	Female	8,062	55	37.28	9.14	0.89	2.98
	Male	8,207	55	35.62	9.87	0.90	3.05
	All Students	16,276	55	36.44	9.55	0.90	3.02
	English Language Learners (ELL)	741	55	25.99	9.01	0.86	3.36
	Individual Education Program (IEP)	2,643	55	27.06	10.15	0.89	3.31
	Plan 504	358	55	36.91	8.46	0.87	3.04

Table R-11. 2016–17 OSTP: Subgroup Reliabilities
Grade 6—ELA

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	9,817	50	31.57	9.34	0.90	3.01
	Black/African American	1,285	50	30.01	9.47	0.89	3.07
	American Indian/Alaskan Native	2,343	50	32.77	9.23	0.90	2.96
	Hispanic or Latino	2,629	50	31.08	9.35	0.89	3.03
	Asian	304	50	37.98	8.74	0.91	2.63
	Pacific Islander	44	50	28.05	10.32	0.91	3.07
	White/Caucasian	8,048	50	35.04	8.91	0.90	2.84
	Two or More Races	1,327	50	34.43	9.01	0.90	2.87
	Female	7,749	50	34.40	8.90	0.90	2.88
	Male	8,222	50	32.92	9.58	0.91	2.93
	All Students	15,980	50	33.64	9.29	0.90	2.91
	English Language Learners (ELL)	610	50	22.57	8.53	0.86	3.23
	Individual Education Program (IEP)	2,853	50	24.19	9.52	0.89	3.19
	Plan 504	375	50	33.95	8.32	0.88	2.93
2	Economically Disadvantaged	9,305	50	31.05	8.61	0.87	3.08
	Black/African American	1,283	50	29.64	8.43	0.86	3.13
	American Indian/Alaskan Native	2,228	50	32.17	8.66	0.88	3.03
	Hispanic or Latino	2,530	50	30.67	8.40	0.86	3.09
	Asian	277	50	36.42	8.23	0.89	2.79
	Pacific Islander	42	50	30.90	8.97	0.88	3.08
	White/Caucasian	7,578	50	34.30	8.36	0.88	2.92
	Two or More Races	1,317	50	33.31	8.52	0.88	2.97
	Female	7,478	50	33.62	8.25	0.87	2.96
	Male	7,765	50	32.30	8.88	0.89	3.01
	All Students	15,255	50	32.94	8.61	0.88	2.99
	English Language Learners (ELL)	510	50	22.81	7.73	0.82	3.26
	Individual Education Program (IEP)	2,211	50	24.34	8.90	0.87	3.24
	Plan 504	336	50	32.74	7.67	0.84	3.04
3	Economically Disadvantaged	9,264	49	32.27	8.87	0.89	2.91
	Black/African American	1,272	49	30.51	9.02	0.89	2.98
	American Indian/Alaskan Native	2,178	49	33.63	8.41	0.88	2.86
	Hispanic or Latino	2,447	49	31.93	8.83	0.89	2.92
	Asian	291	49	37.43	8.70	0.91	2.58
	Pacific Islander	54	49	29.31	10.93	0.93	2.95
	White/Caucasian	7,770	49	35.33	8.26	0.89	2.76
	Two or More Races	1,267	49	34.04	8.84	0.90	2.82
	Female	7,491	49	34.76	8.21	0.88	2.79
	Male	7,778	49	33.38	9.05	0.90	2.85
	All Students	15,279	49	34.05	8.68	0.89	2.82
	English Language Learners (ELL)	479	49	23.10	8.43	0.86	3.17
	Individual Education Program (IEP)	2,210	49	24.76	9.46	0.89	3.13
	Plan 504	372	49	34.21	7.62	0.86	2.86

Table R-12. 2016–17 OSTP: Subgroup Reliabilities
Grade 7—ELA

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	10,180	48	29.09	8.73	0.88	3.00
	Black/African American	1,410	48	27.13	8.61	0.87	3.06
	American Indian/Alaskan Native	2,436	48	30.34	8.41	0.88	2.96
	Hispanic or Latino	2,752	48	28.40	8.80	0.88	3.01
	Asian	330	48	34.19	8.30	0.89	2.74
	Pacific Islander	49	48	26.41	9.53	0.90	3.01
	White/Caucasian	8,168	48	32.58	8.20	0.88	2.87
	Two or More Races	1,298	48	31.57	8.34	0.88	2.92
	Female	8,003	48	31.91	8.15	0.87	2.90
	Male	8,428	48	30.17	8.96	0.89	2.95
	All Students	16,443	48	31.02	8.62	0.88	2.93
	English Language Learners (ELL)	772	48	20.69	7.55	0.83	3.14
	Individual Education Program (IEP)	3,008	48	22.64	8.52	0.87	3.13
	Plan 504	370	48	31.79	7.68	0.85	2.93
2	Economically Disadvantaged	9,646	49	28.90	8.27	0.86	3.07
	Black/African American	1,405	49	27.09	8.48	0.87	3.10
	American Indian/Alaskan Native	2,306	49	30.58	8.21	0.87	3.01
	Hispanic or Latino	2,700	49	28.40	8.34	0.86	3.07
	Asian	330	49	34.71	8.20	0.88	2.78
	Pacific Islander	44	49	25.43	8.39	0.86	3.12
	White/Caucasian	7,751	49	32.42	7.66	0.85	2.95
	Two or More Races	1,270	49	30.61	8.09	0.86	3.00
	Female	7,694	49	31.73	7.86	0.86	2.97
	Male	8,101	49	30.07	8.46	0.87	3.02
	All Students	15,806	49	30.87	8.22	0.87	3.00
	English Language Learners (ELL)	710	49	21.04	7.08	0.80	3.18
	Individual Education Program (IEP)	2,503	49	22.45	8.05	0.84	3.17
	Plan 504	329	49	31.43	7.41	0.84	2.99
3	Economically Disadvantaged	9,813	50	31.26	8.89	0.88	3.06
	Black/African American	1,372	50	29.15	9.00	0.88	3.13
	American Indian/Alaskan Native	2,289	50	32.86	8.71	0.88	3.00
	Hispanic or Latino	2,645	50	30.63	8.93	0.88	3.08
	Asian	339	50	36.28	8.28	0.89	2.80
	Pacific Islander	53	50	30.72	8.35	0.86	3.10
	White/Caucasian	7,791	50	34.89	8.19	0.87	2.90
	Two or More Races	1,328	50	33.54	8.52	0.88	2.96
	Female	7,690	50	33.98	8.32	0.87	2.95
	Male	8,113	50	32.64	9.06	0.89	2.99
	All Students	15,817	50	33.29	8.74	0.88	2.97
	English Language Learners (ELL)	672	50	22.54	7.99	0.84	3.24
	Individual Education Program (IEP)	2,513	50	24.04	9.09	0.88	3.21
	Plan 504	324	50	34.05	8.00	0.86	2.97

Table R-13. 2016–17 OSTP: Subgroup Reliabilities
Grade 8—ELA

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	10,171	54	31.42	8.71	0.87	3.13
	Black/African American	1,440	54	29.71	8.69	0.86	3.19
	American Indian/Alaskan Native	2,422	54	33.06	8.42	0.87	3.08
	Hispanic or Latino	2,764	54	30.65	8.91	0.87	3.16
	Asian	286	54	37.09	8.88	0.89	2.93
	Pacific Islander	57	54	30.70	9.29	0.89	3.05
	White/Caucasian	8,239	54	34.96	8.36	0.87	3.02
	Two or More Races	1,275	54	34.09	8.62	0.88	3.02
	Female	8,045	54	34.67	8.30	0.87	3.01
	Male	8,421	54	32.31	9.01	0.88	3.11
	All Students	16,483	54	33.46	8.75	0.88	3.07
	English Language Learners (ELL)	773	54	22.91	7.51	0.81	3.30
	Individual Education Program (IEP)	2,934	54	24.56	8.39	0.85	3.29
	Plan 504	348	54	34.78	7.64	0.84	3.03
2	Economically Disadvantaged	9,449	55	34.41	8.56	0.87	3.10
	Black/African American	1,386	55	32.23	9.12	0.88	3.16
	American Indian/Alaskan Native	2,273	55	36.24	8.17	0.86	3.02
	Hispanic or Latino	2,525	55	34.06	8.65	0.87	3.11
	Asian	324	55	39.45	8.58	0.89	2.88
	Pacific Islander	53	55	31.83	9.53	0.89	3.14
	White/Caucasian	7,953	55	37.96	7.79	0.86	2.96
	Two or More Races	1,202	55	36.45	8.24	0.87	3.01
	Female	7,752	55	37.68	7.79	0.86	2.95
	Male	7,949	55	35.32	8.80	0.88	3.08
	All Students	15,716	55	36.47	8.40	0.87	3.02
	English Language Learners (ELL)	690	55	26.42	8.23	0.84	3.32
	Individual Education Program (IEP)	2,362	55	27.17	8.91	0.86	3.32
	Plan 504	297	55	36.50	7.40	0.83	3.05
3	Economically Disadvantaged	9,502	53	33.31	8.53	0.87	3.06
	Black/African American	1,377	53	31.27	8.96	0.88	3.13
	American Indian/Alaskan Native	2,300	53	34.74	8.12	0.86	2.99
	Hispanic or Latino	2,535	53	32.79	8.59	0.87	3.08
	Asian	335	53	38.25	8.49	0.89	2.84
	Pacific Islander	57	53	30.75	10.09	0.90	3.15
	White/Caucasian	7,901	53	36.77	7.65	0.86	2.90
	Two or More Races	1,239	53	35.33	8.00	0.86	2.99
	Female	7,753	53	36.44	7.85	0.86	2.92
	Male	7,973	53	34.10	8.53	0.87	3.03
	All Students	15,744	53	35.25	8.29	0.87	2.98
	English Language Learners (ELL)	643	53	24.72	8.08	0.84	3.28
	Individual Education Program (IEP)	2,311	53	25.96	8.88	0.87	3.26
	Plan 504	332	53	35.94	7.12	0.82	3.02

Table R-14. 2016–17 OSTP: Subgroup Reliabilities
Grade 10—ELA

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	8,583	72	38.20	12.19	0.89	3.98
	Black/African American	1,337	72	35.57	12.34	0.89	4.05
	American Indian/Alaskan Native	2,352	72	39.79	12.19	0.90	3.93
	Hispanic or Latino	2,374	72	37.91	12.12	0.89	3.98
	Asian	378	72	45.48	13.47	0.92	3.84
	Pacific Islander	54	72	36.48	12.33	0.88	4.22
	White/Caucasian	8,065	72	43.44	12.30	0.90	3.87
	Two or More Races	1,105	72	41.95	12.24	0.90	3.93
	Female	7,669	72	43.11	12.07	0.90	3.86
	Male	7,996	72	39.57	12.84	0.90	3.96
	All Students	15,665	72	41.31	12.59	0.90	3.92
	English Language Learners (ELL)	529	72	26.36	9.14	0.81	4.03
	Individual Education Program (IEP)	2,569	72	29.48	10.27	0.84	4.05
	Plan 504	300	72	40.88	12.33	0.90	3.90
2	Economically Disadvantaged	8,256	72	36.83	11.54	0.88	3.98
	Black/African American	1,346	72	34.52	11.42	0.88	3.99
	American Indian/Alaskan Native	2,198	72	39.34	11.30	0.88	3.91
	Hispanic or Latino	2,287	72	36.44	11.66	0.88	3.99
	Asian	380	72	43.29	13.00	0.91	3.98
	Pacific Islander	45	72	36.56	13.02	0.89	4.25
	White/Caucasian	7,789	72	41.79	11.63	0.89	3.90
	Two or More Races	1,053	72	40.00	12.24	0.89	4.00
	Female	7,513	72	41.70	11.48	0.89	3.87
	Male	7,583	72	38.07	12.09	0.89	3.98
	All Students	15,098	72	39.87	11.93	0.89	3.94
	English Language Learners (ELL)	522	72	25.16	8.99	0.80	4.02
	Individual Education Program (IEP)	2,105	72	28.16	9.66	0.83	4.04
	Plan 504	292	72	39.87	11.12	0.87	3.99
3	Economically Disadvantaged	8,275	73	37.56	11.37	0.87	4.05
	Black/African American	1,304	73	34.83	11.09	0.86	4.08
	American Indian/Alaskan Native	2,268	73	39.50	11.26	0.87	4.00
	Hispanic or Latino	2,293	73	37.63	11.61	0.88	4.05
	Asian	315	73	44.77	13.00	0.91	3.97
	Pacific Islander	50	73	39.06	11.01	0.86	4.10
	White/Caucasian	7,766	73	42.31	11.38	0.88	3.98
	Two or More Races	1,057	73	40.69	11.54	0.88	4.02
	Female	7,360	73	42.23	11.11	0.87	3.96
	Male	7,692	73	38.76	11.98	0.89	4.04
	All Students	15,053	73	40.45	11.69	0.88	4.01
	English Language Learners (ELL)	507	73	26.59	8.95	0.80	4.03
	Individual Education Program (IEP)	2,120	73	28.83	9.50	0.82	4.08
	Plan 504	294	73	39.94	10.91	0.87	3.99

Table R-15. 2016–17 OSTP: Subgroup Reliabilities
Grade 5—Science

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	30,595	45	24.94	7.80	0.86	2.95
	Black/African American	4,301	45	22.07	7.55	0.84	3.01
	American Indian/Alaskan Native	6,818	45	26.10	7.81	0.86	2.92
	Hispanic or Latino	8,839	45	24.05	7.65	0.85	2.98
	Asian	956	45	29.95	8.28	0.89	2.74
	Pacific Islander	165	45	22.65	8.30	0.87	2.97
	White/Caucasian	23,701	45	28.30	7.83	0.87	2.84
	Two or More Races	4,416	45	27.01	7.87	0.87	2.89
	Female	24,272	45	26.52	7.89	0.86	2.90
	Male	24,900	45	26.66	8.26	0.88	2.89
	All Students	49,196	45	26.58	8.08	0.87	2.90
	English Language Learners (ELL)	2,478	45	19.19	6.46	0.78	3.06
	Individual Education Program (IEP)	8,387	45	21.23	7.66	0.84	3.03
	Plan 504	1,105	45	26.52	8.06	0.87	2.90

Table R-16. 2016–17 OSTP: Subgroup Reliabilities
Grade 8—Science

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	28,679	48	24.68	8.56	0.86	3.22
	Black/African American	4,157	48	22.09	8.10	0.84	3.27
	American Indian/Alaskan Native	6,861	48	26.19	8.53	0.86	3.18
	Hispanic or Latino	7,734	48	24.20	8.47	0.85	3.23
	Asian	964	48	31.61	8.82	0.89	2.93
	Pacific Islander	166	48	23.64	8.76	0.86	3.22
	White/Caucasian	23,794	48	28.56	8.79	0.88	3.09
	Two or More Races	3,669	48	26.78	8.92	0.87	3.16
	Female	23,303	48	26.94	8.52	0.86	3.14
	Male	23,992	48	26.76	9.33	0.89	3.15
	All Students	47,345	48	26.84	8.94	0.88	3.15
	English Language Learners (ELL)	2,096	48	18.54	6.48	0.74	3.30
	Individual Education Program (IEP)	7,180	48	19.34	7.48	0.81	3.28
	Plan 504	961	48	27.39	8.74	0.87	3.15
2	Economically Disadvantaged	421	42	15.61	5.70	0.73	2.98
	Black/African American	23	42	12.74	4.87	0.66	2.85
	American Indian/Alaskan Native	110	42	16.38	5.63	0.72	2.99
	Hispanic or Latino	146	42	13.77	4.69	0.61	2.94
	White/Caucasian	230	42	16.39	6.27	0.78	2.96
	Two or More Races	34	42	14.68	5.48	0.71	2.95
	Female	213	42	15.52	5.67	0.73	2.97
	Male	334	42	15.40	5.91	0.75	2.95
	All Students	547	42	15.45	5.81	0.74	2.96
	English Language Learners (ELL)	114	42	13.80	4.46	0.56	2.94

continued

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
2	Individual Education Program (IEP)	376	42	15.82	5.78	0.74	2.97
	Plan 504	12	42	19.75	6.88	0.81	3.01

Table R-17. 2016–17 OSTP: Subgroup Reliabilities
Grade 10—Science

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	18,064	47	20.02	7.31	0.81	3.18
	Black/African American	2,417	47	17.30	6.24	0.74	3.17
	American Indian/Alaskan Native	5,254	47	21.19	7.46	0.82	3.17
	Hispanic or Latino	4,485	47	19.36	6.98	0.79	3.18
	Asian	439	47	20.86	8.07	0.85	3.15
	Pacific Islander	113	47	18.54	7.07	0.80	3.18
	White/Caucasian	14,594	47	22.30	7.79	0.83	3.17
	Two or More Races	2,073	47	21.46	7.74	0.83	3.17
	Female	14,190	47	21.34	7.32	0.81	3.18
	Male	15,182	47	20.97	7.94	0.84	3.16
	All Students	29,375	47	21.15	7.65	0.83	3.17
	English Language Learners (ELL)	1,314	47	15.39	5.35	0.66	3.12
	Individual Education Program (IEP)	5,238	47	16.27	5.94	0.72	3.15
	Plan 504	539	47	20.97	7.48	0.82	3.19
2	Economically Disadvantaged	252	41	14.36	4.99	0.65	2.94
	Black/African American	34	41	13.15	3.60	0.35	2.89
	American Indian/Alaskan Native	62	41	14.32	5.95	0.76	2.90
	Hispanic or Latino	78	41	13.72	4.40	0.56	2.90
	White/Caucasian	163	41	15.52	5.13	0.66	2.99
	Two or More Races	21	41	14.62	4.31	0.52	2.98
	Female	127	41	14.89	5.40	0.70	2.93
	Male	233	41	14.53	4.79	0.62	2.96
	All Students	360	41	14.66	5.01	0.65	2.95
	English Language Learners (ELL)	60	41	13.45	4.16	0.51	2.90
	Individual Education Program (IEP)	220	41	14.44	4.74	0.61	2.96

Table R-18. 2016–17 OSTP: Subgroup Reliabilities
Grade 10—U.S. History

Form	Description	Number of Students	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
1	Economically Disadvantaged	22,530	60	34.59	11.27	0.91	3.45
	Black/African American	3,896	60	31.95	11.19	0.90	3.50
	American Indian/Alaskan Native	6,520	60	36.78	11.06	0.91	3.40
	Hispanic or Latino	6,327	60	34.69	11.24	0.91	3.45
	Asian	1,000	60	40.15	11.51	0.92	3.23
	Pacific Islander	142	60	34.59	11.29	0.91	3.45
	White/Caucasian	22,689	60	39.28	11.10	0.91	3.30
	Two or More Races	2,941	60	37.89	11.32	0.91	3.34
	Female	21,655	60	36.69	10.83	0.90	3.40
	Male	21,856	60	38.28	11.90	0.92	3.30
	All Students	43,515	60	37.49	11.41	0.91	3.36
	English Language Learners (ELL)	1,157	60	25.29	9.14	0.85	3.57
	Individual Education Program (IEP)	6,070	60	28.16	10.84	0.89	3.54
	Plan 504	843	60	38.25	11.30	0.91	3.33

Table R-19. 2016–17 OSTP: Reliabilities by Reporting Category—Mathematics Grade 3

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	23	23	17.14	4.28	0.83	1.75
02	1	23	23	17.17	4.10	0.82	1.73
03	1	23	23	17.29	4.21	0.83	1.73
01	2	7	7	5.42	1.56	0.64	0.93
02	2	7	7	4.83	1.34	0.43	1.01
03	2	7	7	5.27	1.46	0.55	0.98
01	3	14	14	8.43	3.11	0.74	1.58
02	3	14	14	7.83	3.12	0.74	1.58
03	3	14	14	7.78	3.03	0.73	1.58
01	4	6	6	4.31	1.71	0.73	0.89
02	4	6	6	4.00	1.69	0.66	0.99
03	4	6	6	3.90	1.86	0.75	0.93

Table R-20. 2016–17 OSTP: Reliabilities by Reporting Category—Mathematics Grade 4

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	22	22	14.41	4.71	0.84	1.86
02	1	22	22	16.29	4.13	0.82	1.75
03	1	22	22	15.62	4.58	0.85	1.79
01	2	8	8	4.88	1.70	0.54	1.16
02	2	8	8	4.94	1.91	0.62	1.18
03	2	8	8	4.78	1.83	0.57	1.20
01	3	14	14	8.25	2.97	0.70	1.64
02	3	14	14	8.81	2.78	0.68	1.57
03	3	14	14	9.00	3.00	0.72	1.58
01	4	6	6	4.06	1.21	0.32	1.00
02	4	6	6	4.20	1.31	0.46	0.96
03	4	6	6	3.61	1.33	0.37	1.05

Table R-21. 2016–17 OSTP: Reliabilities by Reporting Category—Mathematics Grade 5

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	23	23	13.63	5.22	0.86	1.97
02	1	23	23	15.77	4.79	0.84	1.90
03	1	23	23	14.73	4.85	0.84	1.94
01	2	9	9	6.15	1.97	0.63	1.20
02	2	8	8	5.36	1.79	0.60	1.13
03	2	9	9	5.69	1.88	0.57	1.23
01	3	12	12	6.41	2.72	0.69	1.51
02	3	12	12	6.31	2.53	0.67	1.45
03	3	12	12	6.51	2.46	0.67	1.41
01	4	6	6	4.06	1.54	0.62	0.95
02	4	6	6	4.30	1.56	0.64	0.93
03	4	6	6	3.93	1.67	0.66	0.98

Table R-22. 2016–17 OSTP: Reliabilities by Reporting Category—Mathematics Grade 6

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	19	19	11.03	4.26	0.82	1.82
02	1	20	20	13.15	4.01	0.79	1.84
03	1	21	21	13.12	4.12	0.78	1.92
04	1	19	19	7.98	3.80	0.74	1.93
01	2	11	11	6.69	2.30	0.68	1.29
02	2	10	10	7.28	1.94	0.62	1.20
03	2	11	11	7.02	1.93	0.58	1.25
04	2	11	11	5.28	2.31	0.61	1.44
01	3	11	11	5.78	1.98	0.47	1.44
02	3	11	11	5.86	1.95	0.53	1.33
03	3	11	11	6.74	1.77	0.46	1.30
04	3	11	11	4.94	2.00	0.43	1.51
01	4	7	7	4.19	1.79	0.68	1.02
02	4	7	7	3.58	1.65	0.61	1.03
03	4	7	7	4.29	1.54	0.53	1.06
04	4	7	7	3.14	1.74	0.56	1.16

Table R-23. 2016–17 OSTP: Reliabilities by Reporting Category—Mathematics Grade 7

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	10	10	4.73	2.55	0.71	1.36
02	1	10	10	6.55	2.43	0.72	1.29
03	1	10	10	6.49	2.41	0.71	1.31
04	1	10	10	3.28	2.20	0.62	1.35
01	2	15	15	6.61	3.02	0.69	1.69
02	2	15	15	9.06	2.98	0.71	1.60
03	2	15	15	7.82	3.09	0.69	1.72
04	2	14	14	5.11	2.28	0.44	1.71
01	3	15	15	5.58	3.09	0.72	1.63
02	3	15	15	6.88	3.14	0.72	1.65
03	3	15	15	6.58	2.89	0.69	1.60
04	3	15	15	4.23	2.35	0.53	1.61
01	4	10	10	4.62	2.02	0.57	1.32
02	4	10	10	5.65	1.89	0.57	1.24
03	4	10	10	5.67	2.17	0.65	1.28
04	4	10	10	3.64	1.80	0.40	1.40

Table R-24. 2016–17 OSTP: Reliabilities by Reporting Category—Mathematics Grade 8

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	9	9	4.81	2.33	0.72	1.25
02	1	9	9	5.33	1.95	0.60	1.23
03	1	9	9	4.84	2.06	0.64	1.24
04	1	9	9	3.62	2.05	0.56	1.36
01	2	23	23	10.75	4.73	0.80	2.12
02	2	23	23	12.01	4.33	0.76	2.10
03	2	23	23	12.40	4.52	0.79	2.08
04	2	23	23	8.19	3.45	0.60	2.18
01	3	10	10	5.00	2.55	0.71	1.37
02	3	8	8	3.87	2.19	0.71	1.19
03	3	9	9	5.15	2.60	0.78	1.23
04	3	10	10	3.56	2.04	0.53	1.40
01	4	8	8	2.93	1.76	0.52	1.21
02	4	8	8	4.01	1.83	0.51	1.29
03	4	7	7	3.15	1.74	0.54	1.18
04	4	8	8	2.42	1.44	0.25	1.25
01	1	9	9	4.81	2.33	0.72	1.25
02	1	9	9	5.33	1.95	0.60	1.23
03	1	9	9	4.84	2.06	0.64	1.24
04	1	9	9	3.62	2.05	0.56	1.36

Table R-25. 2016–17 OSTP: Reliabilities by Reporting Category—Mathematics Grade 10

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	6	6	1.94	1.48	0.51	1.04
02	1	5	5	1.33	1.17	0.45	0.87
03	1	6	6	1.83	1.33	0.48	0.96
04	1	6	6	1.53	1.12	0.14	1.04
01	2	24	24	11.36	5.32	0.84	2.11
02	2	24	24	11.88	5.45	0.85	2.11
03	2	24	24	12.80	4.92	0.81	2.17
04	2	24	24	8.31	3.89	0.68	2.18
01	3	18	18	7.77	3.66	0.73	1.89
02	3	18	18	7.22	3.64	0.73	1.88
03	3	18	18	8.31	3.43	0.70	1.89
04	3	18	18	5.90	2.48	0.40	1.91
01	4	6	6	2.50	1.60	0.55	1.07
02	4	6	6	2.30	1.56	0.58	1.01
03	4	6	6	2.43	1.57	0.56	1.04
04	4	6	6	1.68	1.29	0.36	1.03

Table R-26. 2016–17 OSTP: Reliabilities by Reporting Category—ELA Grade 3

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	19	19	11.44	4.12	0.80	1.86
02	1	20	20	12.68	4.51	0.83	1.87
03	1	20	20	12.61	4.24	0.81	1.86
01	2	6	6	3.77	1.56	0.57	1.02
02	2	6	6	3.76	1.54	0.55	1.03
03	2	6	6	3.16	1.58	0.52	1.09
01	3	12	12	9.03	2.55	0.75	1.28
02	3	12	12	8.62	2.54	0.72	1.34
03	3	12	12	8.46	2.56	0.70	1.40
01	4	5	5	1.79	1.30	0.41	1.00
02	4	6	6	2.84	1.26	0.27	1.07
03	4	6	6	3.26	1.42	0.41	1.09
01	5	6	6	3.38	1.63	0.55	1.09
02	5	6	6	3.45	1.57	0.52	1.08
03	5	6	6	3.83	1.58	0.55	1.05

Table R-27. 2016–17 OSTP: Reliabilities by Reporting Category—ELA Grade 4

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	16	16	10.30	3.34	0.74	1.70
02	1	16	16	9.81	3.33	0.73	1.73
03	1	16	16	9.84	2.90	0.68	1.65
01	2	10	10	6.21	2.20	0.62	1.36
02	2	10	10	6.39	2.24	0.64	1.35
03	2	10	10	6.07	2.22	0.61	1.38
01	3	12	12	8.43	2.45	0.68	1.38
02	3	12	12	8.26	2.40	0.67	1.39
03	3	12	12	8.20	2.32	0.62	1.43
01	4	4	4	3.11	0.97	0.43	0.73
02	4	5	5	3.00	1.23	0.39	0.96
03	4	5	5	3.55	1.10	0.34	0.89
01	5	6	6	3.72	1.64	0.63	1.00
02	5	6	6	3.28	1.60	0.54	1.08
03	5	5	5	2.95	1.40	0.56	0.92

Table R-28. 2016–17 OSTP: Reliabilities by Reporting Category—ELA Grade 5

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	16	16	10.57	3.24	0.73	1.68
02	1	16	16	10.70	3.37	0.76	1.65
03	1	16	16	10.18	3.21	0.73	1.67
01	2	12	12	8.11	2.55	0.70	1.40
02	2	12	12	8.23	2.62	0.73	1.37
03	2	12	12	8.90	2.52	0.73	1.30
01	3	10	10	7.48	2.14	0.69	1.19
02	3	10	10	6.92	2.34	0.69	1.29
03	3	10	10	7.25	2.26	0.71	1.22
01	4	6	6	3.93	1.29	0.48	0.92
02	4	5	5	3.00	1.21	0.30	1.01
03	4	6	6	3.85	1.34	0.43	1.01
01	5	6	6	4.21	1.51	0.59	0.97
02	5	6	6	4.08	1.48	0.53	1.02
03	5	6	6	3.66	1.52	0.48	1.09

Table R-29. 2016–17 OSTP: Reliabilities by Reporting Category—ELA Grade 6

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	18	18	12.65	3.61	0.77	1.71
02	1	18	18	12.31	3.38	0.74	1.73
03	1	18	18	13.07	3.32	0.74	1.69
01	2	10	10	6.50	2.17	0.64	1.31
02	2	10	10	6.30	2.24	0.61	1.40
03	2	10	10	6.39	2.31	0.66	1.34
01	3	10	10	7.02	2.37	0.72	1.25
02	3	10	10	7.05	2.23	0.68	1.25
03	3	10	10	7.67	2.16	0.72	1.15
01	4	6	6	3.50	1.51	0.49	1.08
02	4	6	6	3.09	1.33	0.28	1.13
03	4	5	5	2.66	1.24	0.39	0.97
01	5	6	6	3.97	1.40	0.49	1.00
02	5	6	6	4.19	1.44	0.49	1.03
03	5	6	6	4.27	1.43	0.50	1.01

Table R-30. 2016–17 OSTP: Reliabilities by Reporting Category—ELA Grade 7

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	18	18	11.09	3.58	0.73	1.86
02	1	18	18	11.02	3.78	0.76	1.85
03	1	18	18	12.28	3.52	0.75	1.75
01	2	10	10	7.08	2.27	0.69	1.26
02	2	10	10	7.13	1.92	0.54	1.30
03	2	10	10	7.21	2.05	0.63	1.25
01	3	8	8	5.49	1.75	0.57	1.14
02	3	8	8	5.59	1.73	0.57	1.13
03	3	8	8	5.04	2.00	0.64	1.20
01	4	4	4	1.85	1.07	0.27	0.92
02	4	5	5	1.95	1.20	0.27	1.03
03	4	6	6	3.74	1.44	0.44	1.08
01	5	8	8	5.51	1.79	0.59	1.15
02	5	8	8	5.19	1.68	0.47	1.22
03	5	8	8	5.02	1.69	0.46	1.24

Table R-31. 2016–17 OSTP: Reliabilities by Reporting Category—ELA Grade 8

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	14	14	8.25	3.12	0.72	1.66
02	1	14	14	9.39	2.77	0.68	1.56
03	1	14	14	9.25	2.86	0.69	1.59
01	2	13	13	8.90	2.51	0.64	1.50
02	2	14	14	10.62	2.79	0.74	1.43
03	2	13	13	9.66	2.54	0.72	1.36
01	3	8	8	5.22	1.68	0.59	1.07
02	3	8	8	5.53	1.73	0.61	1.08
03	3	8	8	5.79	1.64	0.58	1.06
01	4	5	5	2.90	1.14	0.32	0.94
02	4	6	6	2.93	1.22	0.24	1.06
03	4	4	4	2.05	1.03	0.16	0.94
01	5	7	7	4.18	1.49	0.44	1.11
02	5	6	6	3.95	1.26	0.28	1.07
03	5	7	7	4.46	1.52	0.42	1.16
01	6	1	7	4.00	1.16		
02	6	1	7	4.05	1.15		
03	6	1	7	4.03	1.13		

Table R-32. 2016–17 OSTP: Reliabilities by Reporting Category—ELA Grade 10

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	17	18	9.59	3.92	0.74	1.99
02	1	17	18	9.25	3.58	0.70	1.95
03	1	17	17	9.45	3.26	0.67	1.86
01	2	16	17	10.05	3.88	0.78	1.80
02	2	17	18	10.47	3.66	0.72	1.94
03	2	17	19	9.95	3.79	0.70	2.08
01	3	8	8	5.73	1.68	0.53	1.16
02	3	7	7	4.43	1.55	0.46	1.14
03	3	8	8	4.55	1.62	0.37	1.29
01	4	10	10	5.62	2.27	0.61	1.43
02	4	10	10	5.44	2.27	0.61	1.42
03	4	10	10	6.12	2.44	0.68	1.38
01	5	8	8	3.98	1.91	0.56	1.27
02	5	8	8	3.91	1.94	0.60	1.22
03	5	8	8	4.00	1.78	0.50	1.26
01	6	1	11	6.33	1.85		
02	6	1	11	6.38	1.84		
03	6	1	11	6.39	1.85		

Table R-33. 2016–17 OSTP: Reliabilities by Reporting Category—Science Grade 5

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	12	12	6.95	2.73	0.69	1.53
01	2	15	15	9.90	3.11	0.74	1.58
01	3	18	18	9.74	3.33	0.68	1.87

Table R-34. 2016–17 OSTP: Reliabilities by Reporting Category—Science Grade 8

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	15	16	9.35	3.47	0.73	1.81
02	1	14	14	5.25	2.38	0.47	1.73
01	2	12	13	6.66	2.64	0.60	1.68
02	2	11	11	3.65	1.94	0.40	1.50
01	3	18	19	10.84	3.94	0.76	1.95
02	3	17	17	6.55	2.88	0.58	1.88

Table R-35. 2016–17 OSTP: Reliabilities by Reporting Category—Science Grade 10

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	14	15	7.32	2.87	0.60	1.80
02	1	13	13	5.14	2.21	0.43	1.67
01	2	15	16	6.63	2.90	0.62	1.80
02	2	14	14	4.87	2.25	0.42	1.72
01	3	15	16	7.20	3.13	0.63	1.89
02	3	14	14	4.65	2.21	0.40	1.71

Table R-36. 2016–17 OSTP: Reliabilities by Reporting Category—U.S. History Grade 10

Form	Reporting Category	Number of Items	Raw Score			Alpha	Standard Error
			Maximum	*Mean*	*Standard Deviation*		
01	1	8	8	4.81	1.94	0.57	1.27
01	2	6	6	3.71	1.52	0.51	1.06
01	3	8	8	4.77	1.68	0.46	1.23
01	4	8	8	5.10	2.03	0.64	1.21
01	5	18	18	11.74	3.84	0.78	1.82
01	6	12	12	7.37	2.67	0.69	1.49

APPENDIX S—DECISION ACCURACY AND CONSISTENCY RESULTS

Table Q-1. 2016–17 OSTP: Summary of Decision Accuracy and Consistency Results by Content Area and Grade—Conditional on Cutpoint

Content Area	Grade	Form	Unsatisfactory / Limited Knowledge			Limited Knowledge / Proficient			Proficient / Advanced		
			Accuracy (consistency)	*False*		*Accuracy (consistency)*	*False*		*Accuracy (consistency)*	*False*	
				Positive	*Negative*		*Positive*	*Negative*		*Positive*	*Negative*
Mathematics	3	1	0.94 (0.94)	0.03	0.03	0.91 (0.91)	0.04	0.04	0.91 (0.91)	0.05	0.04
		2	0.93 (0.93)	0.03	0.04	0.90 (0.90)	0.05	0.04	0.93 (0.93)	0.04	0.02
		3	0.93 (0.93)	0.03	0.04	0.91 (0.91)	0.05	0.04	0.92 (0.92)	0.05	0.03
	4	1	0.91 (0.91)	0.04	0.05	0.92 (0.92)	0.05	0.04	0.95 (0.95)	0.03	0.02
		2	0.93 (0.93)	0.03	0.04	0.91 (0.91)	0.05	0.04	0.93 (0.93)	0.04	0.03
		3	0.92 (0.92)	0.04	0.04	0.91 (0.91)	0.05	0.04	0.93 (0.93)	0.04	0.03
	5	1	0.92 (0.92)	0.04	0.04	0.92 (0.92)	0.04	0.04	0.95 (0.95)	0.03	0.02
		2	0.94 (0.94)	0.03	0.04	0.91 (0.91)	0.05	0.04	0.94 (0.94)	0.04	0.03
		3	0.93 (0.93)	0.03	0.04	0.91 (0.91)	0.05	0.04	0.95 (0.95)	0.03	0.02
	6	1	0.92 (0.92)	0.03	0.04	0.91 (0.91)	0.05	0.04	0.95 (0.95)	0.03	0.02
		2	0.94 (0.94)	0.02	0.04	0.89 (0.89)	0.06	0.05	0.94 (0.94)	0.04	0.02
		3	0.95 (0.95)	0.02	0.04	0.89 (0.89)	0.06	0.06	0.94 (0.94)	0.04	0.02
		4	0.89 (0.89)	0.06	0.05	0.95 (0.95)	0.03	0.02	0.99 (0.99)	0.01	0.00
	7	1	0.91 (0.91)	0.05	0.04	0.94 (0.94)	0.04	0.03	0.98 (0.98)	0.01	0.01
		2	0.90 (0.90)	0.04	0.05	0.91 (0.91)	0.05	0.04	0.95 (0.95)	0.03	0.02
		3	0.90 (0.90)	0.05	0.05	0.91 (0.91)	0.05	0.04	0.96 (0.96)	0.02	0.01
		4	0.93 (0.93)	0.04	0.02	0.97 (0.97)	0.02	0.01	1.00 (1.00)	0.00	0.00
	8	1	0.90 (0.90)	0.05	0.05	0.92 (0.92)	0.04	0.03	0.95 (0.95)	0.03	0.02
		2	0.90 (0.90)	0.05	0.06	0.91 (0.91)	0.05	0.04	0.94 (0.94)	0.03	0.02
		3	0.91 (0.91)	0.04	0.05	0.91 (0.91)	0.05	0.04	0.94 (0.94)	0.04	0.03
		4	0.88 (0.88)	0.07	0.05	0.96 (0.96)	0.03	0.01	0.99 (0.99)	0.01	0.00
	10	1	0.90 (0.90)	0.05	0.04	0.93 (0.93)	0.04	0.03	0.96 (0.96)	0.02	0.02
		2	0.91 (0.91)	0.05	0.04	0.93 (0.93)	0.04	0.03	0.97 (0.97)	0.02	0.01
		3	0.90 (0.90)	0.05	0.05	0.91 (0.91)	0.05	0.04	0.95 (0.95)	0.03	0.02
		4	0.91 (0.91)	0.06	0.03	0.97 (0.97)	0.02	0.01	0.99 (0.99)	0.01	0.00
ELA	3	1	0.93 (0.93)	0.03	0.04	0.91 (0.91)	0.05	0.05	0.94 (0.94)	0.04	0.02
		2	0.94 (0.94)	0.03	0.04	0.91 (0.91)	0.05	0.05	0.92 (0.92)	0.05	0.03
		3	0.94 (0.94)	0.03	0.04	0.91 (0.91)	0.05	0.05	0.92 (0.92)	0.05	0.03

continued

Content Area	Grade	Form	Unsatisfactory / Limited Knowledge			Limited Knowledge / Proficient			Proficient / Advanced		
			Accuracy (consistency)	*False*		*Accuracy (consistency)*	*False*		*Accuracy (consistency)*	*False*	
				Positive	*Negative*		*Positive*	*Negative*		*Positive*	*Negative*
ELA	4	1	0.93 (0.93)	0.03	0.04	0.91 (0.91)	0.05	0.05	0.92 (0.92)	0.05	0.03
		2	0.92 (0.92)	0.03	0.04	0.90 (0.90)	0.05	0.05	0.93 (0.93)	0.04	0.02
		3	0.92 (0.92)	0.03	0.05	0.89 (0.89)	0.06	0.06	0.95 (0.95)	0.04	0.01
	5	1	0.94 (0.94)	0.03	0.04	0.90 (0.90)	0.05	0.05	0.90 (0.90)	0.06	0.04
		2	0.93 (0.93)	0.03	0.04	0.90 (0.90)	0.05	0.05	0.92 (0.92)	0.06	0.02
		3	0.93 (0.93)	0.03	0.04	0.90 (0.90)	0.05	0.05	0.92 (0.92)	0.05	0.03
	6	1	0.93 (0.93)	0.03	0.04	0.90 (0.90)	0.05	0.05	0.91 (0.91)	0.06	0.03
		2	0.92 (0.92)	0.03	0.05	0.90 (0.90)	0.06	0.05	0.94 (0.94)	0.04	0.02
		3	0.94 (0.94)	0.03	0.04	0.89 (0.89)	0.06	0.05	0.92 (0.92)	0.06	0.02
	7	1	0.92 (0.92)	0.04	0.05	0.89 (0.89)	0.06	0.05	0.91 (0.91)	0.06	0.03
		2	0.90 (0.90)	0.04	0.05	0.89 (0.89)	0.06	0.05	0.98 (0.98)	0.02	0.00
		3	0.92 (0.92)	0.03	0.04	0.88 (0.88)	0.06	0.06	0.91 (0.91)	0.07	0.02
	8	1	0.90 (0.90)	0.05	0.05	0.90 (0.90)	0.06	0.04	0.94 (0.94)	0.04	0.02
		2	0.92 (0.92)	0.03	0.05	0.87 (0.87)	0.06	0.06	0.89 (0.89)	0.07	0.04
		3	0.91 (0.91)	0.04	0.05	0.87 (0.87)	0.07	0.06	0.92 (0.92)	0.07	0.01
	10	1	0.92 (0.92)	0.04	0.04	0.91 (0.91)	0.05	0.04	0.95 (0.95)	0.03	0.02
		2	0.91 (0.91)	0.04	0.05	0.91 (0.91)	0.05	0.04	0.96 (0.96)	0.03	0.01
		3	0.92 (0.92)	0.04	0.05	0.91 (0.91)	0.05	0.04	0.96 (0.96)	0.03	0.01
Science	5	1	0.92 (0.92)	0.03	0.05	0.89 (0.89)	0.06	0.05	0.94 (0.94)	0.04	0.02
	8	1	0.91 (0.91)	0.04	0.05	0.90 (0.90)	0.05	0.05	0.94 (0.94)	0.04	0.02
		2	0.93 (0.93)	0.04	0.02	0.98 (0.98)	0.02	0.01	1.00 (1.00)	0.00	0.00
	10	1	0.88 (0.88)	0.06	0.05	0.92 (0.92)	0.05	0.03	0.97 (0.97)	0.02	0.01
		2	0.95 (0.95)	0.04	0.01	0.99 (0.99)	0.01	0.00	1.00 (1.00)	0.00	0.00
U.S. History	10	1	0.93 (0.93)	0.04	0.04	0.92 (0.92)	0.04	0.04	0.93 (0.93)	0.04	0.03

Table S-2. 2016–17 OSTP: Summary of Decision Accuracy and Consistency Results by Content Area and Grade—Overall and Conditional on Performance Level

Content Area	Grade	Form	Overall	Kappa	Conditional on Level			
					Unsatisfactory	*Limited Knowledge*	*Proficient*	*Advanced*
Mathematics	3	1	0.77 (0.68)	0.57	0.88 (0.82)	0.75 (0.66)	0.67 (0.56)	0.80 (0.70)
		2	0.76 (0.67)	0.54	0.87 (0.79)	0.76 (0.68)	0.67 (0.57)	0.76 (0.61)
		3	0.76 (0.67)	0.55	0.88 (0.81)	0.75 (0.67)	0.66 (0.56)	0.76 (0.63)
	4	1	0.78 (0.70)	0.57	0.87 (0.81)	0.76 (0.68)	0.66 (0.55)	0.82 (0.70)
		2	0.76 (0.68)	0.56	0.85 (0.77)	0.76 (0.68)	0.67 (0.56)	0.83 (0.71)
		3	0.77 (0.68)	0.56	0.86 (0.80)	0.74 (0.66)	0.65 (0.54)	0.82 (0.71)
	5	1	0.79 (0.71)	0.59	0.85 (0.77)	0.78 (0.71)	0.71 (0.61)	0.85 (0.75)
		2	0.78 (0.69)	0.57	0.83 (0.73)	0.79 (0.72)	0.72 (0.63)	0.82 (0.70)
		3	0.78 (0.70)	0.57	0.83 (0.73)	0.79 (0.72)	0.72 (0.62)	0.83 (0.72)
	6	1	0.78 (0.70)	0.57	0.86 (0.79)	0.76 (0.68)	0.76 (0.68)	0.74 (0.57)
		2	0.77 (0.68)	0.54	0.82 (0.71)	0.76 (0.69)	0.76 (0.68)	0.78 (0.62)
		3	0.77 (0.68)	0.53	0.79 (0.65)	0.76 (0.68)	0.76 (0.68)	0.81 (0.67)
		4	0.82 (0.75)	0.58	0.89 (0.86)	0.74 (0.64)	0.73 (0.61)	0.74 (0.51)
	7	1	0.83 (0.76)	0.60	0.91 (0.89)	0.63 (0.51)	0.78 (0.68)	0.82 (0.67)
		2	0.77 (0.68)	0.55	0.84 (0.76)	0.64 (0.53)	0.79 (0.71)	0.83 (0.71)
		3	0.77 (0.69)	0.56	0.86 (0.80)	0.64 (0.53)	0.79 (0.70)	0.83 (0.70)
		4	0.91 (0.87)	0.56	0.95 (0.94)	0.62 (0.47)	0.76 (0.61)	0.66 (0.34)
	8	1	0.78 (0.69)	0.57	0.87 (0.82)	0.70 (0.59)	0.63 (0.51)	0.86 (0.77)
		2	0.75 (0.65)	0.52	0.82 (0.74)	0.72 (0.62)	0.65 (0.53)	0.85 (0.74)
		3	0.76 (0.67)	0.56	0.86 (0.78)	0.72 (0.63)	0.65 (0.54)	0.85 (0.75)
		4	0.83 (0.76)	0.52	0.89 (0.87)	0.69 (0.55)	0.62 (0.47)	0.80 (0.63)
	10	1	0.80 (0.72)	0.60	0.89 (0.85)	0.63 (0.50)	0.73 (0.62)	0.88 (0.80)
		2	0.80 (0.73)	0.60	0.89 (0.86)	0.64 (0.52)	0.74 (0.63)	0.87 (0.78)
		3	0.76 (0.68)	0.56	0.84 (0.78)	0.64 (0.53)	0.74 (0.64)	0.87 (0.78)
		4	0.87 (0.81)	0.53	0.92 (0.91)	0.63 (0.46)	0.72 (0.58)	0.81 (0.65)
ELA	3	1	0.78 (0.69)	0.56	0.87 (0.80)	0.75 (0.66)	0.76 (0.69)	0.63 (0.43)
		2	0.76 (0.67)	0.54	0.86 (0.79)	0.74 (0.64)	0.74 (0.67)	0.70 (0.55)
		3	0.76 (0.67)	0.54	0.86 (0.78)	0.74 (0.64)	0.74 (0.66)	0.72 (0.57)
	4	1	0.76 (0.67)	0.53	0.87 (0.80)	0.69 (0.58)	0.76 (0.70)	0.68 (0.51)
		2	0.76 (0.67)	0.53	0.87 (0.80)	0.68 (0.58)	0.76 (0.69)	0.68 (0.49)
		3	0.76 (0.66)	0.51	0.85 (0.76)	0.69 (0.59)	0.77 (0.70)	0.65 (0.41)

continued

Content Area	Grade	Form	Overall	Kappa	Conditional on Level			
					Unsatisfactory	*Limited Knowledge*	*Proficient*	*Advanced*
ELA	5	1	0.74 (0.64)	0.51	0.87 (0.80)	0.76 (0.67)	0.63 (0.54)	0.67 (0.51)
		2	0.75 (0.66)	0.52	0.88 (0.82)	0.76 (0.67)	0.63 (0.55)	0.61 (0.42)
		3	0.75 (0.66)	0.52	0.87 (0.80)	0.76 (0.68)	0.64 (0.54)	0.70 (0.54)
	6	1	0.75 (0.66)	0.52	0.87 (0.80)	0.79 (0.71)	0.59 (0.49)	0.67 (0.51)
		2	0.76 (0.67)	0.51	0.86 (0.77)	0.79 (0.73)	0.60 (0.49)	0.67 (0.46)
		3	0.74 (0.65)	0.50	0.86 (0.78)	0.79 (0.72)	0.60 (0.52)	0.61 (0.42)
	7	1	0.72 (0.63)	0.48	0.87 (0.81)	0.72 (0.62)	0.59 (0.49)	0.64 (0.46)
		2	0.77 (0.69)	0.52	0.88 (0.82)	0.75 (0.67)	0.64 (0.52)	0.00 (0.17)
		3	0.72 (0.63)	0.48	0.87 (0.80)	0.73 (0.63)	0.60 (0.52)	0.58 (0.39)
	8	1	0.75 (0.66)	0.50	0.88 (0.82)	0.73 (0.64)	0.50 (0.40)	0.66 (0.44)
		2	0.69 (0.60)	0.44	0.86 (0.79)	0.72 (0.62)	0.49 (0.40)	0.65 (0.49)
		3	0.71 (0.62)	0.45	0.87 (0.80)	0.72 (0.63)	0.50 (0.43)	0.54 (0.32)
	10	1	0.78 (0.70)	0.57	0.87 (0.80)	0.79 (0.72)	0.67 (0.56)	0.76 (0.60)
		2	0.79 (0.71)	0.56	0.87 (0.80)	0.80 (0.73)	0.68 (0.57)	0.72 (0.52)
		3	0.78 (0.69)	0.54	0.86 (0.78)	0.79 (0.72)	0.67 (0.57)	0.65 (0.42)
Science	5	1	0.75 (0.66)	0.52	0.81 (0.71)	0.72 (0.63)	0.75 (0.67)	0.78 (0.63)
	8	1	0.76 (0.67)	0.53	0.86 (0.80)	0.57 (0.46)	0.78 (0.70)	0.76 (0.60)
		2	0.91 (0.87)	0.48	0.95 (0.94)	0.57 (0.42)	0.73 (0.51)	1.00 (0.15)
	10	1	0.78 (0.71)	0.50	0.89 (0.86)	0.57 (0.45)	0.69 (0.56)	0.72 (0.49)
		2	0.94 (0.91)	0.45	0.96 (0.96)	0.57 (0.39)	0.67 (0.43)	0.69 (0.33)
U.S. History	10	1	0.77 (0.69)	0.57	0.89 (0.84)	0.58 (0.46)	0.78 (0.71)	0.73 (0.60)

APPENDIX T—SAMPLE REPORTS

OKLAHOMA SCHOOL TESTING PROGRAM

Parent/Student Report

Joy Hofmeister
State Superintendent of Public Instruction
Oklahoma State Department of Education

Test Date: 04/2017

Dear Families,

This report reflects student performance after the first year of enacting new, more comprehensive academic standards. As these standards and tests now align with what is necessary to prepare students for life after graduation, individual student scores CANNOT be compared to those of previous years.

These tests help inform decisions about your child's education, but it is important to remember they are ***not*** the sole indicator of his or her academic performance. Our focus is on repositioning to meet the needs of all students so they can be nationally competitive moving forward.

If you have questions, please contact your local school or the State Department of Education. You may also visit our website, www.sde.ok.gov, and search Office of Assessments.

Sincerely,

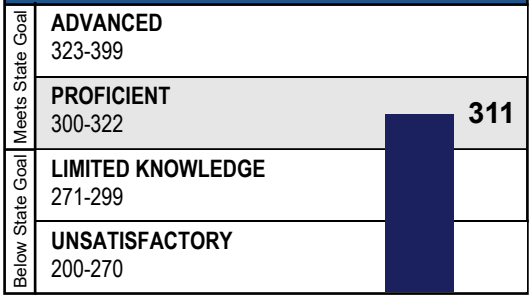
Joy Hofmeister
State Superintendent

ELA
Grade 5

Student:	**FNAME24 W LNAME24**
Local ID:	D001012686
State ID:	D050000024
Birth Date:	05/02/2005
Class:	Demo Class 2
School:	Demonstration School 2
District:	Demonstration District A
Code:	DEMONA-DE2

ACHIEVEMENT LEVEL PERFORMANCE

Your Student's Performance Level
Based on Oklahoma Performance Index (OPI)



(Proficient = 300 or above)

Your student's Performance Level is PROFICIENT.

Your student's OPI score on any one test provides an estimate of what he/she knows and is able to do. If tested again, your student would likely score in this range: 302-320.

IMPORTANT: The Performance Level indicates the student can perform the majority of what is described for that level and even more of what is described for the levels below. The student may also be capable of performing some of what is described in the next level, but not enough to have reached the level. A description of each Performance Level is presented on the back of this report.

Lexile® Measure
Your student's Lexile Measure is **1010L**.
The Lexile® Framework for Reading is a scientific approach to measuring reading ability and the text demand of reading materials. The Lexile Framework involves a scale for measuring both reading ability of an individual and the text complexity of materials he or she encounters. The Lexile scale is like a thermometer, except rather than measuring temperature, the Lexile Framework measures a text's complexity and a reader's skill level. For more information, please visit http://www.lexile.com. Lexile is a registered trademark of MetaMetrics Inc. All rights reserved.

PERFORMANCE BY STANDARDS

Standards		Student Performance	State Performance (Below Standard / At/Near Standard / Above Standard)
Reading/Writing Process	⇧	Above Standard	42% / 35% / 24%
Critical Reading/Writing	⇔	At/Near Standard	35% / 41% / 24%
Vocabulary	⇔	At/Near Standard	38% / 40% / 22%
Language	⇧	Above Standard	34% / 30% / 36%
Research	⇔	At/Near Standard	28% / 55% / 17%
Writing Composite Score	⇔	At/Near Standard	24% / 64% / 12%

OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

Additional Resources and Information
Office of Assessment: (405) 521-3341
Bilingual Education/Migrant Education: (405) 521-2846
Special Education Services: (405) 521-3351
Office of Accountability: (405) 522-5169
Office of Instruction: (405) 522-3521

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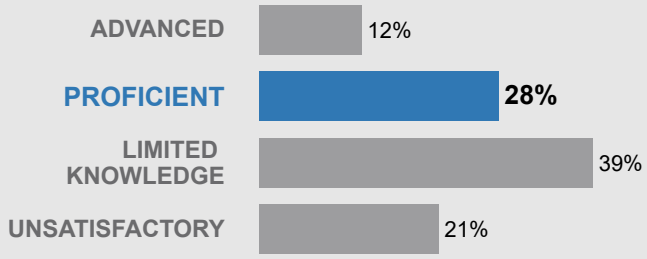
PERFORMANCE LEVELS OF STUDENTS IN THE STATE

Your student's Performance Level is PROFICIENT.



PERFORMANCE LEVEL DESCRIPTORS

ADVANCED
Students demonstrate superior performance on challenging subject matter and a broad, in-depth understanding and application of all Proficient level skills. Students evaluate and analyze literary devices, author's purpose, point of view, and accuracy of fact to interpret the meaning of the text as a whole. Students consistently engage in a recursive writing process to create purposeful, thoroughly organized, engaging works. Students skillfully use vocabulary knowledge and resources to analyze complex text through word parts and relationships, and context clues. Students consistently engage in inquiry to acquire, refine, and share knowledge through a variety of texts.

PROFICIENT
Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade. Students explain how literary elements and devices, author's purpose, point of view, accuracy of facts, and text structure contribute to the meaning of text. Students typically identify objective text-based summaries that include main idea, supporting details, and a logical sequence of events. Students engage in a recursive writing process to create purposeful works, and select and apply the organizational structure that best fits the mode, purpose, and audience. Students use vocabulary knowledge and resources to interpret text through word parts and relationships, and context clues. Students use appropriate vocabulary and frequently identify and apply appropriate use of grammar and mechanics to provide clarity and enhance communication. Students effectively engage in inquiry to acquire, refine, and share knowledge through a variety of texts.

LIMITED KNOWLEDGE
Students demonstrate partial mastery of essential knowledge and skills appropriate to their grade. Students seldom identify the paraphrase of original text or identify literary elements, literary devices, author's purpose, point of view, or accuracy of fact. Students inconsistently compare and contrast texts and ideas within and between texts. Students inconsistently engage in a recursive writing process to create works for various purposes and audiences, and inconsistently select and apply an organizational structure that fits the task. Students inconsistently use vocabulary knowledge and resources to interpret text through word parts and relationships, or context clues. Students inconsistently use appropriate vocabulary and inconsistently identify and apply appropriate use of grammar and mechanics. Students inconsistently engage in inquiry to acquire, refine, and share knowledge through a variety of texts.

UNSATISFACTORY
Students have not performed at least at the Limited Knowledge level. Students scoring Unsatisfactory should be given comprehensive reading instruction.

RESOURCES

Additional information regarding the Oklahoma School Testing Program can be found on the Oklahoma State Department of Education's web site: www.sde.ok.gov.

Office of Accountability and Assessments
Phone: (405) 521-3341
Fax: (405) 522-6272

State Special Education Office
Phone: (405) 521-3351

State Bilingual Office
Phone: (405) 521-2846

The **National Assessment for Educational Progress (NAEP)**, also known as the "Nation's Report Card," is the leading national assessment of what America's students know and can do in Reading, Mathematics, and several other academic subjects. Further information for parents is available on the NAEP Web site at http://nces.ed.gov/nationsreportcard/parents.

Purpose of the Oklahoma School Testing Program: To obtain information about the performance of Oklahoma students to ensure they meet high standards and to evaluate the implementation of the Oklahoma Academic Standards. The OSTP is a standards-based assessment.

GLOSSARY OF TERMS
OPI Score: The Oklahoma Performance Index (OPI) is a scaled score used to place students into one of the four performance levels.
Performance Level: Different ranges of OPI Scores define the four levels of performance—Advanced, Proficient, Limited Knowledge, and Unsatisfactory.
Proficient: Students who score **300** (Proficient) or above on math, science or ELA are considered to be on track for college and career readiness. A score of 700 is the minimum score for placement in the Proficient performance level on the US History test.

OKLAHOMA SCHOOL TESTING PROGRAM

Parent/Student Report

Joy Hofmeister
State Superintendent of Public Instruction
Oklahoma State Department of Education

Test Date: 04/2017

Dear Families,

This report reflects student performance after the first year of enacting new, more comprehensive academic standards. As these standards and tests now align with what is necessary to prepare students for life after graduation, individual student scores CANNOT be compared to those of previous years.

These tests help inform decisions about your child's education, but it is important to remember they are ***not*** the sole indicator of his or her academic performance. Our focus is on repositioning to meet the needs of all students so they can be nationally competitive moving forward.

If you have questions, please contact your local school or the State Department of Education. You may also visit our website, www.sde.ok.gov, and search Office of Assessments.

Sincerely,

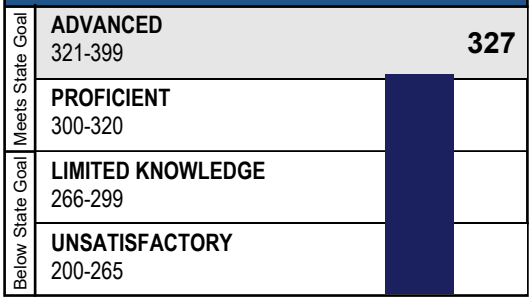
Joy Hofmeister
State Superintendent

Mathematics
Grade 5

Student:	**FNAME24 W LNAME24**
Local ID:	D001012686
State ID:	D050000024
Birth Date:	05/02/2005
Class:	Demo Class 2
School:	Demonstration School 2
District:	Demonstration District A
Code:	DEMONA-DE2

ACHIEVEMENT LEVEL PERFORMANCE

Your Student's Performance Level
Based on Oklahoma Performance Index (OPI)



(Proficient = 300 or above)

Your student's Performance Level is ADVANCED.

Your student's OPI score on any one test provides an estimate of what he/she knows and is able to do. If tested again, your student would likely score in this range: 319-335.

IMPORTANT: The Performance Level indicates the student can perform the majority of what is described for that level and even more of what is described for the levels below. The student may also be capable of performing some of what is described in the next level, but not enough to have reached the level. A description of each Performance Level is presented on the back of this report.

Quantile® Measure
Your student's Quantile Measure is **1125Q**.
The Quantile® Framework for Mathematics is a scale that describes a student's mathematical achievement and the difficulty of specific mathematical skills and concepts. It works a lot like a ruler or thermometer, except rather than measuring length or temperature, the Quantile Framework measures readiness in mathematics learning. For more information, please visit http://www.quantiles.com. Quantile is a registered trademark of MetaMetrics Inc. All rights reserved.

PERFORMANCE BY STANDARDS

Standards	Student Performance	State Performance (Below Standard / At/Near Standard / Above Standard)
Number & Operations ⇧	Above Standard	53% / 21% / 26%
Algebraic Reasoning ⇧	Above Standard	37% / 43% / 20%
Geometry & Measurement ⇧	Above Standard	39% / 38% / 22%
Data & Probability ⇔	At/Near Standard	33% / 43% / 24%

OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

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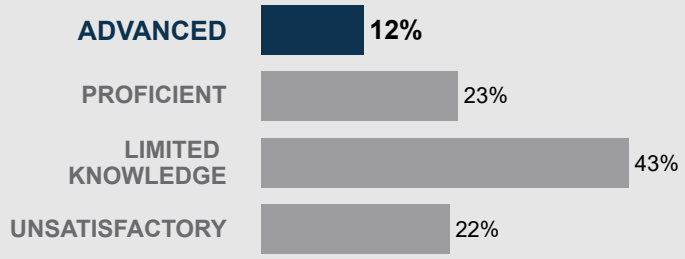
PERFORMANCE LEVELS OF STUDENTS IN THE STATE

Your student's Performance Level is ADVANCED.



PERFORMANCE LEVEL DESCRIPTORS

ADVANCED
Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level typically evaluate complex expressions, equations, and inequalities and interpret the remainder of division problems. Students construct, identify, and compare the volume, perimeter, or surface area of geometric figures. Students analyze complex graphs. Students solve complex and non-routine real-world problems, draw logical conclusions, and justify solutions.

PROFICIENT
Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the Proficient level typically estimate and solve division problems representing remainders in a various ways. Students compare decimals and fractions, including mixed numbers, and estimate, add, and subtract decimals and fractions. Students describe patterns and graph these patterns on a coordinate plane. Students solve volume and simple surface area problems, estimate the perimeter of shapes with curves, and compare angles. Students recognize relationships within a measurement system. Students analyze data sets and simple graphs. Students solve real-world problems and employ problem-solving strategies of identifying and using appropriate information.

LIMITED KNOWLEDGE
Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the Limited Knowledge level estimate and solve division problems. Students solve addition and subtraction real-world problems, including problems with decimals and fractions with like denominators. Students recognize basic equivalent decimals and fractions and compare and order fractions or decimals. Students describe simple patterns of change and identify ordered pairs on a coordinate plane. Students evaluate simple equivalent numerical expressions or equations. Students describe and classify geometric figures, solve simple volume and perimeter problems, and choose an appropriate instrument to measure length of objects. Students read and analyze the length of objects and the measure of angles. Students read simple graphs.

UNSATISFACTORY
Students have not performed at least at the Limited Knowledge level. Students scoring at the Unsatisfactory level should be given comprehensive mathematical instruction.

RESOURCES

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OKLAHOMA SCHOOL TESTING PROGRAM

Parent/Student Report

Joy Hofmeister
State Superintendent of Public Instruction
Oklahoma State Department of Education

Test Date: 04/2017

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Sincerely,

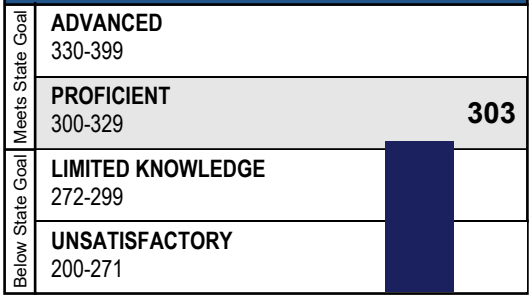
Joy Hofmeister
State Superintendent

Science
Grade 5

Student:	**FNAME24 W LNAME24**
Local ID:	D001012686
State ID:	D050000024
Birth Date:	05/02/2005
Class:	Demo Class 2
School:	Demonstration School 2
District:	Demonstration District A
Code:	DEMONA-DE2

ACHIEVEMENT LEVEL PERFORMANCE

Your Student's Performance Level
Based on Oklahoma Performance Index (OPI)



(Proficient = 300 or above)

Your student's Performance Level is PROFICIENT.

Your student's OPI score on any one test provides an estimate of what he/she knows and is able to do. If tested again, your student would likely score in this range: 295-311.

IMPORTANT: The Performance Level indicates the student can perform the majority of what is described for that level and even more of what is described for the levels below. The student may also be capable of performing some of what is described in the next level, but not enough to have reached the level. A description of each Performance Level is presented on the back of this report.

PERFORMANCE BY STANDARDS

Standards	Student Performance	State Performance (Below Standard / At/Near Standard / Above Standard)
Physical Science ⇩	Below Standard	33% / 36% / 32%
Life Science ⇧	Above Standard	42% / 35% / 23%
Earth & Space Science ⇧	Above Standard	36% / 33% / 31%

OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

Additional Resources and Information
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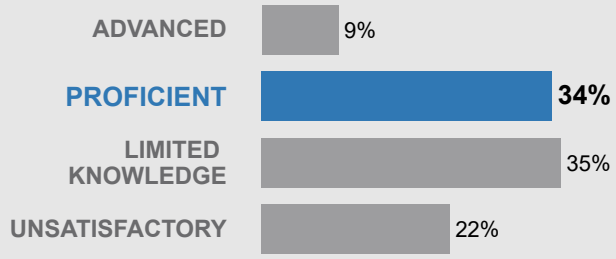
PERFORMANCE LEVELS OF STUDENTS IN THE STATE

Your student's Performance Level is PROFICIENT.



PERFORMANCE LEVEL DESCRIPTORS

ADVANCED
Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students at the Advanced level apply the three dimensions of the standards to predict, modify, and extend complex models and patterns at various scales. They can also analyze data and describe complex relationships.

PROFICIENT
Students demonstrate mastery over appropriate grade-level subject matter, and students are ready for the next grade level. Students scoring at the Proficient level typically will use the three dimensions of the standards to:

- Describe, use and/or develop basic models at various scales to explain the movement of matter and energy between organisms, ecosystems and Earth's systems and the outcomes of these interactions.
- Apply scale, proportion, quantity and/or patterns when performing computational thinking to data as it pertains to distribution of water on Earth, conservation of matter, and Earth's relationship with the sun, moon and stars.
- Use evidence, data and/or models to engage in argument to explain the cause and effect relationships between an object and Earth's gravity, and how scale and proportion affect the apparent brightness of the sun and other stars, and how plants use matter (chiefly air and water) to grow.
- Observe and measure phenomenon to identify patterns that classify materials based on properties and describe cause and effect relationships when mixing substances within an investigation framework.

LIMITED KNOWLEDGE
Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students inconsistently demonstrate use of the three dimensions of the standards beyond identifying basic models, common features, evidence, observing or measuring data or phenomenon to recognize patterns, relationships, and scale, proportion and quantity. Some gaps in knowledge and skill are evident and may require additional instruction in order to achieve a proficient level of understanding.

UNSATISFACTORY
The student does not perform at least at the Limited Knowledge level. Students in this range should be given comprehensive science instruction in order to achieve at the proficient level.

RESOURCES

Additional information regarding the Oklahoma School Testing Program can be found on the Oklahoma State Department of Education's web site: www.sde.ok.gov.

Office of Accountability and Assessments
Phone: (405) 521-3341
Fax: (405) 522-6272

State Special Education Office
Phone: (405) 521-3351

State Bilingual Office
Phone: (405) 521-2846

The **National Assessment for Educational Progress (NAEP)**, also known as the "Nation's Report Card," is the leading national assessment of what America's students know and can do in Reading, Mathematics, and several other academic subjects. Further information for parents is available on the NAEP Web site at http://nces.ed.gov/nationsreportcard/parents.

Purpose of the Oklahoma School Testing Program: To obtain information about the performance of Oklahoma students to ensure they meet high standards and to evaluate the implementation of the Oklahoma Academic Standards. The OSTP is a standards-based assessment.

GLOSSARY OF TERMS
OPI Score: The Oklahoma Performance Index (OPI) is a scaled score used to place students into one of the four performance levels.
Performance Level: Different ranges of OPI Scores define the four levels of performance—Advanced, Proficient, Limited Knowledge, and Unsatisfactory.
Proficient: Students who score **300** (Proficient) or above on math, science or ELA are considered to be on track for college and career readiness. A score of 700 is the minimum score for placement in the Proficient performance level on the US History test.

OKLAHOMA SCHOOL TESTING PROGRAM

Parent/Student Report

Joy Hofmeister
State Superintendent of Public Instruction
Oklahoma State Department of Education

Test Date: 04/2017

Dear Families,

This report reflects student performance after the first year of enacting new, more comprehensive academic standards. As these standards and tests now align with what is necessary to prepare students for life after graduation, individual student scores CANNOT be compared to those of previous years.

These tests help inform decisions about your child's education, but it is important to remember they are ***not*** the sole indicator of his or her academic performance. Our focus is on repositioning to meet the needs of all students so they can be nationally competitive moving forward.

If you have questions, please contact your local school or the State Department of Education. You may also visit our website, www.sde.ok.gov, and search Office of Assessments.

Sincerely,

Joy Hofmeister
State Superintendent

US History
Grade 10

Student:	**FNAME127 LNAME127**
Local ID:	D001763677
State ID:	D100000127
Birth Date:	04/12/2000
Class:	Demo Class 4
School:	Demonstration School 4
District:	Demonstration District B
Code:	DEMONB-DE4

ACHIEVEMENT LEVEL PERFORMANCE

Your Student's Performance Level
Based on Oklahoma Performance Index (OPI)

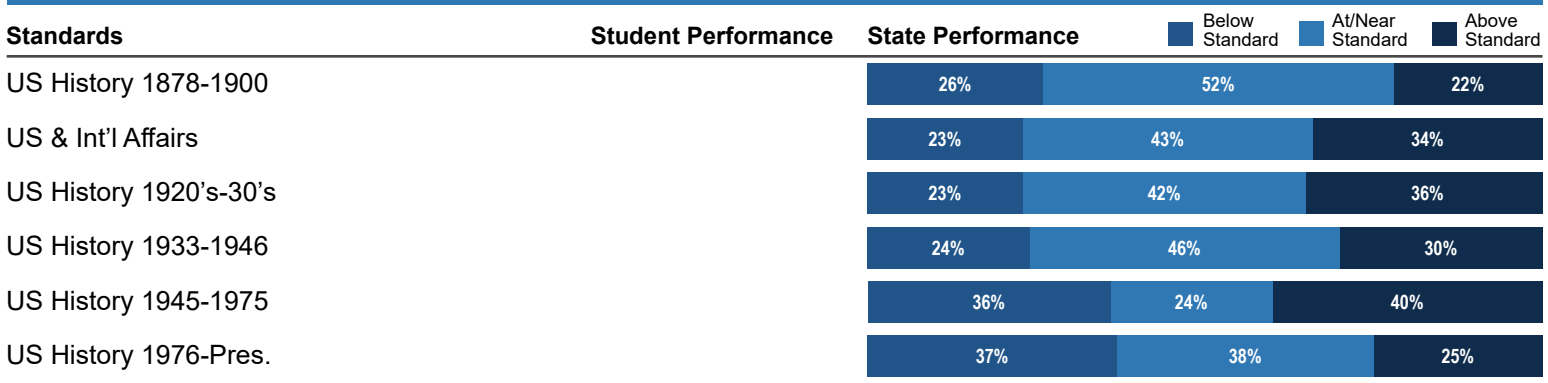
Meets State Goal	**ADVANCED** 761-999	
	PROFICIENT 700-760	**Absent**
Below State Goal	**LIMITED KNOWLEDGE** 668-699	
	UNSATISFACTORY 440-667	

(Proficient = 700 or above)

Your student was absent and did not take the test.
No score is available. No performance level is assigned.

IMPORTANT: The Performance Level indicates the student can perform the majority of what is described for that level and even more of what is described for the levels below. The student may also be capable of performing some of what is described in the next level, but not enough to have reached the level. A description of each Performance Level is presented on the back of this report.

PERFORMANCE BY STANDARDS



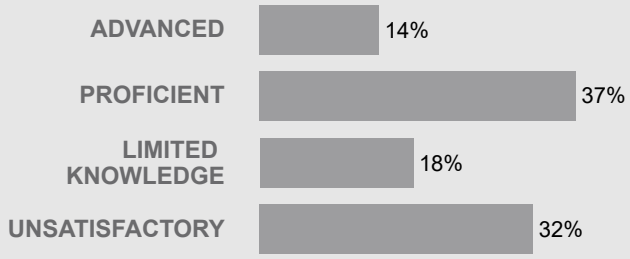
OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

Additional Resources and Information
Office of Assessment: (405) 521-3341
Bilingual Education/Migrant Education: (405) 521-2846
Special Education Services: (405) 521-3351
Office of Accountability: (405) 522-5169
Office of Instruction: (405) 522-3521

Visit the Oklahoma Department of Education at http://www.sde.ok.gov.
Click on the Services tab and then on Assessment to access sample test questions, study materials, and practice test items. Report cards for your student's school can be accessed from the Department of Education's home page.

PERFORMANCE LEVELS OF STUDENTS IN THE STATE

Your student was absent and did not take the test.



PERFORMANCE LEVEL DESCRIPTORS

ADVANCED
Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the Advanced level will integrate and link social, political, and economic concepts. Students will:

- Analyze and evaluate complex historical points-of-view of major events and issues related to U.S. history.
- Critique and differentiate between social, political, and economic concepts that transformed the United States, 1865-2001.
- Analyze and evaluate the United States' social, political, and economic development over time.
- Integrate newly developed concepts with previous historical misconceptions.
- Apply concepts to solve problems as related to U.S. history.
- Evaluate historical justifications and interpretations through the examination of multiple and varied sources.
- Apply content knowledge in multiple contexts to make historical connections and evaluate changes over time.

PROFICIENT
Students demonstrate appropriate course-level knowledge and skills in subject matter and readiness for the next course or level of education. Students scoring at the Proficient level perform above the Limited Knowledge level and will consistently be able to:

- Analyze the transformation of the United States from the Post-Reconstruction period through the Progressive Era.
- Explain the expanding role of the United States in international affairs as the nation transformed into a world power in the late 19th and early 20th centuries.
- Explain the impact of the cycles of boom and bust of the 1920s and 1930s on the transformation of the United States' government, economy, and society.
- Evaluate the major causes, events, and effects of the United States' involvement in World War II, 1933-1946, both foreign and domestic.
- Describe and interpret the role of the United States in significant foreign and domestic affairs during the Cold War period, 1946-1975.
- Interpret the impact of the United States' significant foreign and domestic policies, 1976-2001.

LIMITED KNOWLEDGE
Students demonstrate partial mastery of the essential course-level knowledge and skills. Students at the Limited Knowledge level will:

- Recall and identify significant individuals, events, and issues in U.S. history, 1865-2001.
- Define appropriate social studies terminology and vocabulary.
- Demonstrate partial competency to analyze textual and visual evidence.
- Demonstrate partial competency to draw conclusions, analyze, evaluate, interpret, and/or integrate concepts as related to U.S. history.

UNSATISFACTORY
Students have not performed at least at the Limited Knowledge level. Students at the Unsatisfactory level have not demonstrated course-level knowledge and skills.

RESOURCES

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Spring 16-17 OSTP Grade 10

FNAME12

State ID: D100000012
Birth Date: 06/01/2000
Gender: U
Grade: 10

Subject	Score	Performance Level
ELA	311	Proficient
Math	290	Limited Knowledge
Science	293	Limited Knowledge

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME11

State ID: D100000011
Birth Date: 08/09/2000
Gender: U
Grade: 10

Subject	Score	Performance Level
ELA	256	Unsatisfactory
Math	243	Unsatisfactory
Science	240	Unsatisfactory

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME100, FNAME100 B.

State ID: D100000100
Birth Date: 12/17/1998
Gender: M
Grade: 11

Subject	Score	Performance Level
U.S. History	652	Unsatisfactory

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME13, FNAME13

State ID: D100000013
Birth Date: 02/06/2001
Gender: U
Grade: 10

Subject	Score	Performance Level
ELA	264	Limited Knowledge
Math	268	Unsatisfactory
Science	232	Unsatisfactory

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME101, FNAME101 R.

State ID: D100000101
Birth Date: 05/28/2000
Gender: M
Grade: 11

Subject	Score	Performance Level
U.S. History	766	Advanced

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME14, FNAME14

State ID: D100000014
Birth Date: 03/21/2001
Gender: U
Grade: 10

Subject	Score	Performance Level
ELA	293	Limited Knowledge
Math	271	Unsatisfactory
Science	290	Limited Knowledge

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME102, FNAME102 L.

State ID: D100000102
Birth Date: 12/12/2000
Gender: F
Grade: 10

Subject	Score	Performance Level
ELA	ABS	Absent
Math	ABS	Absent
Science	ABS	Absent

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME15, FNAME15

State ID: D100000015
Birth Date: 03/28/2000
Gender: U
Grade: 10

Subject	Score	Performance Level
ELA	DNA	Did Not Attempt
Math	DNA	Did Not Attempt
Science	DNA	Did Not Attempt

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME103, FNAME103

State ID: D100000103
Birth Date: 07/28/2000
Gender: M
Grade: 10

Subject	Score	Performance Level
Math	215	Unsatisfactory

Demonstration School 2
Demonstration District A

Spring 16-17 OSTP Grade 10

LNAME16, FNAME16

State ID: D100000016
Birth Date: 09/04/2000
Gender: U
Grade: 10

Subject	Score	Performance Level
ELA	316	Proficient
Math	294	Limited Knowledge
Science	263	Unsatisfactory

Demonstration School 2
Demonstration District A

APPENDIX U—ANALYSIS AND REPORTING DECISION RULES

Analysis and Reporting Decision Rules: Oklahoma 2016-2017 Spring OSTP

This document details rules for analysis and reporting that are specific to the Spring OSTP. This document is considered a draft until the Oklahoma State Department of Education (SDE) signs off. If there are rules that need to be added or modified after said sign-off, SDE sign-off will be obtained for each such rule.

Table of Contents:

Year to Year Change Highlights:

Date	Description	Page(s)
3/21/2017	Significant edits have occurred due to the transition from EOI/OCCT to OSTP.	All

Decision Rules

I. Contract Overview

A. Test Administration

Admin ID	Description	Test Grade(s)	Subject
0	OSTP	03-08, 10 05, 08, 10 10	ELA, Mathematics Science US History (Note: students in grades 9-12 may test)

Note: Students taking Grade 10 tests may be listed as 11th Graders in demographics

B. Reporting Cycles

Release	Applies To:
Pre-Test	PreCode Roster Reports (Round 1 and Round 2)
Preliminary Reporting	State Results file (All grades, used for cleanup purposes)
Early Reporting	Grade 3 RSA reporting (eMetric and state results file, no printed reports)
Final Reporting	All Grades (eMetric, state results file, printed reports)

C. Deliverables List

Client and internal deliverables are listed. Specifications for each deliverable are detailed in the Deliverable Specifications Section VI.

Release	Deliverable	Method of Delivery	To Who	Includes	Other details
Pre-Test	Printed PreCode Roster Report Round 1	printed pdf	Shipped to Districts	Paper testers only	
	Printed PreCode Roster Report Round 2	printed pdf	Shipped to Districts	Paper testers only	
Preliminary Reporting	Student Results DataFile	sftp	State	All testers unless excluded by business rules	All grades, only Selected Response scores.
Early Reporting	Data Interaction - Roster Report	eMetric (DI)	Schools and Districts	All testers unless excluded by business rules	Only Selected Response scores and RSA score included.
	Data Interaction - Individual Student Report	eMetric (DI)	Schools and Districts	All testers unless excluded by business rules	
	Data Interaction - Group Summary Report	eMetric (DI)	Schools and Districts	All testers unless excluded by business rules	
	Student Results Data File	sftp	State	All testers unless excluded by business rules	
Final Reporting	Data Interaction - Roster Report	eMetric (DI)	Schools and Districts	All testers unless excluded by business rules	
	Data Interaction - Individual Student Report	eMetric (DI)	Schools and Districts	All testers unless excluded by business rules	
	Data Interaction - Group Summary Report	eMetric (DI)	Schools and Districts	All testers unless excluded by business rules	
	Printed Student Report	printed pdf	Shipped to Districts	All testers unless excluded by business rules	
	Printed Student Results Label	printed pdf	Shipped to Districts	All testers unless excluded by business rules	
	Student Results Data File	sftp	State	All testers unless excluded by business rules	

D. Post-Test Clean Up Expectations

There will be one specified window of opportunity to update student biographical data. This will occur after early reporting and prior to final reporting. Cleanup will be completed through the Assessment Record Cleanup process.

II. Internal Data Sources

A. Test Information

i. **Prior Administrations**

- US History tests are reuses:
  - ***a.*** The Spring 2016 Equivalent form will be used as the Spring 2017 Operational form.
  - ***b.*** The Summer 2016 Operational form will be used as the Spring 2017 Breach form.
- All other tests are new builds.

ii. **Test Design**

Grade	Subject	Form(s)	Items included in Raw Score	Item Types
03-05	Mathematics	Paper Operational: A1, A2, B1, B2, C1, C2 Paper Breach	Common items either to form A, B, C, or Breach	Selected response items (Single part) only.
06-08, 10	Mathematics	Online Operational: A1, A2, B1, B2, C1, C2 Online Breach Paper Operational Paper Breach	Common items either to form A, B, C, Online Breach, Paper Operational, or Paper Breach	Selected response items (Single part) and TEIs.
03-08, 10	ELA	Paper/Online Operational: A1, A2, B1, B2, C1, C2 Paper/Online Breach	Common items either to form A, B, C, or Breach	A Writing Composition is present at grades 5, 8, and 10. All other items are selected response items (Single or Multiple parts).
05	Science	Paper Operational: A1-A6 Paper Breach	Common items to either form A or Breach	Selected response items (Single part) only.
08, 10	Science	Online Operational: A1-A7 Online Breach Paper Operational Paper Breach	Common items to either form A, Online Breach, Paper Operational, or Paper Breach	Selected response items (Single or Multiple parts) and TEIs.
10	US History	Paper/Online Operational Paper/Online Breach	Common items to either form Operational or Breach	Selected response (Single part) items only.

iii. ***Item Reporting Categories*** *(Measured Progress daRepCatTextLookup)*

- Standards are reported for all content areas.
- Writing subtest information is reported as part of ELA tests at Grades 5, 8, and 10:
  - ***a.*** Composite Score
- See Appendix A for a table indicating the text and ordering of each of the Standards on the Student Report.
- Minimum Item Counts
  - ***a.*** If a student attempts a content area, they are considered to have attempted all standards.
  - ***b.*** If less than 6 points are included in a standard, the title is displayed but student scores are not reported.

iv. ***Non-Braille-able Item Identification***

- Responses for students that were administered a Braille accommodation must be transcribed onto an answer document with IEP Braille = Yes. Online tests will not be considered or reported as Braille.
  - ***a.*** The IEP Braille indicator is only printed on the paper answer documents.
- The items that could not be brailled are listed in Appendix B (from the SDE). No items are present on the 16-17 Spring tests.

B. Item Banking

All items and associated metadata are stored in Measured Progress's Content Bank (NTS).

C. School Information (iCore)

i. Schools types are calculated by MP based on SchoolTypeID and SchoolSubTypeID:

SchType	Identification	Description
PUB	**1,1**	Public Schools
CHA	**1,11** **1,12**	Charter Schools, Virtual Charter Schools
PRI	**3,2**	Non Public Schools, including BIA schools

ii. ***Additional iCore Specific Rules/Information***
Non-Public Data are not provided to the SDE, with the exception of The School for the Deaf and The School for the Blind.

D. Scoring

i. ***Multiple Choice Scores – Scanning, eMetric***
Valid multiple choice responses are A, B, C, D, or F, G, H, J, blank, and * = multiple responses. All responses except "blank" are considered a response attempt.

ii. ***Technology Enhanced Items (TEIs) – eMetric***

The TEIs are administered online only and the score is captured based on the scoring rubric.

iii. ***Multiple Part Selected Response***

Each of the two parts has a valid response of A, B, C, D, or F, G, H, J or blank. The two parts are combined for a final response.

iv. ***Writing Composition Scores – Scoring***

- The writing composition is scored on 5 analytic traits:
  - ***a.*** The 5 traits are:
    - Ideas and Development
    - Organization, Unity, and Coherence
    - Word Choice
    - Sentences and Paragraphs
    - Grammar, Usage, and Mechanics
  - ***b.*** Traits are 10% double scored, with a score range of 1-4. A 3rd score is required if scores are non-adjacent, or non-scorable codes do not match. A final trait score is then calculated. *(see calculations under Section V.C)*
- The following scores are valid for each individual score:

Raw Data Value	Description	Reported Value	Point Value
1-4 (per scorer)	Trait 1-5 Score	Final score	1-4
I	Illegible/Incomprehensible	I	0
F	Language Other than English	L	0
B, R	Blank response/ refusal	N	0
O	Off Topic	O	0

v. ***Test Form Determinations***

- Braille form is determined if an answer document has IEP Braille bubbled. Online tests cannot be Braille.
- Otherwise the test form is determined by the answer document or the online test record.

III. Data Reconciliation Audits

The following cleanup will be performed on student level data prior to analysis once demographic data and reconciled test information are compiled to ensure consistency. Calculations are performed in the order listed below, and audited values are used in each subsequent check and for all analysis, reporting, and deliverables as applicable:

A. *IEP Braille and IEP Large Print*

i. If TestMode is online, then IEP Braille and IEP LargePrint are set to 0.

B. ***ELL First & Second Year Proficient (ELLProficient)***

i. If both ELL 1st Year Proficient and ELL 2nd Year Proficient are marked then the student is considered 2nd Year Proficient (ELLProficient = 2). If neither are marked then ELLProficient = 0. Otherwise it is 1.

C. ***Non-Full Academic Year***

i. NFAY data is provided as part of the Assessment Record Cleanup process.

ii. If Non-Full Academic Year (NFAY) is blank, then it is reported as blank.

D. ***Not Tested Code Resolution***

i. If multiple not tested codes are indicated, a single code is assigned based on the following hierarchy:

- No Longer Enrolled
- Absent
- State Alternate Testing (OAAP)

IV. Student Participation and Reporting Status

A. Basic Definitions

The following criteria are defined for use during the participation status assignment hierarchy. Students may meet the criteria for multiple definitions, but during the hierarchy are assigned a single final participation status.

i. ***Test Attemptedness*** *(by subject)*

- A student must attempt a minimum of 5 multiple-choice items in the content area to receive a score. The 5 items must be operational items and not indicated as flawed, placeholder, or field test items (or non-braille-able items in a Braille test) in the item database. These 5 items may be anywhere in the content area, regardless of session.
  - ***a.*** The ELA tests are considered attempted based on the criteria above, regardless of a writing composition score. However, the presence of only a writing composition score is not considered a valid attempt.
  - ***b.*** If no valid attempt, the student receives the Did Not Attempt status (assuming other student statuses are not applicable)

ii. ***Not Tested Indicators*** *(by subject)*

- Not Tested Codes - These codes are collected from the answer document, online testing system, or through the bio data cleanup window. If multiple codes are indicated, a hierarchy is applied.
  - ***a.*** No Longer Enrolled
  - ***b.*** Absent
  - ***c.*** State Alternate Testing (OAAP)
- State approved status codes - These codes are supplied by the state.
  - ***a.*** ELL 1st Year in U.S. Exempt
    - Only applicable for ELA tests
  - ***b.*** Emergency Exemption
  - ***c.*** Do Not Report
  - ***d.*** Do Not Report – Duplicate (set by DP)
  - ***e.*** Invalidated (Breach)

B. Participation Status Assignment Hierarchy *(by subject)*

i. Regardless of attempt status, if the student has a State Code provided they are assigned a participation status per the following hierarchy and existing work is not reported:

- ELL 1st Year in U.S. Exempt
  - ***a.*** Only applies to ELA tests.
- Emergency Exemption
- Do Not Report
  - ***a.*** Breach/Equivalent tests without an Operational test that have been Invalidated will be marked as Do Not Report
- Do Not Report - Duplicate
  (note these are set by data processing, not by the SDE)
- Invalidated (Breach)

ii. Otherwise, if the student attempted the test they are reported as a participant and all Not Tested Codes are suppressed.

iii. Otherwise, if the student did not attempt the test they are assigned a participation status per the following hierarchy of Not Tested Codes:

- No Longer Enrolled
- Absent
- State Alternate Testing (OAAP)

iv. Otherwise, the student is assigned a status of Did Not Attempt.

C. Participation Status Summary

Subjects	Description	MP Part Status	Printed Report Text	
			Results Label	Student Report
All	Valid Participant	Z	Earned Perf. Level	Earned Perf. Level
All	Did Not Attempt	A	DNA	Your student did not attempt the test.
ELA only	ELL 1st Year in U.S. Exempt	C	ELL1	Your student did not take the test based upon your student's *<test name+content area name>* language learner status and being first year in the U.S.
All	Emergency Exemption	D	EE	Your student did not take the test based upon the status of Emergency Exempt.
All	Do Not Report	E	*N/A*	*N/A*
All	Invalidated (Breach)	F	INV	Your student's test was Invalidated.
All	No Longer Enrolled	G	*N/A*	*N/A*
All	Absent	H	ABS	Your student was absent and did not take the test.
All	State Alternate Testing (OAAP)	I	*N/A*	*N/A*
All	Do Not Report- Duplicate	L	*N/A*	*N/A*

D. Post-Discrepancy Participation Status Assignment

After the Assessment Record Cleanup process, an updated bio data file and State Status Code file are sent to Measured Progress. The resolution of these codes and Student Participation Status assignment will be completed again following the rules defined in previous sections.

E. Dual Reporting - The School for the Deaf and the School for the Blind have students who are accountable to a sending school.

i. The student IDs for students at the School for the Blind and the School for the Deaf have been provided to Measured Progress in order to identify students who should be reported at both the sending school (identified in the WAVE) and the School for the Deaf or the School for the Blind (the testing school).

ii. Student reports will be sent to both the sending school and the School for the Deaf or the School for the Blind (the testing school).

iii. Students will appear in the reporting portal at both schools.

iv. The students will be included in aggregation for both schools (sending and testing) and districts (sending and testing).

v. The students will appear once in the state level data file at the sending school.

vi. The student will be included in state aggregations once.

V. Calculations

A. Student Level Calculations

i. Calculations by Participation Status Summary

Description	**MP Part Status**	**Item Scores** *(Reports)*	**OPI Score** *(Reports)*	**Performance Level** *(Reports)*	**Data File Raw Scores**	**Data File Item Scores**	**Data File OPI Score**	**Data File Performance Level**	**Data File Student Status Code**
Valid Participant	Z	✓	✓	✓	✓	✓	✓	✓	
Did Not Attempt	A			DNA					DNA
ELL 1st Year in U.S. Exempt	C			ELL1					ELL1
Emergency Exemption	D			EE					EE
Do Not Report	E*								DNR
Invalidated (Breach)	F			INV					INV
No Longer Enrolled	G*								NLE
Absent	H			ABS					ABS
State Alternate Testing (OAAP)	I*								OAAP
Do Not Report- Duplicate	L*								DNR-D

***** *Student records only appear in State results file. They do not appear in online or paper reports.*
Note: Raw Scores will not be listed on the reports. Raw Scores are only available in the state datafile.

ii. ***Resolved Ethnicity for reporting (Ethnic)***

- If 'Hispanic' is indicated, then the student is marked as Hispanic.
- Otherwise if only one race is indicated, the student is reported as that race.
- Otherwise the student is reported as 'Two or More Races'.
- The values for Ethnic are as follows:
  1 = Black/African American
  2 = American Indian/Alaska Native
  3 = Hispanic/Latino
  4 = Asian
  5 = Pacific Islander
  6 = White/Caucasian
  7 = Two or More Races

iii. ***Resolved IEP and 504 for reporting (rptIEP, rpt504)***

- If IEP and 504 are both 0 and no IEP/504 With Accommodations are marked (paper IEP/504 With Accommodations or online IEP With Accommodations or online 504 With Accommodations), then report as not IEP and not 504.
  a. rpt504 = 0, rptIEP = 0
- If IEP and 504 are both 0 and paper IEP/504 With Accommodations or online IEP With Accommodations is marked, then report as IEP with Accommodations and not 504.
  a. rptIEP = 1, rpt504 = 0
- If IEP and 504 are both 0 and online 504 With Accommodations is marked, then report as 504 with Accommodations and not IEP.
  a. rptIEP = 0, rpt504 = 1
- If IEP and 504 are both 1 then report as IEP (with or without accommodations) and not 504.
  a. rpt504 = 0
  b. If paper IEP/504 With Accommodations or online IEP With Accommodations is present, then rptIEP = 1; otherwise rptIEP = 2.
- If IEP is 0 and 504 is 1, then report as 504 with (or without) Accommodations.
  a. If paper IEP/504 With Accommodations or online 504 With Accommodations is present, then rpt504 = 1; otherwise rpt504 = 2.
- If IEP is 1 and 504 is 0, then report as IEP with (or without) Accommodations.
  a. If paper IEP/504 With Accommodations or online IEP With Accommodations is present, then rptIEP = 1; otherwise rptIEP = 2.

iv. ***Resolved ELL for reporting (rptELL)***

- If ELL With Accommodations is marked, the student is ELL with accommodations.
  a. rptELL = 1
- Otherwise if ELL = '1' and ELL With Accommodations is not marked then the student is ELL without accommodations.
  a. rptELL = 2
- Otherwise set rptELL = '0'.

v. ***Regular Education(RegularEd)***

- If IEP or ELL = 1, then RegularEd = 0. Otherwise RegularEd = 1.

vi. ***Class Name***

- If ClassName is blank, set to 'No Name'.

vii. ***Raw Score calculations***

- Only common, non-flawed items are included in raw score calculations.

viii. **Reading Sufficiency Act (RSA)**

- Applies to Grade 3 ELA. At Grade 3, new legislation requires reporting whether a student has met or not met the Reading Sufficiency Act (RSA) requirement.
- The items included in a student's RSA raw score is a subtest of the grade 3 reading test, included common, non-flawed items identified with standard of either: Reading/Writing Process (2.0) or Vocabulary (4.0).
- A standards validation was held to determine the cut score that is applied based on the RSA raw score.
- Students will be reported with a value of 0 if they have not met the RSA criteria or with a value of 1 if they have met the RSA criteria.
- This is reported on the Grade 3 ELA Student Report per the approved drafts, the reporting portal, and state student results data file.

ix. **Lexile/Quantile –** Note: Quantile is new for Spring 2017

- For grades 3-8 and 10, Lexile measures will be reported for ELA.
- For grades 3-8 and 10, Quantile measures will be reported for Math.
- Lookups will be provided by MetaMetrics.
- The Lexile measure will be applied based on the students ELA scaled score.
- The Quantile measured will be applied based on the students Math scaled score.
- If the student's Lexile or Quantile measure is negative, BR=Beginning Reader will be reported on the student report.
- If the student's Lexile or Quantile measure is not negative, the formatted measure will be reported on the student report, data files and in the reporting portal.

B. Aggregate Calculations

i. ***Number Enrolled***

The following students are included in Enrollment counts:

a. Valid Participants, Did Not Attempt, ELL 1st Year Exempt, Emergency Exemption, Invalidated (Breach), Absent, State Alternative Assessment (OAAP) (PartStatus = Z,A,C,D,F,H,I)

ii. ***Number Tested***

The following students are included in participation tested counts:

a. Valid Participants (PartStatus = Z)

iii. ***Performance Summary***

The following rules describe whether students are included in performance level and OPI score aggregations at the Class, School, District, and State level.

The following students are included in all aggregations unless otherwise noted: (IncludedClass/School/District/State = 1)

a. Valid Participants (PartStatus = Z)

- Additional Rules
  - ***a.*** Students at Non Public schools (Schtype = PRI) are not included in State aggregations. (IncludedState = 0)
  - ***b.*** Other Placement students are not included in Class, School, or District aggregations. (IncludedClass/School/District= 0)
  - ***c.*** Operational, Breach, and Braille tests are included and aggregated together.

iv. ***Standards Summary***

The following rules describe whether students are included in standards raw score aggregations at the Class, School, District, and State level.

The following students are included in all aggregations unless otherwise noted: (IncludedClass/School/District/State = 1)

a. Valid Participants (PartStatus = Z)

- Additional Rules
  - ***a.*** Students at Non Public schools (Schtype = PRI) are not included in State aggregations. (IncludedState = 0)
  - ***b.*** Other Placement students are not included in Class, School, or District aggregations. (IncludedClass/School/District= 0)
  - ***c.*** Operational and Breach tests are aggregated separately.
  - ***d.*** Braille tests are not included.

C. Writing Scores

i. ***Final Analytic Trait score***

- If the trait is single scored then that is the score of record.
- If scorer 1 and 2 both provide scores and the scores are exact or adjacent then the final trait score is the highest of the two scores.
- If scorer 1 and 2 both provide an agreeing not-scorable code the not scorable code is the final trait score.
- Otherwise the final trait score is the 3rd score or non-scorable code.

ii. ***Final Composition Score***

- The final composition score is a linear combination of the 5 final analytical trait scores, which are weighted as follows:

Trait Code	Internal MPCode	Analytic Trait	Weight	Calculation
1.	I	Ideas and Development	.30	Final Trait Score x .30 = weighted score 1
2.	O	Organization, Unity, and Coherence	.25	Final Trait Score x .25 = weighted score 2
3.	W	Word Choice	.15	Final Trait Score x .15 = weighted score 3
4.	S	Sentences and Paragraphs	.15	Final Trait Score x .15 = weighted score 4
5.	G	Grammar, Usage, and Mechanics	.15	Final Trait Score x .15 = weighted score 5
		Total		**Sum (weighted score 1 through 5)**

- Grade 5

Final Composition Score = (5*Sum)/4

The final composition score is rounded to the nearest whole value, with possible values ranging from 1-5.

- Grade 8

Final Composition Score = (7*Sum)/4

The final composition score is rounded to the nearest whole value, with possible values ranging from 1-7.

- Grade 10

Final Composition Score = (11*Sum)/4

The final composition score is rounded to the nearest whole value, with possible values ranging from 1-11.

iii. ***Raw Score***

- ***ELA with Writing Composition (Grades 5, 8, 10)***
  The raw score is calculated by summing the final calculated composition score and the MC raw score (common items). That score is used to get the final Scale Score and Performance Level.

D. Reporting Category Score Calculations

i. Only common, non-flawed items are included in reporting category score calculations.

ii. The percent at each reporting category is rounded to the nearest whole number.

iii. The reporting category associated with the Writing Composition is reported as follows:

a. The Writing Composite score reported is the final calculated composite score, rounded to the nearest whole value.

- If the Writing Composition has a writing condition code, the code is reported as the composite score reporting category.

E. Scaling, Equating, and Item Statistics

i. ***Scaling & Equating***

- US History is pre-equated, all other tests are post-equated.

ii. ***Performance Level Coding***

There are four possible Performance Levels, assigned to students using the raw score to Oklahoma Performance Index (OPI) lookup provided by psychometrics.

Performance Level	Description
1	Unsatisfactory
2	Limited Knowledge
3	Proficient
4	Advanced

VI. Deliverables Specifics

A. State Student Results Data File

i. All students are included in the State Student Results datafiles, per the Student Results Layout. One file is created containing all grades.

ii. Refer to the file layout for specific data elements and valid values.

iii. State Student Results datafiles are comma delimited (CSV).

iv. There will be one (1) record per test.

v. For the Preliminary Reporting file, only Raw Scores will be present. The Raw Score will only include scores from the Selected Response items and TEIs. Scaled Scores, RSA, Lexiles, and Quantiles will be blank.

vi. For the Early Reporting file, only Raw Scores and RSA will be present. The Raw Score will only include scores from the Selected Response items and TEIs. Scaled Scores, Lexiles, and Quantiles will be blank.

vii. For the Final Reporting file, all scores (Raw, Scaled, RSA, Lexiles, Quantiles) will be included.

B. eMetric StudentData and StudentScores

i. Students are included in the StudentData and StudentScores based on their Participation Status. See Participation Status Summary table in Section V. A for a full breakdown.

ii. Files will follow the eMetric Reporting Transfer Layout.

iii. Files will be Tab-delimited.

iv. StudentData will have one record per student, StudentScores will have one record per test.

C. Student Report

i. Each student report consists a 1-page front followed by a 1-page back.

ii. The front page contains information about the student's performance.

iii. The back page contains information about the state's performance distribution and performance level descriptors.

iv. Student reports are generated based on the Participation Status. See Participation Status Summary table in Section V. A for a full breakdown.

v. For Grade 3 ELA tests, information about the student's RSA score will be printed.

vi. For all ELA tests, information about the student's Lexile will be printed.

vii. For all Math tests, information about the student's Quantile will be printed.

viii. Standards performance information will be presented, unless that standard does not meet the minimum item counts requirement (see Section II.A.iii).

D. Student Labels

i. Each student label contains all of the student's tests.

ii. Student labels are generated based on the Participation Status. See Participation Status Summary table in Section V. A for a full breakdown.

iii. The score information presented on the label is determined by the Participation Status (see Section IV.C).

iv. If any of a student's tests are Braille or Breach/Equivalent then a footnote will be printed.

Appendix

A. Reporting Category Text

Description: Reporting Categories Text and Ordering

Grade	Subject	Display Text
03	OSTP Math	Number & Operations
03	OSTP Math	Algebraic Reasoning
03	OSTP Math	Geometry & Measurement
03	OSTP Math	Data & Probability
03	OSTP ELA	Reading/Writing Process
03	OSTP ELA	Critical Reading/Writing
03	OSTP ELA	Vocabulary
03	OSTP ELA	Language
03	OSTP ELA	Research
04	OSTP Math	Number & Operations
04	OSTP Math	Algebraic Reasoning
04	OSTP Math	Geometry & Measurement
04	OSTP Math	Data & Probability
04	OSTP ELA	Reading/Writing Process
04	OSTP ELA	Critical Reading/Writing
04	OSTP ELA	Vocabulary
04	OSTP ELA	Language
04	OSTP ELA	Research
05	OSTP Math	Number & Operations
05	OSTP Math	Algebraic Reasoning
05	OSTP Math	Geometry & Measurement
05	OSTP Math	Data & Probability
05	OSTP ELA	Reading/Writing Process
05	OSTP ELA	Critical Reading/Writing
05	OSTP ELA	Vocabulary
05	OSTP ELA	Language
05	OSTP ELA	Research
05	OSTP ELA	Writing Composite Score
05	OSTP Science	Physical Science
05	OSTP Science	Life Science
05	OSTP Science	Earth & Space Science
06	OSTP Math	Number & Operations
06	OSTP Math	Algebraic Reasoning
06	OSTP Math	Geometry & Measurement
06	OSTP Math	Data & Probability
06	OSTP ELA	Reading/Writing Process

06	OSTP ELA	Critical Reading/Writing
06	OSTP ELA	Vocabulary
06	OSTP ELA	Language
06	OSTP ELA	Research
07	OSTP Math	Number & Operations
07	OSTP Math	Algebraic Reasoning
07	OSTP Math	Geometry & Measurement
07	OSTP Math	Data & Probability
07	OSTP ELA	Reading/Writing Process
07	OSTP ELA	Critical Reading/Writing
07	OSTP ELA	Vocabulary
07	OSTP ELA	Language
07	OSTP ELA	Research
08	OSTP Math	Number & Operations
08	OSTP Math	Algebraic Reasoning
08	OSTP Math	Geometry & Measurement
08	OSTP Math	Data & Probability
08	OSTP ELA	Reading/Writing Process
08	OSTP ELA	Critical Reading/Writing
08	OSTP ELA	Vocabulary
08	OSTP ELA	Language
08	OSTP ELA	Research
08	OSTP ELA	Writing Composite Score
08	OSTP Science	Physical Science
08	OSTP Science	Life Science
08	OSTP Science	Earth & Space Science
10	OSTP Math	Number & Operations
10	OSTP Math	Algebraic Reasoning
10	OSTP Math	Functions
10	OSTP Math	Data & Probability
10	OSTP Math	Geometry: 2D Shapes
10	OSTP Science	Structure and Function
10	OSTP Science	Ecosystem Dynamics
10	OSTP Science	Heredity and Diversity
10	OSTP ELA	Reading/Writing Process
10	OSTP ELA	Critical Reading/Writing
10	OSTP ELA	Vocabulary
10	OSTP ELA	Language
10	OSTP ELA	Research
10	OSTP ELA	Writing Composite Score
10	OSTP US History	US History 1878-1900
10	OSTP US History	US & Int'l Affairs

10	OSTP US History	US History 1920's-30's
10	OSTP US History	US History 1933-1946
10	OSTP US History	US History 1945-1975
10	OSTP US History	US History 1976-Pres.

B. Non-Brailleable Items

Description: List of Items that could not be brailled

Test	Subject	Position
N/A		

APPENDIX V—COGNITIVE LABS

OCCT Science Cognitive Lab Report

In September of 2015, Measured Progress conducted cognitive labs with 58 Oklahoma students on behalf of the Oklahoma State Department of Education. The cognitive labs were an opportunity for students to use a think aloud method to aid item design for future Oklahoma science assessments. Think aloud protocols are valuable in educational and assessment research due to the richness of data that may be gathered by the process.[1]

Starting in the 2016-2017 school year, the Oklahoma science assessments will be aligned to the new Oklahoma Academic Standards for Science (OASS), adopted in 2014. The OASS are based on *A Framework for K-12 Education*[2] and therefore require the integration of Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts to show proficiency in each performance expectation (standard). The new standards are more rigorous than the prior standards and are heavily focused on scientific literacy and the explanation of phenomena.

The change in the standards and the expected accompanying changes in classroom instructional methods have called for a change in the design of Oklahoma's science assessments. The new science assessments will have a cluster-based format, a cluster being a set of three items linked with a common stimulus. In Grades 8 and Biology, some of these clusters will contain technology-enhanced items in addition to multiple-choice items.

Given this multitude of change, the SDE and Measured Progress desired to gain some preliminary information about students' interaction with the new test content, format, and item types. The guiding research questions for the cognitive labs were as follows:

- How are students thinking about items written to the new standards?
- As written, how well are the items measuring the intended constructs?
- How are students responding to new item types and groupings (technology-enhanced items, cluster format)?

By gathering data pertaining to these questions, the SDE and Measured Progress were able to adjust specifications and approaches for item and test development, to support the production of Oklahoma science tests that are accessible, valid, and reliable.

---

[1] Johnstone, C. J., Bottsford-Miller, N. A., & Thompson, S. J. (2006). *Using the think aloud method (cognitive labs) to evaulate test design for students with disabilities and English language learners* (Technical Report 44). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes. Retrieved 29 Sept 2015, from the World Wide Web: http://education.umn.edu/NCEO/OnlinePubs/Tech44/

[2] National Research Council. (2011). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.* Committee on a Conceptual Framework for New K-12 Science Education Standards. Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

This report contains information about the cognitive lab design and an initial summary of the observations from the cognitive lab.

Cognitive Lab Design

The cognitive labs were conducted in Oklahoma on September 15 and 16, 2015. Students in Grades 6 and 9, and those who had just completed High School Biology, were eligible to participate in the cognitive labs. (These grades/courses were chosen in order to collect data from students who had just completed the grades/courses to be tested on the Oklahoma science tests.) Specific participation data is provided in the table below.

Table 1. Cognitive Lab Participation Data

Grade	Number of Students	Number of Schools
6	23	4
9	17	4
HS	18	4

During each cognitive lab session, a Measured Progress facilitator worked with an individual student. A session typically lasted 30–35 minutes. The facilitator followed a standardized protocol in order to guide the student through a series of nine science questions. The first three questions were introductory questions, to familiarize the student with the process of thinking out loud and to help the facilitator establish a baseline for how the student thinks about science. The remaining six questions were organized into two sets. Each set was a cluster of questions written to an OASS performance expectation, with the three questions in each set being linked to a common stimulus. The student completed the questions on either paper (Grade 6) or computer (Grade 9, Biology). The facilitator observed and recorded the student's interaction with each question as the student thought out loud in answering the question, and the facilitator asked the student some follow-up queries after each question and set of questions (e.g., "Why did you make that selection?" "Was that question too easy, too hard, or just about right?" "Did you know how to drag the molecules to the boxes?" "What did you think about answering all three of the questions about the same topic?").

For all cognitive lab sessions, the facilitators recorded their observations and the students' responses in an interactive file version of the facilitator guide. After the cognitive labs, the data for all sessions were exported to Excel spreadsheets to facilitate analysis.

Complete copies of the facilitator guides, containing the cognitive lab protocol for each grade/course, can be found in Figure 1, Figure 2, and Figure 3.

Summary of Observations

An initial debrief among the cognitive lab facilitators revealed a set of recurring themes emerging from the cognitive lab data. These themes and the specific observations pertaining to each are presented below, along with the initial analysis of the observations and any actions recommended for addressing the observations.

Theme: Vocabulary and text complexity

Specific Observations	*Initial Analysis and Recommended Actions*
• Students in all grades seemed to frequently struggle with wording (vocabulary) and sentence structure, particularly if sentences were long or contained several phrases. This observation applied to both the stimulus and the individual items (stem and options). • Students in Grade 6 in particular seemed to find the graphics fairly complex to process. • Students tended to find the amount of information (made more complex by vocabulary and sentence structure in the stimulus and items) to be overwhelming.	Attention to vocabulary and reading load will be important, to avoid conflating students' reading ability with their science proficiency. ✓ Adhere closely to test and item specifications regarding vocab level, word count, sentence structure, and text complexity. ✓ Use footnotes to define unfamiliar words. ✓ Use simpler wording for science terms/concepts when it does not compromise the construct being assessed. ✓ Perform a "second read" by editorial staff to focus on vocab and sentence structure.

Theme: Stimulus length, layout, and content

Specific Observations	*Initial Analysis and Recommended Actions*
• Students seemed overwhelmed by the amount of information in the stimulus. • Students did not always attend to all text and/or graphics in the stimulus, or they had difficulty processing the presentation of paragraphs and graphic elements. • Students noted that some information in the stimulus was not connected to the particular set of questions they answered, and thus felt it was unnecessary, distracting, and/or confusing. • Students had mixed reactions to the "hook" or reasoning for the situation presented in the stimulus. (Some saw this as unnecessary information; others needed and/or liked it for engagement.) • Students voiced preference for familiar topics over new or unique phenomena in order to	The stimulus needs to be presented in a clear and logical manner, first and foremost. While engagement is also a goal, there are conflicting factors related to formulating the context of the stimulus. ✓ Present text and graphics in a logical "storyline" flow, and use clear language/pointers to transition between text and graphics. ✓ In the stimulus, include only that information that pertains to multiple items. Place unique, clarifying information for a single item into the lead for that item. (Note, however, this does *not* mean creating several new, additional scenarios item to item.) ✓ Review clusters in field test layout to ensure it is clear and concise and there is no

perform better.	extraneous information in the stimulus. ✓ Continue to present hooks to convey the relevance and meaning of the context presented, consistent with the intent and vision of the OASS and *A Framework for K-12 Science Education* – but keep hooks brief and concise. ✓ Continue to present a variety of stimulus contexts, including novel phenomena and problems, consistent with the vision of the OASS and *A Framework for K-12 Science Education* – but ensure they are presented clearly and accessibly. ✓ Provide practice opportunities/sample clusters to the field to allow teachers and students to familiarize themselves with the new test format and expectations.

Theme: Item content and structure

Specific Observations	*Initial Analysis and Recommended Actions*
• Students struggled with items that contained science content words not presented in the stimulus. Additionally, students often tried to answer items by looking for an option that contained a content word presented in the stimulus. • Students sometimes seemed confused as to whether or not to refer back to the stimulus in order to answer the items. • Students sometimes struggled to find the actual item stem and understand what the item was asking; the all-bold style of the item text seemed overwhelming at times, particularly for technology-enhanced items. • Students, particularly in Grade 6, tended to like the structure of having a set of items to a common stimulus rather than many discrete items.	There was mixed understanding of the cluster format, and while some practical style and UDL principles can help make the items clearer, practice and exposure are needed for students to familiarize themselves with the new test format. ✓ Update item style to apply bold text to the item stem only; all other information presented before the options will be plain text to help the stem clearly stand out. ✓ Focus on UDL principles in the construction of each item. ✓ Provide practice opportunities/sample clusters to the field to allow teachers and students to familiarize themselves with the new test format and expectations (e.g., students need to use stimulus in answering items, items are not constructed to parrot content words from the stimulus, etc.)

Theme: Technology-enhanced items

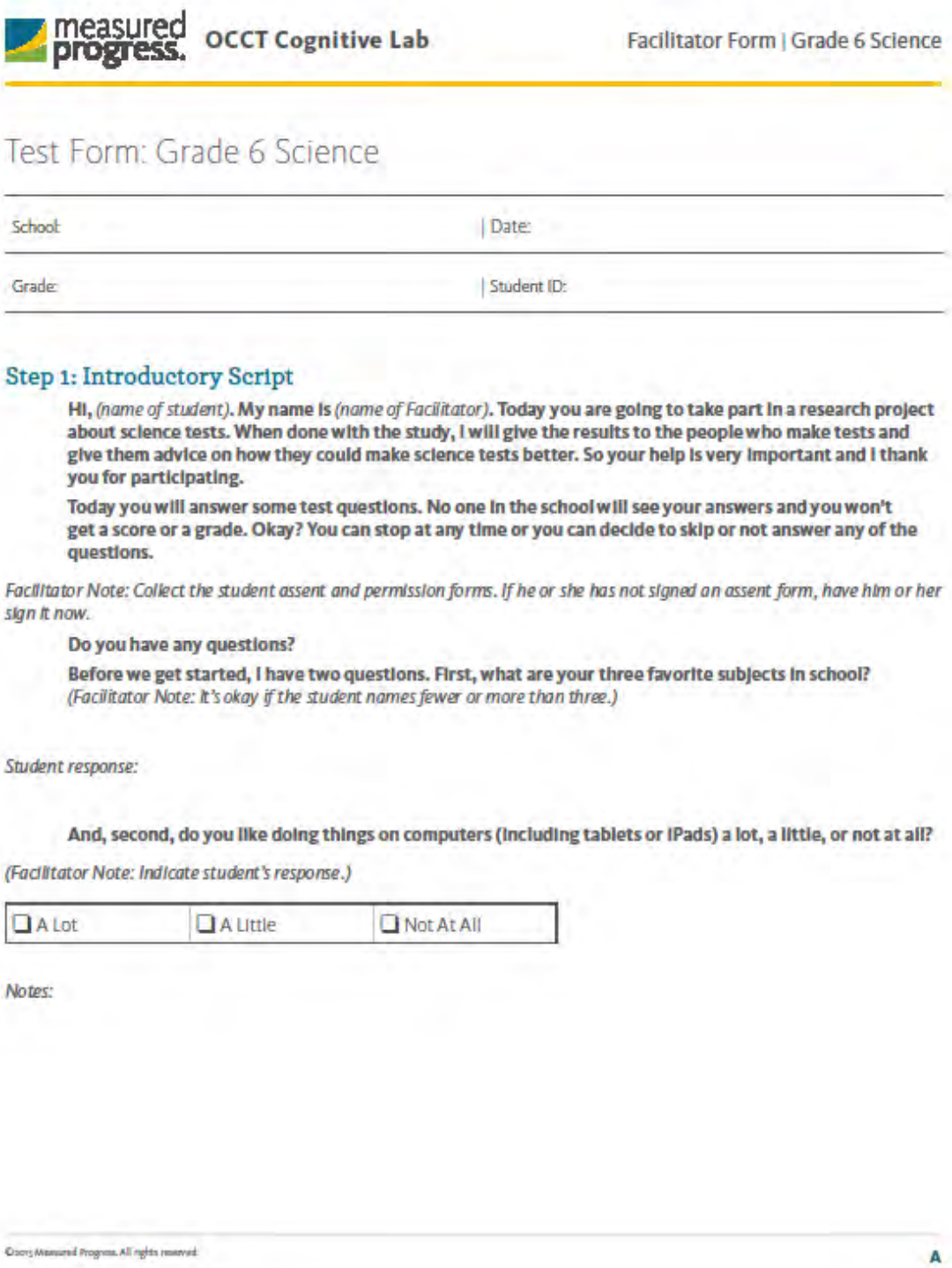
Specific Observations	*Initial Analysis and Recommended Actions*

• Students sometimes did not understand the relevance of the particular interaction type being used in the item. • Students could not answer composite items (technology-enhanced items with two different types of interactions in the same item). • Students often could not isolate the stem of the question and the direction prompt for how to complete the interaction; these blended together in the large amount of item text and the all-bold style. • Students in Grade 9 seemed to have more difficulty in understanding how to complete the interactions in the items (especially drop-down menus) than did the Biology students.	While the variety of interaction types presented to students in the cognitive lab was an artifact of trying to gather information about many different interaction types, the observation of students not understanding the relevance of particular interactions for the construct being measured is important to keep in mind; item writers should always choose the interaction type that is most appropriate and enhancing to the construct being measured. Additional style, presentation, and practice measures can also help improve student interaction with these items. ✓ Write items to contain one interaction type only. ✓ Structure the technology-enhanced items to give the question prompt (content) first, and then provide a one-sentence direction on how to complete in the specific interaction in the item. ✓ Update item style to apply bold text to the question prompt only; all other information (lead, direction on how to complete the interaction) will be plain text to help the stem clearly stand out. ✓ Provide practice opportunities/sample clusters to the field to allow teachers and students to familiarize themselves with the interactions and format of this item type.

Simply based on the initial debrief and analysis, the cognitive lab results provided many actionable points that were immediately implemented to improve cluster and item development. More detailed data analysis will be completed to look for additional nuances and findings that may guide further refinements to test and item development. In making such changes, the SDE and Measured Progress aim to ensure the new science assessments will be accessible and valid for Oklahoma students.

Figure 1

Grade 6 Cognitive Lab Protocol Facilitator Form



measured progress. **OCCT Cognitive Lab** Facilitator Form | Grade 6 Science

Test Form: Grade 6 Science

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student)*. **My name is** *(name of Facilitator)*. **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

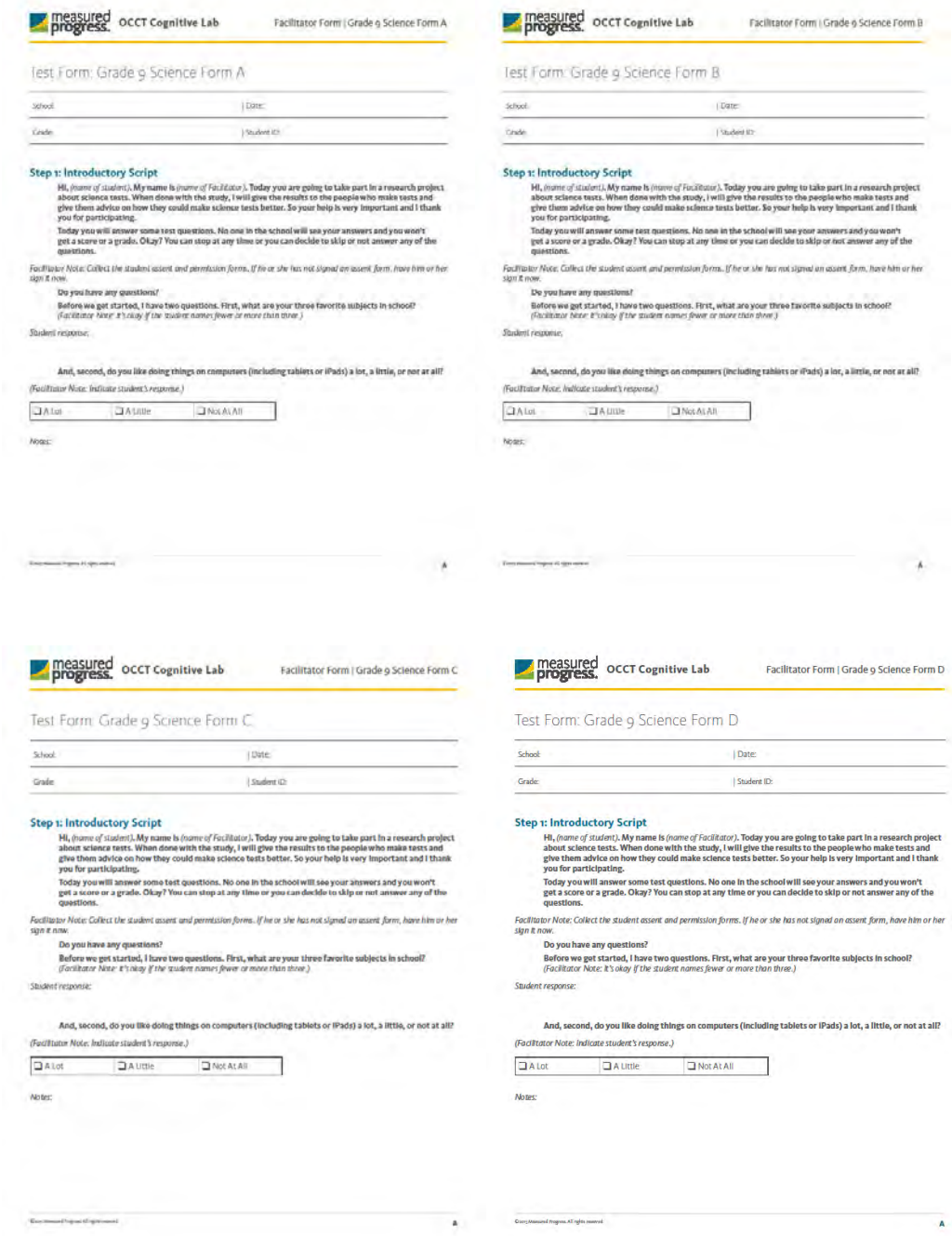
❑ A Lot	❑ A Little	❑ Not At All

Notes:

A

Figure 2

Grade 9 Cognitive Lab Protocol Facilitator Forms (n=4)



measured progress. OCCT Cognitive Lab — Facilitator Form | Grade 9 Science Form A

Test Form: Grade 9 Science Form A

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student).* **My name is** *(name of Facilitator).* **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

❑ A Lot ❑ A Little ❑ Not At All

Notes:

A

measured progress. OCCT Cognitive Lab — Facilitator Form | Grade 9 Science Form B

Test Form: Grade 9 Science Form B

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student).* **My name is** *(name of Facilitator).* **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

❑ A Lot ❑ A Little ❑ Not At All

Notes:

A

measured progress. OCCT Cognitive Lab — Facilitator Form | Grade 9 Science Form C

Test Form: Grade 9 Science Form C

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student).* **My name is** *(name of Facilitator).* **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

❑ A Lot ❑ A Little ❑ Not At All

Notes:

A

measured progress. OCCT Cognitive Lab — Facilitator Form | Grade 9 Science Form D

Test Form: Grade 9 Science Form D

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student).* **My name is** *(name of Facilitator).* **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

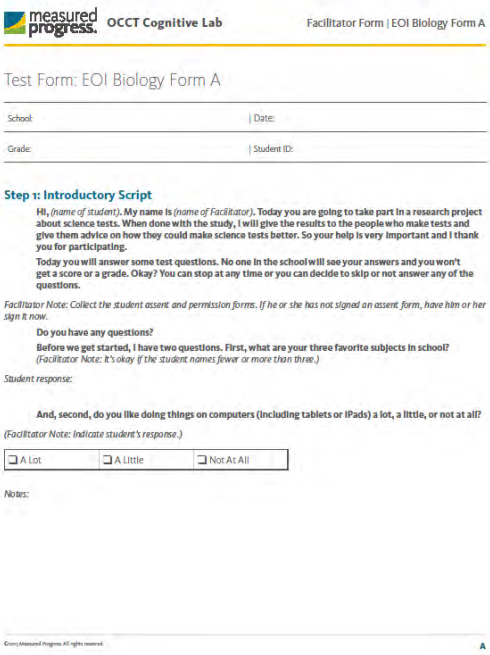
❑ A Lot ❑ A Little ❑ Not At All

Notes:

A

Figure 3

Biology Cognitive Lab Protocol Facilitator Forms (n=4)



measured progress. OCCT Cognitive Lab — Facilitator Form | EOI Biology Form A

Test Form: EOI Biology Form A

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student)*. **My name is** *(name of Facilitator)*. **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

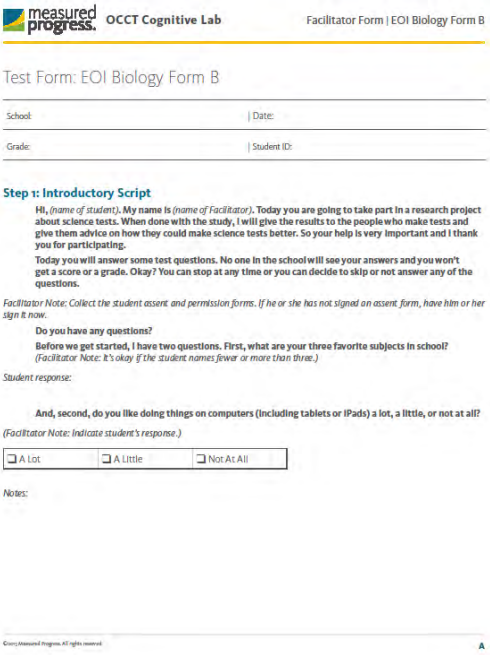
And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

❑ A Lot ❑ A Little ❑ Not At All

Notes:

A



measured progress. OCCT Cognitive Lab — Facilitator Form | EOI Biology Form B

Test Form: EOI Biology Form B

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student)*. **My name is** *(name of Facilitator)*. **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

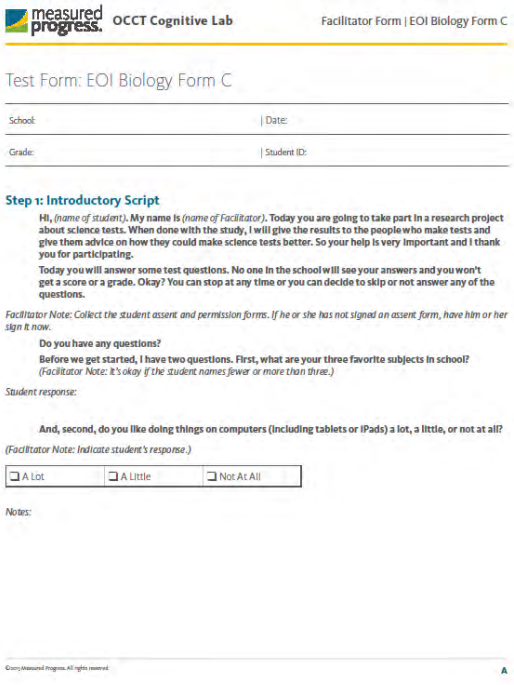
And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

❑ A Lot ❑ A Little ❑ Not At All

Notes:

A



measured progress. OCCT Cognitive Lab — Facilitator Form | EOI Biology Form C

Test Form: EOI Biology Form C

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student)*. **My name is** *(name of Facilitator)*. **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

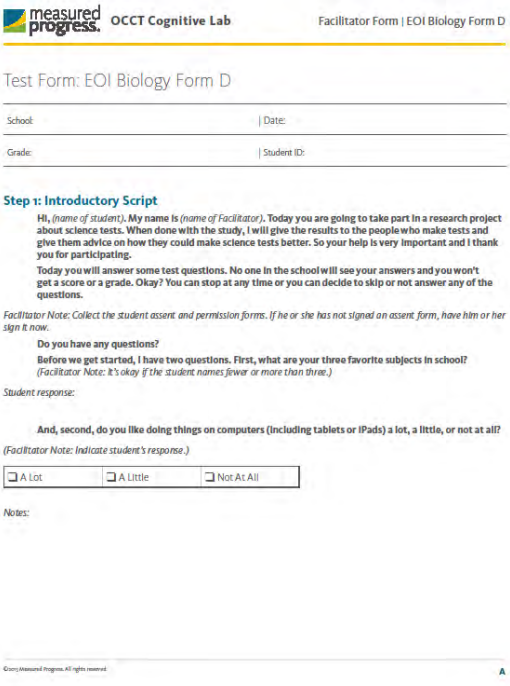
And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

❑ A Lot ❑ A Little ❑ Not At All

Notes:

A



measured progress. OCCT Cognitive Lab — Facilitator Form | EOI Biology Form D

Test Form: EOI Biology Form D

School: | Date:

Grade: | Student ID:

Step 1: Introductory Script

Hi, *(name of student)*. **My name is** *(name of Facilitator)*. **Today you are going to take part in a research project about science tests. When done with the study, I will give the results to the people who make tests and give them advice on how they could make science tests better. So your help is very important and I thank you for participating.**

Today you will answer some test questions. No one in the school will see your answers and you won't get a score or a grade. Okay? You can stop at any time or you can decide to skip or not answer any of the questions.

Facilitator Note: Collect the student assent and permission forms. If he or she has not signed an assent form, have him or her sign it now.

Do you have any questions?

Before we get started, I have two questions. First, what are your three favorite subjects in school?
(Facilitator Note: It's okay if the student names fewer or more than three.)

Student response:

And, second, do you like doing things on computers (including tablets or iPads) a lot, a little, or not at all?

(Facilitator Note: Indicate student's response.)

❑ A Lot ❑ A Little ❑ Not At All

Notes:

A

APPENDIX W—GLOSSARY OF ASSESSMENT TERMS

This glossary of commonly used assessment terms can be used to help interpret and communicate test results. Note that because assessment terms evolve in terms of meaning and application, the definitions for some words may evolve beyond the sense indicated here.

accommodation A general term referring to changes in the setting in which a test is administered, the timing of a test, the scheduling of a test, the ways in which the test is presented, and the ways in which the student responds to the test. The term is used to refer to changes that do not alter in any significant way what the test measures or the comparability of scores.

achievement test An assessment that measures a student's acquired knowledge and skills in a content area (for example, OCCT Grade 5 Mathematics) in which the student has received instruction.

alternate assessment A substitute way of gathering information on the performance and progress of students who cannot participate, even with accommodations, in the regular state or district assessment programs. Alternate assessments provide a mechanism for all students to be included in the accountability system.

analytic scoring A scoring procedure in which a student's writing is evaluated for selected traits or dimensions, with each trait receiving a separate score. The resulting values are combined for an overall score.

bias A systematic error in a test score. Bias occurs when factors irrelevant to the subject matter related to the assessment result in one or more specific groups of students being advantaged or disadvantaged relative to other groups.

classical test theory A psychometric theory based on the perspective that an individual's observed score on a test is composed of the true score of the examinee and an independent component of measurement error.

construct The underlying concept or the characteristic that a test is designed to measure.

construct irrelevance The extent to which test scores are affected by factors that are not relevant to the construct that the test is designed to measure.

construct validity (content validity) Construct validity indicates the extent to which the content of the test samples the subject matter or situation about which conclusions are to be drawn; also described as "evidence based on test content."

constructed-response item An assessment unit with directions, a question, or an idea that elicits a written response from a student.

content standard A statement describing the knowledge and skills in a content area that is expected to be taught in classrooms and should be met at a specified point in time (e.g., at the end of the course).

conversion tables Tables used to convert a student's test scores from raw-score total to scaled score.

criterion A standard or judgment used as a basis for quantitative and qualitative comparison; also a variable to which a test is compared as a measure of the test's validity.

criterion-referenced test An assessment that allows its users to make score interpretations of a student's performance in relation to specified performance standards or criteria, rather than in comparison to the performances of other test takers. See also **performance standard/level**.

cut score Selected points on the score scale of a test. The points are used to determine whether a particular test score is sufficient for some purpose. For example, student performance on a test maybe classified into one of several categories, such as unsatisfactory, limited knowledge, proficient or advanced on the basis of cut scores.

differential item functioning (DIF) A situation that occurs in testing when different groups of examinees (e.g., ethnic or gender groups) with the same true achievement levels have different levels of success on a particular item. Test developers reduce DIF by analyzing item data separately for each group. Items identified with DIF are carefully reviewed by content experts and culture and sensitivity committees. Items that appear to be unfair to one or more groups are discarded.

discrimination parameter Under **Item Response Theory** (IRT), it indicates the degree an item distinguishes between examinees of differing abilities on the trait being measured. Low discrimination values indicate an item does not discriminate students of low and high abilities.

distractor An incorrect answer choice in a selected-response or multiple-choice test item.

frequency distribution An ordered tabulation of individual scores (or groups of scores) showing the number of students obtaining each score or the number of students that were within each score grouping.

holistic scoring A scoring procedure yielding a single score based on overall student performance rather than on an accumulation of points. Holistic scoring uses rubrics to evaluate student performance. Note: This procedure is used to score the OMAAP English II Writing response.

item A statement, exercise, task, question, or problem on a test.

Item Response Theory (IRT) A set of mathematical models that describes the relationship between performance on test items and the student's level of performance on the same scale as the ability or trait being measured. For OCCT 3–8 and EOI, the three-parameter model is used for the calibration and scaling of multiple-choice items; the two-parameter partial credit model (2PPC) is used for Writing prompts in EOI English II and English III. For the EOI OMAAP assessments, the one-parameter (Rasch) model is used for calibration and scaling of multiple-choice items; the one-parameter partial credit model (1PPC) is used for the Writing prompt in English II. The various item parameters associated with each model (discrimination, difficulty, and guessing) are used to describe the statistical characteristics of each item. The Rasch and 1PPC only produce item difficulty estimates.

location (difficulty) parameter In Item Response Theory, this parameter is the point on the ability scale at which an item discriminates, or measures, best.

mean The quotient obtained by dividing the sum of a set of scores by the number of scores; also called the "average." Mathematicians call it the "arithmetic mean."

median The middle score in a set of ranked scores. Equal numbers of ranked scores lie above and below the median. It corresponds to the 50th percentile and the 5th decile.

mode The score or value that occurs most frequently in a distribution.

multiple-choice item A question, problem, or statement called a “stem” that appears on a test followed by two or more answer choices, called alternatives or response choices. The incorrect choices, called distractors, usually reflect common errors. The student’s task is to choose the best answer to the question posed in the stem.

normal distribution curve A bell-shaped curve representing a theoretical distribution of measurements that is often approximated by a wide variety of actual data. It is often used as a basis for scaling and statistical hypothesis testing and estimation in psychology and education because it approximates the frequency distributions of sets of measurements of human characteristics.

norm-referenced test A standardized assessment in which all students perform under the same conditions (e.g., carefully defined directions, time limits, materials, and scoring procedures). This type of test allows for the interpretation of the test score in relation to a specified reference group, usually others of the same grade and level.

Oklahoma Academic Standards The Oklahoma Academic Standards are Oklahoma’s core curriculum. Each subject/grade has a different set of standards and objectives on which students are tested.

Oklahoma Core Curriculum Tests (OCCT) The OCCT is the general testing program administered in Oklahoma public schools to students in Grades 3–8 and End-of-Instruction.

Oklahoma Modified Alternate Assessment Program (OMAAP) The OMAAP EOI is administered for retake purposes only in order to meet a graduation requirement or to apply a Modified Proficiency Score. Students must be 2nd Time Testers with a previous OMAAP score in the same subject and be on an Individualized Education Program (IEP). The current OMAAP assessments are High School EOI for Algebra I, English II, Biology I, and U.S. History.

Oklahoma Performance Index (OPI) The Oklahoma Performance Index (OPI) is a scaled score resulting from the mathematical transformation of the true score, which is associated with each of the raw scores. The OPI score is used to place students in one of four performance levels.

Oklahoma School Testing Program (OSTP) The OSTP is a testing program that includes the OCCT general assessment in Grades 3–8 and EOI, the OMAAP EOI assessments, and the OAAP portfolio assessment.

open-ended item See constructed-response item.

performance level A level of performance on a test, established by education experts, as a goal of student attainment. It may also refer to a description of the knowledge, skills, and abilities typically held by students within a performance level.

performance-level score range The performance-level score range is the range of scale scores that corresponds to one of the four performance levels: Advanced, Proficient/Satisfactory, Limited Knowledge, and Unsatisfactory.

Portfolio assessments The Portfolio assessment is a yearlong collection of information and pieces of evidence, which represent a student’s mastery of the Oklahoma Academic Standards.

raw score The number of correct answers on a test.

reliability The degree to which test scores obtained by a group of individuals are consistent over repeated applications. The reliability coefficient indicates the degree to which scores are free of

measurement error. The conditions that the coefficient estimates may involve variations in test forms (alternate form reliability), repeated administration of the same form to the same groups after a time interval (test-retest reliability), or the statistical interrelationship of responses on separate parts of the test (internal consistency). Internal consistency fits into OCCT and EOI OMAAP test condition.

rubric A scoring tool, or set of criteria, used to evaluate a student's test performance. A scoring rubric is used to evaluate a student's response to the OCCT Grades 5 and 8 Writing, the OCCT ACE English II, and the ACE English III Writing prompt, as well as the EOI OMAAP English II Writing prompt.

scale scores Scores on a single scale with intervals. The scale can be applied to all groups taking a given test, regardless of group characteristics or time of year, making it possible to compare scores from different groups of students. Scale scores are appropriate for various statistical purposes. For example, they can be added, subtracted, and averaged across test levels. Such computations permit educators to make direct comparisons among examinees or compare individual scores to groups in a way that is statistically valid. This cannot be done with percentiles or grade equivalents.

standard A target toward which instruction is specifically directed. In OSTP tests, standards are used to cluster key skills and/or concepts in an instructional domain. For example, skills such as Literal Understanding and Inferences and Interpretation form part of the Comprehension standard in the OCCT Grade 8 Reading test and the ACE English II test.

standard deviation A statistic used to express the extent of the divergence of a set of scores from the average of all the scores in the group. In a normal distribution, approximately two thirds (68.3 percent) of the scores lie within the limits of one standard deviation above and one standard deviation below the mean. The remaining scores are equally distributed more than one standard deviation above and below the mean.

standard error of measurement (SEM) Measurement error is associated with all test scores. The standard error of measurement (SEM) is an estimate of the amount of error to be expected in a score from a particular test. This statistic provides a range within which a student's true score is likely to fall. The smaller the standard error of measurement, the smaller the range in which the student's true score would likely fall and the more accurate the test score.

standardized test a test that is given in exactly the same way to all children taking the test. The items are the same, the instructions are the same, the timing is the same, the method of determining correctness is the same, and the scoring is the same. No variations are allowed.

stem The part of an item that asks a question, provides directions, or presents a statement to be completed.

stimulus A passage or graphic display about which questions are asked.

test A device or procedure designed to elicit responses that permit an inference about what a student knows or can do.

test item See **item**.

true score In classical test theory, the hypothetical average score that would result if the test could be administered repeatedly without practice or fatigue effects. In Item Response Theory, the "true score" is the error-free value of the test taker's performance.

unscorable Writing responses that do not meet certain criteria cannot be scored. A zero composite score is given to responses that fall into the following categories:
N – No Response/Refusal to Answer I – Illegible/Incomprehensible
L – Language other than English O – Off Topic

validity The degree to which accumulated evidence and theory support specific interpretations of test scores proposed by users of a test.

writing prompt An assessment topic, situation, or statement to which students are expected to respond in the form of an essay.

APPENDIX X— ABERRANT RESPONSE PATTERN ANALYSES OF THE OSTP 2017 SPRING TEST

OKLAHOMA
STATE DEPARTMENT of EDUCATION
JOY HOFMEISTER
STATE SUPERINTENDENT of PUBLIC INSTRUCTION

Oklahoma School Testing Program (OSTP)

Test Security Analyses

Statistical Detection Report for the Spring 2017 Administration

Measured Progress

measured progress

100 Education Way, Dover, NH 03820 | measuredprogress.org

Oklahoma School Testing Program (OSTP) Test Security Analyses Statistical Detection Report for the Spring 2017 Administration Measured Progress

Introduction

Measured Progress's test security policies and practices are designed to protect examinee data privacy, test data security, and the security of test content. We organize our planning and execution of test security measures around a framework for comprehensive test security systems, *Prevention, Detection, Investigation, and Resolution* (PDIR; Ferrara, 2017). We rely on collaboration with our clients to protect test security and data integrity. And we work collaboratively with our clients to encourage and support rigorous, professional investigations if security issues should arise and resolution of all details to the degree possible after investigations.

In this report we provide statistical detection findings from two techniques for detecting possible test security violations: inordinate response similarity analyses and inordinate score gains analyses. **Statistical detection findings** provide initial indication of whether additional follow-up may be required to determine if a test security violation may have occurred. **Inordinate response similarity analyses** enable us to detect evidence, in the form of inordinately similar item response patterns, of possible security threats from prior exposure of test items to educators and examinees, educators supplying answers to test items to examinees during administration, educators changing examinee answers after test administration, or examinees copying answers to test items from one another. **Inordinate score gain analyses** enable us to detect evidence of inordinate changes in an examinee's or examinee group's test performance.

Exposure of test items and stimulus material (e.g., reading passages) before test administration, helping students respond to test items during test administration, and changing student responses after test administration represent the highest probability threats to the security of OSTP.

We use the statistical results to flag **possible** evidence of a test security violation or other testing irregularity that may require follow-up. We emphasize that statistical evidence by itself does not indicate that a test security violation has occurred. It signals the need for additional consideration to determine if a violation is likely and whether additional investigation is necessary. Initial follow-up investigations when one of the two statistical flags indicates the need for additional follow-up could include examining results from the other statistical analysis, examining reports of test administration irregularities, and conducting informal conversations with people who may have firsthand knowledge of a situation. When initial evidence indicates the need for more formal follow-up investigations, these may include professional investigative interviews, requests for relevant documents, and examination of examinee online log files and scannable answer documents. Measured Progress can provide advice and other support of investigations after delivery of the statistical detection report.

Statistical Detection Methods

Data Sources

The inordinate response similarity analysis required the examinees' response option selections (i.e., a, b, c, or d not 0 or 1) along with the correct answer key for each item. Those response options were accompanied with the examinee's school ID to identify all possible pairs of examinees in a grade and content area and to assign examinees to examinee groups for group level analysis after the individual level analysis. For the inordinate score gain analysis, two sets of data from the 2016 and 2017 test administrations were required to calculate the score gain. The examinee's unique ID that is identical across grades was vital to identify the examinee in both school years, in addition to the school ID which was necessary to identify the examinee for the group level analysis. As for the scores to be compared to estimate the score gain, it was determined to use a pattern score (Expected a posterior; EAP) instead of the reporting scale scores or the summed scores utilizing the operational item parameters from both years. We planned all the data handling in advance, with clear specifications and dealt with small data issues when they arose.

Procedures

Both the inordinate response similarity analysis which produced the ω-index and the inordinate score gain analysis using the nonparametric regression were done on the corresponding individual level data first. It is worthy to note that by the nature of the analysis and the structure of the data, the analysis units of the inordinate response similarity on the individual level are all possible pairs of examinees in an examinee group (i.e., grade and content area in a school), while the analysis units of the inordinate score gain analysis on the individual level are all the individual examinees in an examinee group. The common output result of both analyses is the

list of flagged pairs of examinees or the list of examinees. Those flagged individuals were used to calculate the proportions of flagged pairs or examinees in a grade and content area within a school in the group level analysis. Then the result of the group level analysis is the list of all schools with identification on whether thee examinee groups with inordinately high proportions of flagged pairs or examinees were flagged for further investigation.

While the lead psychometrician designed and coded the analysis programs and managed running them, another psychometrician monitored the analysis process and examined the results independently to make sure the exactness of the processes and reasonableness of the results.

Inordinate Response Similarity Analysis: Pairs of examinees

Inordinate response similarity analysis focuses on the agreement between two examinees' response patterns by taking their ability into account. Inordinately high response similarity suggests a violation of independent test-taking behavior. Non-independent test-taking could be caused by many factors, such as the prior exposure of test items, examinees copying answers from each other, and test administrators supplying answers during test administration or changing answers after test administration.

Inordinate response similarity analysis is implemented by calculating the ω-index (Wollack, 1997) for every pair of examinees within an examinee group on their responses to multiple-choice items. The ω-index is a commonly used statistic in the literature of inordinate response similarity detection. Previous research (Wollack, 1997, 2003; Wollack & Cohen, 1998; Sotaridona, & Meijer, 2002) suggests that it performs as well as or better than other statistics and the statistical properties of ω are not much affected by examinee sample size or error in item parameter estimates. The ω-index is based on the total number of matched responses, M_{CS}, between a pair of examinees *C* (potential copier) and *S* (potential source). To determine

whether M_{CS} is large enough to be considered suspicious, the expected value of M_{CS} is calculated under the null hypothesis that examinees *C* and *S* worked independently. With examinee *S*'s responses treated as fixed, the expected value of M_{CS} is equal to

$$E(M_{CS}|\theta_C, U_S) = \sum_i P(U_{iC} = u_{is}|\theta_C, U_S)$$

where θ_C is the latent ability of examinee *C*, U_S is the response pattern of examinee *S*, *i* is the index for item *i,* U_{iC} and u_{is} are the response on items *i* by examinee *C* and *S* respectively. $P(U_{iC} = u_{is}|\theta_C, U_S)$ represents the probability that examinee *C* chooses the same response as examinee *S,* given *C's* ability. The variance of M_{CS} is equal to

$$Var(M_{CS}|\theta_C, U_S) = \sum_i P(U_{iC} = u_{is}|\theta_C, U_S)(1 - P(U_{iC} = u_{is}|\theta_C, U_S))$$

The ω-index is calculated by taking the standardized form ofM_{CS}:

$$\omega = \frac{M_{CS} - E(M_{CS}|\theta_C, U_S)}{\sqrt{Var(M_{CS}|\theta_C, U_S)}}$$

The ω-index follows a standard normal distribution as the number of items becomes infinitely large (Wollack, 1997), and large positive values lead to the rejection of independent test-taking behavior.

Calculation of the ω-index requires estimating the probability that *C* chooses a particular response option. This probability is usually estimated by fitting a nominal response model to the data. However, based on our experience, the estimation of the nominal response model is sometimes unstable: The estimation either does not reach a converged solution after a large number of iterations or gives unreasonably large parameter estimates for low-discriminating items. Even if stable estimation is obtained, the fit of a nominal response model to some datasets may be unsatisfactory. To overcome these problems, we used nonparametric item response models to calculate the response probabilities. Nonparametric estimation provides a more flexible modeling tool as it does not assume a parametric form for the item characteristic

curves (ICC). Douglas (1997) has demonstrated that, under mild assumptions, the curved smoothed “ICC estimates and ordinal ability estimates simultaneously converge to their true values” (p.19). Specifically, kernel smoothing is used as the nonparametric estimation technique, due to its computational simplicity and wide use in nonparametric regression, and examinee ability θ is estimated using the same procedure as described in Douglas (1997).

The ω-index was initially developed to identify potential copiers given a known source. However, the source is unknown in our analysis as in most situations, and the calculation typically yields different results depending on which examinee in a pair is treated as a source. In our analysis, the examinee with a higher raw score is treated as the source in each examinee pair, so that there is only one value of ω for each pair of examinees.

A pair of examinees is flagged if the right tailed *p*-value of the ω statistic is smaller than the nominal level for these analyses, 0.01. The nominal level is the *p*-value threshold for rejecting the null hypothesis. The use of 0.01 in a right-tailed test ensures that we flag only large positive, and statistically significant ω values, part of our effort to minimize false positive flagging errors.

Inordinate Score Gain Analysis: Examinees

Inordinate score gain analysis focuses on longitudinal changes in an examinee’s performance. We modeled performance changes between two adjacent years in the same group of examinees. The analysis is conducted at the individual examinee level, followed by the group level analysis. Specifically, each examinee’s score in the current year is compared to what is predicted, based on the examinee’s score from the previous year. This approach is commonly used in this type of analysis (e.g., Clark, Skorupski, & Murphy, 2017; Gaertner, & McBride, 2017; Skorupski, Fitzpatrick, & Egan, 2017). In comparison to directly comparing the difference between two years’ scores, the prediction-based approach does not require both years’ scores to be on the same scale.

We use nonparametric regression as the prediction model. Compared to simple linear regression, nonparametric regression provides a more flexible modeling tool which does not restrict the functional form of the regression line and also makes fewer assumptions for modeling. The statistic for detecting inordinate score gain is the standardized residual from the nonparametric regression:

$$z_i = \frac{Y_{2\mathrm{i}} - \hat{Y}_{2i}}{\sqrt{\widehat{Var}(Y_{2\mathrm{i}}) + \widehat{Var}\left(\hat{Y}_{2i}\right) + \widehat{\mathrm{cov}}(Y_2, \hat{Y}_{2i})}}$$

where *i* is the index for each examinee, $Y_{2\mathrm{i}}$ is the observed score in Year 2, and $\hat{Y}_{2i}$ is predicted score in Year 2 based on examinee *i's* Year 1 score (i.e., $\hat{Y}_{2i} = \hat{E}(Y_{2i}|Y_{1i} = y_{1i})$. $\hat{Y}_{2i}$ is estimated by the Nadaraya-Watson regression estimator, which is a simple nonparametric estimator that takes the weighted average value of y_{2i}'s corresponding to observations in a neighborhood of y_{1i}'s. The weight is based on the distance of each observation from y_{1i}, and is determined through a kernel function such that the smaller distance is associated with a larger weight. The width of the neighborhood is technically referred to as the bandwidth. We fixed the bandwidth as a constant across y_{1i}'s; that is, the estimation of $\hat{Y}_{2i}$ corresponding to a given y_{1i} is based on the same bandwidth for all observations. As for the estimation of the denominator in the standardized residual, $\widehat{Var}(Y_{2\mathrm{i}})$ is estimated another Nadaraya-Watson estimator, and $\widehat{Var}\left(\hat{Y}_{2i}\right)$ is estimated based on asymptotic results. The term $\widehat{\mathrm{cov}}(Y_2, \hat{Y}_{2i})$ is treated as 0, as Y_2 is just one observation, whereas $\hat{Y}_{2i}$ is estimated based on many observations, and thus the correlation between them is expected to be very small.

In terms of the choice for Year 1 and Year 2 scores , instead of using the raw score or scaled score based on one-to-one transformation of the raw score, we used scores estimated from the response pattern in our analysis. Specifically, we used the expected a posterior (EAP) score based on Bayesian estimation. Pattern scoring typically produced a larger number of scores compared to the raw scores, since different response patterns corresponding to the same raw

score may result in different EAP estimates. Our preliminary analysis suggested that discreteness in the raw scores or scale scores (due to the limited number of those scores) could affect the nonparametric regression estimation, and that using pattern scoring is better suited for the nonparametric estimation. The cut-off value for z_i is chosen from a standard normal distribution. Our preliminary simulation study suggested the empirical Type I error rate was close to the nominal level using the cut-off value from the standard normal distribution. Individual examinees are flagged if the right tailed *p*-value of the *Z* statistic is smaller than the nominal level for these analyses, 0.01. The nominal level is the *p*-value threshold for rejecting the null hypothesis. The use of 0.01 in a right-tailed test ensures that we flag only large positive and, statistically significant *Z* values, part of our effort to minimize false positive flagging errors.

Group Level (School) Analyses for both analyses

The focus of these statistical detection analyses is to identify grade level examinee groups within a school with inordinately high numbers of examinees with inordinately (a) similar response patterns, and (b) 2016-2017 test score gains.[1] To evaluate whether a grade level examinee group within a school should be flagged for additional consideration, the individual pair-level, or examinee-level results are aggregated to the school level. As hypothesis testing is conducted for each examinee pair or each examinee, the Type I error at the school level may be inflated due to the multiple comparisons in a school. To control for the inflated Type I error rate (or false positive error rate) at the school level, a three-step procedure is used for school-level detection:

(a) Calculate each statistic for all pairs of examinees or all individual examinees in each school and flag a pair or an examinee if the statistic falls into the rejection region, which is done in the individual level analyses.

[1] The preferred level of analysis is testing group rather than all students within a grade level with a school. Testing group assignment is not available in these data.

(b) Calculate the total number of flagged pairs or examinees (n_F) in each grade within a school.

(c) Compare n_F to the Binomial distribution, *Binom*(*N*, α), where *N* is total number of pairs or examinees in a grade within a school and α is the nominal level used in step (a). If the right tailed *p*-value associated with the $\mathrm{n_F}$ under the Binomial distribution is smaller than 0.01, a school is flagged.

Results

In this section of the report we summarize the numbers of schools flagged in the inordinate response similarity and inordinate score gain analyses. All results from pair and individual analyses and school analyses are attached as excel file format and the description of the tables in the output files is appended at the end of this report. .

The summary tables list numbers and percentages of schools flagged in each analysis and count flagged schools according to numbers of examinees in different-size grade level examinee groups. We selected these group sizes to correspond to what may separate testing accommodations groups (i.e., with 1-5 and 6-10 examinees) and testing groups that correspond to smaller (11-20), typical (21-30), and larger (greater than 30) school enrollment sizes.

Inordinate Response Similarity

Table 1 lists the numbers of schools within grade levels that are flagged for inordinately similar responses to the 2017 OSPT test items and the percentage of the total number of schools within a grade level.

Table 1. Inordinate Response Similarity Analysis Results for 2017: Numbers of Flagged Schools by Examinee Group Size

Content	Grade	No. of Schools Flagged (% of Total Schools)	No. of Examinees in the School				
			1-5	6-10	11-20	21-30	GT 30
ELA	3	10 (1.2)	0	2	1	1	6
	4	9 (1.1)	0	0	0	2	7
	5	9 (1.1)	0	1	1	2	5
	6	3 (0.4)	0	1	0	0	2
	7	5 (0.9)	0	0	2	0	3
	8	8 (1.4)	1	0	1	2	4
	10	6 (1.3)	0	0	2	0	4
Mathematics	3	42 (4.8)	0	1	0	3	38
	4	26 (3.1)	0	2	1	2	21
	5	30 (3.6)	0	1	2	6	21
	6	5 (0.7)	0	0	0	1	4
	7	48 (8.3)	0	1	3	12	32
	8	39 (6.7)	0	0	6	4	29
	10	85 (18.1)	0	1	6	10	68
Science	5	20 (2.4)	0	0	1	3	16
	8	11 (1.9)	0	0	5	3	3
	10	29 (6.5)	0	1	7	4	17

As Table 1 indicates, in the ordinate response similarity analyses:

- Higher numbers of schools are flagged in Mathematics than in ELA or Science.
- In ELA, as few as 0.4% of schools (grade 6) and as many as 1.3% of schools (grade 10) were flagged. The corresponding percentages in Mathematics are 0.7 (grade 6) and 18.1 (grade 10) and the percentages in Sciences are 1.9 and 6.5, respectively.
- Higher numbers of schools are flagged in the testing groups with more than 30 examinees.
- Few schools are flagged for the smaller examinee group sizes.

Inordinate Score Gains

Table 2 lists the numbers and percentages of schools within grade levels that are flagged for inordinately high score gains on in 2017 and the percentage of the total number of schools within a grade level.

Table 2. Inordinate Score Gain Analysis Results for 2017: Numbers of Flagged Schools by Examinee Group Size

Content	Grade	No. of Schools Flagged (% of Total Schools)	No. of Examinees in the School				
			1-5	6-10	11-20	21-30	GT 30
ELA	4	7 (0.8)	0	1	0	0	6
	5	5 (0.6)	0	0	1	0	4
	6	12 (1.7)	0	2	1	1	8
	7	12 (2.0)	0	1	1	0	10
	8	5 (0.9)	0	0	1	1	3
Mathematics	4	17 (2.0)	0	1	3	1	12
	5	24 (2.9)	1	2	3	2	16
	6	20 (2.9)	1	2	3	2	12
	7	12 (2.0)	0	1	0	3	8
	8	13 (2.2)	0	0	2	0	11

As Table 2 indicates, in the ordinate score gain analyses:

- It is noticeable that only tests of which the examinees' scores can be compared against their scores from the directly prior grades are included in the Inordinate Score Gain analysis.
- Slightly larger numbers of schools are flagged in Mathematics than ELA.
- Most flagged schools are due to flagging in the testing groups with more than 30 examinees.
- Few schools are flagged for the smaller examinee group sizes.

Discussion and Recommendations

In this report, we have summarized statistical detection findings from analyses of inordinate response similarities and inordinate score gains. We selected these analyses from a range of other statistical detection techniques because they focus on the highest probability threats to the security of OSTP: exposure of test items and stimulus material (e.g., reading passages) before test administration, helping students respond to test items during test administration, and changing student responses after test administration.

We use the statistical results to flag **possible** evidence of a test security violation or other testing irregularity that may require follow-up. We emphasize that statistical evidence by itself does not indicate that a test security violation has occurred. It signals the need for additional consideration to determine if a violation is likely and whether additional investigation is necessary.

Initial follow-up investigations when one of the two statistical flags indicates the need for additional follow-up could include examining results from the other statistical analysis, examining reports of test administration irregularities, and conducting informal conversations with people who may have firsthand knowledge of a situation. When initial evidence indicates the need for more formal follow-up investigations, these may include professional investigative interviews, requests for relevant documents, and examination of examinee online log files and scannable answer documents. Measured Progress can provide advice and other support of investigations after delivery of the statistical detection report.

Appendix: Description of the tables in the output files

Inordinate Response Similarity Analysis Output

Individual pair level output files

- File name convention:
  - **Inordinate Response Similarity Pair Level Output.xlsx**
  - [#####] Worksheet name indicating specific test (e.g., ELA03)
- All the possible pairs were constructed within the school unit.
- Only the flagged pairs of examinees were listed in the output.

ID.District
- Identification number of the District where the School and the pair of examinees belong

ID.School
- Identification number of the School where the pair of examinees belongs

DistrictName
- Name of the District where the School and the pair of examinees belong

SchoolName
- Name of the School where the pair of examinees belongs

ID.Examinee.1
- Identification number of the first examinee

ID.Examinee.2
- Identification number of the second examinee

Score.Examinee.1
- Raw score of the first examinee

Score.Examinee.2
- Raw score of the second examinee

Observed.Matching
- Number of matching response options between two examinees
- Missing responses were not included in the analysis

Omega
- Answer similarity index

p.value
- Probability of getting the omega index at or above the observed value under the null hypothesis

Flag.at.0.01

- Whether a pair is flagged at the nominal level of 0.01: 1 indicates flagged, and 0 indicates not flagged.

School.Flag.at.0.01
- Whether the school where the pair of examinees belongs is flagged at the nominal level of 0.01: 1 indicates flagged, and 0 indicates not flagged.

Group (School) level output files

- File name convention:
  - **Inordinate Response Similarity School Level Output [#####].xlsx**
  - [#####] Worksheet name indicating specific test (e.g., ELA03)
- All available District and School are listed.

ID.District
- Identification number of the district where the school belongs

ID.School
- Identification number of the school

DistrictName
- Name of the District where the School and the pair of examinees belong

SchoolName
- Name of the School where the pair of examinees belongs

Number.Examinees
- Number of examinees in the school

Proportion.Flag.at.0.01
- Proportion of examinees flagged in the school at the nominal level of 0.01

p.value.0.01
- Probability of getting the proportion at or above the observed value under the null hypothesis

Flag.at.0.01
- Whether the school is flagged at the nominal level of 0.01: 1 indicates flagged, and 0 indicates not flagged.

Inordinate Score Gain Analysis Output

Individual examinee level output files

- File name convention:
  - **Inordinate Score Gain Student Level Output [#####].xlsx**
  - [#####] Worksheet name indicating specific test (e.g., ELA03)
- Only the flagged examinees were listed in the output.

Booklet.Number
- Identification number of the booklet taken by the examinee

ID.Examinee
- Identification number of the examinee

ID.District
- Identification number of the district where the examinee belongs

ID.School
- Identification number of the school where the examinee belongs

DistrictName
- Name of the District where the School and the pair of examinees belong

SchoolName
- Name of the School where the pair of examinees belongs

EAP.Last.Year
- Examinee's ability score in the previous year

EAP.Current.Year
- Examinee's ability score in the current year

Z
- Standardized difference between the examinee's observed score and predicted score in the current year

Flag.at.0.01
- Whether the examinee is flagged at the nominal level of 0.01: 1 indicates flagged, and 0 indicates not flagged.

School.Flag.at.0.01
- Whether the school where the examinee belongs is flagged at the nominal level of 0.01: 1 indicates flagged, and 0 indicates not flagged.

Group (School) level output files

- File name convention:
  - **Inordinate Score Gain School Level Output [#####].xlsx**
  - [#####] Worksheet name indicating specific test (e.g., ELA03)
- All available District and School are listed.

ID.District
- Identification number of the district where the school belongs

ID.School
- Identification number of the school

DistrictName
- Name of the District where the School and the pair of examinees belong

SchoolName

- Name of the School where the pair of examinees belongs

Number.Examinees

- Number of examinees in the school in the current year

Proportion.Flag.at.0.01

- Proportion of examinees flagged in the school at the nominal level of 0.01

p.value

- Probability of getting the proportion at or above the observed value under the null hypothesis

Flag .at.0.01

- Whether the school is flagged at the nominal level of 0.01: 1 indicates flagged and 0 indicates not flagged

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APPENDIX Y—PARTICIPATION RATES

Table Y-1. 2016–17 OSTP: Summary of Participation by Demographic Category—Mathematics

Description	Tested	
	Number	*Percent*
All Students	339,785	100.00
Female	166,670	49.05
Male	173,115	50.95
Hispanic or Latino	58,446	17.20
American Indian/Alaskan Native	47,665	14.03
Asian	6,898	2.03
Black/African American	29,376	8.65
Pacific Islander	1,115	0.33
White/Caucasian	167,136	49.19
Two or More Races	29,149	8.58
Economically Disadvantaged	208,235	61.28
Individual Education Program (IEP)	55,815	16.43
Plan 504	7,011	2.06
English Language Learners (ELL)	20,439	6.02

Table Y-2. 2016–17 OSTP: Summary of Participation by Demographic Category—ELA

Description	Tested	
	Number	*Percent*
All Students	339,352	100.00
Female	166,492	49.06
Male	172,860	50.94
Hispanic or Latino	57,877	17.06
American Indian/Alaskan Native	47,774	14.08
Asian	6,719	1.98
Black/African American	29,393	8.66
Pacific Islander	1,085	0.32
White/Caucasian	167,327	49.31
Two or More Races	29,177	8.60
Economically Disadvantaged	207,880	61.26
Individual Education Program (IEP)	55,957	16.49
Plan 504	7,028	2.07
English Language Learners (ELL)	19,581	5.77

Table Y-3. 2016–17 OSTP: Summary of Participation by Demographic Category—Science

Description	Tested	
	Number	*Percent*
All Students	125,859	100.00
Female	61,688	49.01
Male	64,171	50.99
Hispanic or Latino	21,159	16.81
American Indian/Alaskan Native	18,975	15.08
Asian	2,354	1.87
Black/African American	10,866	8.63
Pacific Islander	436	0.35
White/Caucasian	62,021	49.28
Two or More Races	10,048	7.98
Economically Disadvantaged	77,380	61.48
Individual Education Program (IEP)	21,209	16.85
Plan 504	2,599	2.07
English Language Learners (ELL)	6,023	4.79

Table Y-4. 2016–17 OSTP: Summary of Participation by Demographic Category—U.S. History

Description	Tested	
	Number	*Percent*
All Students	43,451	100.00
Female	21,624	49.77
Male	21,827	50.23
Hispanic or Latino	6,316	14.54
American Indian/Alaskan Native	6,514	14.99
Asian	998	2.30
Black/African American	3,889	8.95
Pacific Islander	142	0.33
White/Caucasian	22,660	52.15
Two or More Races	2,932	6.75
Economically Disadvantaged	22,500	51.78
Individual Education Program (IEP)	6,051	13.93
Plan 504	843	1.94
English Language Learners (ELL)	1,153	2.65