Oklahoma Academic Standards

ENGLISH LANGUAGE ARTS

OKLAHOMA Education

8 Overarching Standards

The following eight standards encompass the content and competencies of English language arts:

1. **Listening and Speaking**
2. **Reading and Writing Foundations/Process**
3. **Critical Reading and Writing**
4. **Vocabulary**
5. **Language**
6. **Research**
7. **Multimodal Literacies**
8. **Independent Reading and Writing**

The eight overarching standards reinforce language arts' recursive nature, a non-linear process that involves the continuous and thoughtful refinement of concepts and skills. Each standard statement is accompanied by two strand statements—listening and speaking for Standard 1 and reading and writing for Standards 2-8. Each pair of strands contains grade-level objectives.

Standard 2 Reading and Writing Foundations includes the five strands of Phonological Awareness, Print Concepts, Phonics and Word Study, Spelling/Encoding, and Fluency. The linear order of the strands suggests a learning progression that begins with basic foundational skills and culminates in fluent readers and writers.

Concepts and skills are expressed in terms of both reading and writing 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.

The order of the standards is meant to suggest that students learn to read and write by listening and speaking (Standard 1) on their way to the ultimate goal of becoming independent, critical readers and writers (Standards 3 and 8). 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 a rigorous curriculum. Standard 8 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 citizenship.

Academic standards establish objective performance criteria. They are used as guides to develop curriculum and instruction that is engaging, challenging, and sequenced for students. Acquiring English 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 standard statements are accompanied by two strand statements—listening and speaking for Standard 1 and reading and writing for Standards 2-8. Standard 2 Reading and Writing Foundations includes five unique strands and statements related to foundational literacy skills. Every strand contains grade-level objectives.

Standard 1: Listening and Speaking | Students will listen and speak effectively in a variety of situations.

- **Listening**: Students will develop and apply effective communication skills through active listening.
- **Speaking**: Students will develop and apply effective communication skills to share ideas through speaking.

Standard 2: Reading and Writing Foundations | Students will develop foundational skills for reading and writing proficiency by working with sounds, letters, and text.

- **Phonological Awareness**: Students will recognize, count, and manipulate the parts of spoken words, including syllables, onset/rimes, and phonemes without using text.
- **Print Concepts**: Students will demonstrate their understanding of the organization and basic features of print.
- **Phonics and Word Study**: Students will decode words by applying phonics and word analysis skills in context and isolation.
- **Spelling/Encoding**: Students will encode and write words in context and isolation by applying phonics, spelling patterns, and structural analysis skills.
- **Fluency**: Students will read grade-level text smoothly and accurately, with appropriate expression.

Standard 2: Reading and Writing Process | Students will use a variety of recursive reading and writing processes.

- **Reading**: Students will read and comprehend inclusive, diverse, and increasingly complex literary and informational texts.
- **Writing**: Students will engage in a recursive process that may include prewriting, drafting, revising, editing, and publishing.

Standard 3: Critical Reading and Writing | Students will apply critical thinking skills to reading and writing.

- **Reading**: Students will analyze, interpret, and evaluate increasingly complex literary and informational texts that include a wide range of historical, cultural, ethnic, and global perspectives from a variety of genres.
- **Writing**: Students will thoughtfully and intentionally write, addressing a range of modes, purposes, and audiences.

Standard 4: Vocabulary | Students will expand and apply their spoken and reading vocabularies to speak, read, and write effectively.

- **Reading**: Students will expand their grade-level vocabularies through reading, word study, and class discussion.
- **Writing**: Students will apply knowledge of vocabulary to speak and write effectively.

Standard 5: Language | Students will expand and apply knowledge of grammar, usage, mechanics, and style to comprehend texts and communicate effectively.

- **Reading**: Students will expand and apply knowledge of grammar, usage, mechanics, and style to comprehend, analyze, and/or evaluate a variety of texts.
- **Writing**: Students will expand and apply knowledge of grammar, usage, mechanics, and style to speak and write effectively, demonstrating standard usage when appropriate.

Standard 6: Research | Students will engage in inquiry to acquire, refine, and communicate accurate information.

- **Reading**: Students will gather, comprehend, evaluate, and synthesize researched information to acquire and refine knowledge.
- **Writing**: Students will synthesize information ethically through speaking and writing.

Standard 7: Multimodal Literacies | Students will comprehend and communicate knowledge through alphabetic, aural, visual, spatial, and/or gestural content.

- **Reading**: Students will comprehend and evaluate multimodal content.
- **Writing**: Students will create multimodal content to communicate effectively.

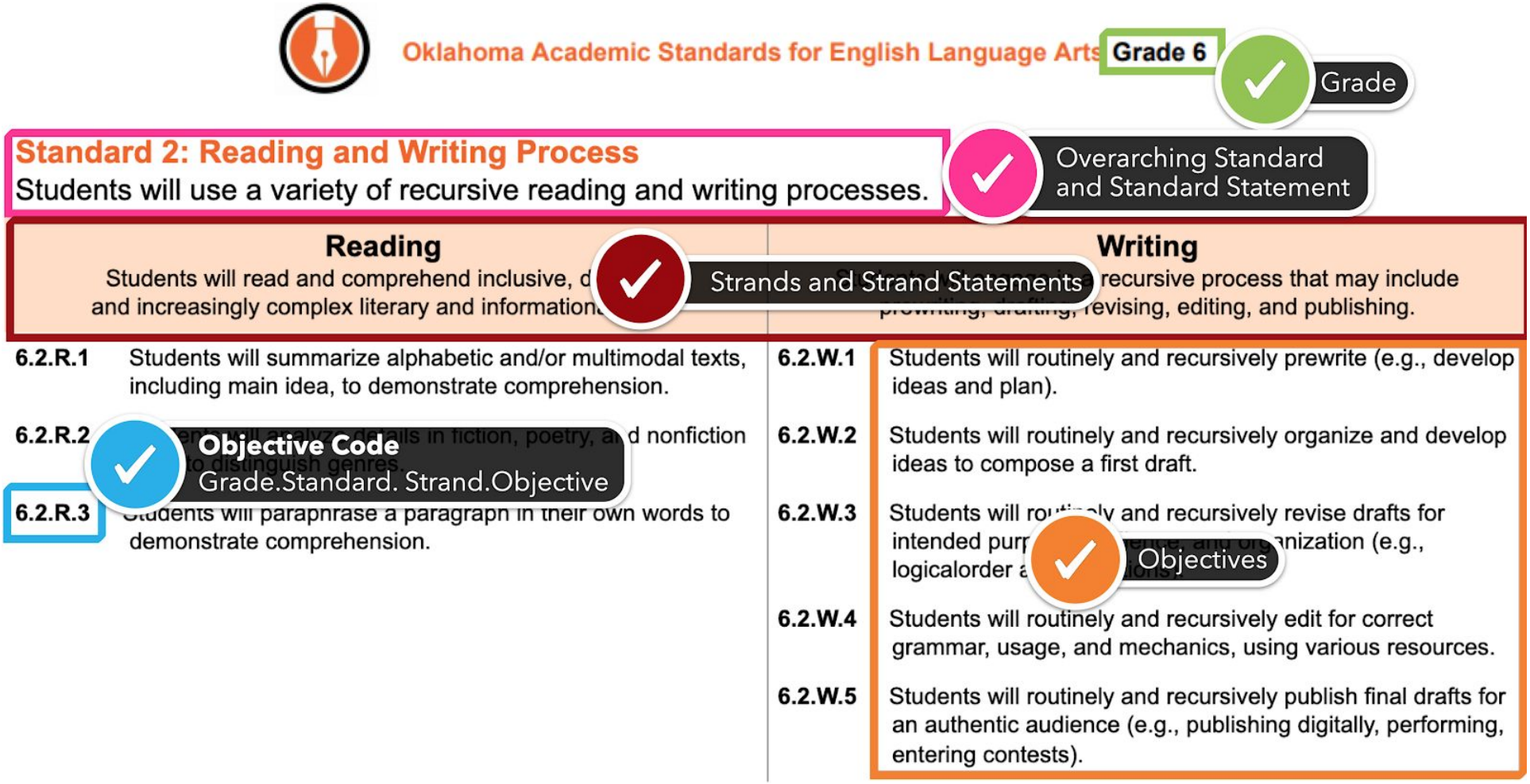
Standard 8: Independent Reading and Writing | Students will read and write independently for a variety of purposes and periods of time.

- **Reading**: Students will read self-selected texts independently, choosing genres to suit and expand their personal preferences and purposes.
- **Writing**: Students will write independently, intentionally selecting modes, purposes, and audiences.

Disciplinary Literacy in Oklahoma Academic Standards

As literacy expert Dr. Timothy Shanahan explains, “Disciplinary literacy is based upon the idea that literacy and text are specialized, and even unique, across the disciplines. Historians engage in very different approaches to reading than mathematicians do, for instance. Similarly, even those who know little about math or literature can easily distinguish a science text from a literary one.” Teachers of English language arts can partner with math, social studies, science, fine arts, computer science, and world languages teachers who are also teaching their students to read, write, listen, and speak within their particular subjects through subject-specific processes and standards. In self-contained elementary classrooms, teachers can incorporate various disciplinary literacies in their lessons.

Navigating the Standards



Grade 6

In grade 6, students practice speaking and listening by sharing their ideas and findings in class discussions. During the revision stage of the writing process, students learn how to better organize their writing through logical order and transitions. Students proficiently read complex literary and informational texts while further developing the ability to cite textual evidence to support analyses, which now includes mood. In this grade, students shift from writing opinion essays to argumentative essays, using claims, organization, and evidence to strengthen their writing. Students' vocabularies expand as they become more attuned to using context clues, knowledge of Latin roots, affixes, and stems to determine the meaning of complex words. They learn how to use commas and colons with increasing sophistication in their writing. They also take a critical stance toward sources and apply criteria for identifying relevant and reliable information. Students critique and create multimodal content and become increasingly independent readers and writers.

Standard 1: Listening and Speaking

Students will listen and speak effectively in a variety of situations.

Listening Students will develop and apply effective communication skills through active listening.		Speaking Students will develop and apply effective communication skills to share ideas through speaking.	
6.1.L.1	Students will actively listen using agreed-upon discussion rules, recognizing verbal and nonverbal cues while maintaining social awareness and responding accordingly.	**6.1.S.1**	Students will work effectively and respectfully in diverse groups by sharing responsibility for collaborative work and recognizing individual contributions.
6.1.L.2	Students will actively listen and interpret a speaker's verbal messages and ask questions to clarify the speaker's purpose.	**6.1.S.2**	Students will engage in collaborative discussions about what they are reading and writing, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole-class settings.
		6.1.S.3	Students will give formal and informal presentations in a group or individually, organizing information and determining the purpose, content, and form to suit the audience.

Standard 2: Reading and Writing Process

Students will use a variety of recursive reading and writing processes.

Reading Students will read and comprehend inclusive, diverse, and increasingly complex literary and informational texts.	Writing Students will engage in a recursive process that may include prewriting, drafting, revising, editing, and publishing.
6.2.R.1 Students will summarize alphabetic and/or multimodal texts, including main idea, to demonstrate comprehension.	**6.2.W.1** Students will routinely and recursively prewrite (e.g., develop ideas and plan).
6.2.R.2 Students will analyze details in fiction, poetry, and nonfiction texts to distinguish genres.	**6.2.W.2** Students will routinely and recursively organize and develop ideas to compose a first draft.
6.2.R.3 Students will paraphrase a paragraph in their own words to demonstrate comprehension.	**6.2.W.3** Students will routinely and recursively revise drafts for intended purpose, audience, and organization (e.g., logicalorder and transitions).
	6.2.W.4 Students will routinely and recursively edit for correct grammar, usage, and mechanics, using various resources.
	6.2.W.5 Students will routinely and recursively publish final drafts for an authentic audience (e.g., publishing digitally, performing, entering contests).

Standard 3: Critical Reading and Writing

Students will apply critical thinking skills to reading and writing.

Reading

Students will analyze, interpret, and evaluate increasingly complex literary and informational texts that include a wide range of historical, cultural, ethnic, and global perspectives from a variety of genres.

6.3.R.1 Students will compare and contrast stated or implied purposes of authors writing on the same topic from a variety of historical, cultural, ethnic, and global perspectives.

6.3.R.2 Students will evaluate how perspective (e.g., historical, cultural, ethnic, and global) affects a variety of literary and informational texts.

6.3.R.3 Students will analyze how literary elements contribute to the meaning of a literary text:

- setting
- plot
- characters (i.e., protagonist, antagonist)
- characterization
- conflict (i.e., internal, external)
- point of view (i.e., third person limited and omniscient)

6.3.R.4 Students will analyze how literary devices contribute to the meaning of a text:

- figurative language (i.e., simile, metaphor, personification, hyperbole, imagery, symbolism, idiom)
- sound devices (i.e., onomatopoeia, alliteration)

6.3.R.5 Students will identify literary elements and devices that impact a text's theme.

Writing

Students will thoughtfully and intentionally write, addressing a range of modes, purposes, and audiences.

6.3.W.1 Students will compose narratives reflecting real or imagined experiences that:

- include plots involving characters resolving conflicts
- unfold in chronological sequence
- include a narrator, precise language, sensory details, and dialogue to enhance the narrative
- use sentence variety to create clarity
- emulate literary elements and/or literary devices from mentor texts

6.3.W.2 Students will compose informative essays or reports that:

- objectively introduce and develop topics
- incorporate evidence (e.g., specific facts, details, charts and graphs, data)
- maintain an organized structure
- use sentence variety and word choice to create clarity
- emulate literary devices from mentor texts

6.3.W.3 Students will compose argumentative essays that:

- introduce precise claims
- organize claims and evidence in a logical sequence
- provide relevant evidence to develop arguments, using credible sources
- use sentence variety and word choice to create clarity

Standard 3 Continued

6.3.R.6 Students will categorize facts included in an argument as for or against an issue.

6.3.R.7 Students will analyze how informational text structures support the author's purpose:

- compare/contrast
- cause/effect
- problem/solution
- description
- sequential

6.3.R.8 Students will analyze one or more ideas from a text, providing textual evidence to support their inferences.

Standard 4: Vocabulary

Students will expand and apply their spoken and reading vocabularies to speak, read, and write effectively.

Reading Students will expand their grade-level vocabularies through reading, word study, and class discussion.		Writing Students will apply knowledge of vocabulary to speak and write effectively.	
6.4.R.1	Students will analyze the relationships among synonyms, antonyms, and analogies.	**6.4.W.1**	Students will use precise, grade-level vocabulary in writing to clearly communicate ideas.
6.4.R.2	Students will use context clues, connotation, and denotation to determine or clarify the meaning of words or distinguish among multiple-meaning words.	**6.4.W.2**	Students will select language in writing to create a specific effect according to purpose.
6.4.R.3	Students will use word parts (e.g., affixes, Latin roots, stems) to define and determine the meaning of increasingly complex words.		
6.4.R.4	Students will use a dictionary, glossary, or thesaurus to determine or clarify the meanings, syllabication, pronunciation, synonyms, antonyms, and parts of speech of words.		

Standard 5: Language

Students will expand and apply knowledge of grammar, usage, mechanics, and style to comprehend texts and communicate effectively.

Reading

Students will expand and apply knowledge of grammar, usage, mechanics, and style to comprehend, analyze, and/or evaluate a variety of texts.

6.5.R.1 Students will recognize simple, compound, and complex sentences.

6.5.R.2 Students will recognize and explain the impact on meaning of parts of speech in sentences:

- nouns
- verb tense to signify various times, sequences, conditions, and states
- subject and verb agreement
- adjectives
- prepositional phrases
- reflexive pronouns and their antecedents
- singular *they*/*them*/*their*
- subordinating conjunctions
- adverbs
- interjections

Writing

Students will expand and apply knowledge of grammar, usage, mechanics, and style to speak and write effectively, demonstrating standard usage when appropriate.

6.5.W.1 Students will compose simple, compound, and complex sentences to add clarity and variety in their writing.

6.5.W.2 Students will add clarity and variety to their writing with nouns, verbs, adjectives, prepositions, adverbs, and pronouns.

6.5.W.3 Students will recognize and correct the following: run-ons, errors in subject and verb agreement, inappropriate shifts in verb tense, and inappropriate shifts in pronoun number and person.

6.5.W.4 Students will write using correct capitalization mechanics.
Grade of Mastery: 4

6.5.W.5 Students will write using correct end mark mechanics.
Grade of Mastery: 4

6.5.W.6 Students will write using correct apostrophe mechanics.
Grade of Mastery: 5

6.5.W.7 Students will use commas to separate an introductory element from the rest of the sentence and to indicate direct address (e.g., Where are you, Sam?).

Standard 5 Continued

6.5.W.8	Students will use a colon to introduce a quotation from a source (e.g., According to *National Geographic*, meerkat homes are quite comfortable: “Each burrow is an extensive tunnel-and-room system that remains cool even under the broiling African sun.”).
6.5.W.9	Students will use quotation marks to indicate dialogue, quoted material, and titles of works.
6.5.W.10	Students will use underlining or italics to indicate titles of works.
6.5.W.11	Students will use a semicolon to punctuate compound sentences.

Standard 6: Research

Students will engage in inquiry to acquire, refine, and communicate accurate information.

Reading Students will gather, comprehend, evaluate, and synthesize researched information to acquire and refine knowledge.		Writing Students will synthesize information ethically through speaking and writing.	
6.6.R.1	Students will use their own viable research questions to gather information about a topic.	**6.6.W.1**	Students will formulate and refine a viable research question.
6.6.R.2	Students will record and organize information from various primary and secondary sources.	**6.6.W.2**	Students will develop a clear, concise thesis statement.
6.6.R.3	Students will determine the relevance and reliability of the information gathered.	**6.6.W.3**	Students will quote findings following a consistent citation style (e.g., MLA, APA) to avoid plagiarism.
		6.6.W.4	Students will create research papers and/or projects independently for shorter timeframes (e.g., a single sitting or a day or two).

Standard 7: Multimodal Literacies

Students will comprehend and communicate knowledge through alphabetic, aural, visual, spatial, and/or gestural content.

Reading Students will comprehend and evaluate multimodal content.	Writing Students will create multimodal content to communicate effectively.
6.7.R Students will compare and contrast the effectiveness of a variety of alphabetic, aural, visual, spatial, and/or gestural content from various perspectives.	**6.7.W** Students will create multimodal content (i.e., alphabetic, aural, visual, gestural and/or spatial) that effectively communicates ideas for an intended audience.

Standard 8: Independent Reading and Writing

Students will read and write independently for a variety of purposes and periods of time.

Reading Students will read self-selected texts independently, choosing genres to suit and expand their personal preferences and purposes.	Writing Students will write independently, intentionally selecting modes, purposes, and audiences.
6.8.R Students will read self-selected texts independently and for various lengths of time, choosing genres to suit and expand their personal preferences and purposes.	**6.8.W** Students will write independently using print, cursive, and/or typing for various lengths of time, choosing modes and genres to suit their audience and purpose.

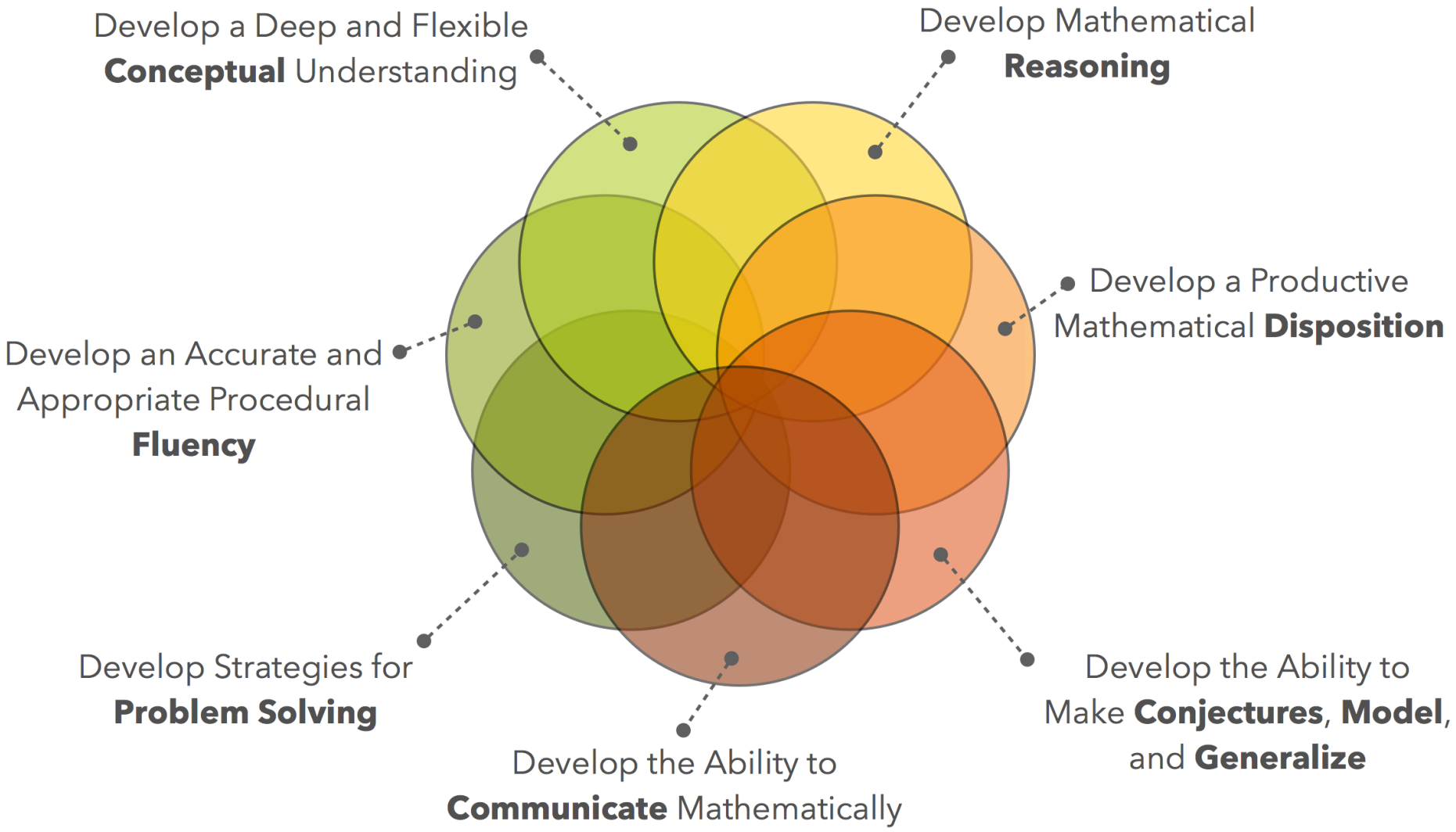
OKLAHOMA ACADEMIC STANDARDS

MATHEMATICS

OKLAHOMA STATE DEPARTMENT OF EDUCATION

CHAMPION EXCELLENCE

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.

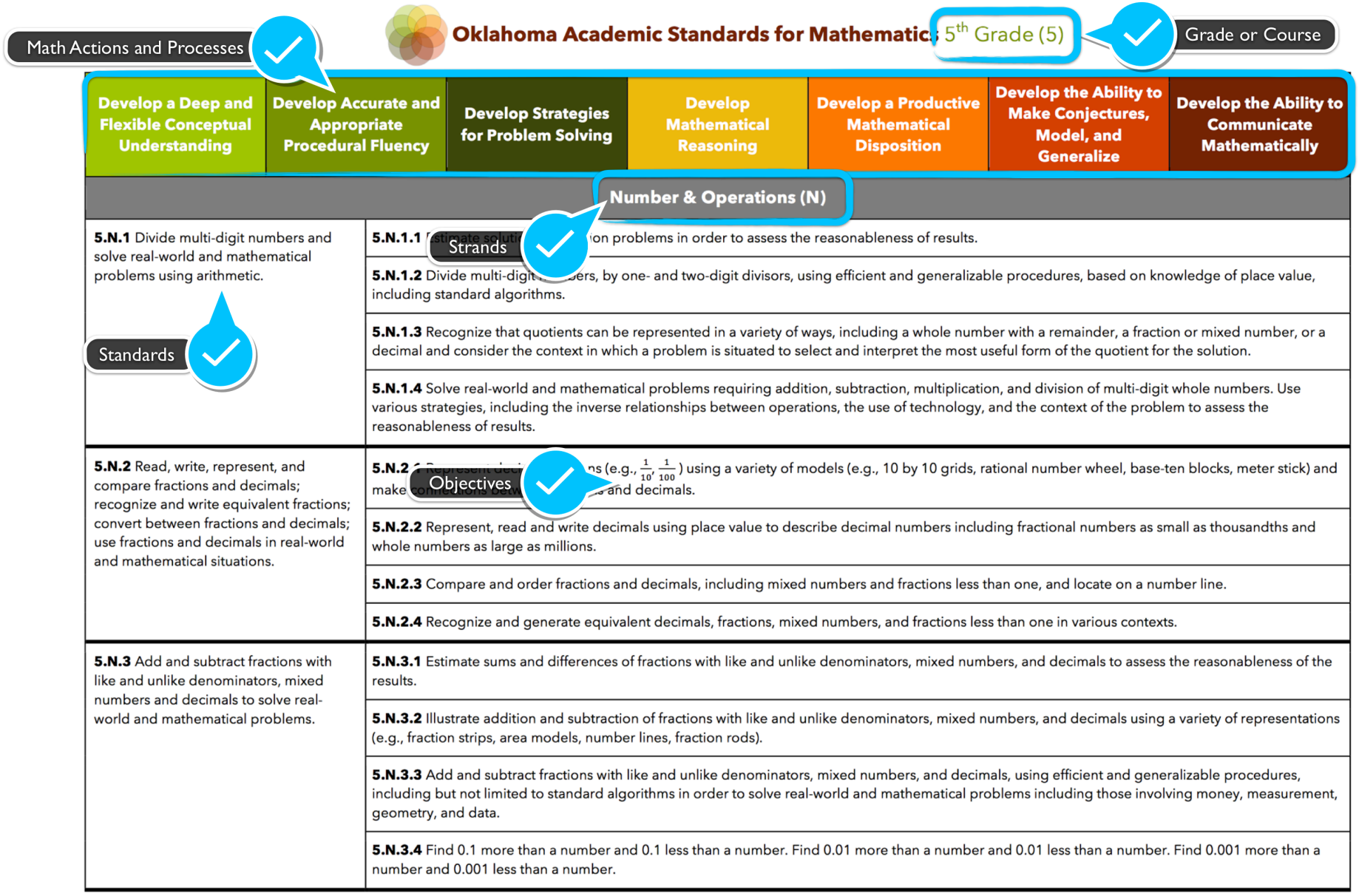
Develop Mathematical Reasoning
Explore and communicate a variety of reasoning strategies to think through problems. Students will apply their logic to critique the thinking and strategies of others to develop and evaluate mathematical arguments, including making arguments and counterarguments and making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

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.

OKLAHOMA ACADEMIC STANDARDS

SCIENCE

OKLAHOMA STATE DEPARTMENT OF EDUCATION

CHAMPION EXCELLENCE

Science Strands Overview

The Draft Oklahoma Academic Standards for Science, K-12 are three-dimensional performance expectations representing the things students should know, understand, and be able to do to be proficient in science and engineering. Performance expectations are considered standards and include a science and engineering practice (everyday skills of scientists and engineers), disciplinary core ideas (science ideas used by scientists and engineers), and crosscutting concepts (ways of thinking like scientists and engineers). The PreK standards emphasize one dimension; the science and engineering practices. This provides early learners with ample time for exploratory play and background experiences that will inform learning experiences K-12.

Performance Expectation:

Each Performance Expectation is built upon recommendations in *A Framework for K-12 Science Education* and the three dimensions of science.

1. Science and Engineering Practices
2. Disciplinary Core Ideas
3. Crosscutting Concepts (NRC, 2012, p. 2)

The following additional components in the standard documents serve as support for instructors in providing clarity and further guidance for each Performance Expectation.

Clarification Statement:

Where needed, a Clarification Statement accompanies a Performance Expectation. The aim of a Clarification Statement is to provide further explanation or examples to better support educators in understanding the aim of the Performance Expectation.

Assessment Boundary:

Where applicable, an Assessment Boundary accompanies a Performance Expectation in order to provide additional support for educators in understanding the intent of the Performance Expectation and its relation to other Performance Expectations in the learning progression. Teachers should utilize the Assessment Boundaries as tools for developing curriculum and local assessments. For 5th grade, 8th grade, Biology, and Physical Science(s) the Assessement Boundaries will be utilized to inform the development of the state summative academic achievement assessments.

Dimension 1: Science and Engineering Practices

The Science and Engineering Practices describe the major practices that scientists employ as they investigate and build models and theories about the world, and a key set of engineering practices that engineers use as they design and build systems. Performance Expectations that emphasize engineering are designated with an asterik *. The eight science and engineering practices are:

Asking Questions and Defining Problems
A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world(s) works. Engineering questions clarify problems to determine criteria for successful solutions.

Developing and Using Models
A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations.

Planning and Carrying Out Investigations
Scientists and engineers plan and carry out investigations in the field or laboratory, working collaboratively as well as individually. Their investigations are systematic and require clarifying what counts as data and identifying variables or parameters.

Analyzing and Interpreting Data
Scientific investigations produce data that must be analyzed in order to derive meaning, and engineering investigations include analysis of data collected in the tests of designs.

Using Mathematics and Computational Thinking
In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for constructing simulations, solving equations exactly or approximately, and recognizing, expressing, and applying quantitative relationships.

Constructing Explanations and Designing Solutions
End products of science are explanations, and end products of engineering are solutions. The construction of theories provides explanatory accounts of the world, and scientific knowledge is utilized in the development of solution to problems.

Engaging Scientific Argument from Evidence
Argumentation is the process by which evidence-based conclusions and solutions are reached. In science and engineering, reasoning and argument based on evidence are essential to identifying the best explanation for a natural phenomenon or the best solution to a design problem.

Obtaining, Evaluating, and Communicating Information
Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity.

Dimension 2: Disciplinary Core Ideas

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; and are teachable and learnable over multiple grades at increasing levels of sophistication. (NRC, 2012, p. 31) Disciplinary Core Ideas are grouped into four domains:

- **Domain 1: Physical Science (PS)**
  Most systems or processes depend at some level on physical and chemical subprocesses, whether the system is a star, Earth's atmosphere, a river, a bicycle, or a living cell. To understand the physical and chemical basis of a system, students must understand the structure of matter, the forces between objects, the related energy transfers, and their consequences. In this way, the underlying principles of physical science, chemistry, and physics allow students to understand all natural and human-created phenomena.

- **Domain 2: Life Science (LS)**
  The life sciences focus on patterns, processes, and relationships of living organisms. The study of life ranges over scales from single molecules, organisms and ecosystems, to the entire biosphere. A core principle of the life sciences is that organisms are related through common ancestry and that processes of natural selection have led to the tremendous diversity of the biosphere. Through courses like Biology and Environmental Science, students explore all aspects of living things and the environments they live in.

- **Domain 3: Earth and Space Science (ESS)**
  Through Earth and Space Sciences (ESS), students investigate processes that operate on Earth and also address Earth's place in the solar system and the galaxy. ESS involve phenomena that range in scale from unimaginably large to invisibly small and provide students opportunities to understand how the atmosphere, geosphere, and biosphere are connected.

- **Domain 4: Engineering, Technology, and Applications of Science (ETS)**
  The applications of science knowledge and practices to engineering have contributed to the technologies and the systems that serve people today. Insights gained from scientific discovery have altered the ways in which buildings, bridges, and cities are constructed; changed the operations of factories; led to new methods of generating and distributing energy; and created new modes of travel and communication. An overarching goal of ETS is for students to explore links among engineering, technology, science, and society throughout the physical, life, and Earth and space sciences.

Dimension 3: Crosscutting Concepts

The 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. These Crosscutting Concepts are:

Patterns
Observed patterns of forms and events guide organization and classification. Patterns prompt questions about the factors that influence cause and effect relationships. Patterns are useful as evidence to support explanations and arguments.

Cause and Effect
Events have causes, sometimes simple, sometimes multifaceted and complex. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.

Scale, Proportion, Quantity
In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.

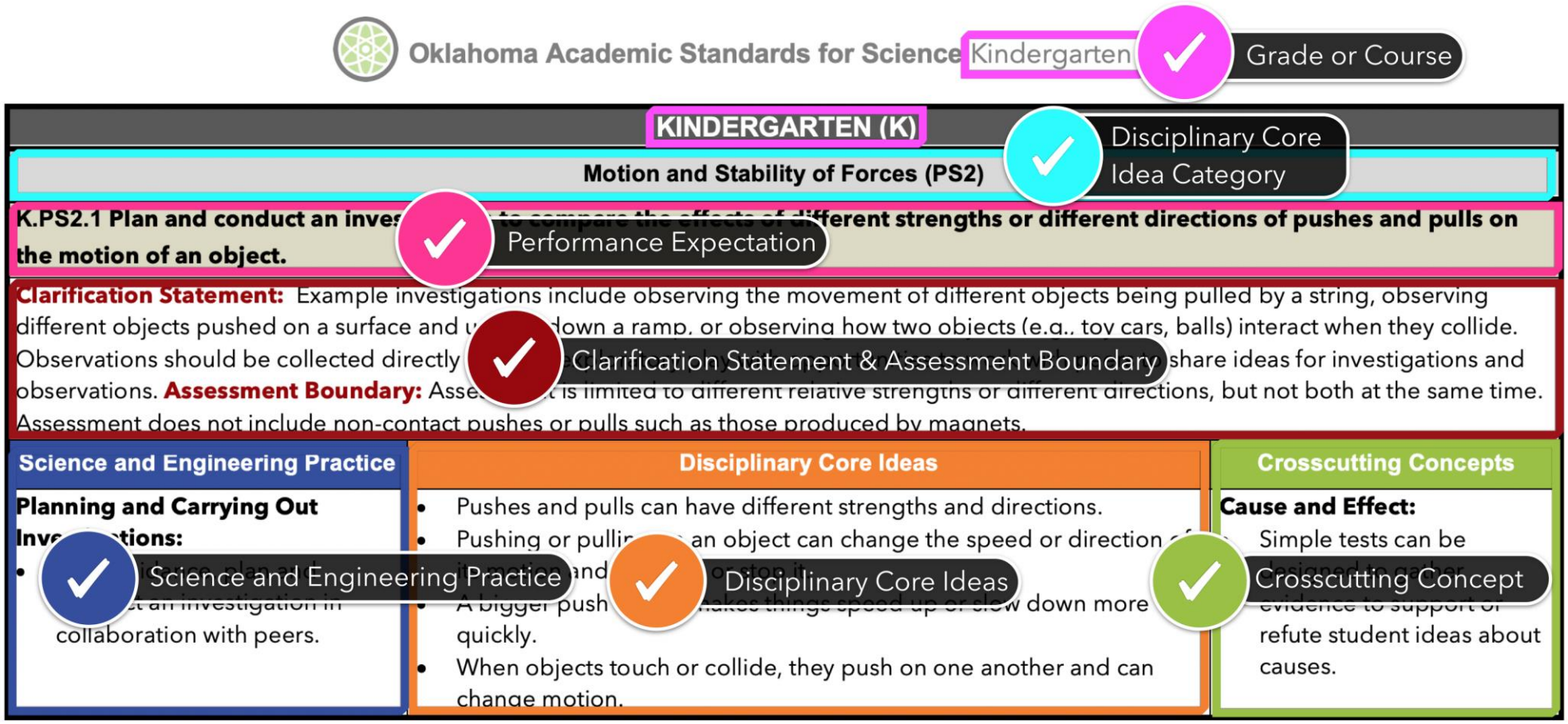
Systems and System Models
Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.

Energy and Matter
Tracking fluxes of energy and matter into, out of, and within systems helps one understand the system's possibilities and limitations.

Structure and Function
An object's structure and shape determine many of its properties and functions. The structures, shapes, and substructures of living organisms determine how the organism functions to meet its needs within an environment.

Stability and Change
For natural and built systems alike, conditions of stability and rates of change provide the focus for understanding how the system operates and causes for changes in syste

Reading the Oklahoma Academic Standards for Science



6TH GRADE (6)		
Matter and Its Interactions (PS1)		
6.PS1.4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.		
Clarification Statement: Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawings and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium. **Assessment Boundary:** The use of mathematical formulas is not intended		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Developing and Using Models: • Develop a model to predict and/or describe phenomena.	• Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. • The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. • The term "heat" as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. • The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system's material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. • Temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material.	**Cause and Effect:** • Cause and effect relationships are routinely identified, tested, and used to explain change.

Energy (PS3)		
6.PS3.3 Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*		
Clarification Statement: Examples of devices could include an insulated box, a solar cooker, and a Styrofoam cup. Care should be taken with devices that concentrate significant amounts of energy, e.g. conduction, convection, and/or radiation. **Assessment Boundary:** Assessment does not include calculating the total amount of thermal energy.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Designing Solutions: • Apply scientific ideas or principles to design, construct, and test a design of an object, tool, process, or system.	• Temperature is a measure of the average kinetic energy of particles of matter. • The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. • Energy is spontaneously transferred out of hotter regions or objects and into colder ones. • The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. • Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. • A solution needs to be tested, and then modified on the basis of the test results in order to improve it. • There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.	**Energy and Matter:** • The transfer of energy can be tracked as energy flows through a designed or natural system.

Energy (PS3)		
6.PS3.4 Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.		
Clarification Statement: Examples of experiments could include comparing final water temperatures after different masses of ice melted in the same volume of water with the same initial temperature, the temperature change of samples of different materials with the same mass as they cool or heat in the environment, or the same material with different masses when a specific amount of energy is added. **Assessment Boundary:** Assessment does not include calculating the total amount of thermal energy transferred.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Planning and Carrying Out Investigations: • 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.	• Temperature is a measure of the average kinetic energy of particles of matter. • The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter present. • The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment.	**Scale, Proportion, and Quantity:** • Proportional relationships (e.g. speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes.

Waves and Their Applications in Technologies for Information Transfer (PS4)		
6.PS4.2 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 of light waves through a prism, mechanical waves through gas vs. liquids vs. solids, or sound waves through different mediums. **Assessment Boundary:** Assessment is limited to qualitative applications pertaining to electromagnetic and mechanical waves.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Developing and Using Models: • Develop and use a model to describe phenomena.	• A sound wave needs a medium through which it is transmitted. • 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 can travel 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.	**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.

From Molecules to Organisms: Structure and Processes (LS1)

6.LS1.1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells. **Assessment Boundary:** Assessment does not include identification of specific cell types and should emphasize the use of evidence from investigations.

Science and Engineering Practice	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations: • Conduct an investigation to produce data to serve as the basis for evidence that meets the goals of an investigation.	• All living things are made up of cells, which is the smallest unit that can be said to be alive. • An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).	**Scale, Proportion, and Quantity:** • Phenomena that can be observed at one scale may not be observable at another scale.

6.LS1.2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall. Other organelles can be introduced while convering this concept. **Assessment Boundary:** Assessment of organelle structure/function relationships limited to cell wall and cell membrane. Assessment of other organelles is limited to their relationship to the whole cell. Assessment does not include biochemical functions of cell or cell parts.

Science and Engineering Practice	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models: • Develop and use a model to describe phenomena.	• Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.	**Structure and Function:** • Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts.

From Molecules to Organisms: Structure and Processes(LS1)

6.LS1.3 Use an argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Clarification Statement: Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems.
Assessment Boundary: Assessment does not include the mechanism of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.

Science and Engineering Practice	Disciplinary Core Ideas	Crosscutting Concepts
Engaging in Argument from Evidence: • Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon.	• In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.	**Systems and System Models:** • Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems.

6.LS1.8 Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Clarification Statement: Examples include: receptors in the eye that respond to light intensity and color; receptors in hair cells of the inner ear that detect vibrations conducted from the eardrum; taste buds that detect chemical qualities of foods including sweetness, bitterness, sourness, saltiness, and umami (savory taste); and receptors in the skin that respond to variations in pressure. **Assessment Boundary:** The assessment should provide evidence of students' abilities to provide a basic and conceptual explanation of the process. Assessment does not include mechanisms for the transmission of this information.

Science and Engineering Practice	Disciplinary Core Ideas	Crosscutting Concepts
Obtaining, Evaluating, and Communicating Information: • Read and comprehend grade appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas.	• Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.	**Cause and Effect:** • Cause and effect relationships may be used to predict phenomena in natural systems.

Earth's Place in the Universe (ESS1)		
6.ESS1.4 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. Scientific explanations can include models to study the geologic time scale. **Assessment Boundary:** Assessment does not include recalling the names of specific periods or epochs and events within them.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Constructing Explanations: • 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.	• The geologic time scale interpreted from rock strata provides a way to organize Earth's history. • Major historical events include the formation of mountain chains and ocean basins, the adaptation and extinction of particular living organisms, volcanic eruptions, periods of massive glaciation, and development of watersheds and rivers through glaciation and water erosion. • Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.	**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.

Earth's Systems (ESS2)		
6.ESS2.1 Develop a model to describe the cycling of Earth's materials and the flow of energy that drives these processes within and among Earth's systems.		
Clarification Statement: Emphasis is on how energy from the sun and Earth's hot interior drive processes that cause physical and chemical changes to materials within and between the geosphere, hydrosphere, atmosphere, and biosphere. Examples of processes could include melting, crystallization, weathering, deformation, and sedimentation, which act together to form and change rocks and minerals through the rock cycle. **Assessment Boundary:** Assessment does not include the identification or naming of minerals.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Developing and Using Models: • Develop and use a model to describe phenomena.	• 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 produces chemical and physical changes in Earth's materials.	**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, including the atomic scale.

Earth's Systems (ESS2)		
6.ESS2.2 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 large mountain ranges) or small (such as rapid landslides or 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. **Assessment Boundary:** Assessment does not include identification or naming of specific events.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Constructing Explanations: • 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.	• 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. • Water's movements, both on the land and underground, cause weathering and erosion, which change the land's surface features and create underground formations.	**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.

Earth's Systems (ESS2)		
6.ESS2.3 Analyze and interpret data on the patterns of distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.		
Clarification Statement: Examples could include identifying patterns on maps of earthquakes and volcanoes relative to plate boundaries, the shapes of the continents, the locations of ocean structures (including mountains, volcanoes, faults, and trenches), or similarities of rock and fossil types on different continents. **Assessment Boundary:** Paleomagnetic anomalies in oceanic and continental crust are not assessed.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Analyze and Interpret Data: • Analyze and interpret data to determine similarities and differences in findings.	• Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. • 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.	**Patterns:** • Patterns in rate of change and other numerical relationships can provide information about natural and human-designed systems.

Earth's Systems (ESS2)

6.ESS2.4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

Clarification Statement: Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical. **Assessment Boundary:** A quantitative understanding of the latent heats of vaporization and fusion is not assessed.

Science and Engineering Practice	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models: • Develop a model to describe unobservable mechanisms.	• Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation, and crystallization, and precipitation, as well as downhill flows on land. • Global movements of water and its changes in form are propelled by sunlight and gravity.	**Energy and Matter:** • Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter.

6.ESS2.5 Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses interact. Emphasis is on how weather can be predicted within probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation). **Assessment Boundary:** Assessment does not include recalling the names of cloud types or weather symbols used on weather maps or the reported diagrams from weather stations.

Science and Engineering Practice	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations: • Collect data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions.	• Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. • These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. • Because these patterns are so complex, weather can be predicted only probabilistically.	**Cause and Effect:** • Cause and effect relationships may be used to predict phenomena in natural or designed systems.

Earth's Systems (ESS2)		
6.ESS2.6 Develop and use a model to describe how unequal heating and rotation of the Earth causes patterns of atmospheric and oceanic circulation that determine regional climates.		
Clarification Statement: Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds; emphasis of ocean circulation (e.g., Gulf Stream, North Pacific Drift, California Current) is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents. Interactions between the atmosphere and oceans can affect the ocean's surface temperature (El Nino/La Nina). Examples of models can be diagrams, maps and globes, or digital representations. **Assessment Boundary:** Assessment should not be focused on specific weather events, but on the patterns that drive Earth's climate systems.		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Developing and Using Models: • Develop and use a model to describe phenomena.	• Variations in density due to variations in temperature and salinity drive a global pattern on interconnected ocean currents. • Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. • These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. • The ocean exerts a major influence on weather and climate by absorbing energy from the sun, and globally redistributing it through ocean currents.	**Systems and System Models:** • Models can be used to represent systems and their interactions (such as inputs, processes, and outputs) and energy, matter, and information flows within the systems.

Earth and Human Activity (ESS3)		
6.ESS3.2 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). **Assessment Boundary:** N/A		
Science and Engineering Practice	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Analyzing and Interpreting Data: • Analyze and interpret data to provide evidence for phenomena.	• 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.	**Patterns:** • Graphs, charts, and images can be used to identify patterns in data.

OKLAHOMA ACADEMIC STANDARDS

SOCIAL STUDIES

OKLAHOMA STATE DEPARTMENT OF EDUCATION

CHAMPION EXCELLENCE

Introduction

The Oklahoma Academic Standards for Social Studies is the result of the contributions of hundreds of social studies educators, representatives of higher education, tribal representatives, and community members. This document reflects a balanced synthesis of the work of all members of the Oklahoma Academic Standards for Social Studies Writing and Draft Committees.

The standards specify what students should know and be able to do as learners of social studies at the end of each grade level or social studies course. 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 Oklahoma Academic Standards for Social Studies were informed by the National Council of the Social Studies (NCSS) Skills Framework , the Center for Civic Education Civics Standards, the National Council for Geographic Education (NCGE) Geography for Life Standards, the Council for Economic Education Voluntary National Content Standards in Economics, the National Council for History Education (NCHE) Habits of Mind, the National Center for History in the Schools Standards for Historical Thinking, the Oklahoma Academic Standards for English Language Arts and Social Studies, and other states' standards documents.

Standards Overview

Having a literate citizenry rests on a commitment to democratic values and the practice of them. It requires the ability to use knowledge about one's community, nation and world, apply inquiry processes, and employ skills of data collection and analysis, collaboration, decision-making; and problem-solving. Young people who are knowledgeable, skillful, and committed to democracy are necessary to sustaining and improving the democratic way of life. This will also enable our students to become participating members of a global community. A well-rounded, vigorous social studies education encourages and enables each student to acquire a core of basic knowledge, an arsenal of useful skills, and a way of thinking drawn from many academic disciplines. Thus equipped, students are prepared to become informed, contributing, and participating citizens in this democratic republic – the United States of America.

The standards are comprised of two primary components, content standards and social studies practices. The content standards designate specific learning targets at each grade level or course. These content standards are derived from the major disciplines of the social sciences: history, geography, civics and economics. The social studies practices define basic skills and disciplinary tools to prepare students for college, career, and civic life. These practices are meant to be integrated with the instruction of content standards.

Social Studies Content Strands Overview

Social Studies is a systematic and coordinated discipline designed to promote civic competence by drawing upon four content strands: history, geography, civics, and economics. These strands draw from all fields of study related to the social sciences to provide a framework used in the development of the content standards for social studies. They are to be threaded through an integrated program, from grades pre-K through 12, as appropriate at each level. While at some grades and for some courses, specific strands will be more dominant than others, all strands are represented and interrelated in the standards for each grade and course.

Strand 1: History
History focuses on the written record of human experience revealing how individuals and societies developed institutions, philosophies, ideals, and cultural values, and resolved their problems. A balanced study of history helps students understand the how and why of the challenges and successes of past societies. By studying the choices and decisions of the past, students can confront today's problems with a deeper awareness of their alternatives and likely consequences.

Strand 2: Geography
Geography has more to do with asking questions and solving problems than with rote memorization of isolated facts. It is the study of the earth's surface and the processes that shape it, the relationships between people and environments, and the connections between people and places. As a discipline, geography provides the skills to help students answer questions about where things are, how they got there, and how they interact with other things - in the past, now, and in the future.

Strand 3: Civics
Civics is defined to mean the study of the rights and duties of Oklahoma and United States citizens and of how their governments work. This strand helps students understand the essential principles and workings of their political system and that of others, as well as the relationship of American politics and government to world affairs. The goal of civics is to develop literate, informed, competent, and responsible citizens who are politically aware, active, and committed to the fundamental values and principles of American constitutional democracy.

Strand 4: Economics
Economics provides students with an understanding of how individuals, communities, states, and nations allocate both scarce and abundant resources. A clear understanding of economics enables students to comprehend the various competing economic philosophies, ideas, and forces that affect them every day, measure the effectiveness of each, and identify and evaluate the consequences of personal decisions and public policies. Students then will understand how a market economy effectively functions preparing them to be producers, consumers, and citizens.

Social Studies Practices Overview

The Social Studies Practices reflect the key skills and disciplinary tools to prepare students for college, career, and civic life. The practices are meant to be integrated with the instruction of content standards. The five practices are defined broadly below and are further delineated on pg. 6. The social studies practices are designed to support student mastery of the content through a progression of skills PK-12.

Engage in Democratic Processes

Understanding civic virtues and the role of civic institutions. Students will gain knowledge of the history, principles, and foundations of American democracy to participate in civic and democratic processes. Students will identify the institutions of American government to analyze their role as responsible citizens.

Analyze and Address Authentic Civic Issues

Understanding the importance of critical questioning to solve real world problems. Students will develop essential questions to frame independent inquiry related to the past and present. Students will identify and address public problems individually and collaboratively to improve communities and society.

Acquire, Apply, and Evaluate Evidence

Understanding and using strategies to analyze evidence in the social studies. Students will evaluate historical, geographic, and economic information. Students will draw conclusions from primary and secondary sources to formulate informed decisions.

Read Critically and Interpret Information Sources

Understanding the purpose of engaging with text.
Students will evaluate factual information and points of view as presented in text. Students will read historical and contemporary texts to engage in collaborative discussion.

Engage in Evidence-Based Writing

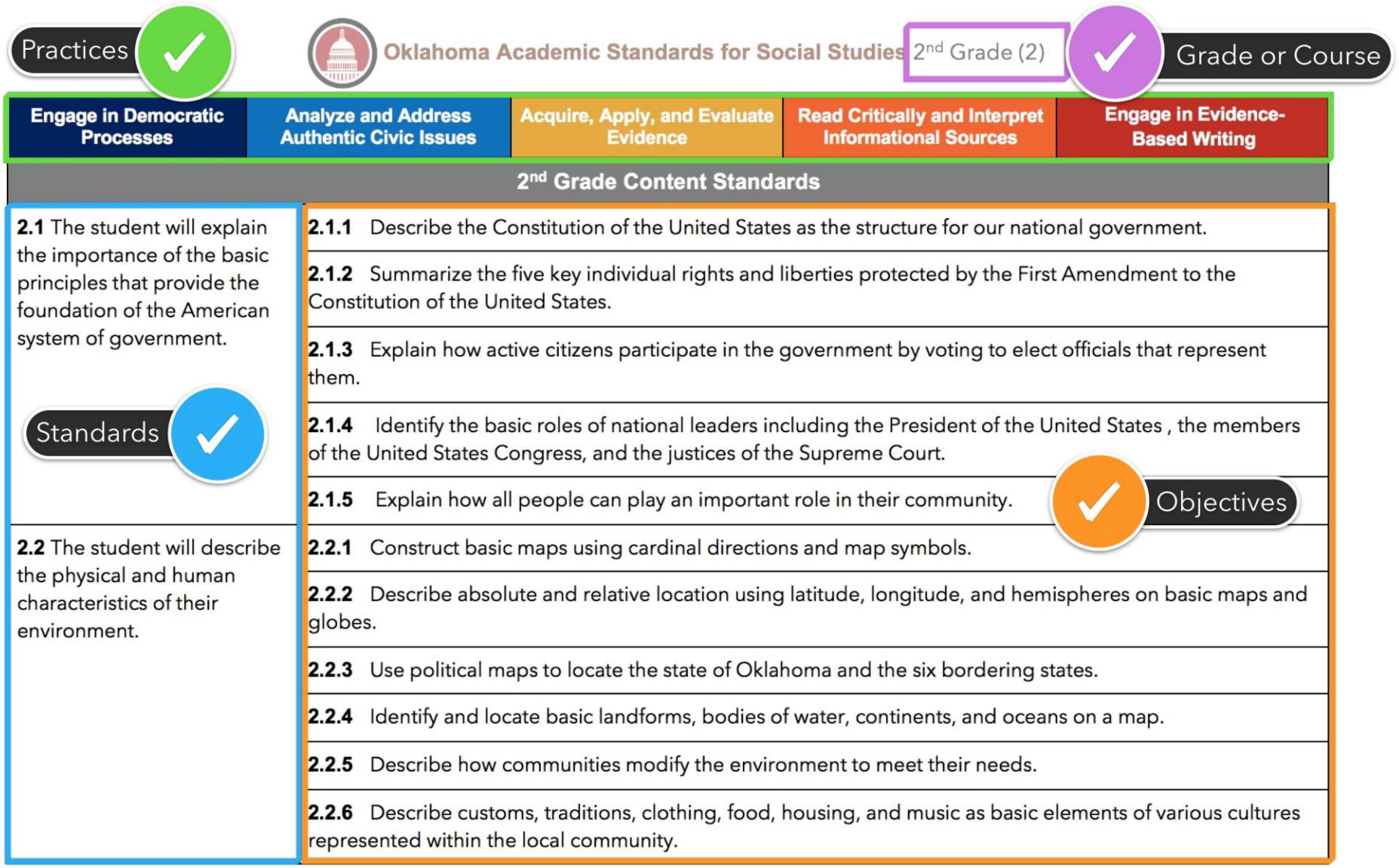
Understanding the multiple purposes of the writing process.
Students will develop written products designed for a variety of social studies related investigations. Students will use and integrate evidence to present knowledge and support opinion.

Social Studies Practices PK-12

The Social Studies Practices describe the experience all students should have as they explore and reason about social studies content PK-12. Additional guidance for what the Social Studies Practices look like across grade levels is provided in **Appendix A: Social Studies Practices PK-12 Progression**.

1. **Engage in Democratic Processes** - Students will understand the principles of government, the benefits of democratic systems, and their responsibilities as citizens.
   - 1.A. Students will demonstrate an understanding of the virtues that citizens should use when interacting with each other and the virtues that guide official government institutions.
   - 1.B. Students will demonstrate an understanding of the important institutions of their society and the principles that these institutions are intended to reflect.
   - 1.C. Students will demonstrate understanding of the processes and rules by which groups of people make decisions, govern themselves, and address public problems.
2. **Analyze and Address Authentic Civic Issues** - Students will determine the kinds of sources that will be helpful in answering essential, compelling, and supporting questions addressing authentic civic issues.
   - 2.A. Students will demonstrate the capability for developing essential, compelling, and supporting questions that address authentic civic issues.
   - 2.B. Students will demonstrate the ability to investigate problems taking into consideration multiple points of view represented in arguments, structure of an explanation, and other sources.
3. **Acquire, Apply, and Evaluate Evidence** - Students will utilize interdisciplinary tools and master the basic concepts of the social studies in order to acquire and apply content understanding in all related fields of study.
   - 3.A. Students will develop skills and practices which demonstrate an understanding that historical inquiry is based on the analysis and evaluation of evidence and its credibility.
   - 3.B. Students will demonstrate an understanding of geographic concepts and develop mastery of geographic tools and ways of thinking in order to become geographically informed.
   - 3.C. Students will analyze the principles of economic systems and develop an understanding of the benefits of a market system in local, national, and global settings.
4. **Read Critically and Interpret Informational Sources** - Students will engage in critical, active reading of grade-level appropriate primary and secondary sources related to key social studies concepts, including frequent analysis and interpretation of informational sources.
   - 4.A. Students will comprehend, evaluate, and synthesize textual sources to acquire and refine knowledge in the social studies.
   - 4.B. Students will apply critical reading and thinking skills to interpret, evaluate, and respond to a variety of complex texts from historical, ethnic, and global perspectives.
5. **Engage in Evidence-Based Writing** - Students will apply effective communication skills by developing a variety of evidence-based written products designed for multiple purposes and tasks, in order to demonstrate their understandings of social studies concepts, ideas, and content.
   - 5.A. Students will summarize and paraphrase, integrate evidence, and cite sources to create written products, research projects, and presentations for multiple purposes related to social studies content.
   - 5.B. Students will engage in authentic inquiry to acquire, refine, and share knowledge through written presentations related to social studies.

Reading the Oklahoma Academic Standards for Social Studies



Engage in Democratic Processes	Analyze and Address Authentic Civic Issues	Acquire, Apply, and Evaluate Evidence	Read Critically and Interpret Informational Sources	Engage in Evidence-Based Writing

6th Grade Content Standards	
6.1 The student will analyze data from a geographic perspective using the skills and tools of geography.	**6.1.1** Apply geographic information to support analysis from primary and secondary sources located in a variety of texts.
	6.1.2 Describe how various map projections distort the surface of the earth; apply the concepts of scale, distance, direction, relative location, absolute location, and latitude and longitude.
	6.1.3 Integrate visual information, draw conclusions, and make predictions from geographic data and analyze spatial distribution and patterns by interpreting that data as displayed on geographic tools.
	6.1.4 Integrate visual information and develop the skill of mental mapping of the political and physical features of Earth's surface in order to organize information about people, places, and environments.
	6.1.5 Describe and analyze the role of geographic factors on current events and issues.
6.2 The student will analyze the physical systems of the major regions of the Western Hemisphere.	**6.2.1** Use visual information to identify and describe on a physical map the landforms, bodies of water, climate, and vegetation zones that are important to each region.
	6.2.2 Explain how the processes and factors of latitude, elevation, Earth-Sun relationships, prevailing winds, and proximity to bodies of water influence climate.
	6.2.3 Describe the predominant natural resources found in each region.
	6.2.4 Describe the relationship and summarize the impact of the distribution of major renewable and nonrenewable resources on each region.

6.3 The student will identify the characteristics, distribution, and demographic patterns of human populations and systems of the Western Hemisphere.	**6.3.1** Identify on a political map the major countries and population centers of each region.
	6.3.2 Identify and describe cultural traits of language, ethnic heritage, religion, and traditions practiced among peoples.
	6.3.3 Analyze the impact of geography on population distribution, growth, and change, applying geographic concepts of population density, the availability of resources.
	6.3.4 Describe how the push and pull factors of migration have affected settlement patterns and the human characteristics of places over time.
	6.3.5 Compare the systems of government, including representative governments (democracy, republic, constitutional monarchy) and authoritarian systems (dictatorship, absolute monarchy).
	6.3.6 Identify the role of the citizen in the selection of government officials and lawmaking; compare individual liberties under different forms of government.
	6.3.7 Identify and explain topics related to indigenous sovereignty.
	6.3.8 Evaluate how the three levels of economic activities (primary, secondary, tertiary) contribute to the development of a nation and region.
	6.3.9 Describe benefits and limitations of the traditional, market, and command economic systems, including how government policies affect economic activities and trade relationships.
	6.3.10 Identify the common characteristics of developed and developing countries, including the impact of education and technology; analyze data used by geographers such as literacy rate, life expectancy, per capita income, and infant mortality.

6.4 The student will analyze the interactions of humans and their environment in the Western Hemisphere.	**6.4.1** Describe the commercial agriculture and industrial regions that support human development.
	6.4.2 Evaluate the effects of human modification on the natural environment through transformation caused by subsistence and commercial agriculture, industry, demand for energy, and urbanization.
	6.4.3 Analyze the impact of climate and natural disasters on human populations, including forced migration, scarcity of consumer goods, economic activities, and loss of life.
	6.4.4 Analyze environmental challenges of each region.
	6.4.5 Evaluate the role of ecotourism in creating environmental awareness of resources, climate, cultures, and wildlife.
	6.4.6 Describe the role of citizens as responsible stewards of natural resources and the environment.
6.5 The student will compare common physical and human characteristics of regions which create identity or uniqueness and influence people's perceptions of the Western Hemisphere.	**6.5.1** Define the concept of region and identify the major political, physical, cultural, and economic regions.
	6.5.2 Explain how cultural diffusion, both voluntary and forced, impacts societies of a region.
	6.5.3 Describe patterns of global economic interdependence and trade, including the concepts of balance of trade and supply and demand; compare measures of economic growth including Gross Domestic Product (GDP) and Gross National Product (GNP).
	6.5.4 Analyze global interdependence which explains the outsourcing of technological and manufacturing jobs to developing regions.
	6.5.5 Analyze reasons for conflict and cooperation among and between groups, societies, nations, and regions.