



# **P21 Review: Oklahoma State Standards**

P21 STANDARDS REVIEW WORKING GROUP

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## Oklahoma State Standards 2015 Review

The Oklahoma Department of Education asked the Partnership for 21st Century Learning to review their new English/Language Arts and math standards for their alignment to P21’s Framework for 21st Century Skills, specifically the Learning and Innovation Skills, referred to as the “4Cs – critical thinking, creativity, collaboration, and communication.” The P21 Framework is a comprehensive definition of what students should know and be able to do for success in college, career, and life now and in the future. The Framework outlines the important symbiotic relationship between the key subject areas, which include English Language Arts and math, and the skills that are needed to apply acquired knowledge to the diverse environments and circumstances of life. The Framework was developed with input from teachers, education experts, and business leaders to define and illustrate the skills and knowledge students need to succeed in work, life and citizenship, as well as the support systems necessary for 21st Century Learning Outcomes. It has been used by thousands of educators and hundreds of schools in the U.S. and abroad to put 21st century skills at the center of learning.

The standards review was designed to address three key questions:

1. Do the ELA/English overarching standards, and math guiding principles incorporate the 4Cs (creativity, collaboration, communication, critical thinking)?
2. Do the individual standards incorporate the 4Cs individually or holistically?
3. Are there overarching recommendations you would make to strengthen the standards regarding the Framework?

Reviewers were also asked to highlight a few examples of strong standards that incorporate the 4Cs, if possible and offer suggestions/recommendations for incorporating the 4Cs in standards.

This review is designed to be a high level summary of how the P21 Framework, specifically the 4Cs and the Oklahoma standards support each other. P21’s Standards Review Working Group reviewed the proposed Oklahoma ELA/math Standards and offers the following summary of their findings.

Overall the ELA standards are well written. Critical thinking and communication are incorporated most strongly into the standards. Because the standards are more focused on the “what” rather than the “how,” collaboration and creativity are incorporated to a lesser degree. Admittedly this is where the expertise of the classroom teacher is critical. However, there are ways that all 4Cs can be strengthened even within the standards.

### **PreK-4 English/Language Arts**

Overall the PreK-4 ELA standards are well written and are strongest in their inclusion of critical thinking and communication. There are excellent communication skills incorporated in the Fluency strand. The Listening and Understanding strand could incorporate more collaboration. Adding opportunities for student production within the basic reading concepts could bring in creativity to the standards. The standards would benefit from strengthening all 4Cs throughout.

**In PreK-4 below are some strong examples of inclusion of 4Cs in PreK-4 ELA standards:**

### **Creativity**

K: "With guidance and support, students will express themselves through drawing and emergent writing."

Grade 1: "With guidance and support, students will express themselves through drawing and emergent writing." (However consider adding "with a variety of tools")

Grade 2: Standard 7 Writing Strand "...Students will create a visual message..."

Grade 3: Standard 3 "... students will publish during writing process."

Grade 4: Listening and understanding strand - "...diverse media and formats..." good use of information literacy

### **Critical Thinking**

PreK-4 Standard 2-Comprehension Strand "Make and confirm/modify predictions when reading"

Grade 1: Standard 2, Comprehension Strand - "With guidance and support, students will begin to monitor their own comprehension and adjust strategies when necessary"

Grade 3: "Make connections between the text and illustrations"

Grade 4: Standard 4, Writing Band, Strand A – "Writing a problem and solution in a narrative. " This includes great student expression through critical thinking.

### **Recommendations**

#### **Overall**

- Incorporate electronic resources and the idea of multimodal literacies in almost all strands. They are mentioned sporadically but would benefit from a more holistic approach in which digital resources were used ubiquitously as a choice throughout.
- Include more options for student choice by incorporating the words: "through a variety of texts, both print and digital" in earlier grade levels standards and strands.

#### **Creativity:**

- Incorporate creativity more explicitly into PreK-4 standards
  - For example, in PreK-Standard 2 for lower grades add the words, "through a variety of exercises and activities" in the working of print concepts for PreK-1st grade. Instead of telling teachers how to teach, it would hopefully give them the freedom to fill out frameworks with creative activities and exercises.
  - In Standard 2, Print Concepts, there is an excellent opportunity to create their own books, identifying front and back cover.  
Example Standard 2: "With guidance and support students will begin...cover of a book through a variety of texts."
  - Grade K and 1 Standard 2, Comprehension Strand, incorporate creativity by adding "respond to text through a variety of media"
  - Grade 2 Standard 3: Writing process band - publishing component. Students could have choice of expressing their learning through media, blogs, and print, digital resources.  
*Example* "Students will create and publish, when appropriate, written pieces with a variety of media."
  - Grade 4 of Standard 3, Reading Band: "Students will apply knowledge of vocabulary to deepen understanding of text through both print and digital resources."

## Communication

- Incorporate more communication at standard level
  - *Example:* Standard 3: Vocabulary - "Students will expand their working vocabulary to effectively understand, communicate and collaborate."
- Incorporate more student choice
  - *Example:* 1st grade: "Students will orally describe personal interests, tell stories, or recite poems on a chosen topic in person or through the use of media technology."
- Incorporate communication into decoding strand
  - *Example:* "Students will read and explain some common high frequency words..."
- Broaden communication vehicles by incorporating oral or media generated presentations, reports and artistic displays in Writing Band
  - *Example:* Standard 6: Writing Band: "Students talk or present from student generated media information learned from print."
  - *Example:* Standard 6: Writing Band: "Students will summarize and present their information in written and oral reports or artistic displays."
- Incorporate more opportunities to explain what words (especially words that sound alike, look alike or begin and end alike) mean or what makes them different.
  - *Example:* "Students will read, write and compare with others words in common word families."

## Critical thinking:

- Strengthen Standard 8: Writing Band by evaluating the audience to create the writing.
  - *Example:* Standard 8: Writing Band - "Students will evaluate the audience to choose the correct mode of expression to suit the audience and task"

## Collaboration:

- Incorporate collaboration as much as possible
  - *Example:* K-1 Standard 7: Writing Band "Students will use multiple formats of print and digital text together and in groups to communicate with others."
  - Grade 3-4 Standard 4: Writing Band – provide options for group or individual work.  
*Example:* Standard 4: Writing Band - C. Opinion – "Students will express in groups or alone an opinion about a topic and provide reasons to support the opinion."
- Ensure students have more choice (building life and career skills of self-direction, responsibility)
  - *Example:* Standard 3: Writing Band: "...to communicate ideas on a variety of topics."

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## Grades 5-8 English/Language Arts

In grades 5-8 ELA the inclusion of critical thinking and communication were more strongly present than creativity and collaboration. Grade 5-8 ELA standards include limited integration of collaboration skills but virtually no integration of creativity and innovation skills. In many places more than one of the 4Cs can be and are incorporated at once. Standard 1 represents the strongest alignment and incorporation of collaboration in that it calls for the student to participate in and contribute to conversations "in pairs, groups," and whole class settings.

We outlined potential ways that each of the 4Cs could be included either by adding a standard or by incorporating key language. These recommendations are illustrative of ways to incorporate the 4Cs more fully into the standards.

## **Recommendations for strengthening grades 5-8 standards**

### **Creativity**

Standard 1 Active Speaking and Listening

Standard 1 calls for students to be active listeners and speakers. Creativity could be incorporated through brainstorming, creating new ideas, analyzing and refining ideas into speaking/presentation opportunities.

### **Critical thinking**

Students listen to other's ideas and responses, participate and contribute, which could include P21 critical thinking skills such as reasoning, analyzing evidence, claims and beliefs and asking clarifying questions.

The standard calls for the student to organize information using appropriate vocabulary and give presentations. This could include P21 critical thinking skills such as making judgments by synthesizing information for the presentation, analyzing and evaluating points of view, interpreting information and drawing conclusions based on analysis. Other suggestions include providing opportunities to ask clarifying questions and acknowledging and clarifying ideas presented. As the standard is developed further, by 8th grade it includes a more fully developed critical thinking component “for the student to be active speaker and listener, participate in and contribute to conversations in pairs, groups, and whole groups by contributing ideas and building on and questioning the ideas of others “which could include critical thinking skills such as reasoning, making judgments by effectively analyzing and evaluating evidence, arguments, claims and beliefs, evaluating points of view, synthesizing connections between information and arguments.

### **Collaboration**

The standard calls for students to ask and answer questions in groups, pairs, and whole class. Student listen and interact with others in the question and answer sessions which could include collaboration skills such as demonstrating the ability to work effectively with others and making contributions as a team member. The standard calls for students to make presentations as a group which could include demonstrating collaboration- the ability to work effectively and respectfully with diverse teams, exercise flexibility and willingness to be helpful to accomplish a goal and contributing as a team member.

By 7th and 8th grade the collaborative work has developed further to “demonstrating the ability to work effectively and respectfully with diverse teams, exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a goal, and assume shared responsibility for collaborative work, and value individual contributions made by each team member.” Within the writing standards, students exercise ability to give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea, which include P21 collaboration skills in addition to the ICT skills for use of technology as a tool, to create, communicate and present information.

### **Communication**

The standard builds a strong communications component, as it calls for the student to ask and answer questions, interact with others and contribute ideas in discussion. It would be good to explicitly state other strong communications skills such as articulating thoughts and ideas effectively (using oral, written (PowerPoint, Prezi, poster, etc.) and non-verbal communication skills, as well as utilizing multiple media and technology), listening carefully to decipher meaning, and communicating in diverse environments. These seem to be inferred but are not explicitly stated.

In 7th and 8th grade the standard builds on itself by adding “contributing and building on and questioning the ideas of others for group work in addition to the ICT skills for use of technology as a tool to create, communicate and present information.”

## **Standard 2 Reading/Writing Process**

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### **Creativity**

**Reading/Writing** - The standard calls for the student to identify, respond, analyze, summarize, make inferences, and provide evidence which could include P21 Learning and Innovation Skills of elaboration, refining and analysis of ideas, and creating new ideas through inference. Moreover, the concept of revising and editing implies at its core that failure is an opportunity to improve the product that is essential to creativity development.

Another suggestion would be to include the use of brainstorming to draw inferences, in addition to the standard calling for students “to identify genre, etc....connect and respond to texts, provide objective summaries, paraphrase with support, make inferences and cite textual evidence to support their analysis.” The standard 2 provides less direct support for students as grades increase, opening up opportunities for more creative thinking, reading and writing.

### **Critical thinking**

Critical thinking is at the heart of this standard as it calls for students not only to identify, respond, analyze, summarize, but to *make inferences, and provide evidence* which includes core critical thinking and problem solving components such as inductive and deductive reasoning, use of system thinking, making judgments thorough analysis and evaluation of evidence, arguments, claims and beliefs, synthesizing information and critical reflection.

In 6th, 7th and 8th grade the standard becomes more complex as it calls for students to identify genre, connect and respond to texts, provide objective summaries, paraphrase with support, make inferences, draw conclusions and cite textual evidence to support their analysis which could include critical thinking skills such as reasoning, synthesizing information, drawing conclusions and interpreting text given arguments, claims and beliefs.

Within the writing standard, the recursive writing process involves reasoning, making judgments based on analysis and evaluation of information, considering alternative points of view, and drawing conclusions. Suggestions include incorporating "critical reflection" practices into the standard. i.e.: ...will read, comprehend and reflect increasingly complex ideas and materials.”

In 5th grade, the writing standard calls for students to use a recursive writing process to write in all modes with a focus on opinion, and in later grades on argument which utilizes critical thinking skills such as synthesizing information, drawing conclusions, making judgments on text, and potentially asking clarifying questions.

### **Collaboration**

Collaboration appears only briefly in this standard as in Grade 6 Reading/Writing, when calling for students to work collaboratively as well as individually to discuss their progress during the recursive process.

### **Communication**

Writing is inherently a communication process; therefore it is certainly present in this standard. Within the upper grades, higher levels of communication skills are articulated. The standard calls for students to use the recursive process and identify genre, connect and respond to texts, provide objective summaries, paraphrase with support, make inferences and cite textual evidence to support their analysis which could include P21's communication skills such as articulating thoughts and ideas effectively using written communication skills.

One suggestion would be to include a standard here on oral communication "reading aloud" to peers for feedback as part of the recursive process.

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## **Standard 3 Vocabulary**

### **Creativity**

Suggestions for increasing creativity could include the use of various collaborative "creativity based" exercises or word games to improve student vocabulary. i.e.: Students will expand vocabulary through reading, word study, collaborative exercises and class discussion.

### **Critical Thinking**

The standard calls for students to expand vocabulary through reading, word study, and class discussion. Critical thinking and reasoning is embedded when students are asked to recognize words with multiple meanings, using figurative language, and drawing conclusions by interpreting information. One example would be determining the connection between two concepts using simile or metaphor. In 6th, 7th and 8th grade, the standard calls for students to use context clues, word origins, and word parts (affixes, roots, stems), recognize and understand words with multiple meanings, and *apply knowledge of vocabulary to deepen understanding of text*, which could include critical thinking skills of making judgments based on analysis of information and solving unfamiliar problems. The writing standard calls for the student to *apply knowledge* of word parts and domain-specific words to provide coherence in writing, use word choice (including figurative language and idioms) to *develop ideas* which could utilize critical thinking skills such as those necessary to develop an idea and apply knowledge of vocabulary to promote coherence in writing. i.e.: making judgments, and problem solving.

### **Collaboration**

Collaboration appears in this standard in 6th grade Reading/Writing as students work collaboratively in situations such as peer coaching as well as individually to discuss their written product.

### **Communication**

In Writing the standard calls for students to apply knowledge of word parts and domain specific words to provide coherence in writing which could include P21 Communication Skills such as articulating thoughts and ideas effectively in written communication, identifying appropriate word choice and applying knowledge of vocabulary to promote coherence in writing.

In Reading, the standard calls for students to use context clues, word origins, and word parts (affixes, roots, stems), recognize and understand words with multiple meanings, and *apply knowledge of vocabulary to deepen understanding of text* that could utilize P21 Communication Skills such as articulating thoughts and ideas effectively through oral and written communication skills.

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## Standard 4 Critical Reading/Writing

### **Creativity**

Creativity may best be included through the delivery of instruction, by using brainstorming, creating new ideas, demonstrating originality of thought and real-world application in the writing process. An example is for students to brainstorm creative new topics in a group setting, then as an individual choose and develop an opinion piece.

### **Critical thinking**

Critical thinking appears in this reading standard as it calls for students to comprehend, evaluate, and respond to a variety of complex texts, bringing in critical thinking skills such as reasoning, and making judgments through analysis, reflecting critically through the evaluation of evidence, arguments, claims and beliefs as well as alternative points of view. The standards also call for students to use close reading strategies on grade-level, literary and informational texts, and explain author's purpose and *compare and contrast* themes, *analyze* the effect of sound devices and literary elements, focusing on irony, symbol, theme, and tone, determine a main idea of a text and provide a summary, including how an author *responds to conflicting evidence and viewpoints all of which involve* critical thinking skills such as reasoning, analyzing and evaluating evidence. As the grade levels advance, so does the level of critical thinking. The 6th grade Reading standard calls for students to utilize multiple readings, and to annotate, identify author's purpose and *comparing and contrasting* characters and events. In 7th grade, more advanced levels of critical thinking such as evaluating evidence are required when "determining an author's purpose and identifying claims and supporting evidence and *recognize errors in reasoning*" is added.

Within the writing standard, as students write for varied purposes and audiences, the incorporation of opinion and informative writing could and should include reasoning, use of system thinking, making judgments, synthesizing information, and solving non-familiar problems - all critical thinking skills. The standard that calls for students to write narratives incorporating techniques of pacing, dialogue, and sensory language, *introduce and develop a topic with evidence*, using transitions, appropriate vocabulary, and a conclusion, maintaining a formal style, introduce a claim and organize reasons and evidence using credible sources, *show relationships* among claim, reasons, and evidence, critical thinking is involved. The writing standard that calls for the student to write narratives incorporating techniques of character development, conflict, introduction, resolution and conclusion, *introduce and develop a topic with evidence*, using transitions, appropriate vocabulary, and a conclusion and clearly state an opinion supported with facts and details, as well as show relationships among facts, opinions, and supporting details and include a concluding statement, require critical thinking skills to be employed in the process.

### **Collaboration**

The standard does not include collaboration for reading and writing. It could call for students to work collaboratively in situations such as peer coaching as well as individually to discuss their written product.

### **Communication**

In Grade 5, 6, 7 and 8 Writing, the standards call for the student to write for a variety of different purposes and audiences and to write narratives incorporating techniques of character development, conflict, introduction, resolution and conclusion, introduce and develop a topic with evidence, using transitions, appropriate vocabulary and a conclusion and clearly state an opinion, supported with facts and details, as well as show relationships among facts, opinions, and supporting details and include a concluding statement. These standards by inference include P21 communication skills such as communicating effectively in diverse environments, articulating thoughts and ideas effectively in a variety of forms and contexts, and using communication to inform, instruct, motivate and persuade.

## **Standard 5 Language**

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The language standard incorporates little or no creativity, collaboration or critical thinking as written.

### **Communication**

Grade 5, 6, 7, 8 standards call for the student to write to demonstrate command of Standard American English conventions which are loosely connected to P21 communication skills, such as articulating thoughts and ideas effectively through writing. Likewise, as the standards call for students to properly use pronouns, complex sentences, and recognize variations in writing, so are these connected to P21 communication skills, such as articulating thoughts and ideas effectively using oral and written communication.

### **Standard 6 Research**

There are no direct links to creativity within the research standards.

### **Critical thinking**

In reading, the standards call for students to record and organize information from a variety of print and/or digital resources, for the student to summarize, paraphrase, integrate evidence and cite sources for reports, projects and presentations, for students to evaluate resources from both primary and secondary sources (print and/or digital) and *follow ethical and legal guidelines* for collecting and recording information. These standards link to P21 critical thinking skills such as synthesizing resources and information, evaluating and making connections between information and arguments as well as media literacy skills such as understanding the legal and ethical issues surrounding the access and use of media.

One recommendation would be to add the standard or *add to* the standard that students will use technology to record, research and organize, evaluate and communicate information.

In writing, the standard calls for the student to summarize, paraphrase, integrate evidence and cite sources *avoiding plagiarism* for reports, projects and presentations which could include P21 critical thinking skills such as evaluating and synthesizing information as well as media literacy skills such as understanding the legal and ethical issues surrounding the use and access of media.

### **Collaboration**

In Grade 5 Writing, the standard calls for the student to summarize, paraphrase, integrate, evidence and cite sources to create reports, projects and presentations for multimedia purposes. This could include

P21 collaboration skills such as demonstrating ability to work effectively and respectfully with diverse teams, assuming a shared responsibility, and exercising flexibility and willingness to be helpful.

One recommendation would be to have a standard such as “students will work in collaborative groups and as individuals to summarize, paraphrase, integrate, evidence and cite sources to create reports, and group projects and presentations for multimedia purposes.”

Another option, which would also bring in the technology, information and media skills at 6th grade, would be to add the standards “students use digital technologies to collaborate on reports, projects, and presentations for multimedia purposes.”

At Grade 7 and/or 8 an option would be to add, “Use digital technologies to communicate and network and appropriately access, manage, integrate and create information,” or students “use digital technologies to collaborate on reports, projects, and presentations for multimedia purposes.”

### **Communication**

Communication is strong in the research standards. For example, the standard calls for students to summarize, paraphrase, integrate, evidence and cite sources to create reports, projects and presentations for multimedia purposes which involves communication skills such as utilizing multiple media and technologies understanding their effectiveness and impact, as well as articulate thoughts and ideas effectively in writing.

The Grade 6 standard that calls for students to properly use pronouns, complex sentences, and recognize variations in writing is linked to communication skills such as articulating thoughts and ideas effectively using oral and written communication skills.

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## **Standard 7 Multimodal Literacies**

### **Creativity**

Creativity appears within the writing standards as students “create multimodal texts.” Depending on the learning environment this could incorporate creativity skills such as creating new ideas, brainstorming, demonstrating originality, inventiveness, and understanding of real-world problems.

### **Critical thinking**

The standard calls for the student to create multimodal texts, evaluate written and oral, visual, and digital texts in order to draw conclusions and analyze arguments, as well as calling for students to *analyze and evaluate* the effectiveness of a variety of written, oral, visual, digital, non-verbal, and interactive texts *with a focus on persuasion and argument* could include P21 critical thinking skills such as analysis, evaluation of evidence, arguments, claims and beliefs, considering alternative points of view, synthesizing information, and drawing conclusions through interpretation. In 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grade Reading, the standards call for students to compare and contrast, analyze and evaluate the effectiveness of a variety of written, oral, visual, digital, non-verbal, and interactive texts (including a focus on persuasion and argument) which could include P21 critical thinking skills such as effectively analyzing and evaluating evidence, arguments, claims and beliefs.

### **Communication**

The writing standard calls for the student to produce visual images, messages and meanings to encompass different points of view. There is an implied “sharing of their images/messages,” but it is not articulated clearly. The recommendation would be to include sharing/presenting and perhaps to include collaborative language (*example*-“students investigate points of view on a particular topic in groups”). The writing standard that calls for students to create a text with a combination of visual messages that effectively communicates an idea using technology or appropriate media brings in P21’s ICT skills such as using technology as a tool to organize, evaluate and communicate information.

### **Collaboration**

There is little or no collaboration within this standard. However there are opportunities to include it by including collaborative language such as “students work individually and in groups to create text with a combination of visual messages that effectively communicates an idea using technology or appropriate media.” Another example would be for “students to discuss informed choices within and across the available communication modes to effectively construct and apply meaning.”

### **Communication**

In writing the standards call for the student to develop multimodal texts; to select, organize, or *produce multimedia texts* to complement and extend meaning for a selected topic to communicate knowledge; or to select, organize, or *produce visual images, messages and meanings* to encompass different points of view (depending on the grade level). These standards include P21 communication skills such as articulating thoughts effectively through writing, use of communication for a range of purposes, and utilizing multiple media and technologies.

### **Standard 8 Independent Reading and Writing**

Standard 8 includes no references, implied, or otherwise, to creativity, collaboration, or critical thinking.

### **Communication**

Within the writing standards, students are asked to write independently for extended periods of time and vary their modes of expression to suit the audience and task which refer to P21’s communication skills such as articulating ideas effectively through writing, and use of communication for a range of purposes.

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## **Grades 9-12 English Language Arts (ELA)**

The committee approached the 9-12th grade ELA standards review somewhat differently, by looking at the language, specifically verbs, in the standards themselves. They began with the individual standards (white band) in the analysis. Regarding the ELA standards, as with the other grade bands, there is a lack of specificity at all levels for collaboration, communication and creativity. Critical thinking is well developed at all of the high school grade levels. There is a lack of scaffolding between the grade levels in that several of the standards are repeated in each grade with only minor variations, rather than becoming increasingly complex or challenging.

### **Creative Thinking**

Within ELA, there was little or no inclusion of creativity or creative thinking within the standards. The word “create” appeared twice within the writing standards.

## **Critical Thinking**

Critical thinking is very strong throughout the high school standards. From 9-12th grade there was frequent use of at least 9-10 critical thinking verbs and language such as questioning the ideas of others, summarize, paraphrase, generalize, and synthesize texts, make logical inferences and cite thorough evidence from the text, assess the reasoning and evidence, and evaluate.

Twelfth grade specifically included multiple references to critique, evaluate, and read with purpose, analyze comparing and contrasting, interpreting, evaluating texts, and synthesize.

Writing has similar results with multiple instances of 9-10 critical thinking verbs such as providing textual and visual evidence to support a main idea, incorporate figurative language, idioms, and analogies, recognize and distinguish from alternate or opposing claims, and organize reasons and evidence, using credible sources.

## **Collaboration**

Standards that included collaboration appeared as the following language in reading and writing at least once in each grade: “participate in and contribute to conversations in pairs, groups, and whole class settings (each grade)” or “in a group.”

## **Communication**

Reading only referred to “participating and contributing to conversations as communication.” Writing showed stronger references to communication with the 9-12 standards. Language included making presentations, contributing ideas, building on and questioning the ideas of others, producing writing that incorporates figurative language, idioms, and analogies to expand on ideas to achieve a desired effect, and developing a topic with evidence. Additional language appears such as “show relationships among claims, reasons, and evidence and communicate findings.”

**Recommendation:** Raise the specificity and frequency (25% more) of collaboration, communication and creativity in the Grade 9-12 ELA standards. Scaffold all Cs to provide increased challenge to student development of 4Cs proficiency. This can be done easily with the precise selection of verbs added to each statement.

## **(2) How well do the intermediate statements (Green Band) include the 4Cs and align or guide statements at the individual level (white band)?**

### **Creativity**

Within the green band, there is little or no inclusion of creativity in reading or writing. In writing standards 2-8, there are multiple calls for students to *use* writing skills, vocabulary, etc. that are loosely linked as using creativity.

**Recommendation:** The best uses here refer to the generic verb “create.” It would be helpful to include specific creative processes such as “ideation, prediction, and hypothesizing, imagining, open problem solving and designing” in the mix as students advance through the high school grades. It would also be useful for a green standard to look at the measurable characteristic of creative thinkers and entrepreneurs (e.g. flexible thinking). This standard/writing strand is a clear advance on CCSS. The Oklahoma State Standards could move even further by further building out creative thinking and the

need for its purposeful development as prep for many fields of higher education study and careers outside academia and the English department.

### **Critical Thinking**

Reading includes critical thinking language related to the recursive process, which includes prewriting, drafting, revising, editing, and publishing. Other related verbs include comprehend, evaluate, and synthesize resources to acquire and refine knowledge. Tenth, eleventh and twelfth grade reading includes multiple instances of critical thinking language such as examples of comprehend, evaluate, and synthesize and of evaluate written, oral, visual, and digital texts in order to draw conclusions and analyze arguments. Eleventh and twelfth grade reading show no progression of difficulty regarding critical thinking.

Writing 9-12 includes much specificity in area of critical thinking related to the recursive process of prewriting, drafting, revising, editing, and publishing as well as language such as comprehend, interpret, evaluate, respond to, analyze and evaluate, summarize and paraphrase, integrate evidence, and cite sources.

**Summary and Recommendation:** Although the green statements show a significant amount of specificity for the critical thinking skills (especially in the writing strand), what is lacking is a progression in the skills that make up critical thinking in writing. Ample evidence based-literature \*(see below) exists for the formal, scaffold development of critical thinking not just in the writing strand, but also for speaking and listening and for critical thinking in the reading process. More precision would be welcomed in all the strands, but especially in the speaking and listening strand, and the reading strand.

### **Collaboration**

Evidence of collaboration is weak. In grade 9, the only reference is “will engage in discourse in pairs, groups, and whole class in reading” and “will engage in discourse and collaborate in pairs, groups, and whole class discussion to create individual and group projects and presentations in writing.”

In grades 10-12, reading and writing there is no verbal change in statements to show scaffolding or purposeful skill development. Standard 1 needs more specificity and standards 2-7 need inclusion of scaffold collaborative skill development in all the writing and in some reading standards at all four grade levels.

*\*There is evidenced based-research, especially from the meta-analyses of Hattie and Marzano which identify multiple best practices for increasing student achievement via development of the much demanded calls by business and others in (see 21st Century Skills: Rethinking How Students Learn by Chris Dede in Bellanca and Brandt, 2010. STP) This resource could be helpful in developing standards that include collaboration and other 4Cs. In each of the strands (reading, writing, speaking and listening) noted in the Oklahoma standards, there could be interjected a scaffold of specific student competencies that lead to the inclusion and development of collaborative skills highly valued in the career workplace. (see Dede).*

### **Communication**

Communication language occurs within the reading and writing of these standards, appearing in language such as engage in discourse, class discussion to communicate through domain-appropriate abstract and concrete words, engaging in a recursive process and effectively communicate and share knowledge.

**Summary and recommendations:** The standards would benefit from more specificity in scaffolding from one grade to the next that shows high expectations for increasingly rigorous communication skills. Such skills should guide students clearly to writing, speaking and listening proficiencies that ready all for college essays (at whatever university wherever), other valid means of written communication, and 21st Century careers in media and communication.

**(3) How well do the overarching statements (BlueBand) include the 4Cs and give direction and coordination to the third level (white band) standard statements?**

**Creativity**

**Recommendation:** At least in #7, make creativity explicit and allow for intentional development of a broad range of creative thinking and writing proficiencies. A whole over-arching standard devoted to creativity, or in each writing element is recommended.

**Critical Thinking**

From the superlative statements in standards #4, 6, and 7 it is abundantly clear that Oklahoma teachers are expected to develop students' critical thinking skills in reading and writing. The specific language in #6 (Students will engage in inquiry to acquire, refine, and share knowledge) provides not only a key critical thinking process, but targets what students are expected to do with the inquiry process.

**Recommendation:**

These standards will benefit from as much specificity as possible. For example, replace words such as "will speak and listen;" "will engage in," with verbs such as "apply and demonstrate" that note the very specific type of fine thinking needed in every standard.

**Communication**

It is commendable that writing is given equal space to reading. The standards would benefit from equal space also to speaking and listening and to writing other than expository writing.

**Recommendation:** Reword and tighten the statements for #1, 3, 6, and 8 so they more reflect the thinking that students must do (apply, refine, demonstrate) not only for college English classes, but for other fields as well.

**Collaborate**

These collaborative statements are more forceful about this basic 21st Century Skill than the statement in the Common Core, especially Standard 2 that calls for recursive discussions.

**Recommendation:** There should be at least one specific standard that says, "Students will collaborate on and off-line to read, analyze, and assess multiple print and digital materials drawn from a variety of cultures and fields represented in Oklahoma life." There are many ways for students to collaborate and learn the career skills that come in real world work situations, if not in college classrooms. However, there are more instances of standards that could include a call for collaborative work and skill development than appear. More emphasis should be placed on preparing students as proficient collaborators for life long career success in a variety of 21st century occupations.

**Overall 9-12 ELA Summary**

In the 9-12 Oklahoma ELA overarching statements, critical thinking earns the highest rating. Within the 8 standards, critical thinking is well represented. Creativity, communication and collaboration should be strengthened.

## Grades K-4 Math

The vision and guiding principles for the math standards are clearly written with 21st Century Learning skills in mind, emphasizing problem solving, communicating, reasoning and proof, making connections, and using representations, and analysis. Oklahoma's vision for its students, as mathematically proficient and literate, align with P21's vision of fusing high level content knowledge with 21st century skills, including the 4Cs, but also the Information, Media and Technology Skills referenced in guiding principle 4. Guiding principle 2 is excellently written for creativity and guiding principle 3 embodies critical thinking and problem solving. Throughout the math standards, the use of creativity authentically can help students "develop a deep and flexible conceptual understanding." There is room for collaboration and communication as mathematical ideas are explored.

Below are some of the examples/comments of Oklahoma's standards that incorporate the 4Cs.

### PreK-4 Math

#### Creativity

PreK K.A.1.2 - Good use of creativity in extending and creating patterns

Grade 1: 1.A.1.2 – Good use of Art and Architecture with patterns

Grade 3: 3.N.1.1 – Good use of creativity in algebraic reasoning

Grade 4: 4.N.1.5 - Great use of idea creation techniques

#### Critical thinking

Grade 1: 1.A.2 - Creating real world, problem solving situations

Grade 2: 2.A.2.2 - Excellent use of critical thinking skills to make number lines "true"

Grade 2.D1.4 - Authentic use of critical thinking skills

#### Collaboration

K: K.A.2 - Communication and critical thinking evident in this standard, solving real work problems

Grade 1: 1.N.2.1 - Model and explain-could this involve working in groups? If so would be a good place for collaboration

#### Communication

K: K.A.1.1 - Excellent use of communication as a tool for understanding

Grade 1: 1.GM.2.3 - Communicate "...how and why the measurements differ"

Grade 2: 2.GM.1.2. -Using art, geometry, etc. to communicate one's understanding of geometry

Grade 3: 3.N.1.4 - Emphasis on understanding - explaining one's understanding "and strategy?"

#### Recommendations

Throughout the math standards, the use of creativity authentically can help students "develop a deep and flexible conceptual understanding." The recommendations below provide examples of ways to further infuse the 4Cs into the standards.

#### Creativity

K: K.DP.1 - Data collection would be a great way to use visual thinking strategies

*Example:* Represent data visually through drawings and 3d manipulatives

Grade 2: 2.N.1.1 - Use the creativity of whole numbers up to 1000 through visual representation, to communicate an understanding of the number concept

*Example:* "Read, write, discuss, and represent whole numbers up to 1000 to express understanding of the number."

Grade 3: 3.A.1.3 - Through a variety of media. 3.N.3.1 and 3.N.3.2 - use of pictures and art to describe and construct fractions

Grade 3: 3.GM.1.1 Use of art

*Example:* 3.A.1.3 - Through a variety of media, construct and explore models of growing patterns and construct the next steps

Grade 3: 3.GM.1.1 - Through the use of pictures and various media, identify parallel and perpendicular lines.

Grade 4: 4.GM.2 - Create displays of manipulated 2 dimensional shapes

*Example:* 4.GM.2.1 Predict and describe the results of sliding, flipping and turning 2-dimensional shapes. Create in groups or alone displays of manipulated 2 dimensional shapes.

### **Critical thinking**

Grade 3: 3.N.2.3 - 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

Grade 4: 4.N.3.1 - Create real world problems based on understanding of coins

*Example:* Given a total cost and amount paid, find the change required in a variety of ways. Create real world problems based on understanding of coins.

### **Collaboration**

K: K.N.2 – This standard could incorporate more collaboration, as it would be an ideal way to teach fraction concepts.

Grade 2: 2.GM.2 - This would be a great standard for collaborative instruction - perhaps not written directly in the standard but as part of the curriculum framework

Grade 3: 3.N.2.6 - Through a variety of media (or in groups)

Grade 4: 4.D1.1.1 - Gather data from the local community

*Example:* 4.D1.1.1 - Gather data from a real world situation. Alone or in groups, represent the data on a frequency table or dot plot marked with whole numbers and fractions using appropriate titles, labels and units to present to others

### **Communication**

Grade 2: 2.N.2.6 - Create real world problems in groups to...

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## **Grades 5-8 Math**

In addition to the general comments on PreK-4, the 5-8 math standards include direct alignment especially to the critical thinking skills. The words in *italics* demonstrate that connection to critical thinking skills *such as reasoning, systems thinking, effectively analyzing evidence, synthesizing information and drawing conclusions and solving real world problems*. Statements on the importance of problem solving and real world applications show direct alignment to the 4Cs, especially critical thinking. As stated in the opening paragraphs, “Students will develop proficiency in the use of fractions and decimals to solve problems. Solving real-world and mathematical problems is a common theme across the number and operation strand.... The development of problem solving skills should be a major goal of the mathematics program at every grade level. Experience with the process of problem solving will need to be integrated early and continuously into each student’s mathematics education. Students must be helped to develop a wide range of skills and strategies for solving a variety of problem types.”

The stated close relationship between mathematics as a language draws important relationships to communication skills, *such as articulating thoughts and ideas effectively using oral and written communication*. The 4Cs are integrated throughout the mathematical actions and processes as well as being reflected within the standards themselves. The additional focus on using the appropriate technologies for understanding rather than ends in itself aligns to P21’s Information, Media and Technology Skills.

The mathematical actions and processes call for students to:

- 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

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## Grades 9-12 Math

### Strengths

Specifically in Grades 9-12, the math standards are a coherent, concise framework of rigorous and specific process standards that make it easy for teachers to see the alignment among Oklahoma’s vision, mathematical processes and standards. From the symbolic multicolored Venn to each grade level chart, the picture of connection between process and content is clearly depicted. Progression and scaffolding are clear. The mathematical processes and actions highlight the connection to the standards. The language is 21st century throughout with an emphasis on math in practice. Critical thinking is the most represented of the 4Cs. Ninety nine percent of the standards statements start with a critical thinking verb to drive the rigorous content to deeper understanding. Creative thinking is implied strongly in Geometry and somewhat in Algebra. Geometry “emphasizes the use of logical reasoning skills in order to develop and justify mathematical arguments,” which involves both critical thinking and communication. Collaboration is perhaps the weakest link within the Grade 9-12 math standards.

### Recommendations:

- (1) For each grade, it would benefit students to have an expectation for ways, set as standards that will guide that they can communicate in writing and speaking not only what they have learned,

but also why it is important, and how it can transfer to career work. While there is a strong action statement (“Develop the skills to communicate mathematically...”) there needs to be standards in number and equality to carry it out in practice.

(2) For each grade, it would benefit students to learn how to collaborate in their math thinking and problem solving. This could well appear in transfer tasks that require students to bridge mathematical reasoning and content understanding into coursework in other disciplines they are studying (certainly the sciences and social sciences) and interdisciplinary work. As it reads now, the document implies connection making, but asks nothing in the standards that comes close to real world applications.

(3) The standards need to include explicit connection making between the processes and the content and their transfer to real world applications.

The table of verb analysis is below for math:

	Communicate	Collaborate	Critical Thinking	Creativity
ALGEBRA I	X	X	Apply Evaluate Use Relate to Interpret Analyze Solve Distinguish Apply to real world	X
GEOMETRY	X	X	Analyze Distinguish Recognize relationships Assess validity Justify Reasoning Arguments Apply Verify Solve problems Develop Validate	Construct Write proofs Graph Discover compose Decompose investigate
ALGEBRA II	Implied	X	Solve (Multiple) Assess Evaluate Explain Factor Use to expand Combine Apply	Graph Model Discover explore

			Apply concept Draw inferences Justify Analyze	
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## Summary

P21 applauds Oklahoma’s commitment to creating standards that will ensure all Oklahoma students have a depth of knowledge and skills that ensure they are ready for a future in which change is the only constant and competition is global. Oklahoma also should be congratulated for their continuing efforts to seek input from a wide range of stakeholders such as experts, practitioners, community leaders, parents to ensure their standards are of the highest quality. We also encourage Oklahoma to continue to encourage input from practitioner-experts from business, mass media communications, marketing, science and technology fields, all of which provide valuable, diverse career perspectives.

As stated within the report, the Prek-12 ELA/math standards are well written, and are strongly aligned with two (critical thinking and communication) of the 4Cs of the 21st Century Learning Framework. Recommendations and suggestions have been offered in critical thinking and communication, the majority of the recommendations call for strengthening collaboration and creativity within the standards. There are many places where the links to the 4Cs are implied, or inferred and we would recommend more direct linkages wherever possible. Specific recommendations and examples are found throughout the report.

In addition, the standards evaluation showed some welcome alignment to the P21 Information, Media and Technology Skills, which includes ICT and Media Literacy Skills.

Further, we would urge Oklahoma to fully develop the Sample Problems or Classroom Activities portion of the standards documents, as guides to not direct teachers “how” to teach, but to provide best practices that demonstrate ways to incorporate the 4Cs more deeply into the standards, curriculum and instruction.

Another suggestion would be to provide a “framework for teaching” companion document that provides teachers with context on the how of integrating 21st century skills into instruction as they relate to Oklahoma standards.

Over the past decade, P21 has strongly advocated for standards that adequately address both the key academic knowledge and the complex thinking skills that are required for success in college, life and career for the 21st century. We have developed tools and resources, including case studies from P21 Exemplar Schools, to assist states and districts in implementing 21st century skills. P21 and our Exemplar schools would be happy to work with Oklahoma to develop companion resources should Oklahoma be interested.