Archdiocese of Philadelphia

Curriculum Standards

English Language Arts and Mathematics

Grade Six

INTRODUCTION

The mission statement of the Office of Catholic Education boldly proclaims that:

Catholic Schools form Catholic students to be full and practicing members of the Church, are centers of evangelization that call all to live fully the message of Jesus Christ, and are centers of academic excellence that rigorously prepare students to be life-long learners and contributing members of the global community.

From this we draw our primary focus, the faith formation of our students. Of major importance, too, is the academic preparation our students receive which will enable them to be college- and career-ready upon commencement from their experience in archdiocesan schools.

This document is a response to the call to prepare our students to become "contributing members of the global community." It is the product of an in-depth study of the data related to existing curriculum, current research, input from respected professional organizations and hours of intense work and dialogue on the part of teachers and administrators from throughout the archdiocese.

Our data study encouraged us to build on the patterns of excellence which have been a hallmark of education in Archdiocesan schools. A review of the existing curriculum and input from many teachers called us to re-focus curriculum content so that instruction and learning would incorporate higher-level thinking and in-depth teaching. At the recommendation of the National Governors' Association, we are moving forward with the adoption of the Common Core State Standards as the basis for curriculum content.

Included in this document are the Common Core State Standards for this level as well as the implementation guides prepared by the curriculum committee members who spent a great deal of time working on them.

As we move forward in the period of transition to full adoption of the Standards and to assessing archdiocesan students using national assessments, we feel confident that our teachers will continue to move forward with the same dedication that will prepare our students to stand shoulder-to-shoulder with the best students both nationally and internationally.

ACKNOWLEDGEMENTS

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English Language Arts	**Mathematics**	
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We are also grateful to the **Elementary Technology Committee** for preparing web links to these guidelines.

CONTENTS

NOTE:

The English Language Arts and Mathematics content are intentionally contained in the same document. With research indicating that skills should be presented in an integrated context, it is the hope that teachers will be more aware of the total curriculum at this level rather than isolated subject matter and make deliberate connections between skills presented in each area.

Also included at each level (with the exception of Kindergarten) are the Common Core State Standards for the grade below and the grade above each level. These are placed here so that, during the transition period leading up to full implementation of the Standards, the teacher is aware of skills that should have been presented at an earlier level and makes plans to incorporate these skills in the event that they have not been presented. It is important, too, that skills designated for higher levels are not anticipated at the current instructional level.

English Language Arts

Grade 6

Common Core State Standards – English Language Arts –Grade 5
Common Core State Standards – English Language Arts – Grade 6
Common Core Standards – English Language Arts – Grade 7
Archdiocesan Implementation Guides – Grade 6

Key Points In English Language Arts

Reading

- The standards establish a "staircase" of increasing complexity in what students must be able to read so that all students are ready for the demands of college- and career-level reading no later than the end of high school. The standards also require the progressive development of reading comprehension so that students advancing through the grades are able to gain more from whatever they read.
- Through reading a diverse array of classic and contemporary literature as well as challenging informational texts in a range of subjects, students are expected to build knowledge, gain insights, explore possibilities, and broaden their perspective. Because the standards are building blocks for successful classrooms, but recognize that teachers, school districts and states need to decide on appropriate curriculum, they intentionally do not offer a reading list. Instead, they offer numerous sample texts to help teachers prepare for the school year and allow parents and students to know what to expect at the beginning of the year.
- The standards mandate certain critical types of content for all students, including classic myths and stories from around the world, foundational U.S. documents, seminal works of American literature, and the writings of Shakespeare. The standards appropriately defer the many remaining decisions about what and how to teach to states, districts, and schools.

Writing

- The ability to write logical arguments based on substantive claims, sound reasoning, and relevant evidence is a cornerstone of the writing standards, with opinion writing---a basic form of argument---extending down into the earliest grades.
- Research---both short, focused projects (such as those commonly required in the workplace) and longer term in depth research---"is emphasized throughout the standards but most prominently in the writing strand since a written analysis and presentation of findings is so often critical.
- Annotated samples of student writing accompany the standards and help establish adequate performance levels in writing arguments, informational/explanatory texts, and narratives in the various grades.

Speaking and Listening

- The standards require that students gain, evaluate, and present increasingly complex information, ideas, and evidence through listening and speaking as well as through media.
- An important focus of the speaking and listening standards is academic discussion in one-on-one, small-group, and whole-class settings. Formal presentations are one important way such talk occurs, but so is the more informal discussion that takes place as students collaborate to answer questions, build understanding, and solve problems.

Language

- The standards expect that students will grow their vocabularies through a mix of conversations, direct instruction, and reading. The standards will help students determine word meanings, appreciate the nuances of words, and steadily expand their repertoire of words and phrases.
- The standards help prepare students for real life experience at college and in 21st century careers. The standards recognize that students must be able to use formal English in their writing and speaking but that they must also be able to make informed, skillful choices among the many ways to express themselves through language.
- Vocabulary and conventions are treated in their own strand not because skills in these areas should be handled in isolation but because their use extends across reading, writing, speaking, and listening.

Media and Technology

- Just as media and technology are integrated in school and life in the twenty-first century, skills related to media use (both critical analysis and production of media) are integrated throughout the standards.

Key Features of the Standards

Reading: Text complexity and the growth of comprehension

The Reading standards place equal emphasis on the sophistication of what students read and the skill with which they read. Standard 10 defines a grade-by-grade "staircase" of increasing text complexity that rises from beginning reading to the college and career readiness level. Whatever they are reading, students must also show a steadily growing ability to discern more from and make fuller use of text, including making an increasing number of connections among ideas and between texts, considering a wider range of textual evidence, and becoming more sensitive to inconsistencies, ambiguities, and poor reasoning in texts.

Writing: Text types, responding to reading, and research

The Standards acknowledge the fact that whereas some writing skills, such as the ability to plan, revise, edit, and publish, are applicable to many types writing, other skills are more properly defined in terms of specific writing types: arguments, informative/explanatory texts, and narratives. Standard 9 stresses the importance of the writing-reading connection by requiring students to draw upon and write about evidence from literary and informational texts. Because of the centrality of writing to most forms of inquiry, research standards are prominently included in this strand, though skills important to research are infused throughout the document.

Speaking and Listening: Flexible communication and collaboration

Including but not limited to skills necessary for formal presentations, the Speaking and Listening standards require students to develop a range of broadly useful oral communication and interpersonal skills. Students must learn to work together, express and listen carefully to ideas, integrate information from oral, visual, quantitative, and media sources, evaluate what they hear, use media and visual displays strategically to help achieve communicative purposes, and adapt speech to context and task.

Language: Conventions, effective use, and vocabulary

The Language standards include the essential "rules" of standard written and spoken English, but they also approach language as a matter of craft and informed choice among alternatives. The vocabulary standards focus on understanding words and phrases, their relationships, and their nuances and on acquiring new vocabulary, particularly general academic and domain-specific words and phrases.

Appendices A, B, and C

- Appendix A contains supplementary material on reading, writing, speaking and listening, and language as well as a glossary of key terms.
- Appendix B consists of text exemplars illustrating the complexity, quality, and range of reading appropriate for various grade levels with accompanying sample performance tasks.

- Appendix C includes annotated samples demonstrating at least adequate performance in student writing at various grade levels

Anchor Standards for Reading K-5

The K–5 standards on the following pages define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.[1]
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

Anchor Standards for Writing K-5

The K–5 standards on the following pages define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Text Types and Purposes

1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Note on range and content in student writing

To build a foundation for college and career readiness, students need to learn to use writing as a way of offering and supporting opinions, demonstrating understanding of the subjects they are studying, and conveying real and imagined experiences and events. They learn to appreciate that a key purpose of writing is to communicate clearly to an external, sometimes unfamiliar audience, and they begin to adapt the form and content of their writing to accomplish a particular task and purpose. They develop the capacity to build knowledge on a subject through research projects and to respond analytically to literary and informational sources. To meet these goals, students must devote significant time and effort to writing, producing numerous pieces over short and extended time frames throughout the year.

Anchor Standards for Speaking and Listening K-5

Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Note on range and content of student speaking and listening

To build a foundation for college and career readiness, students must have ample opportunities to take part in a variety of rich, structured conversations—as part of a whole class, in small groups, and with a partner. Being productive members of these conversations requires that students contribute accurate, relevant information; respond to and develop what others have said; make comparisons and contrasts; and analyze and synthesize a multitude of ideas in various domains.

New technologies have broadened and expanded the role that speaking and listening play in acquiring and sharing knowledge and have tightened their link to other forms of communication. Digital texts confront students with the potential for continually updated content and dynamically changing combinations of words, graphics, images, hyperlinks, and embedded video and audio.

Anchor Standards for Language K-5

The K–5 standards on the following pages define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Knowledge of Language

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Vocabulary Acquisition and Use

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
5. Demonstrate understanding of word relationships and nuances in word meanings.
6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

Note on range and content of student language use

To build a foundation for college and career readiness in language, students must gain control over many conventions of standard English grammar, usage, and mechanics as well as learn other ways to use language to convey meaning effectively. They must also be able to determine or clarify the meaning of grade-appropriate words encountered through listening, reading, and media use; come to appreciate that words have nonliteral meanings, shadings of meaning, and relationships to other words; and expand their vocabulary in the course of studying content. The inclusion of Language standards in their own strand should not be taken as an indication that skills related to conventions, effective language use, and vocabulary are unimportant to reading, writing, speaking, and listening; indeed, they are inseparable from such contexts.

ELA Standards – Grade 5

Reading Standards for Literature

Key Ideas and Details

RL.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
RL.5.2. Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.
RL.5.3. Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text (e.g., how characters interact).

Craft and Structure

RL.5.4. Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes.
RL.5.5. Explain how a series of chapters, scenes, or stanzas fits together to provide the overall structure of a particular story, drama, or poem.
RL.5.6. Describe how a narrator's or speaker's point of view influences how events are described.

Integration of Knowledge and Ideas

RL.5.7. Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).
RL.5.9. Compare and contrast stories in the same genre (e.g., mysteries and adventure stories) on their approaches to similar themes and topics.

Range of Reading and Level of Text Complexity

RL.5.10. By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 4–5 text complexity band independently and proficiently.

Reading Standards for Informational Text

Key Ideas and Details

RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
RI.5.2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
RI.5.3. Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

Craft and Structure

RI.5.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*.

RI.5.5. Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.

RI.5.6. Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.

Integration of Knowledge and Ideas

RI.5.7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

RI.5.8. Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

RI.5.9. Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Range of Reading and Level of Text Complexity

RI.5.10. By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4–5 text complexity band independently and proficiently.

Reading Standards: Foundational Skills

Phonics and Word Recognition

RF.5.3. Know and apply grade-level phonics and word analysis skills in decoding words.

- Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.

Fluency

RF.5.4. Read with sufficient accuracy and fluency to support comprehension.

- Read on-level text with purpose and understanding.
- Read on-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.
- Use context to confirm or self-correct word recognition and understanding, rereading as necessary.

Writing Standards

Text Types and Purposes

W.5.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

- Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose.
- Provide logically ordered reasons that are supported by facts and details.
- Link opinion and reasons using words, phrases, and clauses (e.g., *consequently*, *specifically*).
- Provide a concluding statement or section related to the opinion presented.

W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

- Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
- Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
- Link ideas within and across categories of information using words, phrases, and clauses (e.g., *in contrast*, *especially*).
- Use precise language and domain-specific vocabulary to inform about or explain the topic.
- Provide a concluding statement or section related to the information or explanation presented.

W.5.3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

- Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally.
- Use narrative techniques, such as dialogue, description, and pacing, to develop experiences and events or show the responses of characters to situations.
- Use a variety of transitional words, phrases, and clauses to manage the sequence of events.
- Use concrete words and phrases and sensory details to convey experiences and events precisely.
- Provide a conclusion that follows from the narrated experiences or events.

Production and Distribution of Writing

W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

W.5.5. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

W.5.6. With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.

Research to Build and Present Knowledge

W.5.7. Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

W.5.8. Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

W.5.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

a. Apply *grade 5 Reading standards* to literature (e.g., "Compare and contrast two or more characters, settings, or events in a story or a drama, drawing on specific details in the text [e.g., how characters interact]").

b. Apply *grade 5 Reading standards* to informational texts (e.g., "Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point[s]").

Range of Writing

W.5.10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Speaking and Listening Standards

Comprehension and Collaboration

SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

- Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
- Follow agreed-upon rules for discussions and carry out assigned roles.
- Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
- Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

SL.5.2. Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

SL.5.3. Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.

Presentation of Knowledge and Ideas

SL.5.4. Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

SL.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

SL.5.6. Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation.

Language Standards

Conventions of Standard English

L.5.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences.
- Form and use the perfect (e.g., *I had walked; I have walked; I will have walked*) verb tenses.
- Use verb tense to convey various times, sequences, states, and conditions.
- Recognize and correct inappropriate shifts in verb tense.
- Use correlative conjunctions (e.g., *either/or, neither/nor*).

L.5.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- Use punctuation to separate items in a series.
- Use a comma to separate an introductory element from the rest of the sentence.
- Use a comma to set off the words *yes* and *no* (e.g., *Yes, thank you*), to set off a tag question from the rest of the sentence (e.g., *It's true, isn't it?*), and to indicate direct address (e.g., *Is that you, Steve?*).
- Use underlining, quotation marks, or italics to indicate titles of works.
- Spell grade-appropriate words correctly, consulting references as needed.

Knowledge of Language

L.5.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- Expand, combine, and reduce sentences for meaning, reader/listener interest, and style.
- Compare and contrast the varieties of English (e.g., dialects, registers) used in stories, dramas, or poems.

Vocabulary Acquisition and Use

L.5.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 5 reading and content,* choosing flexibly from a range of strategies.

- Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.
- Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., *photograph, photosynthesis*).
- Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.

L.5.5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

- Interpret figurative language, including similes and metaphors, in context.
- Recognize and explain the meaning of common idioms, adages, and proverbs.
- Use the relationship between particular words (e.g., synonyms, antonyms, homographs) to better understand each of the words.

L.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., *however, although, nevertheless, similarly, moreover, in addition*).

ELA Standards – Grade 6

Anchor Standards for Reading 6-12

The grades 6–12 standards define what students should understand and be able to do by the end of each grade. They correspond to the College and Career Readiness (CCR) anchor standards below by number. The CCR and grade-specific standards are necessary complements—the former providing broad standards, the latter providing additional specificity—that together define the skills and understandings that all students must demonstrate.

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.[1]

8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

Note on range and content of student reading

To become college and career ready, students must grapple with works of exceptional craft and thought whose range extends across genres, cultures, and centuries. Such works offer profound insights into the human condition and serve as models for students' own thinking and writing. Along with high-quality contemporary works, these texts should be chosen from among seminal U.S. documents, the classics of American literature, and the timeless dramas of Shakespeare. Through wide and deep reading of literature and literary nonfiction of steadily increasing sophistication, students gain a reservoir of literary and cultural knowledge, references, and images; the ability to evaluate intricate arguments; and the capacity to surmount the challenges posed by complex texts.

[1] Please see "Research to Build Knowledge" in Writing and "Comprehension and Collaboration" in Speaking and Listening for additional standards relevant to gathering, assessing, and applying information from print and digital sources.

Anchor Standards for Writing

Text Types and Purposes[1]

1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Note on range and content of student writing

For students, writing is a key means of asserting and defending claims, showing what they know about a subject, and conveying what they have experienced, imagined, thought, and felt. To be college- and career- ready writers, students must take task, purpose, and audience into careful consideration, choosing words, information, structures, and formats deliberately. They need to know how to combine elements of different kinds of writing—for example, to use narrative strategies within argument and explanation within narrative—to produce complex and nuanced writing. They need to be able to use technology strategically when creating, refining, and collaborating on writing. They have to become adept at gathering information, evaluating sources, and citing material accurately, reporting findings from their research and analysis of sources in a clear and cogent manner. They must have the flexibility, concentration, and fluency to produce high-quality first-draft text under a tight deadline as well as the capacity to revisit and make improvements to a piece of writing over multiple drafts when circumstances encourage or require it.

Anchor Standards for Listening and Speaking 6-12

Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Note on range and content of student speaking and listening

To become college and career ready, students must have ample opportunities to take part in a variety of rich, structured conversations—as part of a whole class, in small groups, and with a partner—built around important content in various domains. They must be able to contribute appropriately to these conversations, to make comparisons and contrasts, and to analyze and synthesize a multitude of ideas in accordance with the standards of evidence appropriate to a particular discipline. Whatever their intended major or profession, high school graduates will depend heavily on their ability to listen attentively to others so that they are able to build on others' meritorious ideas while expressing their own clearly and persuasively.

New technologies have broadened and expanded the role that speaking and listening play in acquiring and sharing knowledge and have tightened their link to other forms of communication. The Internet has accelerated the speed at which connections between speaking, listening, reading, and writing can be made, requiring that students be ready to use these modalities nearly simultaneously. Technology itself is changing quickly, creating a new urgency for students to be adaptable in response to change.

Anchor Standards for Language 6-12

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Knowledge of Language

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Vocabulary Acquisition and Use

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

5. Demonstrate understanding of word relationships and nuances in word meanings.

6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Note on range and content of student language use

To be college and career ready in language, students must have firm control over the conventions of standard English. At the same time, they must come to appreciate that language is as at least as much a matter of craft as of rules and be able to choose words, syntax, and punctuation to express themselves and achieve particular functions and rhetorical effects. They must also have extensive vocabularies, built through reading and study, enabling them to comprehend complex texts and engage in purposeful writing about and conversations around content. They need to become skilled in determining or clarifying the meaning of words and phrases they encounter, choosing flexibly from an array of strategies to aid them. They must learn to see an individual word as part of a network of other words—words, for example, that have similar denotations but different connotations. The inclusion of Language standards in their own strand should not be taken as an indication that skills related to conventions, effective language use, and vocabulary are unimportant to reading, writing, speaking, and listening; indeed, they are inseparable from such contexts.

ELA Standards for Grade 6

Reading: Literature

Key Ideas and Details

RL.6.1. Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

RL.6.2. Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

RL.6.3. Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.

Craft and Structure

RL.6.4. Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone.

RL.6.5. Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.

RL.6.6. Explain how an author develops the point of view of the narrator or speaker in a text.

Integration of Knowledge and Ideas

RL.6.7. Compare and contrast the experience of reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch.

RL.6.8. (Not applicable to literature)

RL.6.9. Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics.

Range of Reading and Level of Text Complexity

RL.6.10. By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Reading: Informational Text

Key Ideas and Details

RI.6.1. Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

RI.6.3. Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).

Craft and Structure

RI.6.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

RI.6.5. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.

RI.6.6. Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.

Integration of Knowledge and Ideas

RI.6.7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

RI.6.8. Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

RI.6.9. Compare and contrast one author's presentation of events with that of another (e.g., a memoir written by and a biography on the same person).

Range of Reading and Level of Text Complexity

RI.6.10. By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Writing

Text Types and Purposes

W.6.1. Write arguments to support claims with clear reasons and relevant evidence.

- Introduce claim(s) and organize the reasons and evidence clearly.
- Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
- Use words, phrases, and clauses to clarify the relationships among claim(s) and reasons.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from the argument presented.

W.6.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

- Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
- Use appropriate transitions to clarify the relationships among ideas and concepts.
- Use precise language and domain-specific vocabulary to inform about or explain the topic.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from the information or explanation presented.

W.6.3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

- Engage and orient the reader by establishing a context and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
- Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.
- Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another.
- Use precise words and phrases, relevant descriptive details, and sensory language to convey experiences and events.
- Provide a conclusion that follows from the narrated experiences or events.

Production and Distribution of Writing

W.6.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

W.6.5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

W.6.6. Use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of three pages in a single sitting.

Research to Build and Present Knowledge

W.6.7. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

W.6.8. Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

W.6.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Apply grade 6 Reading standards to literature (e.g., “Compare and contrast texts in different forms or genres [e.g., stories and poems; historical novels and fantasy stories] in terms of their approaches to similar themes and topics”).

Apply grade 6 Reading standards to literary nonfiction (e.g., “Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not”).

Range of Writing

W.6.10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Speaking and Listening

Comprehension and Collaboration

SL.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

- Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
- Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.
- Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
- Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.

SL.6.2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

SL.6.3. Delineate a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

Presentation of Knowledge and Ideas

SL.6.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

SL.6.5.. Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

SL.6.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Language

Conventions of Standard English

L.6.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- Ensure that pronouns are in the proper case (subjective, objective, possessive).
- Use intensive pronouns (e.g., myself, ourselves).
- Recognize and correct inappropriate shifts in pronoun number and person.*
- Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).*
- Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.*

L.6.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.*
- Spell correctly.

Knowledge of Language

L.6.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- Vary sentence patterns for meaning, reader/listener interest, and style.*
- Maintain consistency in style and tone.*

Vocabulary Acquisition and Use

L.6.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.

- Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
- Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible).

- Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
- Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

L.6.5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

- Interpret figures of speech (e.g., personification) in context.
- Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
- Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, unwasteful, thrifty).

L.6.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Grade 7

Reading: Literature

Key Ideas and Details

RL.7.1. Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

RL.7.2. Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.

RL.7.3. Analyze how particular elements of a story or drama interact (e.g., how setting shapes the characters or plot).

Craft and Structure

RL.7.4. Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama.

RL.7.5.. Analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning.

RL.7.6. Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.

Integration of Knowledge and Ideas

RL.7.7. Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).

RL.7.8. (Not applicable to literature)

RL.7.9. Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.

Range of Reading and Level of Text Complexity

RL.7.10. By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Reading: Informational Text

Key Ideas and Details

RI.7.1. Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.7.2. Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.

RI.7.3. Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).

Craft and Structure

RI.7.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

RI.7.5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.

RI.7.6. Determine an author's point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others.

Integration of Knowledge and Ideas

RI.7.7. Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).

RI.7.8. Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

RI.7.9. Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts.

Range of Reading and Level of Text Complexity

RI.7.10. By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Writing

Text Types and Purposes

W.7.1. Write arguments to support claims with clear reasons and relevant evidence.

- Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
- Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
- Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), reasons, and evidence.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from and supports the argument presented.

W.7.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

- Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

- Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.
- Use precise language and domain-specific vocabulary to inform about or explain the topic.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from and supports the information or explanation presented.

W.7.3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

- Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
- Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.
- Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another.
- Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events.
- Provide a conclusion that follows from and reflects on the narrated experiences or events.

Production and Distribution of Writing

W.7.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

W.7.5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

W.7.6. Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.

Research to Build and Present Knowledge

W.7.7. Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

W.7.8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

W.7.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

- Apply *grade 7 Reading standards* to literature (e.g., "Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history").
- Apply *grade 7 Reading standards* to literary nonfiction (e.g. "Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims").

Range of Writing

W.7.10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Speaking and Listening

Comprehension and Collaboration

SL.7.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

- Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
- Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.
- Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.
- Acknowledge new information expressed by others and, when warranted, modify their own views.

SL.7.2. Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

SL.7.3. Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.

Presentation of Knowledge and Ideas

SL.7.4. Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

SL.7.5. Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

SL.7.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Language

Conventions of Standard English

L.7.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- Explain the function of phrases and clauses in general and their function in specific sentences.
- Choose among simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas.
- Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.*

L.7.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- Use a comma to separate coordinate adjectives (e.g., *It was a fascinating, enjoyable movie* but not *He wore an old[,] green shirt*).
- Spell correctly.

Knowledge of Language

L.7.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.*

Vocabulary Acquisition and Use

L.7.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 7 reading and content*, choosing flexibly from a range of strategies.

- Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
- Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., *belligerent, bellicose, rebel*).
- Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
- Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

L.7.5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

- Interpret figures of speech (e.g., literary, biblical, and mythological allusions) in context.
- Use the relationship between particular words (e.g., synonym/antonym, analogy) to better understand each of the words.
- Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., *refined, respectful, polite, diplomatic, condescending*).

L.7.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Literacy Standards for History/Social Studies 6-8

Key Ideas and Details

RH.6-8.1. Cite specific textual evidence to support analysis of primary and secondary sources.

RH.6-8.2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

RH.6-8.3. Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

Craft and Structure

RH.6-8.4. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

RH.6-8.5. Describe how a text presents information (e.g., sequentially, comparatively, causally).

RH.6-8.6. Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).

Integration of Knowledge and Ideas

RH.6-8.7. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

RH.6-8.8. Distinguish among fact, opinion, and reasoned judgment in a text.

RH.6-8.9. Analyze the relationship between a primary and secondary source on the same topic.

Range of Reading and Level of Text Complexity

RH.6-8.10. By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.

Literacy Standards for Science and Technical Subjects

Key Ideas and Details

RST.6-8.1. Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

RST.6-8.3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Craft and Structure

RST.6-8.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

RST.6-8.5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

RST.6-8.6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Integration of Knowledge and Ideas

RST.6-8.7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

RST.6-8.8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

RST.6-8.9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Range of Reading and Level of Text Complexity

RST.6-8.10. By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

Writing Standards for History/Science/Technical Subjects 6-8

Text Types and Purposes

WHST.6-8.1. Write arguments focused on discipline-specific content.

- Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
- Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
- Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
- Establish and maintain a formal style.
- Provide a concluding statement or section that follows from and supports the argument presented.

WHST.6-8.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

- Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
- Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
- Use precise language and domain-specific vocabulary to inform about or explain the topic.
- Establish and maintain a formal style and objective tone.
- Provide a concluding statement or section that follows from and supports the information or explanation presented.

WHST.6-8.3. (See note; not applicable as a separate requirement)

Production and Distribution of Writing

WHST.6-8.4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

WHST.6-8.5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

WHST.6-8.6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Research to Build and Present Knowledge

WHST.6-8.7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

WHST.6-8.8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

WHST.6-8.9. Draw evidence from informational texts to support analysis reflection, and research.

Range of Writing

WHST.6-8.10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Note

Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historical import. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results.

Measuring Text Complexity

Qualitative evaluation of the text

- **Levels of meaning, structure, language conventionality and clarity, and knowledge demands**

Quantitative evaluation of the text

- **Readability measures and other scores of text complexity**

Matching reader to text and task

- **Reader variables (such as motivation, knowledge, and experiences) and task variables (such as purpose and the complexity generated by the task assigned and the questions posed)**

Students in K–5 apply the Reading standards to the following range of text types, with texts selected from a broad range of cultures and periods.

Literature			Informational Text
Stories	**Dramas**	**Poetry**	**Literary Nonfiction and Historical, Scientific, and Technical Texts**
Includes children's adventure stories, folktales, legends, fables, fantasy, realistic fiction, and myth	Includes staged dialogue and brief familiar scenes	Includes nursery rhymes and the subgenres of the narrative poem, limerick, and free verse poem	Includes biographies and autobiographies; books about history, social studies, science, and the arts; technical texts, including directions, forms, and information displayed in graphs, charts, or maps; and digital sources on a range of topics

Texts Illustrating the Complexity, Quality, & Range of Student Reading 4-8

	Literature: Stories, Drama, Poetry	Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts
4-5	• *Alice's Adventures in Wonderland* by Lewis Carroll (1865) • "Casey at the Bat" by Ernest Lawrence Thayer (1888) • *The Black Stallion* by Walter Farley (1941) • "Zlateh the Goat" by Isaac Bashevis Singer (1984) • *Where the Mountain Meets* the Moon by Grace Lin (2009)	• *Discovering Mars: The Amazing Story of the Red Planet* by Melvin Berger (1992) • *Hurricanes: Earth's Mightiest Storms* by Patricia Lauber (1996) • *A History of US* by Joy Hakim (2005) • *Horses* by Seymour Simon (2006) • *Quest for the Tree Kangaroo: An Expedition to the Cloud Forest of New Guinea* by Sy Montgomery (2006)
6-8	• *Little Women* by Louisa May Alcott (1869) • *The Adventures of Tom Sawyer* by Mark Twain (1876) • "The Road Not Taken" by Robert Frost (1915) • *The Dark Is Rising* by Susan Cooper (1973) • *Dragonwings* by Laurence Yep (1975) • *Roll of Thunder*, Hear My Cry by Mildred Taylor (1976)	• "Letter on Thomas Jefferson" by John Adams (1776) • *Narrative of the Life of Frederick Douglass, an American Slave* by Frederick Douglass (1845) • "Blood, Toil, Tears and Sweat: Address to Parliament on May 13th, 1940" by Winston Churchill (1940) • *Harriet Tubman: Conductor on the Underground Railroad* by Ann Petry (1955) • *Travels with Charley: In Search of America* by John Steinbeck (1962)

Note:

Given space limitations, the illustrative texts listed above are meant only to show individual titles that are representative of a wide range of topics and genres. (See Appendix B of the Common Core Standards for excerpts of these and other texts illustrative of K–5 text complexity, quality, and range.) At a curricular or instructional level, within and across grade levels, texts need to be selected around topics or themes that generate knowledge and allow students to study those topics or themes in depth. On the next page is an **example** of progressions of texts building knowledge across grade levels.

Implementation Guide – Grade 6 ELA

COMMON CORE STANDARDS: ELA

Implementing the Common Core Standards may seem to be a daunting task, however, the ELA Curriculum Committee has created four sample guidelines/templates to introduce you to the standards. We have provided a guideline for each of the four types of writing prescribed for each grade. You will see that we have correlated Reading Standards with each Writing piece. These guidelines are meant to be a starting point and while they are comprehensive they do not include every standard. Our intent is that teachers will plug-in other standards as needed. The book companies have created correlations to the Common Core Standards so you will have them to use as well, and you will have the flexibility to add ELA standards from each category (Reading, Writing, Speaking and Listening, and Language) depending on the theme or story.

Coding: ELA.6.A.1 refers to English Language Arts –Grade 6 Topic A – Skill 1

Persuasive writing – Grade 6	Writing Standards: ELA.I 1. Write arguments to support claims with clear reasons and relevant evidence.	Reading Standards: ELA.6.A.1 Key Ideas and Details
Essential Questions *What should I be able to answer?* *What guides my thinking?*	What does it mean to persuade? How can I persuade an audience? How do I substantiate my argument? Did I convince the reader of my position? Are my arguments clear and concise?	What is the difference between fact and opinion? What is a valid argument? What is the author's viewpoint and how does that determine your reaction to the text?

Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	Use persuasion to fulfill a purpose. Support claims with specific details using credible sources which demonstrate an understanding of the topic. Refute claims from opposition with relative, logical details. Use words, phrases, and clauses to clarify the relationships among your claims and reasons for your argument. Provide a concluding statement.	Sequential transition words Cite textual evidence to support analysis of text Provide a summary of the text distinct from personal opinions /judgments Assess text as to the author's point of view Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and those which are not . .
Skills *What skills do I need to have in order to answer the essential questions?*	6.1a; organization; 6.1b; supporting details with credible sources; 6.1c; supporting claims ;6.1d; formal style 6.1e; conclusion	6.E1 inference and analysis 6.E2; summary 6.E3; Analyze 6.F4 words: figurative, connotative and technical meaning; 6. F5; analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.

Content *What content do I need to know in order to answer the essential questions?*	Present an effective persuasive essay that shows a strong persuasive purpose, targets a specific audience, and supports your position with well constructed arguments.	Cause and effect Facts and opinions Author's viewpoint
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Social Studies – "Was it Murder or an Accident – King Tut" Student Congress Court cases – How do the defense and prosecutor present their arguments for and against their client?	Social Studies – Compare the different governments to our own. Read and discuss picture books that highlight social barriers and then write about what we could do to eliminate them. Webquests
Tools for Learning *Which tools will I use that will assist me in my learning?*	Samples of valid arguments Example – bills in congress Editorials from the newspaper	Editorials from various newspapers and magazines Digital sources Examples from Anthology text

Which 21st Century Skills are woven into this standard? _Critical Thinking/Problem Solving _Collaboration __Communications __Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

Narrative - Grade 6	**Writing Standards: ELA. I.3. Write narratives to develop real or imagined experiences or events using effective techniques, relevant descriptive details, and well-structured event sequences.**	**Reading Standards: ELA.6.C. Integration of Knowledge and Ideas**

Essential Questions *What should I be able to answer?* *What guides my thinking?*	How do I develop a real or imagined experience? How do I tell a story? How do I engage and orient the reader?	Can I identify the elements of a story? Can I cite evidence to support analysis of the text? Can I interpret the author's point of view? Can I develop conflict in a story?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	Establish a context, introduce a narrator or characters that will unfold naturally and logically. Use narrative techniques, such as dialogue, pacing, and description to develop experiences, events and/or characters. Transition words, phrase and clauses to convey sequence and signal shifts from one time frame to another. Use of description through precise words and phrase, sensory language to convey experiences or events Conclusion that follows from the narrated experiences or events. Compare and contrast the reading of a story, such as "Repunzal" to current version, "Dangled"..	Compare and contrast texts in different forms or genres. Compare and contrast the experience of reading a story, drama or poem to listening to or viewing a video, audio or a live version of the text. Describe how a plot unfolds in a series of episodes as well as how the characters respond or change during the reading of the text. Explain how an author develops the point of view in a given text. Summarize the given text distinct from my personal opinion.

Skills *What skills do I need to have in order to answer the essential questions?*	6.I 3; use of effective technique, relevant descriptive details, and a well-structured event sequence. 6.I 3a; Establish a context and introduction of a narrator/characters: organization of sequence 6.I 3b; Narrative techniques: use of dialogue, pacing, and description to develop experience, events, and/or characters 6.I 3c; Use of transition words. 6.I 3d; Use of precise words and phrases, descriptive details, sensory language to convey experiences and events 6.I 3e; Conclusion that follows from the narrated experiences	6.A2; How is the theme conveyed? 6.A3; unfolding of plot as well as development of characters 6.B4; Figurative and connotative meanings 6.B5; Analyze how a particular scene, chapter or stanza fits into the overall structure of a text and how it contributes to the development of the theme, plot or setting. 6.B6; point of view 6.C7 compare and contrast readings with audio, video, or live version of the text, including contrasting what they “see” and “hear” when reading the text to what they perceive when they listen or watch.
Content *What content do I need to know in order to answer the essential questions?*	How to write an effective paragraph with a topic, 2 or 3 details that support your argument and a concluding statement.	How to create setting and build character Difference between first person narrative and third person narrative How can genre affect the mood and tone of the story

Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Personal Narrative – from the perspective of a farmer during the potato famine in Ireland or a person living through the Great Depression. Incorporate the use of technology for publishing Use of Story bird for effective story writing for younger students	Perform a scene from a myth or legend for classmates. Read, compare, and contrast myths, legends, and tall tales from a variety of countries/cultures.
Tools for Learning *Which tools will I use that will assist me in my learning?*	Reference materials; different types of literature Samples of narratives	Different types of literature including those from our anthology; Graphic Organizers

Which 21st Century Skills are woven into this standard? _Critical Thinking/Problem Solving _Collaboration
__Communications __Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

Informative/ Explanatory text – Grade 6	**Writing Standards: ELA.6. 2. Write informative/explanatory text to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.**	**Reading Standards: ELA.6.2:Integration of Knowledge and Ideas; craft and structure**

Essential Questions *What should I be able to answer?* *What guides my thinking?*	How do I develop the topic with relevant facts and details? How do I convey my ideas to the reader so that they will understand? Will the reader be able to explain the topic after reading my essay?	What is the author's viewpoint and how does that determine your reaction to that text?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	Use appropriate transitions to clarify the relationship among ideas and concepts. Use text organization Use precise language to inform about or explain the topic. Provide a concluding statement or section that follows from the information or explanation presented. .	Analyze text for what is explicitly stated as well as what is inferred. Write a summary of the text. Determine the author's point of view Integrate information presented in different media.

Skills *What skills do I need to have in order to answer the essential questions?*	6.2a; introduce a topic: organize ideas, concepts, information using strategies such as definition, classification etc. 6.2b: develop the topic with relevant facts, definitions, details, and examples. 6.2c: transitions 6:2d: precise language to inform or explain the topic 6.2e: formal style 6.2f: conclusion	6.E1:Cite textual evidence to support analysis – inferences 6.E2: summary of text 6.E3:Analyze in detail how a key individual, event, or idea is introduced, illustrate and elaborated in a text 6.F4: figurative and connotative meanings 6. F5: Analysis of a sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas. 6.F6: author's point of view 6.G7: integration of information in different media 6.G9:Compare and Contrast author's presentation
Content *What content do I need to know in order to answer the essential questions?*	How to write an informative paragraph with precise language that will enable the reader to understand the topic. Command of the conventions of standard English grammar and usage when writing and speaking	The author's viewpoint Analyze text Sequence of information

Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Social Studies – Compare and Contrast a biography with a memoir on the same person Multi-media components (graphics, images, music, sound) to clarify information	Various informational texts to build background and provide prior knowledge of what the students know.
Tools for Learning *Which tools will I use that will assist me in my learning?*	Samples of informative or explanatory paragraphs. Multimedia components (graphic organizers, images and sounds) – including multiple print and digital sources	Various informational texts on the topic; biographies, general nonfiction, and science Graphic Organizers Literary responses in a journal

Which 21st Century Skills are woven into this standard? _Critical Thinking/Problem Solving _Collaboration __Communications __Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

Research – Grade 6	Writing Standards: ELA6. K. Research to build and present Knowledge	Reading Standards: ELA.6.K.9: Draw evidence from literary or informational text to support research
Essential Questions *What should I be able to answer?* *What guides my thinking?*	How do I gather information to answer a constructed response? How do I write an outline? How to I write a note card? How do I paraphrase?	How do I assess the credibility of each source? How do I draw evidence from Literary or informational text to support my research?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	I should be able to identify the main idea of a paragraph. I should be able to support the main idea with supporting details. I should be able to assess the credibility of each quote, source, and information to answer the constructed response or short research project.	Analyze text for what is explicitly stated as well as what is inferred. I should be able to gather relevant information from multiple print and digital sources.

Skills *What skills do I need to have in order to answer the essential questions?*	6.K7; draw on several sources and refocus the inquiry when appropriate 6.K8; gather information from multiple print and digital sources; quote or paraphrase the data; provide basic bibliographic information for sources 6.K9; draw evidence from literary or informational texts to support analysis, reflection, and research 6.G7: Integrate information presented in different media or formats	6.K9a; Compare and contrast texts in different forms or genres 6. K9b; Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported compared to those who are not. 6.E1: Site textual evidence based on what the text says as well as inference drawn from a text
Content *What content do I need to know in order to answer the essential questions?*	How to answer a simple essay question? How do I avoid plagiarism? How to I write an outline?	Main Ideas and details of a text Distinguishing claims that are supported by reasons and those that are not Paraphrase the data and conclusions of others while avoiding plagiarism
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Use Technology to produce and publish writings as well as to interact and collaborate with others on the same topic. Compare the information from primary source documents with the secondary sources (biographies read.	Choose informational text about a country or culture of origin to read. Choose a prophet from the Old Testament to research and what would he experience if he were living now in the 21st Century?

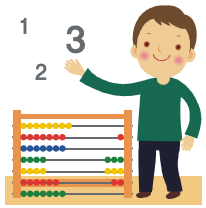
Tools for Learning *Which tools will I use that will assist me in my learning?*	Use of Noodle tools for gathering information and sources Multimedia print Encyclopedia, web 2.0 Primary sources depending on the topic given	Digital resources Reference materials Primary sources

Which 21st Century Skills are woven into this standard? _Critical Thinking/Problem Solving _Collaboration __Communications __Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

Mathematics

Grade 6



Common Core State Standards – Grade Five
Common Core State Standards – Grade Six
Common Core State Standards – Grade Seven
Implementation Guide – Grade Six

Key Points In Mathematics

- The K-5 standards provide students with a *solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions and decimals*—which help young students build the foundation to successfully apply more demanding math concepts and procedures, and move into applications.
- In kindergarten, the standards follow successful international models and recommendations from the National Research Council's Early Math Panel report, by focusing kindergarten work on the number core: learning how numbers correspond to quantities, and learning how to put numbers together and take them apart (the beginnings of addition and subtraction).
- The K-5 standards build on the best state standards to provide detailed guidance to teachers on how to navigate their way through knotty topics such as *fractions, negative numbers, and geometry*, and do so by maintaining a continuous progression from grade to grade.
- The standards stress not only procedural skill but also conceptual understanding, to make sure students are learning and absorbing the critical information they need to succeed at higher levels - rather than the current practices by which many students learn enough to get by on the next test, but forget it shortly thereafter, only to review again the following year.
- Having built a strong foundation K-5, students can do hands on learning in geometry, algebra and probability and statistics. Students who have completed 7th grade and mastered the content and skills through the 7th grade will be *well-prepared for algebra* in grade 8.
- The middle school standards are robust and provide a coherent and rich *preparation for high school mathematics*.
- The high school standards call on students to *practice applying mathematical ways of thinking to real world issues and challenges*; they prepare students to think and reason mathematically.
- The high school standards set a *rigorous definition of college and career readiness*, by helping students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do.
- The high school standards *emphasize mathematical modeling*, the use of mathematics and statistics to analyze empirical situations, understand them better, and improve decisions. For example, the standards state: Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. It is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data.

Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1 **Make sense of problems and persevere in solving them**.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2 Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems\involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3 Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

4 Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a

student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5 Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6 Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7 Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7 × 8 equals the well remembered 7 × 5 + 7 × 3, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 × 7 andthe 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 – 3(x – y)2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

8 Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y – 2)/(x – 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x – 1)(x + 1)$, $(x – 1)(x^2 + x + 1)$, and $(x – 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word “understand” are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices. In this respect, those content standards which set an expectation of understanding are potential “points of intersection” between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

Mathematics Standards

Grade 5

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

1. Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.)

2. Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.

3. Students recognize volume as an attribute of three-dimensional space. They understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps. They understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They decompose three-dimensional shapes and find

volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems.

Grade 5 Overview

- **Operations and Algebraic Thinking**
  - Write and interpret numerical expressions.
  - Analyze patterns and relationships.

- **Number and Operations in Base Ten**
  - Understand the place value system.
  - Perform operations with multi-digit whole numbers and with decimals to hundredths.

- **Number and Operations—Fractions**
  - Use equivalent fractions as a strategy to add and subtract fractions.
  - Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

- **Measurement and Data**
  - Convert like measurement units within a given measurement system.
  - Represent and interpret data.
  - Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

- **Geometry**
  - Graph points on the coordinate plane to solve real-world and mathematical problems.
  - Classify two-dimensional figures into categories based on their properties.

Operations and Algebraic Thinking

Write and interpret numerical expressions.

5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

Analyze patterns and relationships.

5.OA.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

Number and Operations in Base Ten

Understand the place value system.

5.NBT.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

5.NBT.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.3. Read, write, and compare decimals to thousandths.

- Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
- Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

5.NBT.4. Use place value understanding to round decimals to any place.

Perform operations with multi-digit whole numbers and with decimals to hundredths.

5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Number and Operations—Fractions

Use equivalent fractions as a strategy to add and subtract fractions.

5.NOF.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NOF 2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

5.NOF 3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

5.NOF 4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*

- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.NOF 5. Interpret multiplication as scaling (resizing), by:

- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
- Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.

5.NOF 6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

5.NOF 7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. *[Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.]*

- Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*
- Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*
- Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

Measurement and Data

Convert like measurement units within a given measurement system.

5.MD.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Represent and interpret data.

5.MD.2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

5.MD.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

- A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
- A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.

5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

5.MD.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
- Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
- Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Geometry

Graph points on the coordinate plane to solve real-world and mathematical problems.

5.G,1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).

5.G,2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Classify two-dimensional figures into categories based on their properties.

5.G,3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

5.G,4. Classify two-dimensional figures in a hierarchy based on properties.

Grade 6

In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

1. Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

2. Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

3. Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities.

4. Building on and reinforcing their understanding of number, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability.

Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected. Students in Grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Grade 6 Overview

- **Ratios and Proportional Relationships**
  - Understand ratio concepts and use ratio reasoning to solve problems.
- **The Number System**
  - Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
  - Multiply and divide multi-digit numbers and find common factors and multiples.
  - Apply and extend previous understandings of numbers to the system of rational numbers.
- **Expressions and Equations**
  - Apply and extend previous understandings of arithmetic to algebraic expressions.
  - Reason about and solve one-variable equations and inequalities.
  - Represent and analyze quantitative relationships between dependent and independent variables.
- **Geometry**
  - Solve real-world and mathematical problems involving area, surface area, and volume.
- **Statistics and Probability**
  - Develop understanding of statistical variability.
  - Summarize and describe distributions.

Ratios and Proportional Relationships

Understand ratio concepts and use ratio reasoning to solve problems.

6.RP.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

6.RP.2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*[1]

6.RP.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

- Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
- Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*
- Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
- Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

[1] Expectations for unit rates in this grade are limited to non-complex fractions

The Number System

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

6.NS.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi? Compute fluently with multi-digit numbers and find common factors and multiples.*

Compute fluently with multi-digit numbers and find common factors and multiples.

6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.

6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

6.NS.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2). Apply and extend previous understandings of numbers to the system of rational numbers.*

Apply and extend previous understandings of numbers to the system of rational numbers.

6.NS.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

6.NS.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

- Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.
- Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
- Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.7. Understand ordering and absolute value of rational numbers.

- Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.*
- Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 ^{o}C > –7 ^{o}C to express the fact that –3 ^{o}C is warmer than –7 ^{o}C.*
- Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*
- Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.*

6.NS.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.

6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.

- Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*
- Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*
- Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = s^3$ *and* $A = 6\ s^2$ *to find the volume and surface area of a cube with sides of length s = 1/2.*

6.EE.3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*

6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for. Reason about and solve one-variable equations and inequalities.*

Reason about and solve one-variable equations and inequalities.

6.EE.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

6.EE.8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x <$ c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Represent and analyze quantitative relationships between dependent and independent variables.

6.EE.9.Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.

Geometry

Solve real-world and mathematical problems involving area, surface area, and volume.

6.G.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\,w\,h$ and $V = b\,h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

6.G.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

6.G.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Statistics and Probability

Develop understanding of statistical variability.

6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*

6.SP.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

6.SP.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

Summarize and describe distributions.

6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6.SP.5. Summarize numerical data sets in relation to their context, such as by:

- Reporting the number of observations.

- Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

- Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Grade 7

In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

2. Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.

3. Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems

involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.

4. Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

Grade 7 Overview

- **Ratios and Proportional Relationships**
  - Analyze proportional relationships and use them to solve real-world and mathematical problems.

- **The Number System**
  - Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

- **Expressions and Equations**
  - Use properties of operations to generate equivalent expressions.
  - Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

- **Geometry**
  - Draw, construct and describe geometrical figures and describe the relationships between them.
  - Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

- **Statistics and Probability**
  - Use random sampling to draw inferences about a population.
  - Draw informal comparative inferences about two populations.
  - Investigate chance processes and develop, use, and evaluate probability models.

Ratios and Proportional Relationships

Analyze proportional relationships and use them to solve real-world and mathematical problems.

7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction* $^{1/2}/_{1/4}$ *miles per hour, equivalently 2 miles per hour.*

7.RP.2. Recognize and represent proportional relationships between quantities.

- Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
- Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*
- Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

7.RP.3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

7.NS.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

- Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*

- Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
- Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
- Apply properties of operations as strategies to add and subtract rational numbers.

7.NS.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

- Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(–1)(–1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
- Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $–(p/q) = (–p)/q = p/(–q)$. Interpret quotients of rational numbers by describing real-world contexts.
- Apply properties of operations as strategies to multiply and divide rational numbers.
- Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

7.NS.3. Solve real-world and mathematical problems involving the four operations with rational numbers.

[1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

Expressions and Equations

Use properties of operations to generate equivalent expressions.

7.EE.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

7.EE.2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

7.EE.3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

7.EE.4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

- Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
- Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a*

salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

Geometry

Draw construct, and describe geometrical figures and describe the relationships between them.

7.G.1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

7.G.2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

7.G.3. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

7.G.4. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

7.G.5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

7.G.6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Statistics and Probability

Use random sampling to draw inferences about a population.

7.SP.1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

7.SP.2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*

Draw informal comparative inferences about two populations.

7.SP.3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*

7.SP.4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

Investigate chance processes and develop, use, and evaluate probability models.

7.SP.5.7.SP.5. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

7.SP.6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*

7.SP.7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

- Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*
- Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*

7.SP.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

- Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
- Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
- Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

Implementation Guide – Grade 6 Mathematics

Code: M.6.A.1 refers to: Mathematics –Grade 6 – Topic A – Skill 1

CATEGORY: Ratio and Proportional Relationships. <u>Standard:</u> M.6.A. Understand ratio concepts and use ratio reasoning to solve problems.

Essential Questions *What should I be able to answer?* *What guides my thinking?*	What is a mathematical way to compare quantities? How do mathematical models and/or tables shape my understanding of mathematics? How can unit rates help me to make comparisons? How does fluency with operations help me to solve ratio and percent problems? How are ratios, rates, and percents connected/related?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative** – Have students use online or "hands-on" manipulatives (assorted shapes, colors) to create representation of, describe and illustrate ratio concepts in a journal entry; Have students demonstrate fluency with relating commonly used percents as fractions and decimals using interactive web-based activities or flash cards. Have students create a story problem for ratios written on board (example: 9/7, 2:10, and 6 to 4). **Summative** – Performance Assessment to include student creating, writing, and solving a "real-life" ratio problem: "Describe a situation in your life that represents a ratio…" Example: number of boys to girls in your class or family; Sports - number of hits to at bats in a baseball/softball game or shots on goals to actual goals (use your own stats or research a professional player or team stats); Music – number of rock songs to rap songs on your Ipod; Research a recipe and compare ingredients (dry to liquid, teaspoons to tablespoons), etc. Students can extend and compute percentages, and/or create graphs.

Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.A.** 1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* **M.6.A.** 2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." [Expectations for unit rates in this grade are limited to non-complex fractions.]* **M.6.A.** 3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Content *What content do I need to know in order to answer the essential questions?*	Use mathematical representation (equivalent fractions, tables) to solve unit, rate and/or ratio problems Use mathematical operations and properties to solve problems (Multiplication/Division, Cross Product Rule) Writing math sentences in equation or proportion format and solve for missing value (16 is 50% of what number? 16 = .5n) Vocabulary: ratio, ratio representation, rate, unit rate, proportion, cross product rule, percent, formula
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Social Studies: use of mileage scale to interpret distances on maps, globes, &/or Google earth. Consumer Science: computing unit costs and percentages; manipulating recipes to increase/decrease measurement of ingredients Science: Using formulas to compute rates, distance travelled, (example: mph, mpg, etc).; Physical Education (heart rate), Art (perspective)
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

Which 21st Century Skills are woven into this standard? ___Critical Thinking/Problem Solving ___Collaboration ___Communications ___Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

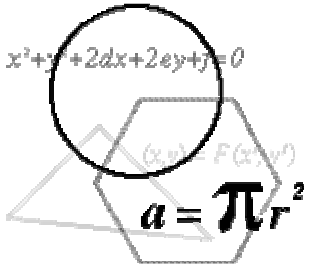
CATEGORY: The Number System . <u>Standard:</u> M.6.B Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	
Essential Questions *What should I be able to answer?* *What guides my thinking?*	**Why do I need to work with parts of numbers?** How can I use fractions efficiently to solve real-world problems? Why would I use division as a strategy to solve for a variable?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative:** use models , concrete objects and/or on-line manipulatives to represent parts and division of parts (fractions); Have students use fraction strips to model multiplication of fractions, example: Two 1/4s are as long as ½; 1/6 is half of 1/3; 2/3 of 2/3 = 4/9. Have students fold a piece of paper in half vertically twice and shade ¼ with a colored pencil. Then, have students fold paper in half horizontally and shade ½ with a different colored pencil. The part shaded with both colors is ½ of ¼ or ½ times ½. What part of the whole is shaded with both colors? (1/2 x ¼ = 1/8). In a journal entry, have students explain steps to divide fractions by fractions and simplify the quotient to lowest terms using mathematical terms. **Summative:** Performance based assessment to demonstrate dividing fractions using models; for example, (1) in a lab environment, have students divide a recipe, illustrate or write steps used, write equation and show work used to solve; (2) have each student write a fraction between 0 and 1 on a small piece of paper or index card <u>and</u> on a piece of paper that they will keep. Have each student pass their fraction to another student and find the product of their fractions. Repeat with division. Continue passing fractions and computing products and quotients as time allows. Have student select one of each operation and create a word problem using the fractions.

Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.B.** 1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*
Content *What content do I need to know in order to answer the essential questions?*	Previous mastery of multiplication of whole numbers, fractions, and mixed numbers and expressing products in lowest terms; Measurement equivalents; Vocabulary: fraction, numerator, denominator, equivalent fraction, dividend, divisor, quotient, mixed numbers, improper fractions, bar notation, reciprocal, simplest form/lowest terms; Apply formulas to solve problems
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Problem solving in multiple subject areas, including Science (measurement), Social Studies (land size, distances), Consumer Sciences (applying formulas to cooking, measurement), Art, Technology (using virtual manipulatives).

Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities. NCTM), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

Which 21st Century Skills are woven into this standard? ___Critical Thinking/Problem Solving ___Collaboration ___Communications ___Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)



CATEGORY: The Number System. Standard: M.6.C – Compute fluently with multi-digit numbers and find common factors and multiples.

Essential Questions *What should I be able to answer?* *What guides my thinking?*	**Why is it important for me to compute multi-digit numbers with fluency?** How can I use common factors and multiples to solve problems? Why is it important for me to be able to estimate quantities involving multi-digit numbers and/or decimals? When would estimation of quantities be helpful? How can I use models to understand operations with decimals? How can I use the Distributive Property to simplify problem solving?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative**: use on-line and/or hands-on base ten manipulatives or centimeter grid paper to model decimals and decimal operations; Have students write a decimal (example: 0.43) and a mixed decimal (2.067) on two strips of paper. Put all strips in a bag. Have each student pick 2 strips, rewrite the numbers on a sheet of paper, being careful to line up the decimal points, and add; Have students solve problems using the standard algorithm for all operations with multi-digit numbers and numbers containing decimals. **Summative**: (1) Present completed problems containing errors to students either on paper or *interactive board.* Have students identify the error and explain. Then, have student complete problem correctly. (2) *Describe* several situations in everyday life where decimals are used; Performance Assessment example: Compute the cost of a special event; Using the internet and/or print media (advertisements, newspapers), have students prepare a "shopping list" for an event and research costs associated with products to be purchased (for example, Back to School supplies, Christmas shopping, Planning a party, a class trip, a family night out to a Phillies game, etc.), and then present a budget to classmates for the event (Could extend and have students offer two different budget plan choices).

Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.C.1**. Fluently divide multi-digit numbers using the standard algorithm. **M.6.C.2**. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **M.6.C.3**. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*
Content *What content do I need to know in order to answer the essential questions?*	Fluency with: multiplication facts of multi-digit numbers; Estimation; Divisibility Rules for 2,3,4,5,6,9,10; Properties of Multiplication and Addition: Commutative, Associative, Distributive; Prime Factorization of numbers; Vocabulary: factors, greatest common factor, products, multiples, least common multiple, quotients, divisor, dividend, place value, decimal
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Problem solving in multiple subject areas, including Science, Social Studies; Consumer Sciences, Art, Technology, PE

Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities. NCTM), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

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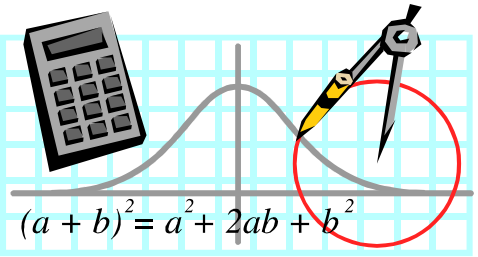

CATEGORY: The Number System. <u>Standard</u>: M.6.D. Apply and extend previous understandings of numbers to the system of rational numbers.

Essential Questions *What should I be able to answer?* *What guides my thinking?*	**Why is important for me to know when a value is "above" or "below" zero? (Bank account, Temperature, Sea level)** Why is – 12 less than 2? How can I use a number line to compare integers? What is an absolute value and how can I use a number line to prove the meaning of the term, absolute value?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	Formative –describe how to use online or hands-on manipulatives (chips, beads, tiles) to model working with integers; Have students create a number line from -20 to +20 (use a long strip of paper, similar to a tape measure width) and model adding integers (examples: 3 + -5, -8 + -4, -16 + 6); Have students read a temperature from a thermometer (can be drawn on board or accessed through interactive technology), then read the opposite temperature (the opposite of 5□ is - 5□. How far away from 0 is 5 and -5? (absolute value); Have students graph ordered pairs (x,y) on a coordinate plane; Identify given points on a coordinate plane and indicate quadrant; Have students plot and connect points which result in a picture. Summative – Have students create their own picture utilizing all quadrants of the coordinate plane, identify and document points to be plotted. Students trade with another student and complete each other's picture problem; Use manipulatives to demonstrate and solve problems for values above/below zero; Cross Curricula Performance Assessment: Research a topic involving

	numbers above/below zero and prepare a informational presentation (for example, prepare a presentation on a recently studied land mass in Social Studies; or have students plan an event and create a budget to include estimating costs, paying vendors, and balancing the income and expenditures.
Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.D.1**. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **M.6.D.2**. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. **M.6.D.3**. Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a

	number line diagram. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.* b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3 ^{o}C > –7 ^{o}C to express the fact that –3 ^{o}C is warmer than –7 ^{o}C.* c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.* d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.* **M.6.D.4**. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
Content *What content do I need to know in order to answer the essential questions?*	Number sets (natural, whole, integers, rational, irrational); Symbols used to represent negative (-) and positive (+), and absolute value / / ; Positive and negative numbers; number line containing positive and negative numbers; coordinate plane; quadrants, ordered pairs (x,y) and graphing of such on the coordinate plane;

Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Science (temperature, positive/negative electrical charge); Social Studies/Geography (land mass above/below sea level); Consumer Sciences (bank accounts, reconciling bank accounts); Art (Contrast); Economics (Stock Market)
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

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CATEGORY: Expressions and Equations. <u>Standard:</u> M.6.E. Apply and extend previous understandings of arithmetic to algebraic expressions.

Essential Questions *What should I be able to answer?* *What guides my thinking?*	**How would translating word sentences into mathematical sentences help me to solve problems?** How do algebraic and numerical expressions help me to solve problems? Why can I use variables to represent a value? How can I use properties to simplify expressions, solve for missing values, and show equivalency?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative:** Use manipulatives (algebra scales, tiles, fraction bars) to demonstrate equivalent expressions; Journey entry/Exit card: Provide a word sentence and have students translate the word sentence into an expression and/or equation using variables (Example: A number divided by three OR Twice a number subtracted from ten is two.) ; Have students identify key words used in word phrases (example key words for addition: increased by, sum, more than, etc); Use interactive board to create two lists. One side containing word phrases and the other side containing mathematical expressions. Have students "match" the phrase to the appropriate expression (OR use "flash cards" for students to match). **Summative:** Using real-life experiences, create a list of mathematical phrases and another list of the correlating algebraic expressions. Have students match the phrase to the expression or vice

	versa. Then, provide phrases and have students write an expression to represent each phrase.
Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.E.** 1. Write and evaluate numerical expressions involving whole-number exponents. **M.6.E.** 2. Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.* b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.* c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = s^3$ *and* $A = 6\ s^2$ *find the volume and surface area of a cube with sides of length s = 1/2.* **M.6.E.** 3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*

	M.6.E. 4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*
Content *What content do I need to know in order to answer the essential questions?*	Order of Operations; positive, whole number exponents, working with properties, Evaluating formulas with given values; Apply formulas with and without exponents to solve for missing values and/or calculate measurements; Vocabulary: sum, term, like terms, product, factor, quotient, coefficient, formulas, equivalents, base, exponent, power
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Problem solving in multiple subject areas, including Science, Social Studies, Consumer Sciences, Art, Technology
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

Which 21st Century Skills are woven into this standard? ___Critical Thinking/Problem Solving ___Collaboration ___Communications ___Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

CATEGORY: Expressions and Equations. <u>Standard</u>: M.6.F. Reason about and solve one-variable equations and inequalities.

Essential Questions *What should I be able to answer?* *What guides my thinking?*	**How will fluency in solving for unknown values help me succeed in a global environment? Marketplace? Community?** How can I represent an unknown value? Why are variables used in solving equations and inequalities? What strategies can I use to solve for unknowns in algebraic equations or inequalities? How can I use inverse properties to get the variable alone? How can a formula aid me in problem solving?

Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative:** Practice writing equations/inequalities from word phrases and vice versa; Use manipulatives to model equations (example: algebra tiles and scales); Provide equations and inequalities to students to solve for unknown values using appropriate strategies and properties in a step by step procedure. **Summative:** Provide equations and have students solve for missing values by "balancing" both sides of the equation using the Properties of Equality; Have students count the number of pieces in a stained glass window in your school chapel or church. Then, have students create an equation to determine how many complete windows they could create with 650 pieces of stained glass (if 24 pieces in one window then $24x = 650$).Performance based assessment: Have students create an original problem requiring they write a one variable equation (or inequality) to represent the problem, solve for the variable using appropriate strategies/properties, graph the solution on a number line and write an answer statement reflecting the solution as described through the original problem. For example, Tim is expected to swim 20 laps during practice on Wednesday and Thursday. He swam 9 laps on Wednesday. Write and solve an inequality to show how many laps he had to swim on Thursday. $x + 9 \geq 20$; $x \geq 11$, 11 laps or more. Make sure number line graph has a **solid** point on 11 and is shaded in the correct direction, > 11.

Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.F.1**. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. **M.6.F.2**. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. **M.6.F.3**. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers. **M.6.F.4**. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
Content *What content do I need to know in order to answer the essential questions?*	**VOCABULARY:** expression, equation, inequalities, evaluate, variable, coefficient, terms, like terms, constant terms, inverse operation, solution, graph, function, linear function, **APPLY PROPERTIES**: Properties of Equality, Inverse Properties, Distributive Property; **NUMBER SENSE**: Numbers can be represented in multiple ways; Being able to compute fluently means making smart choices about which strategies and/or tools to use and when to use them; Knowing the reasonableness of an answer comes from using good number sense and estimation strategies. **GRAPHING SOLUTIONS:** Interpreting results and graphing solutions on a number line.
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Formulas and equations are used extensively throughout the science curriculum, for example: measurement conversion (metric/customary), distance, speed, and velocity problems.
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives (algebra tiles or scales), and graphing calculators.

Which 21st Century Skills are woven into this standard? ___Critical Thinking/Problem Solving ___Collaboration ___Communications ___Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

CATEGORY: Expressions and Equations <u>Standard</u>: M.6.G.Represent and analyze quantitative relationships between dependent and independent variables

Essential Questions *What should I be able to answer? What guides my thinking?*	How can I use equations, graphs, and tables to understand quantitative relationships?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative –** Practice solving equations, graphing ordered pairs on a coordinate plane, and explain the relationship between variables. **Summative** – Performance assessment: Using a real-world problem, have students create and solve an equation; Graph results and explain relationships (i.e., Outside Temperature and air conditioning and/or electric usage; Snowfall and Snow Removal costs, etc).
Skills *What skills do I need to have in order to answer the essential questions?*	M.6.G.1. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*

Content *What content do I need to know in order to answer the essential questions?*	Graphing on the coordinate plane; Solving equations containing variables; Appropriately displaying and/or using data in problem-solving settings; Creating a table to display data; **VOCABULARY:** expression, equation, inequalities, evaluate, variable, coefficient, terms, like terms, constant terms, inverse operation, solution, graph, function, linear function, **APPLY PROPERTIES**: Properties of Equality, Inverse Properties, Distributive Property; **NUMBER SENSE**: Numbers can be represented in multiple ways; Being able to compute fluently means making smart choices about which strategies and/or tools to use and when to use them; Knowing the reasonableness of an answer comes from using good number sense and estimation strategies. **GRAPHING SOLUTIONS:** Interpreting results and graphing solutions on a number line and coordinate plane.
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Formulas and equations are used extensively throughout the science curriculum, for example: motion, distance, speed, and velocity problems; Social Studies; Technology (Using Microsoft and/or web-based products for graphing, tables, etc).
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives, math songs, and graphing calculators.

Which 21st Century Skills are woven into this standard? ___Critical Thinking/Problem Solving ___Collaboration ___Communications ___Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

CATEGORY: Geometry . <u>Standard</u>: M.6.H. Solve real-world and mathematical problems involving area, surface area, and volume.

Essential Questions *What should I be able to answer?* *What guides my thinking?*	**Why do I need to identify the basic shape of a figure and use the appropriate formula to find the area, surface area, and volume?** What is Pi and how can I use it to solve problems? Why do I need to find a missing dimension when given the area, surface area, and/or volume of a figure?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative:** Have students use manipulatives to identify familiar polygons and three dimensional figures; have students evaluate formulas when given measurements; Have students use centimeter paper to construct parellelograms and estimate area, then compute area of parellelograms when given measurements. Repeat with triangles, then use two congruent triangles to construct a parallelogram and investigate relationship between the area of the triangles and the parallelogram created. Write a journal entry to explain the relationship; Present irregular figures to students and have them divide it into familiar shapes, compute the area of each shape, and add the area of each part. **Summative:** Performance Assessment: Have students use nets to create three dimensional figures and compute surface area and volume; Have students use deconstruct/unfold boxes and compute surface area of each box (example, boxes from cereal, snacks, etc.); Using different shape containers of a similar size, have students predict which container has greater volume. Then have students compute volume using appropriate formula(s); Contrast/compare results; Measure

	walls/ceiling of a room for painting (surface area) and/or new flooring (area) and compute associated costs of supplies.
Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.H.** 1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. **M.6.H.** 2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. **M.6.H.** 3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. **M.6.H.** 4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Content *What content do I need to know in order to answer the essential questions?*	Classify polygons by sides and angles, Classifying three dimensional figures by faces, edges, vertices; Applying formulas for Perimeter, Area, Surface Area, and Volume; Using nets to identify and construct figures; Graphing ordered pairs on a coordinate plane and use coordinates to draw polygons; Apply to real-life problem solving.
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Formulas are used extensively to solve problems involving Science, Architecture, Geography, Social Studies; Technology (Using Microsoft and/or web-based products for graphing, tables, etc).
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

Which 21st Century Skills are woven into this standard? ___Critical Thinking/Problem Solving ___Collaboration ___Communications ___Creativity/Innovation

What level of rigor will I be using? (A, C)_____ What level of relevance will I be using?_____ (B,D)

CATEGORY: Statistics and Probability Standard: M.6.I. Develop understanding of statistical variability.	
Essential Questions *What should I be able to answer? What guides my thinking?*	**Why is it important for me to be able to represent data in different formats?** How will understanding different representations of data help me to solve problems? Why are some data collection methods more appropriate than others? How do I decide which method to use? How can I compare measures of central tendency and distribution?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	**Formative**: In a journal entry, have students interpret data based on plots/graphs provided (from a newspaper, book, or online) – compare/contrast results and give reason for differences/similarities. **Summative:** Performance Based Assessment: Have students collect and organize data (for example, student heights in class/grade, sports team data – batting averages, points scored/game, amount of sugar (grams) in different cereals, etc.); represent the data in an appropriate format; and interpret results/trends/distributions (For example, measure heights of students in a grade/class, and have students create a histogram and/or box and whisker plot using height data collected).
Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.J.1**. Display numerical data in plots on a number line, including dot plots, histograms, and box plots. **M.6.J.2**. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any

	striking deviations from the overall pattern with reference to the context in which the data were gathered. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
Content *What content do I need to know in order to answer the essential questions?*	Data collection methods (i.e., survey, samples – random, unbiased); Using appropriate tools to organize and represent data (tables, graphs, plots, etc); Measures of Central Tendency - used to summarize data (Mean, Median, Mode, and Range); Developing "intervals" based on data collected for histograms; Using a Box & Whisker Plot to organize data into four groups (quartiles).
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Problem solving in multiple subject areas, including Science, Social Studies, Consumer Sciences, Art, Technology
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

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CATEGORY: Statistics and Probability Standard: M.6.J. Summarize and describe distributions.

Essential Questions *What should I be able to answer? What guides my thinking?*	**In what ways can sets of data be represented by statistical measures?** How do you collect, organize, and display data? What kinds of questions can be answered using different data displays? How can you tell if the data collection is sufficient?
Assessment *What will I be expected to know, understand, and be able to do in order to demonstrate my learning?*	Formative: Have students work in small groups/partners to draft a school survey (use survey in class setting to "test" effectiveness, ease of understanding, etc). Example survey topics: shoe size, height, bed time, number of letters in first name. Students can "test" survey in their own class and plot results to see the results (example, use a line plot). Summative: Using small group survey activity results from above, have students finalize a school survey and administer the survey; Using data gathered in the student administered school survey, compute measures of Central Tendency, analyze data distribution, and display results in an appropriate graph/plot. Compare/contrast results by grade level.
Skills *What skills do I need to have in order to answer the essential questions?*	**M.6.I.** 1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* **M.6.I.** 2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. **M.6.I.** 3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number

Content *What content do I need to know in order to answer the essential questions?*	Data collection methods (i.e., survey, samples – random, unbiased); Using appropriate tools to organize and represent data (tables, graphs, plots, etc); Measures of Central Tendency - used to summarize data (Mean, Median, Mode, and Range); Understanding of ratios ; Fluency with all operations
Integration of Learning *How does this learning connect to my other areas (subjects) of learning?*	Problem solving in multiple subject areas, including Science, Social Studies, Consumer Sciences, Art, Technology
Tools for Learning *Which tools will I use that will assist me in my learning?*	Various commercial products and websites for practice activities (example: AIMS activities, Interactive board activities), virtual manipulatives, math songs, and calculators; See AOP Math Curriculum Committee website for Performance Assessments at: http://teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/

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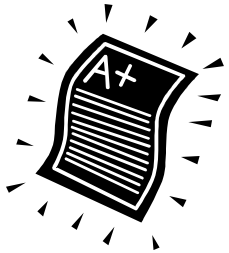

Assessment and Grading

Grading and Assessment

Report Cards

The change in curriculum has prompted a change in our reporting document.

- **Report cards** will not be grade specific.
    - **Kindergarten** students will receive reports aligned to the skills appropriate to that level.
    - Students in **grades 1 – 3** will receive the primary form of the report card.
    - The grading system will continue as letter grades.
    - **No** numerical equivalents are attached to these grades.
        - The children in grades 4 – 8 will receive the elementary form of the report card
    - The grading system will continue as number grades for major content areas: Religion, Math and English Language Arts, Science and Social Studies. The general average is calculated from these grades.
    - A number scale is used for other content areas: Art, Music, Physical Education, Technology and World Language.

- **Grading Practices:**
    - The students will receive **<u>one grade</u>** for ELA and **<u>one grade</u>** for Math
    - The overall grade for each of these content areas will be an average of the progress shown in all of the "sub-set" categories for that content area.
    - **ELA** -- Care must be taken to ensure that the assessments reflect the entirety of ELA
        - At a minimum 2 assessments must be planned to assess progress in each of the sub-categories.
        - In each "sub-category":
            - a "+" will indicate that the student meets or exceeds expectations in that area.
            - a "√" will indicate that the student continues to work towards meeting expectations.
    - In **Math**, the students will again receive one overall grade.
        - Progress in sub-categories" will be noted with a "+" or a " √" as indicated above.
        - Progress should be able to documented by at least two different assessments in each area.

Portfolios:

- Portfolio assessment is a *"perfect fit"* with the Core Curriculum State Standards
- Portfolios should be used to gather relevant samples of student work over time
- Students are involved in the selection of artifacts
    - Students do self-reflection of their work
    - Teachers and students periodically discuss the work contained in the portfolio

- **Minimum Requirements for Student Portfolios:**
    - Baseline writing samples – start and end of school year
    - 2 ELA Performance assessments (all stages with rubric attached.)
    - 2 Math Performance assessments
    - Standardized test scores
    - Social Studies, Science, Art, Technology, Music, World Language samples
    - Student Choices with entry slip attached
    - Other items deemed necessary by the local school
        - Writing pieces
        - Science experiments
        - Mathematics problems and solutions
        - Applied Mathematics
        - Book reviews
        - Research projects
        - Physical Fitness Summary
        - Interdisciplinary projects/assignments

Resources

Web site for Common Core Standards:

http://www.corestandards.org/the-standards/

- **Resources aligned to the Common Core Standards can be found at : http://teacherweb.com/PA/AOP/ETCC/apt1.aspx**

You will find a wealth of resources related to curriculum on the following Curriculum Committee web sites.

- **Curriculum web site: http://www.teacherweb.com/PA/AOP/ElementaryCurriculumandInstruction/h1.aspx English Language Arts web site: http://www.teacherweb.com/PA/AOP/ElementaryIntegratedLanguageArts%28ILA%29/ap2.aspx**
- **Mathematics web site: http://www.teacherweb.com/PA/AOP/ElementaryMathematicsCurriculumCommittee/apt1.aspx**
- **Library Media web site: http://www.teacherweb.com/PA/AOP/ElementaryLibraryMediaCommittee/h0.stm**
- **Early Childhood web site: http://www.teacherweb.com/PA/AOP/EarlyChildhood/**
- **Assessment: http://www.teacherweb.com/PA/AOP/ElementaryAssessmentCommittee/ap1.aspx**