



Grade 7-8 Standards

English Language Arts (ELA) (2012) - Grade 7

Reading for 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 meanings 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 for 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.
 - W.7.1.a.** Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
 - W.7.1.b.** Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
 - W.7.1.c.** Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), reasons, and evidence.
 - W.7.1.d.** Establish and maintain a formal style.
 - W.7.1.e.** 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.
 - W.7.2.a.** 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.
 - W.7.2.b.** Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
 - W.7.2.c.** Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.
 - W.7.2.d.** Use precise language and domain-specific vocabulary to inform about or explain the topic.
 - W.7.2.e.** Establish and maintain a formal style.
 - W.7.2.f.** 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.

W.7.3.a. 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.

W.7.3.b. Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.

W.7.3.c. Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another.

W.7.3.d. Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events.

W.7.3.e. 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. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 7.)

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.

W.7.9.a. 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”).

W.7.9.b. 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.

SL.7.1.a. 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.

SL.7.1.b. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

SL.7.1.c. 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.

SL.7.1.d. 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. (See grade 7 Language standards 1 and 3 for specific expectations.)

Language

Conventions of Standard English

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

L.7.1.a. Explain the function of phrases and clauses in general and their function in specific sentences.

L.7.1.b. Choose among simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas.

L.7.1.c. 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.

L.7.2.a. Use a comma to separate coordinate adjectives (e.g., *It was a fascinating, enjoyable movie but not He wore an old[,] green shirt*).

L.7.2.b. Spell correctly.

Knowledge of Language

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

L.7.3.a. 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.

- L.7.4.a. 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.
 - L.7.4.b. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., belligerent, bellicose, rebel).
 - L.7.4.c. 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.
 - L.7.4.d. 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.
- L.7.5.a. Interpret figures of speech (e.g., literary, biblical, and mythological allusions) in context.
 - L.7.5.b. Use the relationship between particular words (e.g., synonym/antonym, analogy) to better understand each of the words.
 - L.7.5.c. 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.

English Language Arts (ELA) (2012) - Grade 8

Reading for Literature

Key Ideas and Details

- RL.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly, as well as inferences drawn from the text.
- RL.8.2 Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.
- RL.8.3 Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.

Craft and Structure

- RL.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.
- RL.8.5 Compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.
- RL.8.6 Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.

Integration of Knowledge and Ideas

- RL.8.7 Analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the text or script, evaluating the choices made by the director or actors.
- RL.8.8 (Not applicable to literature)
- RL.8.9 Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new.

Range of Reading and Level of Text Complexity

RI.8.10 By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6–8 text complexity band independently and proficiently.

Reading for Informational Text

Key Ideas and Details

RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly, as well as inferences drawn from the text.

RI.8.2 Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.

RI.8.3 Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).

Craft and Structure

RI.8.4 Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

RI.8.5 Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.

RI.8.6 Determine an author’s point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

Integration of Knowledge and Ideas

RI.8.7 Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

RI.8.8 Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

RI.8.9 Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.

Range of Reading and Level of Text Complexity

RI.8.10 By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6–8 text complexity band independently and proficiently.

Writing

Text Types and Purposes

W.8.1 Write arguments to support claims with clear reasons and relevant evidence.

W.8.1.a. Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.

W.8.1.b. Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

W.8.1.c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.

W.8.1.d. Establish and maintain a formal style.

W.8.1.e. Provide a concluding statement or section that follows from and supports the argument presented.

W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

W.8.2.a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

W.8.2.b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

W.8.2.c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

W.8.2.d. Use precise language and domain-specific vocabulary to inform about or explain the topic.

W.8.2.e. Establish and maintain a formal style.

W.8.2.f. Provide a concluding statement or section that follows from and supports the information or explanation presented.

W.8.3 Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

W.8.3.a. 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.

W.8.3.b. Use narrative techniques, such as dialogue, pacing, description, and reflection, to develop experiences, events, and/or characters.

W.8.3.c. Use a variety of transition words, phrases, and clauses to convey sequence, signal shifts from one time frame or setting to another, and show the relationships among experiences and events.

W.8.3.d. Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events.

W.8.3.e. Provide a conclusion that follows from and reflects on the narrated experiences or events.

Production and Distribution of Writing

W.8.4 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 W.8.1 through W.8.3.)

W.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. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 8.)

W.8.6 Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently, as well as to interact and collaborate with others.

Research to Build and Present Knowledge

W.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.

W.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.

W.8.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

W.8.9.a. Apply grade 8 Reading standards to literature (e.g., “Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new”).

W.8.9.b. Apply grade 8 Reading standards to literary nonfiction (e.g., “Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced”).

Range of Writing

W.8.10 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.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

SL.8.1.a. 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.

SL.8.1.b. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

SL.8.1.c. Pose questions that connect the ideas of several speakers and respond to others’ questions and comments with relevant evidence, observations, and ideas.

SL.8.1.d. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

SL.8.2 Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

SL.8.3 Delineate a speaker’s argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

Presentation of Knowledge and Ideas

SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

SL.8.6 Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 8 Language standards 1 and 3 for specific expectations.)

Language

Conventions of Standard English

- L.8.1** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.8.1.a.** Explain the function of verbals (gerunds, participles, infinitives) in general and their function in particular sentences.
 - L.8.1.b.** Form and use verbs in the active and passive voice.
 - L.8.1.c.** Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood.
 - L.8.1.d.** Recognize and correct inappropriate shifts in verb voice and mood.
- L.8.2** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- L.8.2.a.** Use punctuation (comma, ellipsis, dash) to indicate a pause or break.
 - L.8.2.b.** Use an ellipsis to indicate an omission.
 - L.8.2.c.** Spell correctly.

Knowledge of Language

- L.8.3** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- L.8.3.a.** Use verbs in the active and passive voice and in the conditional and subjunctive mood to achieve particular effects (e.g., emphasizing the actor or the action; expressing uncertainty or describing a state contrary to fact).

Vocabulary Acquisition and Use

- L.8.4** Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.
- L.8.4.a.** 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.
 - L.8.4.b.** Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., precede, recede, secede).
 - L.8.4.c.** 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.
 - L.8.4.d.** 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.8.5** Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
- L.8.5.a.** Interpret figures of speech (e.g. verbal irony, puns) in context.
 - L.8.5.b.** Use the relationship between particular words to better understand each of the words.
 - L.8.5.c.** Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., bullheaded, willful, firm, persistent, resolute).
- L.8.6** 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.

Science (2016)

These standards are created in grade bands. These are the grade 6-8 middle school standards. Please note school districts make local decisions on how to break up/repeat these standards across the 3-year span.

Science & Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Crosscutting Concepts

1. Patterns
2. Cause and effect
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter
6. Structure and function
7. Stability and change

Physical Science

PS1 Matter and Its Interactions

MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

MS-PS1-2 Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

MS-PS1-4 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS1-5 Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

MS-PS1-6 Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

PS2 Motion and Stability: Forces and Interactions

MS-PS2-1 Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

MS-PS2-2 Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

- MS-PS2-4** Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
- MS-PS2-5** Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

PS3 Energy

- MS-PS3-1** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
- MS-PS3-2** Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
- MS-PS3-3** Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
- MS-PS3-4** Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- MS-PS3-5** Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

PS4 Waves and their Applications in Technologies for Information Transfer

- MS-PS4-1** Use mathematical representations to describe a simple model for waves, which includes how the amplitude of a wave is related to the energy in a wave.
- MS-PS4-2** Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
- MS-PS4-3** Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

Life Science

LS1 From Molecules to Organisms: Structure and Processes

- MS-LS1-1** Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- MS-LS1-2** Develop and use models to describe the parts, functions, and basic processes of cells.
- MS-LS1-3** Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- MS-LS1-4** Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- MS-LS1-5** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- MS-LS1-6** Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- MS-LS1-7** Develop a model to describe how food molecules (sugar) are rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- MS-LS1-8** Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

LS2 Ecosystems: Interactions, Energy, and Dynamics

- MS-LS2-1** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- MS-LS2-2** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- MS-LS2-3** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- MS-LS2-4** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- MS-LS2-5** Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

LS3 Heredity: Inheritance and Variation of Traits

- MS-LS3-1** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
- MS-LS3-2** Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

LS4 Biological Evolution: Unity and Diversity

- MS-LS4-1** Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
- MS-LS4-2** Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
- MS-LS4-4** Construct an explanation based on evidence that describes how genetic variations of traits in a population affects individuals' probability of surviving and reproducing in a specific environment.
- MS-LS4-5** Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
- MS-LS4-6** Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Earth and Space Science

ESS1 Earth's Place in the Universe

- MS-ESS1-1** Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
- MS-ESS1-2** Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- MS-ESS1-3** Analyze and interpret data to determine scale properties of objects in the solar system.
- MS-ESS1-4** Construct a scientific explanation based on evidence from rocks and rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

ESS2 Earth's Systems

- MS-ESS2-1** Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

- MS-ESS2-2** Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
- MS-ESS2-3** Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
- MS-ESS2-4** Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- MS-ESS2-5** Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
- MS-ESS2-6** Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

ESS3 Earth and Human Activity

- MS-ESS3-1** Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- MS-ESS3-2** Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- MS-ESS3-3** Apply scientific principles to design a method for monitoring, evaluating, and managing a human impact on the environment.
- MS-ESS3-4** Construct an argument supported by evidence for how changes in human population and per-capita consumption of natural resources impact Earth's systems.
- MS-ESS3-5** Ask questions to clarify evidence of the factors that have caused changes in global temperatures over time.

Engineering and Design

ETS1 Engineering, Technology, and Applications of Science

- MS-ETS1-1** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3** Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4** Develop a model for a proposed object, tool or process and then use an iterative process to test the model, collect data, and generate modification ideas trending toward an optimal design.

ETS2 Engineering, Technology, Science, and Society

- MS-ETS2-1** Ask questions about a common household appliance, collect data to reverse-engineer the appliance and learn how its design has evolved, describe how scientific discoveries, technological advances, and engineering design played significant roles in its development, and explore how science, engineering, and technology might be used together or individually in producing improved versions of the appliance.
- MS-ETS2-2** Develop a model defining and prioritizing the impacts of human activity on a particular aspect of the environment, identifying positive and negative consequences of the activity, both short- and long-term, and investigate and explain how the ethics and integrity of scientists and engineers and respect for individual property rights might constrain future development.

Math (2018) - Grade 7

Grade 7 Math Practices

MP1 Make sense of problems and persevere in solving them.

7.MP.1 In grade 7, students solve real-world problems involving ratios, rates, proportions, rational numbers, and geometric concepts and discuss (verbally or in writing) how they solve them. Students analyze the problem (including what is given, not given, and what is being asked), identify what strategies are needed, choose an appropriate pathway, then make an initial attempt to solve the problem. Students analyze the result for validity and refine strategies if necessary.

MP2 Reason abstractly and quantitatively.

7.MP.2 Students represent a wide variety of real-world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.

MP3 Construct viable arguments and critique the reasoning of others.

7.MP.3 Students construct arguments using verbal or written explanations that involve solving problems with rational numbers. They make conjectures, explore validity, reason mathematically, justify, evaluate their own thinking and the thinking of other students.

MP4 Model with mathematics.

7.MP.4 Students can clearly show their work by using diagrams, words, symbols, or pictures. 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/or formulas. They can analyze those relationships mathematically to draw conclusions. They interpret their mathematical results of problems involving rational numbers in the context of the situation and reflect on whether the results make sense.

MP5 Use appropriate tools strategically.

7.MP.5 Students consider available tools (including estimation, concrete models, and technology as appropriate) and decide when certain tools might be helpful. Students develop more efficacy with technology. They choose the representation (table, graph, equation, words) that best suits the problem. Students use concrete models to develop insight into proportions and other concepts. Students then extend this insight to more abstract representations, including pictures and symbols. Students understand the limitations of each tool. Tools might include: integer tiles, algebra tiles, geometric nets, number lines, graphing technology, scientific calculator, paper and pencil, and others.

MP6 Attend to precision.

7.MP.6 Students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students define variables, including their relationship, specify units of measure, and label each axis accurately. Students use appropriate terminology when referring to rates, ratios, proportions, probability models, geometric figures, data displays, and components of expressions, equations, or inequalities. Students use appropriate symbols, labels, and units of measure when solving problems with calculations that are accurate and efficient. Answer to the problem matches what was asked in the problem.

MP7 Look for and make use of structure.

7.MP.7 Students routinely seek patterns or structure to model and solve problems. They recognize that patterns exist in ratio tables and make connections with the constant of proportionality in a table and the slope of a graph. Students recognize patterns and identify and develop strategies for creating equivalent expressions. Students identify complicated expressions or figures as compositions of simple parts.

MP8 Look for and express regularity in repeated reasoning.

7.MP.8 Students routinely seek patterns or structure to model and solve problems. They apply properties to solve problems based upon patterns they have identified. Students examine patterns to generate equations and describe relationships. Students simplify complicated expressions into simple terms. Students recognize the effects of transformations and describe them in terms of congruence and similarity.

Ratios and Proportional Relationships

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

7.RP.A.1 Compute unit rates, including those involving complex fractions, with like or different units.

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

7.RP.A.2a Decide whether two quantities in a table or graph are in a proportional relationship.

7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

7.RP.A.2c Represent proportional relationships with equations.

7.RP.A.2d 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.A.3 Solve multi-step real-world and mathematical problems involving ratios and percentages.

The Number System

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

7.NS.B.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers.

7.NS.B.1a Describe situations in which opposite quantities combine to make 0 (the additive identity).

7.NS.B.1b Understand that $p + q$ represents the distance $|q|$ from p whose placement is determined by the sign of q . Interpret sums of rational numbers by describing real-world contexts.

7.NS.B.1c Show that a number and its opposite have a sum of 0 (are additive inverses).

7.NS.B.1d Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Apply this principle in real-world contexts.

7.NS.B.1e Apply properties of addition as strategies to add and subtract rational numbers.

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

7.NS.B.2a 1. Understand that the multiplicative inverse of a number is its reciprocal and their product is equal to one (the multiplicative identity). 2. Understand positive and negative sign rules for multiplying rational numbers. Interpret products of rational numbers by describing real-world contexts.

- 7.NS.B.2b** Understand that integers can be divided, provided that the divisor is not 0, and every quotient of integers is a rational number. Recognize that if p and q are integers then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
- 7.NS.B.2c** Apply properties of multiplication (Commutative, Associative, Distributive, or Properties of Identity and Inverse elements) to multiply and divide rational numbers.
- 7.NS.B.2d** Convert a rational number to a decimal. Recognize that rational numbers can be written as fractions or decimal numbers that terminate or repeat.
- 7.NS.B.3** Solve real-world and mathematical problems involving the four arithmetic operations with rational numbers. (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.C.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- 7.EE.C.2** Recognize that algebraic expressions may have a variety of equivalent forms that reveal different information, and determine an appropriate form for a given real-world situation.

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

- 7.EE.D.3** Solve multi-step real-world and mathematical problems involving rational numbers. Include fraction bars as a grouping symbol.
- 7.EE.D.4** Apply the concepts of linear equations and inequalities in one variable to real-world and mathematical situations.
 - 7.EE.D.4a** Write and fluently solve linear equations of the form $ax+b = c$ and $a(x+b)=c$ where a , b , and c are rational numbers.
 - 7.EE.D.4b** Write and solve multi-step linear equations that include the use of the Distributive Property and combining like terms. Exclude equations that contain variables on both sides.
 - 7.EE.D.4c** Write and solve two-step linear inequalities. Graph the solution set on a number line and interpret its meaning.
 - 7.EE.D.4d** Identify and justify the steps for solving multi-step linear equations and two-step linear inequalities.

Geometry

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

- 7.G.E.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing.
- 7.G.E.2** Draw geometric shapes with given conditions using a variety of tools (e.g., ruler and protractor, or technology). 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.E.3** Describe the two-dimensional figures that result from slicing three-dimensional figures parallel to the base, 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.F.4** Investigate the concept of circles.
 - 7.G.F.4a** Demonstrate an understanding of the proportional relationships between diameter, radius, and circumference of a circle.

- 7.G.F.4b Understand that π is defined by the constant of proportionality between the circumference and diameter.
- 7.G.F.4c Given the formulas for circumference and area of circles, solve real-world and mathematical problems.
- 7.G.F.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.F.6 Solve real-world and mathematical problems involving:
 - 7.G.F.6a Area and surface area of objects composed of triangles and quadrilaterals;
 - 7.G.F.6b Volume of objects composed only of right prisms having triangular or quadrilateral bases.

Statistics and Probability

Use random sampling to draw inferences about a population.

- 7.SP.G.1 Solve real-world and mathematical problems involving:
 - 7.SP.G.1a Understand that a sample is a subset of a population.
 - 7.SP.G.1b Differentiate between random and non-random sampling.
 - 7.SP.G.1c Understand that generalizations from a sample are valid only if the sample is representative of the population.
 - 7.SP.G.1d Understand that random sampling is used to gather a representative sample and tends to support valid inferences about the population.
- 7.SP.G.2 Draw inferences about a population by collecting multiple random samples of the same size to investigate variability in estimates of the characteristic of interest.

Draw informal comparative inferences about two populations.

- 7.SP.H.3 Visually compare the centers, spreads, and overlap of two displays of data (e.g., back-to-back stem and leaf plots, dot plots, histograms, box plots) that are graphed on the same scale and draw inferences about this data.
- 7.SP.H.4 Given measures of center and variability (mean, median, and/or mode; range, interquartile range, and/or standard deviation), for numerical data from random samples, draw appropriate informal comparative inferences about two populations.

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

- 7.SP.I.5 Find and interpret the probability of a random event. Understand that the probability of a random event is a number between, and including, 0 and 1 that expresses the likelihood of the event occurring.
- 7.SP.I.6 Collect multiple samples to compare the relationship between theoretical and experimental probabilities for simple events.
- 7.SP.I.7 Apply the concepts of theoretical and experimental probabilities for simple events.
 - 7.SP.I.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
 - 7.SP.I.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
 - 7.SP.I.7c Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancies.
- 7.SP.I.8 Find probabilities of compound events using organized lists, tables, and tree diagrams.
 - 7.SP.I.8a 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.

7.SP.1.8b 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.

Math (2018) - Grade 8

Grade 8 Math Practices

MP1 Make sense of problems and persevere in solving them.

8.MP.1 In grade 8, students solve real-world problems through the application of algebraic and geometric concepts and discuss (verbally or in writing) how they solve them. Students analyze the problem (including what is given, not given, and what is being asked), identify what strategies are needed, choose the most efficient pathway, then make an initial attempt to solve the problem. Students analyze the result for validity and refine strategies if necessary.

MP2 Reason abstractly and quantitatively.

8.MP.2 Students represent a wide variety of real-world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students examine patterns in data and assess the degree of linearity of functions. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.

MP3 Construct viable arguments and critique the reasoning of others.

8.MP.3 Students construct arguments using verbal or written explanations that involve solving problems with real numbers. They make conjectures, explore validity, reason mathematically, justify, evaluate their own thinking, and analytically critique the reasoning of other students.

MP4 Model with mathematics.

8.MP.4 Students can clearly show their work by using diagrams, words, symbols, or pictures. 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 of problems involving real numbers 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.

MP5 Use appropriate tools strategically.

8.MP.5 Students consider available tools (including estimation, concrete models, and technology as appropriate), and decide when certain tools might be helpful. Students can interpret results provided by technology. They choose the representation (table, graph, equation, words) that best suits the problem. Students use concrete models to develop insight into linear equations and other concepts. Students then extend this insight to more abstract representations, including pictures and symbols. Students understand the limitations of each tool. Tools might include: integer tiles, algebra tiles, geometric nets, number lines, graphing technology, scientific calculator, paper and pencil, and others.

MP6 Attend to precision.

8.MP.6 Students continue to refine their mathematical communication skills by using clear and precise mathematical language in their discussions with others and in their own reasoning. Students define variables, including their relationship, specify units of measure, and label each axis accurately. Students use appropriate terminology when referring to the number system, functions, geometric figures, and data displays. Students use appropriate symbols, labels, and units of measure when solving problems with calculations that are accurate and efficient. Answer to the problem matches what was asked in the problem.

MP7 Look for and make use of structure.

8.MP.7 Students routinely seek patterns or structure to model and solve problems. They apply properties to solve problems based upon patterns they have identified. Students examine patterns to generate equations and describe relationships. Students simplify complicated expressions into simple terms. Students recognize the effects of transformations and describe them in terms of congruence and similarity.

MP8 Look for and express regularity in repeated reasoning.

8.MP.8 Students use repeated reasoning to understand algorithms and make generalizations about patterns. They develop efficient strategies for solving problems and check for reasonableness of answers. Students ask questions such as, “What evidence supports that conclusion?”

The Number System

Know that there are numbers that are not rational, and approximate them by rational numbers.

8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. Explore the real number system and its appropriate usage in real-world situations.

8.NS.A.1a Make comparisons between rational and irrational numbers.

8.NS.A.1b Understand that all real numbers have a decimal expansion.

8.NS.A.1c Model the hierarchy of the real number system, including natural, whole, integer, rational, and irrational numbers.

8.NS.A.1d Convert repeating decimals to fractions.

8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.

Expressions and Equations

Work with radicals and integer exponents.

8.EE.B.1 Understand and apply the Laws of Exponents (i.e. Product Rule, Quotient Rule, Power to a Power, Product to a Power, Quotient to a Power, Zero Power Property, negative exponents) to generate equivalent numerical expressions limited to integer exponents.

8.EE.B.2 Investigate concepts of square and cube roots.

8.EE.B.2a Use radical notation, if applicable, to represent the exact solutions to equations of the form $x^2 = p$ and $x^3 = q$ where p is a positive rational number and q is any rational number.

8.EE.B.2b Evaluate square roots of small perfect squares and cube roots of small perfect cubes.

8.EE.B.2c Recognize that square roots of non-perfect squares and the cube roots of non-perfect cubes are irrational.

8.EE.B.3 Explore the relationship between quantities in decimal and scientific notation.

8.EE.B.3a Express very large and very small quantities, p , in scientific notation in the form $a \times 10^b = p$ where $1 \leq a < 10$ and b is an integer.

8.EE.B.3b Translate between decimal notation and scientific notation.

8.EE.B.3c Estimate and compare the relative size of two quantities in scientific notation.

8.EE.B.4 Apply the concepts of decimal and scientific notation to real-world and mathematical problems.

8.EE.B.4a Select appropriate units of measure when representing answers in scientific notation.

8.EE.B.4b Interpret scientific notation that has been generated by a variety of technologies.

Understand the connections between proportional relationships, lines, and linear equations.

8.EE.C.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

8.EE.C.6 Explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at $(0, b)$.

Analyze and solve linear equations and pairs of simultaneous linear equations.

8.EE.D.7 Extend concepts of linear equations and inequalities in one variable to more complex multi-step equations and inequalities in real-world and mathematical situations.

8.EE.D.7a Solve linear equations and inequalities with rational number coefficients that include the use of the Distributive Property, combining like terms, and variable terms on both sides.

8.EE.D.7b Recognize the three types of solutions to linear equations: one solution, infinitely many solutions, or no solutions.

8.EE.D.7c Generate linear equations with the three types of solutions.

8.EE.D.7d Justify why linear equations have a specific type of solution.

8.EE.D.8 Analyze and solve pairs of simultaneous linear equations.

8.EE.D.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

8.EE.D.8b Solve systems of two linear equations in two variables with integer solutions by graphing the equations.

8.EE.D.8c Solve simple real-world and mathematical problems leading to two linear equations in two variables given $y = mx + b$ form with integer solutions.

Functions

Define, evaluate, and compare functions.

8.F.E.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

8.F.E.2 Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

8.F.E.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

Use functions to model relationships between quantities.

8.F.F.4 Apply the concepts of linear functions to real-world and mathematical situations.

8.F.F.4a Understand that the slope is the constant rate of change and the y -intercept is the point where $x = 0$.

- 8.F.F.4b** Determine the slope and the y -intercept of a linear function given multiple representations, including two points, tables, graphs, equations, and verbal descriptions.
- 8.F.F.4c** Construct a function in slope-intercept form that models a linear relationship between two quantities.
- 8.F.F.4d** Interpret the meaning of the slope and the y -intercept of a linear function in the context of the situation.
- 8.F.F.5** Describe qualitatively the functional relationship between two quantities by analyzing a graph where the function is increasing, decreasing, constant, linear, or nonlinear. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Geometry

Understand congruence and similarity using physical models, transparencies, or geometry software.

- 8.G.G.1** Verify experimentally the properties of rotations, reflections, and translations.
 - 8.G.G.1a** Lines are taken to lines, and line segments to line segments of the same length.
 - 8.G.G.1b** Angles are taken to angles of the same measure.
 - 8.G.G.1c** Parallel lines are taken to parallel lines.
- 8.G.G.2** Recognize through visual comparison that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
- 8.G.G.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- 8.G.G.4** Recognize through visual comparison that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
- 8.G.G.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

Understand and apply the Pythagorean Theorem.

- 8.G.H.6** Use models or diagrams to explain the Pythagorean Theorem and its converse.
- 8.G.H.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems.
- 8.G.H.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

- 8.G.I.9** Given the formulas, solve real-world and mathematical problems involving volume and surface area of cylinders.

Statistics and Probability

Investigate patterns of association in bivariate data.

- 8.SP.J.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe the association by form (linear / nonlinear), direction (positive / negative), strength (correlation), and unusual features.
- 8.SP.J.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

- 8.SP.J.3 Use an equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
- 8.SP.J.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table.
 - 8.SP.J.4a Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.
 - 8.SP.J.4b Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

Social Studies (2014+2018)

These standards are created in grade bands. These are the grade 6-8 standards. Please note school districts make local decisions on how to break up/repeat these standards across the 3-year span.

Citizenship, Government, and Democracy

Students analyze how people create and change structures of power, authority, and governance to understand the continuing evolution of governments and to demonstrate civic responsibility.

- SS8.1.1 Explain the rights, duties, and responsibilities of a United States citizen.
 - SS8.1.1.a Explain the rights, duties, and responsibilities of being a tribal member on the Wind River Indian Reservation (e.g., inherent rights, treaty obligations, and tribal sovereignty).
- SS8.1.2 Explain how to participate in the political process. (i.e., tribal, local, state, and national elections).
- SS8.1.3 Explain the historical development of the United States Constitution and treaties (e.g., 1868 Fort Bridger Treaty) and how they have shaped the United States, Wyoming, and tribal government.
- SS8.1.4 Understand the differences between United States civil and criminal legal systems within the federal, state, and tribal levels.
- SS8.1.5 Describe the structures of the United States and Wyoming Constitutions (e.g., Articles, Bill of Rights, amendments).
 - SS8.1.5.a Describe how the U.S. Constitution creates a special relationship with tribal governments (i.e., Plenary Power, [Indian Commerce Clause - Article I, Section 8, Clause 3](#); [Supremacy Clause - Article VI, Clause 2](#); [Cherokee Nation v. Georgia](#)).
- SS8.1.6 Understand the basic structures of various political systems (e.g., tribal, local, national, and world).

Culture and Cultural Diversity

Students demonstrate an understanding of the contributions and impacts of human interaction and cultural diversity on societies.

- SS8.2.1 Compare and contrast the ways various groups (e.g., ethnic communities and Indigenous Tribes of Wyoming) meet human needs and concerns (e.g., self-esteem, friendship, and tribal heritage) and contribute to identity, situations, and events.
- SS8.2.2 Evaluate how human expression (e.g., language, literature, arts, architecture, traditions, beliefs, and spirituality) contributes to cultural development, understanding, and continuity (e.g., oral tradition, Pow Wows, ceremonies, and assimilation).
- SS8.2.3 Analyze the unique cultural characteristics of various groups within Wyoming and the nation, including Indigenous Tribes of Wyoming (e.g., language, traditions, spirituality, art, and lifestyle).
- SS8.2.4 Explain the cultural contributions of and tensions between groups in Wyoming, the United States, and the World (e.g., racial, ethnic, social, and institutional).

SS8.2.4.a Explain the cultural contributions of and interactions between Native Americans and immigrant groups in Wyoming and the United States.

Production, Distribution, and Consumption

Students describe the influence of economic factors on societies and make decisions based on economic principles.

- SS8.3.1** Identify and apply basic economic concepts (e.g., supply, demand, production, exchange and consumption, labor, wages, scarcity, prices, incentives, competition, and profits).
- SS8.3.2** Compare and contrast how people organize for the production, distribution, and consumption of goods and services in various economic systems (e.g., characteristics of market, command, and mixed economies).
- SS8.3.3** Describe the impact of technological advancements on production, distribution, and consumption. (e.g., businesses and/or corporations in the United States and the world).
- SS8.3.4** Explain or illustrate how money is used by individuals, groups, and financial institutions.
- SS8.3.5** Describe how values and beliefs influence individual, family, and business decisions (microeconomics).

Time, Continuity, and Change

Students analyze events, people, problems, and ideas within their historical contexts.

- SS8.4.1** Describe how historical events impact the future (cause and effect) and how change spreads to other places (e.g., spread of industrial revolution or causes of the Civil War, impacts of Manifest Destiny, aftermath of French and Indian War, and progression of Indian Removal Act).
- SS8.4.2** Describe how tools and technology in different historical periods impacted the way people, including Indigenous Tribes of Wyoming, lived, made decisions, and saw the world (e.g., impact of horses and European trade goods on Plains Indian cultures, mechanized agriculture, and Industrial Revolution technologies).
- SS8.4.3** Analyze the way current events affect all people, including Indigenous Tribes of Wyoming. Investigate the history leading up to those events and suggest alternative ways such events may have played out.
- SS8.4.4** Identify historical interactions between and among individuals, groups, and/or institutions (e.g., family, neighborhood, political, economic, religious, social, cultural, and workplace).
 - SS8.4.4.a** Identify how federal policies have impacted Indigenous Tribes of Wyoming historically and currently (e.g., reservations, treaties, allotment, boarding schools, and forced assimilation).
- SS8.4.5** Identify relevant primary (e.g., historical photographs, artifacts, and documents, including treaties) and secondary sources for research. Compare and contrast treatment of the same topic in several primary and secondary sources, which may include oral history and traditional storytelling.

People, Places, and Environments

Students apply their knowledge of the geographic themes (location, place, movement, region, and human/environment interactions) and skills to demonstrate an understanding of interrelationships among people, places, and environment.

- SS8.5.1** Use and create models of the Earth to analyze the interactions of physical and human systems to demonstrate global interconnectedness.
 - SS8.5.1.a** Analyze the impact of natural resources on tribal locations, past and present.

- SS8.5.2** Analyze and evaluate how physical features and changes influenced historical events (e.g., route of Union Pacific Railroad, location of Wind River Indian Reservation, state and national monuments and parks) and participate in collaborative problem solving and decision making in the selection of professional and personal choices.
- SS8.5.3** Explain how communities' current and past demographics, migrations, and settlement patterns influence place (e.g., culture, needs, and political and economic systems) and use this analysis to predict future settlement patterns.
- SS8.5.3.a** Explain how the migration and settlement patterns of indigenous tribes influence place (e.g., migration of pre-Columbian Tribes, and reservation movement).
- SS8.5.4** Analyze the changes to and consequences of human, natural, and technological impacts on the physical environment.
- SS8.5.4.a** Analyze how cultural practices continue to influence how Indigenous Tribes of Wyoming interact with the environment.

Technology, Literacy, and Global Connections

Students use technology and literacy skills to access, synthesize, and evaluate information to communicate and apply social studies knowledge to global situations.

- SS8.6.1** Use and evaluate multiple sources of information in diverse formats and media in order to address a question or solve a problem.
- SS8.6.2** Distinguish among fact, opinion, and reasoned judgment in a text.
- SS8.6.3** Use digital tools to research, design, and present social studies concepts (e.g., understand how individual responsibility applies in usage of digital media). Link to [ISTE student standards](#).
- SS8.6.4** Use accurate, sufficient, and relevant information from primary and secondary sources to support writing.

Career and Vocational Education (CTE) (2014)

These standards are created in grade bands. These are the grade 6-8 standards. Please note school districts make local decisions on how to break up/repeat these standards across the 3-year span.

Career Development and Readiness

Students demonstrate career planning and employability skills.

- CV8.1.1** Career-aware students explore several career pathways including but not limited to outlook, salary, needed training, duties, and lifestyle.
- CV8.1.2** Career-aware students conduct an inventory of personal skills, aptitude, and interests and identify career pathways that align with their results.
- CV8.1.3** Career-aware students prepare a self-improvement plan including secondary and postsecondary programs to gain desired knowledge and experience toward possible career opportunities.
- CV8.1.4** Career-aware students demonstrate an awareness of characteristics and skills necessary to enhance employability.

Communication and Collaboration

Students develop the skills necessary to effectively lead, collaborate, and communicate.

- CV8.2.1** Career-aware students effectively communicate using a variety of appropriate methods.
- CV8.2.2** Career-aware students successfully lead a group activity.

CV8.2.3 Career-aware students actively participate as a team member to accomplish group goals while effectively working with diverse individuals/groups.

CV8.2.4 Career-aware students apply safe, legal, and responsible use of information and technology as appropriate to the task.

Critical Thinking and Problem Solving

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate technology, tools, and resources.

CV8.3.1 Career-aware students identify real-world problems and efficiently locate & effectively use various sources of information for informed decision making.

CV8.3.2 Career-aware students demonstrate an awareness of the working process of business and political systems and how they affect specific careers.

CV8.3.3 Career-aware students demonstrate an ability to explain and interpret solutions to problems using data and information compiled from a variety of reputable sources.

CV8.3.4 Career-aware students plan, manage, and complete projects in a timely and effective manner.

Technical Literacy

Students effectively read, evaluate, write, and communicate technical information.

CV8.4.1 Career-aware students produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose and audience. (CCSS W.9.4)

CV8.4.2 Career-aware students demonstrate the ability to identify sources from which they locate, interpret, extract, and summarize data in an ethical and appropriate manner.

CV8.4.3 Career-aware students demonstrate the ability to create compositions and presentations of technical data in both written and verbal formats.

CV8.4.4 Career-aware students integrate and translate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

Technical Proficiency and Productivity

Students safely, ethically, and productively use existing and new technologies and systems.

CV8.5.1 Career-aware students identify technical and digital systems, how they are properly and ethically used, and their relationship to other systems globally.

CV8.5.2 Career-aware students plan tasks recognizing human resources, financial, and timeline constraints that take into account priorities and goals.

CV8.5.3 Career-aware students demonstrate technical knowledge and skills by safely, ethically, and appropriately acquiring, storing, organizing, and using materials, tools, and workspace.

CV8.5.4 Career-aware students demonstrate proficiency in selecting and utilizing technologies in the completion of tasks and projects.

Health (2012) - Grades 7-8

These standards are created in grade bands. These are the grade 7-8 standards. Please note school districts make local decisions on how to break up/repeat these standards across the 2-year span.

Health Information, Products, and Resources

Students will access, analyze, and evaluate health information, products, and resources.

- HE8.1.1 Demonstrate the ability to locate appropriate health resources at school or in the community that help *enhance* health. ME, PH, NUT
- HE8.1.2 Demonstrate the ability to locate appropriate health resources at school or in the community that help *reduce* health risks. SEXUALITY, ATOD, VP/B
- HE8.1.3 Analyze situations or conditions to determine when health services are needed (e.g., Distinguish when symptoms warrant a visit to the doctor versus taking over the counter medication). ME, VP/B, SEXUALITY
- HE8.1.4 Explain criteria for determining validity of health information. SEXUALITY, ATOD, NUT
- HE8.1.5 Analyze health information for characteristics of validity (e.g. compare and contrast currency of info in different health articles on ATOD, Violence or mental/emotional health). ATOD, ME, VP/B
- HE8.1.6 Analyze characteristics of products and how they enhance health or reduce health risks (e.g., compare products). NUT, IP/S, PA

Problem Solving and Decision Making

Students will use critical thinking and systematic processes to examine health related problems and make decisions that enhance health and reduce or avoid health risks.

- HE8.2.1 Distinguish when individual or collaborative decision-making is appropriate. CEH, ATOD, VP/B
- HE8.2.2 Explain various types of decision-making processes to enhance health or reduce health risks (e.g., automatic, intuitive, etc.). ATOD, IP/S, NUT
- HE8.2.3 Apply a systematic decision making process that includes analysis of consequences to *enhance* health (e.g., impact of decision on self, on others). ME, PA, PCD
- HE8.2.4 Apply a systematic decision-making process that includes analysis of consequences to *reduce* or *avoid* health risks. ATOD, SEXUALITY, VP/B
- HE8.2.5 Analyze how peers, culture, and media can influence decisions students make about health practices and risk behaviors (e.g., time, fiscal, etc.). SEXUALITY, ATOD, ME
- HE8.2.6 Apply a systematic process to examine non-familiar health-related issues or problems (e.g., identify problems, collect information, analyze data, draw conclusions, make recommendations). ATOD, CEH, PCD (e.g., pandemics)

Effective Communication

Students will demonstrate the ability to use interpersonal communication skills to enhance health and reduce or avoid health risks.

- HE8.3.1 Demonstrate the ability to use effective communication techniques (written, verbal, nonverbal, visual, electronic, etc.) for a variety of purposes for *enhancing* health (e.g., to inform, to persuade or advocate, to instruct). PH, CEH, PCD
- HE8.3.2 Demonstrate the ability to use effective communication techniques (written, verbal, nonverbal, visual, electronic, etc.) for a variety of purposes for reducing or avoiding health risks (e.g., to inform, to persuade or advocate, to instruct). IP/S, SEXUALITY, ATOD

- HE8.3.3 Demonstrate the ability to apply effective refusal and conflict resolution skills to *avoid* risky situations. ATOD, SEXUALITY, VP/B
- HE8.3.4 Analyze characteristics of and demonstrate the ability to use effective listening to decipher meaning from a health message (e.g., listen for details, listen for specific information, identify emotions, listen for opinions, infer meaning, etc.). ANY CONTENT AREA

Personal and Social Responsibility

Students will demonstrate the ability to use personal and social skills that are associated with taking responsible action for enhancing health and reducing or avoiding health risks.

- HE8.4.1 Differentiate between appropriate and inappropriate behaviors for improving or maintaining personal health. PH, PA, NUT
- HE8.4.2 Analyze behaviors that avoid and reduce health risks, to self and others. ATOD, SEXUALITY, IP/S
- HE8.4.3 Demonstrate an understanding of behaviors that prevent the spread of disease. SEXUALITY, ATOD, PCD
- HE8.4.4 Describe signs of stress and how stress can affect health status. ME, ATOD
- HE8.4.5 Analyze age appropriate factors that create good stress and bad stress. ME, ATOD, SEXUALITY
- HE8.4.6 Demonstrate the ability to apply strategies to manage bad stress and use good stress to motivate successful performance. PA, NUT, PH
- HE8.4.7 Use criteria to set a short-term personal health goal and make a plan for achieving it. ME, PA, NUT
- HE8.4.8 Monitor progress toward achieving a short-term personal health goal and analyze why it is achieved or not achieved (e.g., the goal to be physically active for 30 minutes every day was achieved because it met all SMART criteria and my plan included activities for all weather conditions). ME, PA, NUT
- HE8.4.9 Analyze the effects of taking action to oppose bullying based on individual and group differences. VP/B, CEH, ME
- HE8.4.10 Describe various forms of bullying and the roles of all involved (aggressor, bystander, victim, etc.) in bullying situations. VP/B, CEH, ME
- HE8.4.11 Describe the impact of bullying on physical health, mental and emotional health, and social health (e.g. depression, violence, avoidance, suicide, physical illness, etc.). VP/B, CEH, ME

Physical Education (2014)

These standards are created in grade bands. These are the grade 6-8 middle school standards. Please note school districts make local decisions on how to break up/repeat these standards across the 3-year span.

Movement

The physically literate individual demonstrates competency and applies knowledge of a variety of movement skills, movement patterns, concepts, principles, and strategies/tactics as they apply to the learning and performance of physical activities.

- PE 8.1.1 Students demonstrate movement skills and patterns in a variety of activities.
- PE 8.1.2 Students demonstrate critical elements of specialized manipulative skills in modified team activities.
- PE 8.1.3 Students demonstrate critical elements of specialized skills in modified individual, dual, or lifetime activities.

- PE 8.1.4 Students apply tactical concepts and performance principles in modified team activities.
- PE 8.1.5 Students apply tactical concepts and performance principles in individual, dual, or lifetime activities.
- PE 8.1.6 Students compare and contrast skills used for different movement patterns.
- PE 8.1.7 Students analyze critical elements of specialized skills in a variety of activities.
- PE 8.1.8 Students analyze the use of strategies and tactics in a variety of physical activities.

Fitness

The physically literate individual demonstrates the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness.

- PE 8.2.1 Students create and monitor a personal plan using current levels of fitness and physical activity.
- PE 8.2.2 Students differentiate the health benefits associated with a variety of physical activities.
- PE 8.2.3 Students apply the principles, components, and practices of health-related fitness to improve short-term fitness goals.
- PE 8.2.4 Students engage in a variety of physical activities that will enhance health-related fitness (inside and/or outside of school).
- PE 8.2.5 Students explain valid characteristics of fitness-related products, technology, and resources related to fitness literacy.

Personal and Social Behavior

The physically literate individual exhibits responsible personal and social behavior that respects self and others and recognizes the value of physical activity for challenge, self-expression, and/or social interaction.

- PE 8.3.1 Students develop and apply appropriate rules, safe practices, and procedures in physical activity settings.
- PE 8.3.2 Students communicate effectively with others to promote respect and conflict resolution in physical activity settings.
- PE 8.3.3 Students engage in challenging experiences that develop confidence and independence.
- PE 8.3.4 Students engage in physical activities that promote self-expression and provide opportunities for social and group interaction.

Foreign/ World Language (2013)

These standards were created across the K-12 grade band. The committee recognized students approach these standards at different levels, not based on their grade, but based on their level of expertise or exposure to the language(s). Not shown here, the committee created 6 levels of performance level descriptors ranging from Novice-Mid to Advanced-Low.

Interpretive

All students will be able to use a foreign language other than English to understand and interpret spoken and written language, concepts, and ideas, while also gaining an understanding of the perspectives of other cultures. Through language study, they will make connections with other content areas, compare the language and culture studied with their own, and participate in home and global communities.

- FL1.IL.1 Students will perform at Intermediate Low Level while listening to a culturally authentic **audio** source.
- FL1.IL.2 Students will perform at Intermediate Low level while viewing a culturally authentic **audio-visual** source.
- FL1.IL.3 Students will perform at Intermediate Low level while reading culturally authentic **printed** material.

Interpersonal

All students will be able to use a foreign language other than English to negotiate meaning through the spoken or written exchange of information, concepts, and ideas, while gaining an understanding of the relationships among the products, practices, and perspectives of other cultures. Through language study, they will make connections with other content areas, compare the language and culture studied with their own, and participate in home and global communities.

FL2.IL.1 Students will perform at Intermediate Low level in **spoken** communication (2 way).

FL2.IL.2 Students will perform at Intermediate Low level in **written** communication (2 way).

Presentational

All students will be able to use a foreign language other than English to present information, concepts, and ideas, while also gaining an understanding of the perspectives of other cultures. Through language study, they will make connections with other content areas, compare the language and culture studied with their own, and participate in home and global communities.

FL3.IL.1 Students will present at the Intermediate Low level in a **spoken** presentation.

FL3.IL.2 Students will present at the Intermediate Low level in a **written** presentation.

Computer Science (2019)

These standards are created in grade bands. These are the grade 6-8 middle school standards. Please note school districts make local decisions on how to break up/repeat these standards across the 3-year span.

Computer Science (CS) Practices

1. Fostering an Inclusive Computing Culture
2. Collaborating Around Computing
3. Recognizing and Defining Computational Problems
4. Developing and Using Abstractions
5. Creating Computational Artifacts
6. Testing and Refining Computational Artifacts
7. Communicating About Computing

Computing Systems

Devices (D), Hardware & Software (HS), and Troubleshooting (T)

8.CS.D.01 Recommend improvements to the design of computing devices based on an analysis of how a variety of users interact with the device. [Practice 3.3 Recognizing and Defining Computational Problems]



8.CS.HS.01 Design and refine a project that combines hardware and software components to collect and exchange data. [Practice 5.1 Creating Computational Artifacts]

8.CS.T.01 Systematically identify, resolve, and document increasingly complex software and hardware problems with computing devices and their components. [Practice 6.2 Testing and Refining Computational Artifacts]

Network and the Internet

Network, Communication, & Organization (NCO) and Cybersecurity (C)

8.NI.NCO.01 Model the role of protocols in transmitting data across networks and the internet (e.g., explain protocols and their importance to data transmission; model how packets are broken down into smaller pieces and how they are delivered). [Practice 4.4 Developing and Using Abstractions]



8.NI.C.01 Critique physical and digital procedures that could be implemented to protect electronic data/information. . [Practice 7.3 Communicating About Computing]

8.NI.C.02 Apply multiple methods of encryption to model the secure transmission of data. [Practice 4.4 Developing and Using Abstractions]

Data Analysis

Storage (S), Collection, Visualization, & Transformation (CVT), and Inference & Models (IM)

8.DA.S.01 Represent data using multiple encoding schemes (e.g., ASCII, binary). [Practice 4.4 Developing and Using Abstractions]



8.DA.CVT.01 Using computational tools, transform collected data to make it more useful and reliable. [Practice 6.3 Testing and Refining Computational Artifacts]



8.DA.IM.01 Refine computational models based on generated data. [Practice 4.4 Developing and Using Abstractions] [Practice 5.3 Creating Computational Artifacts]

Algorithms and Programming

Algorithms (A), Variables (V), Control (C), Modularity (M), and Program Development (PD)

8.AP.A.01 Create flowcharts and pseudocode to design algorithms to solve complex problems. [Practice 4.1 & 4.4 Developing and Using Abstractions]

8.AP.V.01 Using grade appropriate content and complexity, create clearly named variables that represent different data types and perform operations on their values. [Practice 5.1 & 5.2 Creating Computational Artifacts]



8.AP.C.01 Using grade appropriate content and complexity, design and iteratively develop programs that combine control structures, including nested loops and compound conditionals. [Practice 5.1 & 5.2 Creating Computational Artifacts]

8.AP.M.01 Using grade appropriate content and complexity, decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs. [Practice 3.2 Recognizing and Defining Computational Problems]

8.AP.M.02 Using grade appropriate content and complexity, create procedures with parameters to organize code and make it easier to reuse. [Practice 4.1 & 4.3 Developing and Using Abstractions]

8.AP.PD.01 Using grade appropriate content and complexity, seek and incorporate feedback from team members and users to refine a solution to a problem. [Practice 1.1 Fostering an Inclusive Computing Culture] [Practice 2.3 Collaborating Around Computing]




8.AP.PD.02 Incorporate existing code, media, and libraries into original programs of increasing complexity and give attribution. [Practice 4.2 Developing and Using Abstractions] [Practice 5.2 Creating Computational Artifacts] [Practice 7.3 Communicating About Computing]

8.AP.PD.03 Systematically test and refine programs using a range of test cases. [Practice 6.1 Testing and Refining Computational Artifacts]

- 8.AP.PD.04 Using grade appropriate content and complexity, document programs in order to make them easier to follow, test, and debug. [Practice 7.2 Communicating About Computing]
- 8.AP.PD.05 Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts. [Practice 2.2 Collaborating Around Computing]

Impacts of Computing

Culture (C), Social Interactions (SI), and Safety, Law, and Ethics (SLE)

- 8.IC.C.01 Describe impacts associated with computing technologies that affect people’s everyday activities and career options. [Practice 7.2 Communicating About Computing]
- 8.IC.C.02 Describe issues of bias and accessibility in the design of technologies. [Practice 1.2 Fostering an Inclusive Computing Culture]
- 8.IC.SI.01 Using grade appropriate content and complexity, collaborate using tools to connect with peers when creating a computational artifact. [Practice 2.4 Collaborating Around Computing] [Practice 5.2 Creating Computational Artifacts]
-  8.IC.SI.02 Practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior. [Practice 2.1 Collaborating Around Computing] [Practice 7.3 Communicating About Computing]
- 8.IC.SLE.01 Using grade appropriate content and complexity, describe tradeoffs between allowing information to be public and keeping information private and secure. [Practice 7.2 Communicating About Computing]
- 8.IC.SLE.02 Using grade level appropriate content and complexity, discuss the legal, social, and ethical impacts associated with software development and use, including both positive and malicious intent. [Practice 1.1 Fostering an Inclusive Computing Culture] [Practice 7.2 Communicating About Computing]

Fine and Performing Arts (FPA) (2013)

These standards are created in grade bands. These are the grade 5-8 standards under each of 4 disciplines: Visual Arts, Dance, Music, and Theatre. Please note: school districts make local decisions on how to break up/repeat these standards across the 4-year span.

Visual Arts

Creative Expression Through Production

Students create, perform, exhibit, or participate in the arts.

- FPA8.1.A.1 Students create and revise original art to express ideas, experiences, and stories.
- FPA8.1.A.2 Students select and recognize qualities and characteristics of art media, techniques, technologies, and processes to communicate their experiences and ideas through art.
- FPA8.1.A.3 Students analyze the use of the elements and principles of design in their artwork.
- FPA8.1.A.4 Students collaborate with others in creative artistic processes.
- FPA8.1.A.5 Students use art materials and tools in a safe and responsible manner.
- FPA8.1.A.6 Students prepare and exhibit their artwork.

Aesthetic Perception

Students respond to, analyze, and make informed judgments about the arts.

FPA8.2.A.1 Students observe and describe in detail the physical properties of works of art.

FPA8.2.A.2 Students interpret art, identifying subjects, themes and symbols that communicate their knowledge of context, values and meaning.

FPA8.2.A.3 Students describe and analyze works of art using the language of artistic elements and principles.

FPA8.2.A.4 Students form and defend their preferences for artists and specific works.

Historical and Cultural Context

Students demonstrate an understanding of the arts in relation to history, cultures, and contemporary society.

FPA8.3.A.1 Students know, identify, and compare the characteristics of works of art from various environments, eras, and cultures.

FPA8.3.A.2 Students describe and place a variety of art objects in historical, environmental, and cultural contexts.

FPA8.3.A.3 Students analyze, describe, and relate how factors of culture, time, and environment influence visual characteristics that give meaning and value to a work of art.

Artistic Connections

Students relate the arts to other disciplines, careers, and everyday life.

FPA8.4.A.1 Students describe ways in which the principles and subject matter of other disciplines taught in the school are interrelated with the visual arts.

FPA8.4.A.2 Students explore visual arts careers and recreational opportunities and investigate the artistic skills needed for those opportunities.

FPA8.4.A.3 Students recognize the role of visual artists in their culture and investigate how these artists create their work.

FPA8.4.A.4 Students demonstrate appropriate behavior in a variety of art settings.

Dance

Creative Expression Through Production

Students create, perform, exhibit, or participate in the arts.

FPA8.1.D.1 Students demonstrate and explain isolated and coordinated dance movements with body awareness and intent.

FPA8.1.D.2 Students perform movements with an understanding of alignment, balance, initiation of movement, range of motion, weight shift, elevation and landing, fall and recovery.

FPA8.1.D.3 Students apply and analyze the elements of dance in their own and others' performance.

FPA8.1.D.4 Students understand and perform musical phrasing.

FPA8.1.D.5 Students perform multiple movement phrases to demonstrate different choreographic structures and forms. Students explain the choreographic structures they performed.

FPA8.1.D.6 Explore and discuss ways of using technologies with dance.

FPA8.1.D.7 Students use improvisation and revision to choreograph to communicate images, ideas, intent,

situations, or feelings.

Aesthetic Perception

Students respond to, analyze, and make informed judgments about the arts.

FPA8.2.D.1 Students explain how different kinds of movement impact meaning and interpretation of artistic choices.

FPA8.2.D.2 Students observe or perform dance and discuss the main ideas of the dance, articulating emotional and kinesthetic responses in relation to personal context.

FPA8.2.D.3 Students use dance terminology to analyze how technical, organizational and dance elements contribute to the ideas, aesthetic quality, and impact of the performance.

FPA8.2.D.4 Students discuss how production elements contribute to the ideas and impact of the performance.

Historical and Cultural Context

Students demonstrate an understanding of the arts in relation to history, cultures, and contemporary society.

FPA8.3.D.1 Students explain how values and beliefs are reflected in dance in their community and in different cultures.

FPA8.3.D.2 Students investigate historical events and periods and their influence on dance.

FPA8.3.D.3 Students compare and contrast choreography from a variety of styles of dance.

FPA8.3.D.4 Students recognize the role of dancers in their community and investigate how these artists create their work.

Artistic Connections

Students relate the arts to other disciplines, careers, and everyday life.

FPA8.4.D.1 Students cite examples of concepts common between dance and other disciplines.

FPA8.4.D.2 Students understand the relationships between various careers in and related to dance.

FPA8.4.D.3 Students identify personal goals to improve themselves as dancers and the steps they are taking to reach those goals.

FPA8.4.D.4 Students are attentive and respond appropriately to vocal, musical, social, or observed cues.

FPA8.4.D.5 Students understand the economics of dance, including the role of advocacy and philanthropy.

Music

Creative Expression Through Production

Students create, perform, exhibit, or participate in the arts.

FPA8.1.M.1 Students demonstrate musicianship through individual practice, rehearsal, and revision.

FPA8.1.M.2 Students perform independently and with others a varied repertoire of music, demonstrating correct posture, playing position, breath control, dynamics, intonation, range, and tone quality.

FPA8.1.M.3 Students improvise rhythms, melodies, and accompaniments within a consistent style, meter, and tonality.

FPA8.1.M.4 Students compose and arrange music within specified guidelines.

FPA8.1.M.5 Students develop musical literacy through reading, sight reading, and notating music.

Aesthetic Perception

Students respond to, analyze, and make informed judgments about the arts.

FPA8.2.M.1 Students apply appropriate terminology in the analysis of compositional devices and techniques used in a musical work.

FPA8.2.M.2 Students respond to aural examples by describing musical elements of a varied repertoire of music.

FPA8.2.M.3 Students discuss criteria and evaluate the quality and effectiveness of their own and others' performances, compositions, arrangements, or improvisations.

FPA8.2.M.4 Students form and defend their preferences for musicians, musical works, and genres.

Historical and Cultural Context

Students demonstrate an understanding of the arts in relation to history, cultures, and contemporary society.

FPA8.3.M.1 Students describe distinguishing characteristics of musical genres or styles from various historical periods and cultures.

FPA8.3.M.2 Students listen to a varied repertoire of music and explain the characteristics that cause a work to be considered historically or culturally significant.

FPA8.3.M.3 Students compare the purposes of music, roles of musicians, and environments in which music is typically performed in a variety of world cultures.

Artistic Connections

Students relate the arts to other disciplines, careers, and everyday life.

FPA8.4.M.1 Students demonstrate safe, responsible, and appropriate behavior in a variety of musical settings.

FPA8.4.M.2 Students describe ways in which other disciplines are interrelated with music.

FPA8.4.M.3 Students develop an awareness of careers, cultural and recreational opportunities in music.

FPA8.4.M.4 Students discuss the economics of music, including the role of advocacy.

Theatre

Creative Expression Through Production

Students create, perform, exhibit, or participate in the arts.

FPA8.1.T.1 Students perform in a theatrical setting.

FPA8.1.T.2 Students create for a theatrical setting using technical theatre skills.

FPA8.1.T.3 Students improve theatrical skills and self-discipline through rehearsal, practice, and memorization.

FPA8.1.T.4 Students apply collaborative skills in the creative dramatic process.

FPA8.1.T.5 Students explore character and theme within a dramatic piece.

FPA8.1.T.6 Students understand the role of a script in a production.

Aesthetic Perception

Students respond to, analyze, and make informed judgments about the arts.

FPA8.2.T.1 Students view and analyze a live performance including articulating emotional responses to the performance.

FPA8.2.T.2 Students observe and analyze how technical, organizational, and theatrical elements contribute to the ideas, aesthetic quality, and impact of the theatrical form.

FPA8.2.T.3 Students interpret dramatic works, identifying subjects, themes, artistic choices, and symbols

that communicate their knowledge of context, values, and meaning through use of theatrical terminology.

FPA8.2.T.4 Students explain personal preferences for dramatic works and styles through the influence of personal experiences.

FPA8.2.T.5 Students read and analyze a script.

Historical and Cultural Context

Students demonstrate an understanding of the arts in relation to history, cultures, and contemporary society.

FPA8.3.T.1 Students investigate dramatic works as belonging to various cultures, times, and places.

FPA8.3.T.2 Students explain how history, culture, and theatre influence each other.

Artistic Connections

Students relate the arts to other disciplines, careers, and everyday life.

FPA8.4.T.1 Students demonstrate appropriate etiquette in a variety of theatrical settings.

FPA8.4.T.2 Students demonstrate and practice safe and responsible behavior in theatrical spaces.

FPA8.4.T.3 Students describe ways in which the principles and subject matter of theatre are interrelated with other disciplines.

FPA8.4.T.4 Students explore careers and recreational opportunities utilizing theatrical skills.

FPA8.4.T.5 Students recognize the role of theatre artists in their culture and investigate how these artists create their work.

FPA8.4.T.6 Students understand the economics of the theatre, including the role of advocacy and philanthropy.