



# Grade 6 Standards

## English Language Arts (ELA) (2012)

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### Reading for Literature

#### Key Ideas and Details

- RL.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- RL.6.2 Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- RL.6.3 Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.

#### Craft and Structure

- RL.6.4 Determine the meanings of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone.
- RL.6.5 Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.
- RL.6.6 Explain how an author develops the point of view of the narrator or speaker in a text.

#### Integration of Knowledge and Ideas

- RL.6.7 Compare and contrast the experience of reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch.
- RL.6.8 Not applicable to literature.
- RL.6.9 Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics.

#### Range of Reading and Level of Text Complexity

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

### Reading for Informational Text

#### Key Ideas and Details

- RI.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- RI.6.2 Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- RI.6.3 Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).

## **Craft and Structure**

- RI.6.4** Determine the meanings of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
- RI.6.5** Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.
- RI.6.6** Determine an author’s point of view or purpose in a text and explain how it is conveyed in the text.

## **Integration of Knowledge and Ideas**

- RI.6.7** Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
- RI.6.8** Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.
- RI.6.9** Compare and contrast one author’s presentation of events with that of another (e.g., a memoir written by and a biography on the same person).

## **Range of Reading and Level of Text Complexity**

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

## **Writing**

### **Text Types and Purposes**

- W.6.1** Write arguments to support claims with clear reasons and relevant evidence.
  - W.6.1.a** Introduce claim(s) and organize the reasons and evidence clearly.
  - W.6.1.b** Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.
  - W.6.1.c** Use words, phrases, and clauses to clarify the relationships among claim(s) and reasons.
  - W.6.1.d** Establish and maintain a formal style.
  - W.6.1.e** Provide a concluding statement or section that follows from the argument presented.
- W.6.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
  - W.6.2.a** Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
  - W.6.2.b** Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
  - W.6.2.c** Use appropriate transitions to clarify the relationships among ideas and concepts.
  - W.6.2.d** Use precise language and domain-specific vocabulary to inform about or explain the topic.
  - W.6.2.e** Establish and maintain a formal style.
  - W.6.2.f** Provide a concluding statement or section that follows from the information or explanation presented.
- W.6.3** Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
  - W.6.3.a** Engage and orient the reader by establishing a context and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
  - W.6.3.b** Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.

**W.6.3.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.6.3.d** Use precise words and phrases, relevant descriptive details, and sensory language to convey experiences and events.

**W.6.3.e** Provide a conclusion that follows from the narrated experiences or events.

### **Production and Distribution of Writing**

**W.6.4** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in Writing standards W.6.1 through W.6.3 in Domain 3.)

**W.6.5** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 6. The grade 6 Language standards are found in Domain 5)

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

### **Research to Build and Present Knowledge**

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

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

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

**W.6.9.a** Apply grade 6 Reading standards (found in Domain 1) to literature (e.g., “Compare and contrast texts in different forms or genres [e.g., stories and poems; historical novels and fantasy stories] in terms of their approaches to similar themes and topics”).

**W.6.9.b** Apply grade 6 Reading standards (found in Domain 2) to literary nonfiction (e.g., “Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not”).

### **Range of Writing**

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

## **Speaking and Listening**

### **Comprehension and Collaboration**

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

**SL.6.1.a** Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

**SL.6.1.b** Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

**SL.6.1.c** Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

**SL.6.1.d** Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.

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

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

### **Presentation of Knowledge and Ideas**

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

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

**SL.6.6** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards L.6.1 and L.6.3 in Domain 5 for specific expectations.)

## **Language**

### **Conventions of Standard English**

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

**L.6.1.a** Ensure that pronouns are in the proper case (subjective, objective, possessive).

**L.6.1.b** Use intensive pronouns (e.g., myself, ourselves).

**L.6.1.c** Recognize and correct inappropriate shifts in pronoun number and person.

**L.6.1.d** Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).

**L.6.1.e** Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.

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

**L.6.2.a** Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.

**L.6.2.b** Spell correctly.

### **Knowledge of Language**

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

**L.6.3.a** Vary sentence patterns for meaning, reader/ listener interest, and style.

**L.6.3.b** Maintain consistency in style and tone.

### **Vocabulary Acquisition and Use**

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

**L.6.4.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.6.4.b** Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible).

- L.6.4.c Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
- L.6.4.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.6.5 Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
  - L.6.5.a Interpret figures of speech (e.g., personification) in context.
  - L.6.5.b Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
  - L.6.5.c Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, un wasteful, thrifty).
- L.6.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

## Science (2016)

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**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)**

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### **Grade 6 Math Practices**

#### **MP1 Make sense of problems and persevere in solving them.**

**6.MP.1** In grade 6, students solve problems involving ratios and rates 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, recognize multiple pathways to a solution, and make an initial attempt to solve the problem. Students analyze the result for validity and refine strategies if necessary.

#### **MP2 Reason abstractly and quantitatively.**

**6.MP.2** Students recognize a wide variety of real-world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. Students begin to contextualize to understand the meaning of the number or variable as it relates to the problem.

#### **MP3 Construct viable arguments and critique the reasoning of others.**

**6.MP.3** Students begin to contextualize to understand the meaning of the number or variable as it relates to the problem. They make conjectures, explore validity, reason mathematically, justify, and evaluate their own thinking.

#### **MP4 Model with mathematics.**

**6.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 tools such as diagrams, two-way tables, graphs, flowcharts, or formulas. They can recognize and analyze those relationships mathematically to draw conclusions. They can interpret their mathematical results of problems involving non-negative rational numbers in the context of the situation and reflect on whether the results make sense.

### **MP5 Use appropriate tools strategically.**

**6.MP.5** Students consider available tools (including estimation, concrete models, and technology), and decide when certain tools might be helpful. They choose the representation (table, graph, equation, words) that best suits the problem. Students use concrete models to develop insight into ratios and other concepts. Students extend this insight to more abstract representations, including pictures and symbols. Students understand the limitations of each tool. Tools might include: unifix cubes, fraction bars, base-ten blocks, number lines, graph paper, calculator, paper and pencil, and others.

### **MP6 Attend to precision.**

**6.MP.6** Students continue to refine their mathematical communication and reasoning skills by using clear language in their discussions with others. Students define variables, including their relationship, specify units of measure, and label each axis accurately. Students use appropriate terminology when referring to rates, ratios, 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. The answer to the problem matches what was asked in the problem.

### **MP7 Look for and make use of structure.**

**6.MP.7** Students routinely seek patterns or structure to model and solve problems. They recognize that patterns exist in ratio tables. Students notice patterns and identify 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.**

**6.MP.8** Students use repeated reasoning to understand algorithms and make generalizations about patterns. They construct examples and models that confirm their generalization. They develop shortcuts and check for reasonableness of answers. Students ask questions such as, "How would we verify that?" and "How is this similar to patterns with whole numbers?"

## **Ratios and Proportional Relationships**

### **Understand ratio concepts and use ratio reasoning to solve problems.**

**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

**6.RP.A.2** Understand the concept of a unit rate  $\frac{a}{b}$  associated with a ratio  $a:b$  with  $b \neq 0$ , and use rate language in the context of a ratio relationship.

**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems.

**6.RP.A.3a** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

**6.RP.A.3b** Solve unit rate problems including those involving unit pricing and constant speed.

**6.RP.A.3c** Understand that a percentage is a rate per 100 and use this to solve problems involving wholes, parts, and percentages.

**6.RP.A.3d** Use ratio reasoning to convert measurement units; convert units appropriately when multiplying or dividing quantities.

## The Number System

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

**6.NS.B.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions by using visual fraction models and equations to represent the problem.

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

**6.NS.C.2.** Divide multi-digit numbers using efficient and generalizable procedures including, but not limited to the standard algorithm.

**6.NS.C.3** Add, subtract, multiply, and divide manageable multi-digit decimals using efficient and generalizable procedures including, but not limited to, the standard algorithm for each operation.

**6.NS.C.4** Find common factors and multiples using two whole numbers.

**6.NS.C.4a** Find the greatest common factor of two whole numbers less than or equal to 100.

**6.NS.C.4b** Find the least common multiple of two whole numbers less than or equal to 12.

**6.NS.C.4c** Use the Distributive Property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

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

**6.NS.D.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values and use them to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

**6.NS.D.6** Extend the understanding of the number line to include all rational numbers and apply this concept to the coordinate plane.

**6.NS.D.6a** Understand the concept of opposite numbers, including zero, and their relative locations on the number line.

**6.NS.D.6b** Understand that signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

**6.NS.D.6c** Find and position rational numbers on a horizontal or vertical number line diagram; find and position pairs of rational numbers on a coordinate plane.

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

**6.NS.D.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.

**6.NS.D.7b** Write, interpret, and explain statements of order for rational numbers in real-world contexts.

**6.NS.D.7c** Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

**6.NS.D.7d** Distinguish comparisons of absolute value from statements about order.

**6.NS.D.8** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Find distances between points with the same first coordinate or the same second coordinate; relate absolute value and distance.

## Expressions and Equations

### Apply and extend previous understandings of arithmetic to algebraic expressions.

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

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

- 6.EE.E.2a Write expressions that record operations with numbers and with letters standing for numbers.
- 6.EE.E.2b Identify parts of an expression using mathematical terms (sum, difference, term, product, factor, quotient, coefficient, constant).
- 6.EE.E.2c Use Order of Operations to evaluate algebraic expressions using positive rational numbers and whole-number exponents. Include expressions that arise from formulas in real-world problems.
- 6.EE.E.3 Apply the properties of operations to generate equivalent expressions.
- 6.EE.E.4 Identify when two expressions are equivalent.

**Reason about and solve one-variable equations and inequalities.**

- 6.EE.F.5 Understand a solution to an equation or an inequality makes the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
- 6.EE.F.6 Use variables to represent unknown numbers and write expressions when solving a real-world or mathematical problem.
- 6.EE.F.7 Write and solve real-world and mathematical problems in the form of one-step, linear equations involving non-negative rational numbers.
- 6.EE.F.8 Write an inequality of the form  $x > c$  or  $x < c$  to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form  $x > c$  or  $x < c$  have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

**Represent and analyze quantitative relationships between dependent and independent variables.**

- 6.EE.G.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity (dependent variable) in terms of the other quantity (independent variable). Analyze their relationship using graphs and tables, and relate these to the equation.

## Geometry

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

- 6.G.H.1 Find area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
- 6.G.H.2 Find the volume of a right rectangular prism with fractional edge lengths in the context of solving real-world and mathematical problems by applying the formulas  $V = (l)(w)(h)$  and  $V = (B)(h)$ , and label with appropriate units.
- 6.G.H.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
- 6.G.H.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures in the context of solving real-world and mathematical problems.

## Statistics and Probability

### Develop understanding of statistical variability.

- 6.SP.I.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
- 6.SP.I.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- 6.SP.I.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

### Summarize and describe distributions.

- 6.SP.J.4 Display numerical data in plots on a number line, including dot plots, stem-and-leaf plots, histograms, and box plots.
- 6.SP.J.5 Summarize numerical data sets in relation to their real-world context.
  - 6.SP.J.5a Report the sample size.
  - 6.SP.J.5b Describe the context of the data under investigation, including how it was measured and its units of measurement.
  - 6.SP.J.5c Find quantitative measures of center (median, mode, and mean) and variability (range and interquartile range). Describe any overall pattern (including outliers, clusters, and distribution), with reference to the context in which the data was gathered.
  - 6.SP.J.5d Justify the choice of measures of center (median, mode, or mean) based on the shape of the data distribution and the context in which the data was gathered.

## Social Studies (2014+2018)

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**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).

**SS8.6.4** Use accurate, sufficient, and relevant information from primary and secondary sources to support writing.

## **Career and Vocational Education (CTE) (2014)**

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**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)

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**These standards are created in grade bands. These are the grade 5-6 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.**

- HE6.1.1 Analyze family, school, or community resources that can be used to enhance health (e.g., compare/contrast what help different people can give). VP/B, PCD, ME
- HE6.1.2 Analyze family, school, or community resources that can be used to reduce or avoid health risks (e.g., DARE officer help with strategies). VP/B, ATOD, G&D
- HE6.1.3 Access appropriate information about health and health risks (e.g., where do you find info about growth and development, ATOD, or nutrition). G&D, ATOD, NUT
- HE6.1.4 Explain how products can *enhance* personal health (e.g., deodorant, toothpaste, etc.). NUT, PH, ME (Related to self-esteem)
- HE6.1.5 Explain how products can *reduce* health risks. PH, PCD, IP/S

### 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.**

- HE6.2.1 Differentiate between situations when a health-related decision can be made individually or when assistance is needed. ATOD, IP/S, ME
- HE6.2.2 Determine when health-related situations require the application of a thoughtful decision-making process. IP/S, VP/B, ATOD
- HE6.2.3 Explain the steps of a decision-making process to enhance health or reduce health risk. ATOD, IP/S, ME
- HE6.2.4 Analyze the potential short-term impact of each alternative on self and others when making a health-related decision (e.g., if I intervene in bullying situation and I get beat up, I may get a black eye, but I may prevent the victim from getting badly hurt). ATOD, IP/S, VP/B
- HE6.2.5 Explain how family and peers can influence decisions students make about health practices and risk behaviors. ME, ATOD, VP/B
- HE6.2.6 Analyze healthy options to health-related issues or problems (e.g., compare and contrast extracurricular physical activity programs offered at elementary schools in the community). PA, NUT, CEH
- HE6.2.7 Apply a systematic process to examine familiar health-related issues or problems (e.g., identify problem, collect information, analyze data, draw conclusions, make simple recommendations). NUT, PA, VP/B

### Effective Communication

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

- HE6.3.1 Explain how various verbal and non-verbal techniques are effective in enhancing health or avoiding/reducing health risks (e.g., argument will not escalate if I use “I” messages and avoid blaming others). VP/B, ATOD, FAM

- HE6.3.2 Analyze communication techniques used to enhance health or reduce/avoid health risks (e.g., example specific to cultural differences, how to ask for help to enhance personal health or reduce risks). VP/B, ATOD, CEH
- HE6.3.3 Analyze refusal strategies for potential effectiveness. VP/B, IP/S, ATOD
- HE6.3.4 Describe barriers to effective communication about health. ME, G&D, PCD
- HE6.3.5 Demonstrate the ability to use listening skills for specific health purposes (e.g., asking questions to gather information and/or obtain instructions, make connections, ask clarifying questions). ATOD, IP/S, G&D

## 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.**

- HE6.4.1 Demonstrate an understanding of behaviors that improve or maintain personal health. G&D, IP/S, ME
- HE6.4.2 Demonstrate an understanding of behaviors to avoid or reduce health risks. ATOD, IP/S, VP/B
- HE6.4.3 Demonstrate an understanding of behaviors that prevent the spread of disease. PCD, CEH, PH
- HE6.4.4 Analyze factors that create stress or motivate successful performance. ME
- HE6.4.5 Analyze age appropriate factors that create good stress and bad stress. ME, ATOD, PA
- HE6.4.6 Demonstrate the ability to apply strategies to manage bad stress and use good stress to motivate successful performance (e.g., getting sufficient sleep). PA, NUT, PH
- HE6.4.7a Use multiple criteria to set short-term personal health goals (e.g., SMART Goals are Specific, Measurable, Action oriented, Realistic, Timely). PA, NUT, PH
- HE6.4.7b 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 not achieved because of snowy weather and no community facility was available for exercise). PA, NUT, PH
- HE6.4.8 Explain how individual, social, and cultural differences may increase vulnerability to bullying and identify ways to address it. VP/B, ME
- HE6.4.9 Define various types of bullying and the roles of the aggressor and bystanders in bullying situations (e.g., physical aggression, social/relational aggression, intimidation, verbal aggression, written aggression, cyber bullying, hazing, 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.**

PE8.1.1 Students demonstrate movement skills and patterns in a variety of activities.

PE8.1.2 Students demonstrate critical elements of specialized manipulative skills in modified team activities.

- PE8.1.3 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.**

- PE8.2.1 Students create and monitor a personal plan using current levels of fitness and physical activity.
- PE8.2.2 Students differentiate the health benefits associated with a variety of physical activities.
- PE8.2.3 Students apply the principles, components, and practices of health-related fitness to improve short-term fitness goals.
- PE8.2.4 Students engage in a variety of physical activities that will enhance health-related fitness (inside and/or outside of school).
- PE8.2.5 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.**

- PE8.3.1 Students develop and apply appropriate rules, safe practices, and procedures in physical activity settings.
- PE8.3.2 Students communicate effectively with others to promote respect and conflict resolution in physical activity settings.
- PE8.3.3 Students engage in challenging experiences that develop confidence and independence.
- PE8.3.4 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)

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**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)

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**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.