



Eighth Grade
Curriculum Standards

READING STANDARDS FOR LITERATURE

Key Ideas and Details

- 1: Cite textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
- 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.
- 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

- 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.
- 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.
- 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

- 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.
- 8: N/A
- 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

- 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 STANDARDS FOR INFORMATIONAL TEXT

Key Ideas and Details

- 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.
- 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.
- 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

- 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, including analogies or allusions to other texts.
- 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.
- 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.

READING STANDARDS FOR INFORMATIONAL TEXT (cont.)**Integration of Knowledge and Ideas**

- 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.
- 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.
- 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

- 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 STANDARDS**Text Types and Purposes**

- 1: Write arguments to support claims with clear reasons and relevant evidence.
 - a: Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
 - b: Support claims(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
 - c: Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
 - d: Establish and maintain a formal style.
 - e: Provide a concluding statement or section that follows from and supports the argument presented.
- 2: Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
 - 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.
 - b: Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
 - c: Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
 - d: Use precise language and domain-specific vocabulary to inform about or explain the topic.
 - e: Establish and maintain a formal style.
 - f: Provide a concluding statement or section that follows from and supports the information or explanation presented.
- 3: Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
 - 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.
 - b: Use narrative techniques, such as dialogue, pacing, description, and reflection, to develop experiences, events, and/or characters.
 - 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.
 - d: Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events.
 - e: Provide a conclusion that follows from and reflects on the narrated experiences or events.

WRITING STANDARDS (cont.)**Production and Distribution of Writing**

- 4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- 5: 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.
- 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

- 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.
- 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.
- 9: Draw evidence from literary or informational texts to support analysis, reflection, and research.
 - 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).
 - 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

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

SPEAKING AND LISTENING STANDARDS**Comprehension and Collaboration**

- 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.
 - 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.
 - b: Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.
 - c: Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.
 - d: Acknowledge new information expressed by others and, when warranted, qualify or justify their own views in light of the evidence presented.
- 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.
- 3: Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

Presentation of Knowledge and Ideas

- 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.
- 5: Include multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
- 6: Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

LANGUAGE STANDARDS**Conventions of Standard English**

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

Knowledge of Language

- 3: Use knowledge of language and its conventions when writing, speaking, reading, or listening.
 - 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

- 4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 8 reading and content*, choosing flexibly from a range of strategies.
 - 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.
 - b: Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., *precede*, *recede*, *secede*).
 - 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.
 - 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).
- 5: Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
 - a: Interpret figures of speech (e.g., verbal irony, puns) in context.
 - b: Use the relationship between particular words to better understand each of the words.
 - c: Distinguish among the connotations (associations) of words with similar denotation (definitions) (e.g., *bullheaded*, *willful*, *firm*, *persistent*, *resolute*).
- 6: Acquire and use accurately grade-appropriate conversational, general academic, and domain-specific words and phrases, gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

READING STANDARDS FOR LITERACY IN HISTORY/SOCIAL STUDIES**Key Ideas and Details**

- 1: Cite specific textual evidence to support analysis of primary and secondary sources.
- 2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
- 3: Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).

Craft and Structure

- 4: Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.
- 5: Describe how a text presents information (e.g., sequentially, comparatively, causally).
- 6: Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).

READING STANDARDS FOR LITERACY IN HISTORY/SOCIAL STUDIES (cont.)**Integration of Knowledge and Ideas**

- 7: Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
- 8: Distinguish among fact, opinion, and reasoned judgment in a text.
- 9: Analyze the relationship between a primary and secondary source on the same topic.

Range of Reading and Level of Text Complexity

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

READING STANDARDS FOR LITERACY IN SCIENCE AND TECHNICAL SUBJECTS**Key Ideas and Details**

- 1: Cite specific textual evidence to support analysis of science and technical texts.
- 2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- 3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Craft and Structure

- 4: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
- 5: Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
- 6: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Integration of Knowledge and Ideas

- 7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- 8: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
- 9: Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Range of Reading and Level of Text Complexity

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

WRITING STANDARDS FOR LITERACY IN HISTORY/SOCIAL STUDIES, SCIENCE, AND TECHNICAL SUBJECTS**Text Types and Purposes**

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

**WRITING STANDARDS FOR LITERACY IN HISTORY/SOCIAL STUDIES, SCIENCE,
AND TECHNICAL SUBJECTS****Text Types and Purposes (cont.)**

- 2: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
- a: Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
 - b: Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
 - c: Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
 - d: Use precise language and domain-specific vocabulary to inform about or explain the topic.
 - e: Establish and maintain a formal style and objective tone.
 - f: Provide a concluding statement or section that follows from and supports the information or explanation presented.
- 3: N/A

Production and Distribution of Writing

- 4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- 5: 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.
- 6: Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Research to Build and Present Knowledge

- 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.
- 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.
- 9: Draw evidence from informational texts to support analysis, reflection, and research.

Range of Writing

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

MATHEMATICS**THE NUMBER SYSTEM****Know that there are numbers that are not rational, and approximate them by rational numbers.**

- 1: Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.
- 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 (e.g., $\sqrt{2}$). *Ex: By truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

EXPRESSIONS AND EQUATIONS**Work with radicals and integer exponents.**

- 1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.
Ex: $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
- 2: Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
- 3: Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *Ex: Estimate the population of the U.S. as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.*
- 4: Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

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

- 5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *Ex: Compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*
- 6: Use similar triangles to 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 b .

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

- 7: Solve linear equations in one variable.
 - a: Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
 - b: Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
- 8: Analyze and solve pairs of simultaneous linear equations.
 - a: 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.
 - b: Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *Ex: $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.*
 - c: Solve real-world and mathematical problems leading to two linear equations in two variables. *Ex: Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

FUNCTIONS**Define, evaluate, and compare functions.**

- 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. (Function notation is not required in Grade 8.)
- 2: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *Ex: Given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*
- 3: Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; given examples of functions that are not linear. *Ex: The function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points $(1,1)$, $(2,4)$ and $(3,9)$, which are not on a straight line.*

Use functions to model relationships between quantities.

- 4: Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
- 5: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, 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.**

- 1: Verify experimentally the properties of rotations, reflections, and translations:
 - a: Lines are taken to lines, and line segments to line segments of the same length.
 - b: Angles are taken to angles of the same measure.
 - c: Parallel lines are taken to parallel lines.
- 2: Understand 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.
- 3: Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- 4: Understand 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.
- 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.
Ex: Arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversal why this is so.

Understand and apply the Pythagorean Theorem.

- 6: Explain a proof of the Pythagorean Theorem and its converse.
- 7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
- 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.

- 9: Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

STATISTICS AND PROBABILITY**Investigate patterns of association in bivariate data.**

- 1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
- 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.
- 3: Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *Ex: In a linear model for a biology experiment, interpret a slope of 1.5cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*
- 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. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *Ex: Collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

SCIENCE**INQUIRY PROCESS****Observations, Questions, and Hypotheses**

Formulate questions based on observations that lead to the development of a hypothesis.

Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis.

Generate a hypothesis that can be tested.

Scientific Testing

Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

Design a controlled investigation to support or reject a hypothesis.

Conduct a controlled investigation to support or reject a hypothesis.

Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).

Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.

Analysis and Conclusions

Analyze data obtained in a scientific investigation to identify trends.

Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

Interpret data that show a variety of possible relationships between two variables, including: positive relationship, negative relationship, no relationship.

Formulate a future investigation based on the data collected.

Explain how evidence supports the validity and reliability of a conclusion.

Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).

Critique scientific reports from periodicals, television, or other media.

Formulate new questions based on the results of a previous investigation.

Communication

Communicate the results of an investigation.

Choose an appropriate graphic representation for collected data: line graph, double bar graph, stem and leaf plot, histogram.

Present analyses and conclusions in clear, concise formats.

Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns).

Communicate the results and conclusion of the investigation.

HISTORY AND NATURE OF SCIENCE**History of Science as a Human Endeavor**

Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson and Crick [scientists], Rosalind Franklin [scientist], Charles Darwin [scientist], George Washington Carver [scientist, inventor], Joseph Priestley [scientist], Sir Francis Bacon [philosopher], Isaac Newton [scientist]).

Evaluate the effects of the following major scientific milestones on society: Mendelian Genetics, Newton's Laws.

Evaluate the impact of a major scientific development occurring within the past decade.

Evaluate career opportunities related to life and physical sciences.

HISTORY AND NATURE OF SCIENCE (cont.)**Nature of Scientific Knowledge**

Apply the following scientific processes to other problem solving or decision making situations:
observing, questioning, communicating, comparing, measuring, classifying, predicting, organizing data,
inferring, generating hypotheses, identifying variables.

SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES**Changes in Environments**

Analyze the risk factors associated with natural, human induced, and/or biological hazards, including:
waste disposal of industrial chemicals, greenhouse gases.

Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.

Science and Technology in Society

Propose viable methods of responding to an identified need or problem.

Compare solutions to best address an identified need or problem.

Design and construct a solution to an identified need or problem using simple classroom materials.

Compare risks and benefits of the following technological advances: radiation treatments, genetic engineering, airbags.

LIFE SCIENCE**Reproduction and Heredity**

Explain the purposes of cell division: growth and repair, reproduction.

Explain the basic principles of heredity using the human examples of: eye color, widow's peak, blood type.

Distinguish between the nature of dominant and recessive traits in humans.

Diversity, Adaptation, and Behavior

Explain how an organism's behavior allows it to survive in an environment.

Describe how an organism can maintain a stable internal environment while living in a constantly changing external environment.

Determine characteristics of organisms that could change over several generations.

Compare the symbiotic and competitive relationships in organisms within an ecosystem (e.g., lichen, mistletoe/tree, clownfish/sea anemone, native/non-native species).

Analyze the following behavioral cycles of organisms: hibernation, migration, dormancy (plants).

Describe the following factors that allow for the survival of living organisms: protective coloration, beak design, seed dispersal, pollination.

PHYSICAL SCIENCE**Properties and Changes of Properties in Matter**

Identify different kinds of matter based on the following physical properties: states, density, boiling point, melting point, solubility.

Identify different kinds of matter based on the following chemical properties: reactivity, pH, oxidation (corrosion).

Identify the following types of evidence that a chemical reaction has occurred: formation of a precipitate, generation of gas, color change, absorption or release of heat.

Classify matter in terms of elements, compounds, or mixtures.

Classify mixtures as being homogeneous or heterogeneous.

Explain the systematic organization of the periodic table.

Investigate how the transfer of energy can affect the physical and chemical properties of matter.

PHYSICAL SCIENCE (cont.)**Motion and Forces**

Demonstrate velocity as the rate of change of position over time.

Identify the conditions under which an object will continue in its state of motion (Newton's 1st Law of Motion).

Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton's 2nd Law of Motion).

Describe forces as interactions between bodies (Newton's 3rd Law of Motion).

Create a graph devised from measurements of moving objects and their interactions, including: position-time graphs, velocity-time graphs.

EARTH AND SPACE SCIENCE

No performance objectives at this grade level.

SOCIAL STUDIES**AMERICAN HISTORY****Research Skills for History**

Construct charts, graphs, and narratives using historical data.

Interpret historical data displayed in graphs, tables, and charts.

Construct timelines (e.g., presidents/world leaders, key events, people) of the historical era being studied.

Formulate questions that can be answered by historical study and research.

Describe the difference between a primary source document and a secondary source document and the relationships between them.

Determine the credibility and bias of primary and secondary sources.

Analyze cause and effect relationships between and among individuals and/or historical events.

Revolution and New Nation

Analyze the following events which led to the American Revolution: Tea Act, Stamp Act, Boston Massacre, Intolerable Acts, Declaration of Independence.

Describe the significance of key events of the Revolutionary War: major battles (e.g., Lexington, Saratoga, Trenton), aid from France, surrender at Yorktown.

Describe the impact of the following key individuals on the Revolutionary War: Benjamin Franklin, Thomas Jefferson, George Washington, Patrick Henry, Thomas Paine, King George III.

Describe the significance of the following documents: Declaration of Independence, Articles of Confederation, Constitution, Bill of Rights.

Explain the influence of the following individuals in the establishment of a new government: Thomas Jefferson, James Madison, John Adams, Benjamin Franklin.

Describe how one nation evolved from thirteen colonies: Constitutional Convention, George Washington's presidency, creation of political parties (e.g., Federalists, Whigs, Democratic-Republicans).

Great Depression and World War II

Review the impact of the Great Depression on the United States.

Explain how Pearl Harbor led to United States involvement in World War II.

Explain the impact of World War II on economic recovery from the Great Depression.

Explain how the following factors affected the U.S. home front during World War II: war bond drives, war industry, women and minorities in the work force, rationing, internment of Japanese-, German-, and Italian-Americans.

Describe Arizona's contributions to the war effort: Native American Code Talkers, Ira Hayes, mining, training bases, POW and internment camps.

Summarize the United States' role in the following events: D-day invasion, battles of the Pacific, development and use of the atomic bomb, V-E Day/V-J Day.

Analyze the following individuals' significance to World War II: Franklin D. Roosevelt, Dwight Eisenhower, George Patton, Douglas MacArthur, Harry Truman, Eleanor Roosevelt.

AMERICAN HISTORY (cont.)**Postwar United States**

Describe the following origins of the Cold War: Western fear of communist expansion, Soviet fear of capitalist influences, development of nuclear weapons, Truman Doctrine.

Describe the impact of the Cold War on the United States: McCarthyism, arms race, space race, Cuban Missile Crisis, creation of the CIA.

Identify the role of the United States in the Korean War: Communist containment, military involvement, resolution of conflict.

Identify the role of the United States in the Vietnam Conflict:

- Containment of Communism – Domino Theory

- Gulf of Tonkin Resolution

- Tet Offensive

- Anti-war protests

- Vietnam Peace Accords

Describe life (e.g., transportation, communication, technology, medical entertainment, growth of suburbs) in the U.S. during the Post War period.

Describe the importance of following civil rights issues and events:

- Jim Crow Laws

- Nonviolent protests

- Desegregation

- Civil Rights Acts of 1964

- Voting Rights Act of 1965

Contemporary United States

Describe events (e.g., opening of foreign relations with China, Watergate, resignation) of the presidency of Richard Nixon.

Describe events (e.g., succession to presidency, pardoning of Nixon) of the presidency of Gerald Ford.

Describe events (e.g., Camp David Peace Accords, Iran Hostage Crisis) of the presidency of Jimmy Carter.

Describe events (e.g., Star Wars, Iran-contra Affair) of the presidency of Ronald Reagan.

Describe events (e.g., Persian Gulf War, Berlin Wall falls) of the presidency of George H. W. Bush.

Describe events (e.g. economic growth, impeachment) of the presidency of William Clinton.

Describe events (e.g., September 11 Terrorist Attacks, Afghanistan, Iraq War), of the presidency of George W. Bush.

Describe current events using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

Identify the connection between current and historical events and issues studied at this grade level using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

Describe how key political, social, geographic, and economic events of the late 20th century and early 21st century affected, and continue to affect, the United States.

WORLD HISTORY**Research Skills for History**

Construct charts, graphs, and narratives using historical data.

Interpret historical data displayed in graphs, tables, and charts.

Construct timelines (e.g., presidents/world leaders, key events, people) of the historical era being studied.

Formulate questions that can be answered by historical study and research.

Describe the difference between a primary source document and a secondary source document and the relationships between them.

Determine the credibility and bias of primary and secondary sources.

Analyze cause and effect relationships between and among individuals and/or historical events.

WORLD HISTORY (cont.)**World at War**

Review the rise of totalitarianism in Europe following World War I.

Analyze the major causes of World War II:

- Aggressive search for resources by Japan
- Political ideologies of Fascism and Nazism
- Resentment toward the Treaty of Versailles

Trace the series of invasions and conquests in the European and Pacific Theaters in World War II.

Describe the following events leading to the Allied victory:

- D-Day Invasion
- Battle of the Bulge
- Japanese defeat in Iwo Jima and Okinawa
- Atomic bombing of Hiroshima and Nagasaki

Describe how racism and intolerance contributed to the Holocaust.

Summarize each of the following outcomes of World War II:

- Redrawing of political boundaries in Europe
- Tensions leading to Cold War
- Formation of the United Nations
- Beginning of atomic age
- Rebuilding of Japan

Compare the rebuilding of Japan with the rebuilding of Germany following World War II.

Describe the following events resulting from World War II:

- Nuremberg Trial
- Marshall Plan
- NATO/Warsaw Pact
- Creation of United Nations
- Creation of Israel

Describe the spread of Communism after World War II:

- China – Mao Tse-tung and Chinese Revolution
- Korea – 38th parallel and division of country
- Cuba – Fidel Castro and Cuban Missile Crisis
- Vietnam – Ho Chi Minh

Describe the impact of the Cold War (i.e., creation of the Iron curtain, arms race, space race) that led to global competition.

Describe the following events of the Korean War:

- Chinese involvement
- U.N. police actions
- Containment of Communism
- Partition of Korea at the 38th Parallel

Describe how the following impacted the Vietnam War:

- Historical relationship of China and Vietnam
- French Indochina War
- Containment of Communism
- Ho Chi Minh Trail
- Conflict resolution

Examine the fall of communism and the unification of European nations:

- Germany – reunification, Berlin Wall torn down
- Russia – Gorbachev, Glasnost and Perestroika
- Union of Soviet Socialist Republics – countries regained independence
- European Union formed

Describe the following events in the Middle East during the 20th and 21st centuries:

- Creation of Israel
- Conflicts between Israeli and Palestinian governments
- Camp David Peace Treaty
- Persian Gulf War
- Iraq War

Compare independence movements in various parts of the world (e.g., India/Pakistan, Latin America, Africa, Asia) during the 20th century.

Examine human rights issues during the 20th century (e.g., Apartheid, genocide, famine, disease).

WORLD HISTORY (cont.)**Contemporary World**

Describe current events using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

Identify the connection between current and historical events and issues studied at this grade level using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

Analyze how world events of the late 20th century and early 21st century affected, and continue to affect, the social, political, geographic and economic climate of the world (e.g., terrorism, globalization, conflicts, interdependence, natural disasters, advancements in science and technology and environmental issues).

CIVICS/GOVERNMENT**Foundations of Government**

Describe how the following philosophies and documents influenced the creation of the constitution:

- Magna Carta
- English Bill of Rights
- Montesquieu's separation of power
- John Locke's theories – natural law, social contract
- Mayflower compact
- Declaration of Independence
- Articles of Confederation

Analyze the purpose (e.g., weaknesses of the Articles of Confederation) and outcome (e.g., compromises) of the Constitutional Convention.

Analyze the struggle (e.g., Federalists' Papers, Bill of Rights) between the federalists and the anti-federalists over the ratification of the Constitution.

Structure of Government

Describe the following principles on which the Constitution (as the Supreme Law of the Land) was founded:

- Federalism (i.e., enumerated, reserved, and concurrent powers)
- Popular sovereignty
- Separation of Powers
- Checks and balances
- Limited government
- Flexibility (i.e., Elastic Clause, amendment process)

Differentiate the roles and powers of the three branches of the federal government.

Explain the electoral process (e.g., primary and general elections, electoral college).

Explain how a candidate can be elected president (e.g., Adams-Jackson, Hayes-Tilden, Bush-Gore) without receiving a majority of the popular vote.

Describe the line of succession to the presidency as stated in the 25th Amendment.

Functions of Government

Compare the ways the federal and Arizona governments operate:

- Three branches
- Constitution
- Election process (e.g., congressional and legislative districts, propositions, voter registration).

Compare the process of how a bill becomes a law at the federal and state level.

Describe the following forms of direct democracy in Arizona: initiative, referendum, recall process.

Compare the roles and relationships of different levels of government (e.g., federal, state, county, city/town, tribal).

Describe the significance of the Amendments to the Constitution.

Compare the adult and juvenile criminal justice systems.

CIVICS/GOVERNMENT**Functions of Government (cont.)**

Summarize the significance of the following Supreme Court cases:

- Marbury v. Madison
- Plessy v. Ferguson
- Brown v. Board of Education
- Gideon v. Wainright
- Miranda v. Arizona
- Korematsu v. United States

Describe the impact of the following executive orders and decisions:

- Executive Order 9066 – creation of internment camps on U. S. soil.
- Manhattan Project
- Use of Atomic Bomb

Describe the impact that the following Acts had on increasing the rights of groups and individuals:

- Civil Rights Act of 1964
- Voting Rights Act of 1965
- Indian Rights Act of 1968
- Americans with Disabilities Act

Rights, Responsibilities, and Roles of Citizenship

Describe the benefits of community service.

Discuss the character traits (e.g., respect, responsibility, fairness, involvement) that are important to the preservation and improvement of constitutional democracy in the United States.

Describe the importance of citizens being actively involved in the democratic process (i.e., voting, student government, involvement in political decision making, analyzing issues, petitioning public officials).

Explain the obligations and responsibilities of citizenship:

- Upholding the Constitution
- Obeying the law
- Paying taxes
- Registering for selective service
- Jury duty

Describe the impact that the following had on rights for individuals and groups:

- Jim Crow Laws – literacy test, poll taxes, Grandfather Clause
- Civil Rights Movement (i.e., Martin Luther King, Jr., Rosa Parks)
- Desegregation – military, schools, transportation, sports
- United Farm Workers (i.e. Cesar Chavez)
- National Organization for Women (NOW) – Equal Rights Amendment (ERA)

Government Systems of the World

Compare the different world governments and ideologies: dictatorship, totalitarian (fascist, Nazis), democracy, Socialism, Communism.

Explain U.S. and world foreign policies leading the Cold War:

- Truman Doctrine
- NATO
- Warsaw Pact
- Marshall Plan

Identify U.S. and world foreign policies (e.g., economic sanctions, arms reduction agreements) resulting from the Cold War.

GEOGRAPHY**The World in Spatial Terms**

Construct maps, charts, and graphs to display geographic information.

Identify purposes and differences of maps, globes, aerial photographs, charts, and satellite images.

Interpret maps, charts, and geographic databases using geographic information.

Locate physical and cultural features (e.g., continents, cities, countries, bodies of water, landforms, mountain ranges, climate zones) throughout the world.

Interpret thematic maps, graphs, charts and databases depicting various aspects of the United States and world regions.

Places and Regions

Identify common characteristics of contemporary and historical regions on the basis of climate, landforms, ecosystems, and culture.

Explain the factors that contribute to political and social change in various world regions (e.g., USSR/Russia, Israel, European Union, China, Korea, Germany).

Examine relationships and interactions (E.G. Middle East conflicts, NATO, European Union) among regions.

Identify how the role of the media, images, and advertising influences the perception of a place.

Describe how a place changes over time.

Human Systems

Identify the push and pull factors (e.g., economic conditions, human rights conditions, famines, political strife/wars, natural disasters, changes in technology) that drive human migrations.

Describe the effects (e.g., economic, environmental, cultural, political) of human migrations on places and regions.

Describe the characteristics and locations of various cultures throughout the world.

Identify the factors (e.g., breakup of USSR, unification of Germany, cheap labor forces, outsourcing of services, oil industry) that influence the location, distribution and interrelationships of economic activities in different regions.

Explain how cooperation contributes to political, economic, and social organization (e.g., United Nations, European Union, NAFTA).

Describe the aspects of culture (e.g., literacy, occupations, clothing, property rights) related to beliefs and understandings that influence the economic, social, and political activities of men and women.

Describe how changes in technology, transportation, communication, and resources affect economic development.

Environment and Society

Describe how (e.g., deforestation, desertification) humans modify ecosystems.

Describe why (e.g., resources, economic livelihood) humans modify ecosystems.

Explain how changes in the natural environment can increase or diminish its capacity to support human activities.

Explain how technology positively and negatively affects the environment.

Analyze changing ideas and viewpoints on the best use of natural resources (e.g., value of oil, water use, forest management).

Explain how societies and governments plan for and respond to natural disasters (e.g., evacuation routes, changing farming techniques, warning systems).

Geographic Applications

Describe ways geographic features and conditions influence history.

Describe ways different groups of people (i.e. Native Americans, Hispanics, retirees) create and shape the same environment.

Use geographic knowledge and skills (e.g., recognizing patterns, mapping, graphing) when discussing current events.

ECONOMICS**Foundations of Economics**

Explain how limited resources and unlimited human wants cause people to choose some things and give up others.

Analyze how scarcity, opportunity costs, and trade-offs, influence decision-making.

Analyze how individuals, governments and businesses make choices based on the availability of resources.

Apply Adam Smith's ideas of a market economy to: property rights, freedom of enterprise, competition, consumer choice, limited role of government.

Describe the impact of the availability and distribution of natural resources on an economy.

Microeconomics

Identify the functions and relationships among various institutions (e.g., business firms, banks, government agencies, labor unions, corporations) that make up an economic system.

Explain the impact of government investment in human capital:

Human (e.g., immunizations)

Education (e.g., college grants, loans)

Training of people (e.g., Job Corps)

Explain the impact of government investment in physical capital (e.g., NASA, transportation).

Describe how income for most people is determined by the value of the goods and services they sell.

Describe the impact of entrepreneurs (e.g., Bill Gates, Martha Stewart, Oprah Winfrey, Ted Turner, Donald Trump) in the free enterprise system.

Analyze how investment in physical capital (e.g., factories, medical advancements, new technologies) leads to economic growth.

Describe how competition (e.g., Microsoft/Apple, Wal-Mart/Target) affects supply and demand from the vantage point of the consumer and producer.

Describe how market prices provide incentives to buyers and sellers.

Describe how protection of private property rights provides incentives to conserve and improve property (e.g., resale market).

Macroeconomics

Identify the organization and functions of the Federal Reserve System.

Identify the effects of inflation of society.

Analyze the government's role in economic recovery.

Global Economics

Compare how private property rights differ in market (capitalism) economies versus command (communist) economies.

Identify the effects of trade restrictions between national and world regions.

Describe the role of the United States government in influencing international commerce in regions studied.

Identify interdependence (e.g., North American Free Trade Agreement, European Union, International Monetary Fund/World Bank) between nations.

Personal Finance

Explain how scarcity influences personal financial choices (e.g., budgeting, saving, investing, credit).

Describe types of personal investments (e.g., saving accounts, stocks, mutual funds, bonds, retirement funds, land).

Describe the role of the stock market in personal investing.

Describe various forms of credit (e.g., personal loans, credit cards, lines of credit, mortgages, auto loans).

Analyze the advantages, disadvantages, and alternatives to consumer credit.

Analyze the costs and benefits of producing a personal budget.

Create a personal budget to include fixed and variable expenses.

Identify the benefits of future financial planning.