



Seventh Grade
Curriculum Standards

READING STANDARDS FOR LITERATURE

Key Ideas and Details

- 1: Cite textual evidence to support 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; provide an objective summary of the text.
- 3: Analyze how particular elements of a story or drama interact (e.g., how setting shapes the characters or plot).

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 rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama.
- 5: Analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning.
- 6: Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.

Integration of Knowledge and Ideas

- 7: Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).
- 8: N/A
- 9: Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.

Range of Reading and Level of Text Complexity

- 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 STANDARDS FOR INFORMATIONAL TEXT

Key Ideas and Details

- 1: Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- 2: Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.
- 3: Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).

Craft and Structure

- 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.
- 5: Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.
- 6: Determine an author's point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others.

Integration of Knowledge and Ideas

- 7: Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject (e.g., how the delivery of a speech affects the impact of the words).
- 8: Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.
- 9: Analyze how two or more authors writing about the same topic shape their presentation of key information by emphasizing different evidence or advancing different interpretations of facts.

READING STANDARDS FOR INFORMATIONAL TEXT (cont.)**Range of Reading and Level of Text Complexity**

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 STANDARDS**Text Types and Purposes**

- 1: Write arguments to support claims with clear reasons and relevant evidence.
 - a: Introduce claim(s), acknowledge 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), 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, 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.
 - b: Develop the topic with relevant facts, definitions, concrete details, quotation, or other information and examples.
 - c: Use appropriate 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, and description, to develop experiences, events, and/or characters.
 - c: Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another.
 - 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.

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 link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.

Research to Build and Present Knowledge

- 7: Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.
- 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 7 Reading standards* to literature (e.g., Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history).
 - b: Apply *grade 7 Reading standards* to literary nonfiction (e.g., Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims).

Range of Writing

- 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 7 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, track progress toward specific goals and deadlines, and define individual roles as needed.
 - c: Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.
 - d: Acknowledge new information expressed by others and, when warranted, modify their own views.
- 2: Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
- 3: Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.

Presentation of Knowledge and Ideas

- 4: Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
- 5: Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
- 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 phrases and clauses in general and their function in specific sentences.
 - b: Choose among simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas.
 - c: Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.

LANGUAGE STANDARDS (cont.)**Conventions of Standard English**

- 2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- a: Use a comma to separate coordinate adjectives (e.g., *It was a fascinating, enjoyable movie* but not *He wore an old[,] green shirt*).
 - b: Spell correctly.

Knowledge of Language

- 3: Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- a: Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.

Vocabulary Acquisition and Use

- 4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 7 reading and content*, choosing flexibly from a range of strategies.
- 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., *belligerent, bellicose, rebel*).
 - 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., literary, biblical, and mythological allusions) in context.
 - b: Use the relationship between particular words (e.g., synonym/antonym, analogy) to better understand each of the words.
 - c: Distinguish among the connotations (associations) or words with similar denotation (definitions) (e.g., *refined, respectful, polite, diplomatic, condescending*).
- 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**RATIOS AND PROPORTIONAL RELATIONSHIPS****Analyze proportional relationships and use them to solve real-world and mathematical problems.**

- 1: Compute unit rates associated with ratios of fractions, including ratios of lengths, area and other quantities measured in like or different units. *Ex: If a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $(\frac{1}{2})/(\frac{1}{4})$ miles per hour, equivalently 2 miles per hour.*
- 2: Recognize and represent proportional relationships between quantities.
 - a: Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin).
 - b: Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
 - c: Represent proportional relationships by equations. *Ex: If total cost T is proportional to the number N of items purchased at a constant price P , the relationship between the total cost and the number of items can be expressed as $T=PN$.*
 - d: Explain what a point (x,y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0,0)$ and $(1,r)$ where r is the unit rate.
- 3: Use proportional relationships to solve multistep ratio and percent problems. *Ex: simple interest, tax, markups*

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

- 1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
 - a: Describe situations in which opposite quantities combine to make 0. *Ex: A hydrogen atom has 0 charge because its two constituents are oppositely charged.*
 - b: Understand $p + q$ as the number located a distance $|q|$ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
 - c: Understand subtraction of rational numbers as adding the additive inverse, $p - 1 = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
 - d: Apply properties of operations as strategies to add and subtract rational numbers.
- 2: Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
 - a: Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
 - b: Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q)=(-p)/q=p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
 - c: Apply properties of operations as strategies to multiply and divide rational numbers.
 - d: Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
- 3: Solve real-world and mathematical problems involving the four operations with rational numbers.

EXPRESSIONS AND EQUATIONS**Use properties and operations to generate equivalent expressions.**

- 1: Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- 2: Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *Ex: $a+0.05a=1.05a$ means that “increase by 5%” is the same as “multiply by 1.05”.*

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

- 3: Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fraction, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *Ex: If a woman making \$25 an hour gets a 10% raise, she will make an additional $1/10$ of her salary an hour, or \$2.50, for a new salary of \$27.50.*
- 4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
 - a: Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *Ex: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
 - b: Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *Ex: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.*

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

- 1: Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
- 2: Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
- 3: Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

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

- 4: Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
- 5: Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
- 6: Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

STATISTICS AND PROBABILITY**Use random sampling to draw inferences about a population.**

- 1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
- 2: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *Ex: Estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*

Draw informal comparative inferences about two populations.

- 3: Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *Ex: The mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*
- 4: Use measures of center and measure of variability to numerical data from random samples to draw informal comparative inferences about two populations. *Ex: Decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

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

- 5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
- 6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *Ex: When rolling a number cube 600 times, predict that a 3 or 5 would be rolled roughly 200 times, but probably not exactly 200 times.*
- 7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
 - a: Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *Ex: If a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*
 - b: Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *Ex: Find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*
- 8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
 - a: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
 - b: Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
 - c: Design and use a simulation to generate frequencies for compound events. *Ex: Use random digits as a simulation tool to approximate the answer to the questions: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

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.

Select appropriate resources for background information related to a question, for use in the design of a controlled investigation.

Explain the role of a hypothesis in a scientific inquiry.

Scientific Testing

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

Design an investigation to test individual variables using scientific processes.

Conduct a controlled investigation, utilizing multiple trials, to test a hypothesis using scientific processes.

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).

Analyze results of data collection in order to accept or reject the hypothesis.

Determine the validity and reliability of results of an investigation.

Formulate a conclusion based on data analysis.

Refine hypotheses based on results from investigations.

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

Communication

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

Display data collected from a controlled investigation.

Communicate the results of an investigation with appropriate use of qualitative and quantitative information.

Write clear, step-by-step instructions for following procedures (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., Rachel Carson [scientist]; Luis Alvarez [scientist] and Walter Alvarez [scientist], Percival Lowell [scientist], Copernicus [scientist]).

Nature of Scientific Knowledge

Describe how science is an ongoing process that changes in response to new information and discoveries. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.

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 environmental risks (e.g., pollution, destruction of habitat) caused by human interaction with biological or geological systems.

Analyze environmental benefits of the following human interactions with biological or geological systems: reforestation, habitat restoration, construction of dams.

Propose possible solutions to address the environmental risks in biological or geological 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.

Describe a scientific discovery that influences technology.

LIFE SCIENCE**Populations of Organisms in an Ecosystem**

Compare food chains in a specified ecosystem and their corresponding food web.

Explain how organisms obtain and use resources to develop and thrive in: niches, predator/prey relationships.

Analyze the interactions of living organisms with their ecosystems: limiting factors, carrying capacity.

Evaluate data related to problems associated with population growth (e.g., overgrazing, forest management, invasion of non-native species) and the possible solutions.

Predict how environmental factors (e.g., foods, droughts, temperature changes) affect survival rates in living organisms.

Create a model of the interactions of living organisms within an ecosystem.

EARTH AND SPACE SCIENCE**Structure of the Earth**

Classify rocks and minerals by the following observable properties: grain, color, texture, hardness.

Describe the properties and the composition of the following major layers of the Earth: crust, mantle, core.

Explain the following processes involved in the formation of the Earth's structure: erosion, deposition, plate tectonics, volcanism.

Describe how the rock and fossil records show that environmental conditions have changed over geologic and recent time.

Earth's Processes and Systems

Explain the rock cycle.

Distinguish the components and characteristics of the rock cycle for the following types of rocks: igneous, metamorphic, sedimentary.

Analyze the evidence that lithospheric plate movements occur.

Explain lithospheric plate movement as a result of convection.

Relate plate boundary movements to their resulting landforms, including: mountains, faults, rift valleys, trenches, volcanoes.

Describe how earthquakes are measured.

Emergence of the Modern United States

Examine the reasons why people emigrated from their homelands to settle in the United States during the late 19th century.

Describe how the United States was positively and negatively affected by factors and events resulting from the arrival of a large number of immigrants.

Discuss how the Industrial Revolution in the United States was supported by multiple factors (e.g., geographic security, abundant natural resources, innovations in technology, available labor, global markets).

Analyze the impact of industrialization on the United States:

- Rural to urban migration
- Factory conditions
- Unions
- Influence of big businesses

Describe the following Progressive Reforms that resulted from the Industrial Revolution:

- Labor unions
- Women's Suffrage
- Trust busting
- Conservation of natural resources
- Temperance Movement

Describe how innovations of the Industrial Revolution (e.g., manufacturing, textiles, transportation, improvements) contributed to U.S. growth and expansion.

Identify the following groups' contributions to the changing social and political structure of the U. S. :

- Labor leaders (e.g., Samuel Gompers, Mother Jones)
- Social reformers (e.g., Susan B. Anthony, Elizabeth Cady Stanton)
- Industrialists (e.g., John D. Rockefeller, Andrew Carnegie)
- Inventors (e.g., Thomas Edison, Henry Ford)
- Populists (e.g., William Jennings Bryan)
- Financiers (e.g., J. P. Morgan, Jay Gould)

Describe the following factors that fostered the growth of American imperialism during the late 19th and early 20th centuries:

- Desire for military strength
- Interest in new markets
- Need for inexpensive source of raw materials

Analyze the United States' expanding role in the world during the late 19th and early 20th centuries:

Spanish American War, Panama Canal, Alaska and Hawaii, Open Door Policy, China-Boxer Rebellion.

Describe major factors in Arizona history (e.g., territorial status, mining, constitutional convention) leading to statehood.

Describe the following events that led to United States involvement in World War I:

- Shift away from isolationism
- Sinking of the Lusitania
- Zimmermann Telegram

Describe important events associated with World War I:

- Anti-German feelings in the United States
- Passing of the Selective Service Act
- Migration of African-Americans to the north
- Wilson's Fourteen Points
- Controversy over the Treaty of Versailles

Great Depression and World War II

Identify economic policies and factors (e.g., unequal distribution of income, weaknesses in the farm sector, buying on margin, stock market crash) that led to the Great Depression.

Determine the impact of natural and manmade crises (e.g., unemployment, food lines, the Dust Bowl and the western migration of Midwest farmers) of the Great Depression.

Describe how the following New Deal programs affected the American people: works program (e.g., WPA, CCC, TVA), farm subsidies, Social Security.

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

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

Contemporary United States

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 historical era being studied.

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

Describe the relationship between a primary source document and a secondary source document.

Determine the credibility and bias of primary and secondary sources.

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

Describe two points of view on the same historical event.

Age of Revolution

Describe how innovations and inventions during the Industrial Revolution impacted industry, manufacturing, and transportation.

Determine the effect of the Industrial Revolution on the Western World:

- Growth of cities

- Rise of middle class

- Spread of industrialism

- Rise of imperialism

- Foundation for future technological advances

- Labor issues

Age of Imperialism

Describe the effects of the following factors on the rise of Imperialism:

- Increased need for raw materials
- Increased need for consumers

- Nationalism – countries increased power

Describe how areas in the world (e.g., Africa, India, China) were impacted by the imperialism of European countries.

Describe how industrialization in Japan led to its rise as a world power.

Describe the impact of American interests in the following area during the late 19th century and early 20th century:

- Philippines, Cuba, Puerto Rico and the Spanish American War

- China and the Boxer Rebellion

- Colombia and the building of the Panama Canal

- Hawaiian annexation

World at War

Explain how the following world movements led to World War I: militarism, imperialism, nationalism, formation of alliances.

Summarize the outcomes of World War I:

- Treaty of Versailles (e.g., restrictions on Germany, end of the Ottoman Empire, redrawing of European boundaries)

- Economic issues (e.g., national debt, spread of socialism)

Describe the rise of totalitarianism in Europe following World War I:

- Italy under Mussolini

- Germany under Hitler

- Soviet Union under Stalin

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 identified in Concept 8 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 (e.g., terrorism, globalization, conflicts, interdependence, natural disasters, advancements in science and technology, environmental issues) affected, and continue to affect, the social, political, geographic, and economic climate of the world.

Compare the economic, political, and social aspects of a country identified in Concept 8 during the first half of the 20th century to its contemporary economic, political, and social aspects.

CIVICS/GOVERNMENT**Foundations of Government**

Analyze the significance of the principles and ideals of the following documents: Bill of Rights (as related to specific time periods), Emancipation Proclamation.

Analyze Arizona's transition from territory to statehood: locations of capital, founding people, Arizona's constitution.

Structure of Government

Describe how the powers of checks and balances are used in the following: impeachment, declaring war, treaties, veto, judicial review.

Functions of Government

Analyze the significance of the following judicial decisions: Dred Scott, Plessy vs. Ferguson, Scopes Trial. Identify the government's role in progressive reforms (e.g., women's suffrage, labor unions, temperance movement, civil rights).

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 laws
- Paying taxes
- Registering for selective service
- Jury duty

Describe the impact of Constitutional Amendments and laws (i.e., Thirteenth, Fourteenth, Fifteenth, Eighteenth, Nineteenth, and Twenty-first Amendments, Jim Crow Laws, Black Codes, Dawes Act) that came about during the historical time periods studied.

Government Systems of the World

Discuss how negotiations with foreign governments have led to the development of foreign policy initiatives (e.g., Treaty of Versailles, Fourteen Points, League of Nations).

Compare different types of governments: dictatorship, totalitarian, monarchies.

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, significant waterways, mountain ranges, climate zones, major water bodies, landforms) throughout the world.

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

Places and Regions

Describe the human and physical characteristics of places and regions.

Explain the concept of regions and why they change.

Compare the historical and contemporary interactions among people in different places and regions.

Describe how a place changes over time.

Human Systems

Discuss the implications of the demographic structure of places and regions.

Describe the push and pull factors (e.g., need for raw materials, enslavement, employment opportunities, impact of war, religious freedom, political freedom) that cause human migrations.

Describe the effects of human migration (e.g., imperialism, quota system, changing of political boundaries, multiculturalism) in the U.S. and regions of the world.

Analyze how social (e.g., family), physical (e.g., good climate, farmland, water, minerals) and economic (e.g., jobs) resources influence where human populations choose to live.

Analyze the effects of settlement (e.g., quality of life, transportation, population density) on places.

Describe the distributions and patterns of cultural characteristics (e.g., religions, language, standards of living) over time.

Describe the factors, e.g., nearness to transportation routes, markets, raw materials, labor force) that influence the location, distribution and interrelationships of economic activities in different places and world regions.

Explain how cooperation and conflict contribute to political, economic, and social activities.

Identify cultural aspects (e.g., literacy rates, occupations, property rights) based on social and political factors.

Describe how changes in technology, transportation, communication, and resources affect the location of economic activities in places and world regions.

Environment and Society

Identify the physical processes (e.g., conservation of natural resources, mining, water distribution in Arizona) that influence the formation and location of resources.

Describe the consequences of natural hazards (e.g., Dust Bowl, hurricanes, droughts, earthquakes).

Describe how humans modify environments (e.g., conservation, deforestation, dams) and adapt to the environment.

Describe the positive and negative outcomes of human modification on the environment.

Explain how modification in one place (e.g., canals, dams, farming techniques, industrialization) often leads to changes in other locations.

Describe the ways human population growth can affect environments and the capacity of environments to support populations.

Compare different points of view and research on environmental issues (e.g., land use, natural resources, wildlife, biomes).

Geographic Applications

Describe ways geographic features and conditions influence history.

Describe how environments (e.g. Sun Belt, urban areas) influence living conditions.

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.

Identify how governments and businesses make choices based on the availability of resources.

Describe the characteristics of a market economy: property rights, freedom of enterprise, competition, consumer choice, limited role of government.

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.

Describe how (private) investment in human capital such as health (e.g., immunizations), education (e.g., college) and training of people (e.g., on the job experience), leads to economic growth.

Describe how investment in physical capital (e.g., factories, machinery, new technology) leads to economic growth.

Describe the role of entrepreneurs (e.g., Carnegie, Ford, Rockefeller, J.P. Morgan, Vanderbilt) in the free enterprise system.

Describe the function of private business in producing goods and services.

Describe how the interaction between buyers and sellers determines market prices.

Explain how the (unequal) distribution of income affects public policy and standards of living.

Describe the government's investment in human capital: health, education, training of people.

Describe the government's investment in physical capital (e.g., NASA, transportation).

Describe the government's role in economic recovery for the individual (e.g., farm subsidy, securities, Social Security, exchange regulations).

Macroeconomics

Describe the effects of inflation (e.g., higher prices, rising interest rates, less business activity) on society.

Analyze the effects (e.g., inflation, unemployment) of the Great Depression.

Analyze the government's role (e.g., FDIC, Securities and Exchange Commission) in national economic recovery.

Describe how scarcity influences the choices (e.g., war time rationing, women in the work force, reallocation of resources) made by governments and businesses.

Global Economics

Explain how voluntary exchange benefits buyers and sellers.

Identify the patterns of economic interaction (e.g., national debt, balance of trade) between countries.

Personal Finance

Describe how scarcity influenced the historical times studied.

Describe how scarcity influences personal financial choices (e.g., buying on-margin, budgeting, saving, investing, credit).

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

Describe types of personal investments (e.g., saving accounts, stocks, bonds).