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http://www.projectaero.org/aero_standards/AEROhomepage.html



Grade 5 Standards

Grade 5 English Curriculum

READING

- **Students will read fluently using the skills and strategies of the reading process.**
 - Recognize words and understand sentences (using knowledge of sounds, syllables and letter patterns; a range of cueing systems; familiarity with vocabulary and word origins; contextual cues; knowledge of syntax; etc.
 - Read a variety of text aloud with appropriate fluency, accuracy, pacing, intonation, and expression.

Knowledge/Skills

Word Recognition

1. Read aloud narrative and expository text fluently and accurately with appropriate pacing, intonation, and expression.

Vocabulary and Concept Development

2. Use words origins to determine the meaning of unknown words.
3. Understand and explain frequently used synonyms, antonyms, and homographs.
4. Know abstract, derived roots and affixes from Greek and Latin and use this knowledge to analyze the meaning of complex words (e.g., controversial)
5. Understand and explain the figurative and metaphorical use of words in context.

- **Students will comprehend, respond to, and analyze a wide variety of literary texts.**

- Imagine, using a variety of senses.
- Make connection drawing upon prior knowledge to make text-to-self, text-to text and text-to- world connections.
- Explore inferences involving thinking about the text, recognizing cause-and-effect relationships, making predictions, developing analogies, extending the logic of a piece of writing, and merging known and new information.
- Ask questions about text and pose meta-cognitive questions such as: “Am I getting the point?” “Why does this text (not) engage me?”
- Determine important ideas and themes.
- Evaluate, summarize, and synthesize.
- Reread and adjust approaches to the text.

Knowledge/Skills

Structural Features of Informational Materials

1. Understand how text features (e.g., format, graphics, sequence, diagrams, illustrations, charts, maps) make information accessible and usable.
2. Analyze text that is organized in sequential or chronological order.

Comprehension and Analysis of Leveled Texts

3. Identify main ideas and concepts presented in texts.
4. Identify and assess evidence that supports main ideas and concepts presented in texts.
5. Draw conclusions and generalizations about text.
6. Draw inferences about text and support them with textual evidence and prior knowledge.

Expository Critique

7. Distinguish facts, supported inferences, and opinions in text.

Structural Features of Literature

8. Identify and analyze the characteristics of poetry, fiction, and nonfiction and explain the appropriateness of the literary forms chosen by and author for a specific purpose.

Narrative Analysis of Leveled Texts

9. Identify the main problem or conflict of the plot and explain how it is resolved.
10. Contrast the actions, motives (e.g., loyalty, selfishness, conscientiousness), and appearances of characters in a work of fiction and discuss the importance of the contrasts to the plot or theme.
11. Understand that theme refers to the meaning or moral of a selection and recognize themes (whether implied or stated directly) in sample works.
12. Describe the function and effect of common literary devices (e.g., imagery, metaphor, similes, symbolism).

Literary Criticism

13. Evaluate the meaning of archetypal patterns and symbols that are found in myth and tradition by using literature from different eras and cultures.
14. Evaluate the author's use of various techniques (e.g., appeal of characters in a picture book, logic and credibility of plots and settings, use of figurative language) to influence readers' perspectives.

➤ **Students will apply skills and strategies appropriate for reading non-fiction texts.**

- Analyze text structure.

Knowledge/Skills

1. Read structural organizational cues such as: boldface headings, italicized words, visuals (photographs, maps, graphs, timelines, captions).
2. Use text features such as: table of contents, index, glossary.
3. Recognize types of nonfiction text structure: sequence, compare-contrast, cause-effect, problem- solution, description.

WRITING

➤ **Students will write with a command of informal and formal English.**

- Construct complex sentences
- Identify and correctly use the right basic parts of speech
- Use correct punctuation and spelling.

Knowledge/Skills

Sentence Structure

1. Correctly use transitions and conjunctions to connect ideas.

2. Correctly use the prepositional phrases, and independent and dependent clauses.

Grammar

3. Identify and correctly use verbs that are often misused (e.g., lie/lay, sit/set, rise/raise), modifiers, and pronouns.

Punctuation

4. Use a colon to separate hours and minutes and to introduce a list.
5. Use quotation marks around the exact words of a speaker and titles of poems, songs, short stories, and so forth.

Capitalization

6. Use correct capitalization.

Spelling

7. Spell roots, suffixes and prefixes, contractions, and syllable constructions correctly.

➤ **Students will write with clarity, logic, validity, and effectiveness on a wide range of topics and for a variety of purposes and audiences.**

- Write freely from topics of interest demonstrating voice and consideration for purpose and audience.
- Write in a variety of genre.
- Progress through the stages of the writing process in selected pieces.
- Use the 6+1 traits as a tool.

Knowledge/Skills

Organization and Focus

1. Create multiple-paragraph narrative compositions:
 - Establish and develop a situation or plot.
 - Describe the setting.
 - Present an ending.
2. Create multiple-paragraph expository compositions:
 - Establish a topic, important ideas, or events in sequence or chronological order.
 - Provide details and transitional expressions that link one paragraph to another in a clear line of thought.
 - Offer a concluding paragraph that summarizes important ideas and details.

Research and Technology

3. Define focus to guide research.
4. Gather and record information (e.g., note taking, photography, surveys).
5. Quote or paraphrase information sources, citing them appropriately.
6. Use standard reference tools (e.g., dictionary, thesaurus, library information systems, encyclopedia, on-line information) to gather information for research.
7. Research information for reports that frame a key question about an issue or situation, drawing from multiple sources of information (e.g., speakers, books, newspapers, media sources).
8. Use organizational features of printed text (e.g., citations, end notes, bibliographic references) to locate relevant information.
9. Create simple documents by using electronic media and employing organizational features (e.g., passwords, entry and pull-down menus, word searches, the thesaurus, spell checks).

Evaluation and Revision

10. Edit and revise manuscripts by adding, deleting, consolidating, clarifying, and rearranging words and sentences to improve the meaning and focus of writing.

Genres and Their Characteristics

11. Write narratives:
 - Establish a plot and a setting.
 - Establish a point of view and conflict.
 - Tell the events of story.
12. Write responses to literature:
 - Demonstrate an understanding of the literary work.

- Support judgments through references to the text and to prior knowledge.
 - Develop interpretations that exhibit careful reading and understanding.
13. Write research reports about important ideas, issues, or events by using the following guidelines:
- Frame questions that direct the investigation.
 - Establish a controlling idea or topic.
 - Develop the topic with simple facts, details, examples, and explanations.
14. Write persuasive letters or compositions:
- State a clear position in support of a proposal.
 - Support a position with relevant evidence.
 - Follow a simple organizational pattern.
 - Address reader concerns.
15. Write poetry in free verse.

LISTENING AND SPEAKING

- **Students will listen and respond critically to oral communication.**
 - Ask questions that seek information.
 - Interpret a speaker's verbal and nonverbal messages, purposes, and perspectives.
 - Make inferences or draw conclusions based on an oral report.
- **Students will deliver coherent, well-focused informal and formal oral presentations.**
 - Convey ideas clearly and relate to the background and interest of the audience.
 - Evaluate the content of oral communication.

Knowledge/Skills

1. Correctly use transitions and conjunctions to connect ideas.
2. Correctly use the prepositional phrases, and independent and dependant clauses.
3. Select a focus, organizational structure, and point of view for an oral presentation.
4. Clarify and support spoken ideas with evidence and examples.
5. Engage the audience with appropriate verbal cues, facial expressions, and gestures.
6. Make narrative presentations:
 - Relate ideas, observations, or recollections about an event or experience.
 - Provide a context that enables the listener to imagine the circumstances of the event or experience.
 - Provide insight into why the selected event or experience is memorable.
7. Deliver narrative presentations:
 - Establish a situation, plot, point of view, and setting with descriptive words and phrases.
 - Show, rather than tell, the listener what happens.
8. Deliver informative presentations about an important idea, issue, or event by the following means:
 - Frame questions to direct the investigation.
 - Establish a controlling idea or topic.
 - Develop the topic with simple facts, details, examples, and explanations.
9. Deliver oral responses to literature:
 - Summarize significant events and details.
 - Articulate and understanding of several ideas or images communicated by the literary work.
 - Use examples or textual evidence from the work to support conclusions.
10. Recite poems (i.e., two or three stanzas), or dramatic dialogues.

- **Students will analyze and evaluate the content and its presentation in a variety of media.**

- Identify, analyze, and critique persuasive techniques (e.g., promises, dares, flattery, glittery generalities)
- Identify logical fallacies used in oral presentations and media messages.
- Identify media as sources for information, entertainment, persuasion, interpretation of events, and transmission of culture.

- **Students will demonstrate a command of research skills.**
(See “research” in Reading, Writing, and Speaking Standards).

Grade 5 Math Curriculum

Numbers and Operations

- **Understand numbers, ways of representing numbers, relationship among numbers, and number systems.**
- Explore numbers through the billions (and ten-thousandths).
 - Understand the concepts of fractions and decimals.
 - Understand the relative values on non-negative fractions or decimals.
 - Understand and apply the concept of divisibility.

Knowledge/Skills

1. Identify, read, write, and illustrate any given positive or negative whole number, fraction, or decimal.
2. Recognize negative numbers as those less than zero and give real life situations where negative numbers are used.
3. Demonstrate the relationship between place value and powers of 10.
4. Identify equivalent decimals.
5. Identify and generate equivalent fractions; simplify answers.
6. Convert between mixed and improper fractions.
7. Identify GCF, LCM, and common factors.
8. Investigate powers of 2 and 3.
9. Explore the relative size of decimals and fractions through illustrations, models, and number lines.
10. Recognize equivalent fraction, decimal, percent forms ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$).
11. Demonstrate multiple ways to represent numbers and select the appropriate representation given a situation.
12. Interpret the relative magnitude of numbers.
13. Explore fractions as a ratio.
14. Explore the meaning of percent.
15. Express numbers less than or equal to one as a percent.

- **Understand meanings of operations and how they relate to one another.**
- Compare operations with whole numbers, fractions, and decimals, using various models.
 - Explain, derive, compare, and use properties of operations and relationships among operations.
 - Explain and apply number theory concepts (such as primes, multiples, and composites).

Knowledge/Skills

1. Identify real world situations when fractions, decimals, integers, and percents are used
2. Graph on a number line integers, fractions, and decimals.
3. Recognize that addition/subtraction and multiplication/division are inverse operations.

4. Investigate division as multiplying by the reciprocal.
5. Compare any two given numbers.
6. Explore the properties of real numbers (commutative, associative, additive and multiplicative identities, multiplying by zero).
7. Recognize that division by zero is undefined.
8. Multiply with the distributive property.
9. Apply order of operations (excluding exponents) with positive numbers, basic fractions, and decimals.
10. Apply divisibility rules (2,3,5,9,10).
11. Identify prime and composite numbers; use prime factorization.

➤ **Compute fluently and make reasonable estimates.**

- Demonstrate proficiency with and memorize multiplication and division facts through 12.
- Create and solve practical problems involving addition, subtraction, multiplication, and division of whole numbers, fractions, and mixed numbers.
- Develop, analyze, and compare algorithms for computing with fractions, decimals, percents, and integers and compute with them efficiently and accurately, including in multi-step problems that require application of order of operations.
- Apply, explain, and assess the appropriateness of a variety of estimation strategies (such as rounding to compatible numbers).
- Use various forms of estimation, including rounding, to determine the reasonableness of calculated answers; determine if an estimate is too high or too low.

Knowledge/Skills

1. Add, subtract, multiply, and divide a series of positive whole numbers.
2. Add, subtract, and multiply, a minimum of two decimals to the thousandths place.
3. Divide a decimal by a whole number.
4. Add, subtract, multiply, and divide a minimum of two fractions, mixed and improper, with like and unlike denominators.
5. Estimate the percent of a number.
6. When dividing whole numbers, write the remainder as a fraction.
7. Use rounding to estimate sums, differences, products, and quotients.
8. Select and use computation techniques appropriate to specific problems.
9. Predict the results of a problem.
10. Explore multiplying and dividing by multiples of 10.
11. Round decimals; know appropriate situations to round up or down.

Patterns/Algebra

➤ **Understand patterns, relations, and functions.**

- Apply understanding of a pattern to develop a rule describing the pattern including combinations of two arithmetic operations.
- Use patterns and their extensions to make predictions and solve problems.
- Use rules and variables to describe patterns, functions, and other relationships and to solve equations.
- Generate and solve simpler functions by identifying and applying multiplication and division patterns.

Knowledge/Skills

1. Observe and describe patterns in the real world looking in nature, art, and geography.
2. Describe, extend, analyze, and create a wide variety of patterns in interdisciplinary situations.
3. Distinguish between repeating patterns and growing patterns.
4. Organize data into a table, identify and explain number patterns and rules.

➤ **Represent and analyze mathematical situations and structures using algebraic symbols.**

- Use variables in simple expressions, compute the value of the expression for specific values of the variable, and plot and interpret the results.

Knowledge/Skills

1. Understand the concept of variable.
2. Translate written expressions into algebraic statements using 1 variable.
3. Translate written statements into 1 step equations.
4. Determine the missing value in a 1step equation using manipulatives and mental math.

Data Analysis and Probability

- **Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.**
 - Understand how different collection methods or different questions can affect the results.

Knowledge/Skills

1. Ask the same question using different data collection methods that result in other points of view being supported and explain why the method affected the data.
 2. Explain how different data collection methods affect the nature of the data set with a given question (e.g. phone survey, internet search, person-to-person survey).
 3. Identify or describe the appropriate sample for a given question.
 4. Identify or describe the appropriate population for a given sample.
 5. Understand the meaning of random sample and why random sample is used.
 6. Use graphs and charts to analyze data (pictograph, bar graph, line graph, circle graph, stem and leaf).
 7. Collect, organize, and present a given set of data in a variety of forms (bar graph, line graph, stem and leaf).
- *Select and use appropriate statistical methods to analyze data.*
 - Understand and apply the mean of a set of data.

Knowledge/Skills

1. Explain how to find the mean of a set of data and explain the significance of the mean.
 2. Find the mean from a given set of data using objects, pictures, or formulas.
 3. Given a problem situation, determine and defend whether mean, median, or mode is the most appropriate measure of average.
 4. Compare the mean, median, and mode for a given set of data.
 5. Find and compare mean for two samples from the same population.
 6. Calculate the mean, median, mode, and range.
- **Develop and evaluate inferences and predictions that are based on data**
 - Apply strategies to organize, display, and interpret data.

Knowledge/Skills

1. Read and interpret data from text, line and bar graphs, histograms, stem-and –leaf plots, and circle graphs and determine when using each of these is appropriate.
2. Use histograms, pictographs, and stem-and leaf plots to display data.
3. Construct assorted graphs that include labels, appropriate scale, and key.
4. Determine what type of data should be represented on a bar graph, circle graph, histogram, or line graph.
5. Compare the consistency of results from two different displays that address the same question.
6. Construct and compare graphs with different scales representing the same data.
7. Compare and contrast results gathered from different samples; identify biases.

8. Make inferences and arguments based on data analysis.

- *Understand and apply basic concepts of probability.*
 - Understand the likelihood (chance) of events occurring.

Knowledge/Skills

1. Classify events on the probability scale of 0-1.
2. Predict the probability of an event as a fraction and ratio.
3. Explore probability and fairness.
4. Model situations by carrying out experiments to determine probabilities.
5. Identify a sample space to determine a probability.
6. Compare individual, small group, and larger group experimental results of an experiment to understand larger samples.

Geometry

- **Analyze characteristics and properties of two and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.**
 - Identify, describe, and classify the properties of, and the relationships between, plane and solid geometric figures.
 - Understand properties of angles and polygons.
 - Apply understanding of the properties of parallel and perpendicular and line symmetry to two-dimensional shapes and figures.

Knowledge/Skills

1. Identify, describe, and draw lines, line segments, and rays; include parallel and perpendicular.
 2. Identify, describe and classify angles.
 3. Classify and describe regular polygons according to the number of sides and vertices; explore irregular polygons.
 4. Name triangles and quadrilaterals according their properties.
 5. Identify the parts of a circle.
 6. Investigate similar and non-similar polygons.
 7. Identify and describe pyramids and prisms using the terms face, edge, vertex.
 8. Identify, make, and describe cubes, cylinders, pyramids, and prisms; compare to two dimensional figures.
 9. Find examples in the real world of two and three dimensional shapes.
- *Apply transformations and use symmetry to analyze mathematical situations.*
 - Analyze and model transformations of geometric figures and rotations of line segments, describing the motions as slides, flips, or rotations.

Knowledge/Skills

1. Tessellate a plane.
2. Recognize and draw lines of symmetry.
3. Demonstrate flips (reflections), slides (translations), and turns (rotations) through the use of manipulatives and technology.

Measurement

- **Understand measurable attributes of objects and the units, systems, and processes of measurement.**
 - Understand and compute the volumes, areas, and perimeters of simple objects.
 - Understand the concept of angle measurement.

- Understand degrees (30° , 45° , 60° , 90° , and 180°) as units of measurement for angles.
- Understand how measurement units of capacity, weight, and length are organized in the metric system.

Knowledge/Skills

1. Describe and compare angles in a variety of objects.
 2. Identify angles in the environment.
 3. Classify or sort angles as right, acute, or obtuse.
 4. Identify types of angles in polygons (e.g., right, acute, obtuse).
 5. Explain and provide examples of how angles are formed.
 6. Describe an angle in relation to a right angle.
 7. Measure angles to the nearest 5 degrees using a protractor, angle ruler, or other appropriate tool.
 8. Measure angles in assorted polygons and determine the total number of degrees in the polygon.
 9. Explain how degrees are used as measures of angles (e.g., a circle can be divided into 360°).
 10. Identify, draw, or demonstrate angles that match or approximate 30° , 45° , 60° , 90° , and 180° .
 11. Explain and give examples of the metric system standard units for capacity, weight, and length.
 12. Demonstrate or explain how grams are organized into kilograms.
 13. Demonstrate or explain how millimeters are organized into centimeters and how centimeters are organized into meters.
 14. Demonstrate or explain how milliliters are organized into liters.
 15. Select and use appropriate units for measuring area (e.g., square units) or dimensions.
 16. Select and use tools that match the unit (e.g., grid paper, squares, ruler).
 17. Explain a method for measuring the area of a rectangle or right triangle (e.g., use the formula for the area of a rectangle or triangle, select grid paper).
 18. Use measurements of area to describe and compare rectangles or triangles.
 19. Solve problems involving measurement of area in rectangle and triangle (e.g., create a design using triangles and rectangles and determine how much paint is needed to cover the area of each of the shapes).
 20. Analyze a measurement situation and determine whether measurement has been done correctly.
 21. Explain how to find the perimeter or area of any rectangle using a rule.
 22. Explain and use formulas to find the perimeter or area of a rectangle.
 23. Explain and use a formula to find the area of a right triangle.
 24. Find and compare all possible rectangles or right triangles with whole number dimensions with a given perimeter or area (e.g., a rectangle with an area of 24 square feet could be $1' \times 24'$, $2' \times 12'$, $3' \times 8'$, or $4' \times 6'$).
 25. Explain why formulas are used to find area and/or perimeter.
 26. Add and subtract hours and minutes.
 27. Read temperatures on a thermometer and calculate changes in temperature
- *Apply appropriate techniques, tools, and formulas to determine measurements.*
- Select and use appropriate instruments and customary and metric units for measuring quantities, including perimeter, volume, area, weight, time, and temperature, with specified accuracy; match tools with the attribute they measure (for example, rulers measure length, thermometers measure temperature).

Knowledge/Skills

1. Measure and draw to the nearest $\frac{1}{4}$ of an inch.
2. Measure and draw to the nearest centimeter.
3. Measure and draw angles with a protractor.
4. Explore the concepts of area and perimeter.
5. Calculate the perimeter of polygons; with similar and mixed units.
6. Develop a formula for the area of squares, rectangles, and right triangles.
7. Convert between different time zones.
8. Convert between different currencies.

Grade 5 Science Curriculum

Grade 5 Physical Science

- Understand the relationship between force, mass, and the motion of objects.
- Know and understand scientific theories of the nature of matter and how those theories developed.

Foss Kit: Simple Machines

- Understand that force can be applied to objects by simple machines to create motion.
- Know that when a force is applied to an object, the object either speeds up, slows down, or goes in a different direction.
- Know the relationship between the strength of a force and its effect on an object (e.g., the greater the force, the greater the change in motion, the more massive the object, the smaller the effect of a given force).

Knowledge

- 1. Gain experience constructing and manipulating levers.**
2. Learn the concepts of lever arm, fulcrum, load, and effort.
3. Experience one advantage that can be gained by using a lever - reduced effort.
4. Learn to identify class-1, class-2, and class-3 levers.
5. Diagram levers to show placement of the load and effort.
6. Analyze common tools in terms of levers.
7. Analyze pictures in terms of levers.
8. Assemble and investigate pulley systems.
9. Learn the vocabulary associated with pulley systems.
10. Discover the advantages to be gained by using pulleys: decrease in effort and change in direction of effort.
11. Diagram pulley systems.
12. Investigate pulley systems with one or two pulleys.
13. Discover the relationship between the number of ropes pulling on a load and the effort required to lift that load.
14. Record and compare the distance moved by the load and the effort in four different pulley systems.
15. Describe instances where scientific ideas and discoveries have led to new inventions and applications.
16. Describe technologies that have been developed to improve their living conditions.
17. Identify positive and negative effects of familiar technologies.
18. Describe how technological products and systems can be used to conserve natural resources.

Matter/Atoms

- Know that things can be done to materials to change some of their properties (e.g., heating, freezing, melting, cutting, dissolving, boiling) but not all materials respond in the same way to what is done to them.
- Know that objects can be classified according to their properties (e.g., magnetism, conductivity, density, solubility).
- Know that materials may be composed of parts that are too small to be seen without magnification.
- Know that properties such as length, weight, temperature, and volume can be measured using appropriate tools. (e.g., rulers, balances, thermometers, graduated cylinders).
- Know that the mass of a material remains constant whether it is together, in parts, or in a different state.

Grade 5 Earth Science

- Understand basic Earth processes.
- Understand scientific theories of how the Earth's surface is formed and how those theories developed.

Solar System

- Understand essential ideas about composition and structure of the universe and the Earth's place in it.
- Know time and space relationship of to the Sun-Earth-Moon system.
- Know that the Earth is one of several planets that orbit the Sun and the Moon orbits around the Earth.
- Describe and explain the importance of the Sun as the central star of our solar system.
- Know that the patterns of stars in the sky stay the same, although they appear to slowly move from east to west across the sky nightly, and different stars can be seen in different seasons.
- Know that planets look like stars, but over time they appear to wander among the constellations.
- Know that telescopes magnify distant objects in the sky (e.g., the Moon, Planets) and dramatically increase the number of stars we can see.
- Know that astronomical objects in space are massive in size and are separated from one another by vast distances. (e.g. many stars are more massive than our Sun but so distant they look like parts of light).

Knowledge

- 1. Describe lunar and solar eclipses.**
- 2. Identify telescopes, satellites, and space probes as instruments scientists use to study the solar system.**
3. Conduct a simple experiment using selected equipment.
4. Evaluate information to construct reasonable explanations from direct evidence.
5. Describe the structure and cycles of the sun.
6. Classify stars based on their physical properties.
7. Identify star formation.
8. Recognize how scientists use telescopes to collect information about stars.
9. Use a model to determine the sun's position in the Milky Way Galaxy.
10. Describe the four basic types of galaxies.
11. Compare galactic clusters to nebulae.
12. Evaluate the impact of research and technology on scientific thought, society, and the environment.
13. Identify careers related to science.

Weathering, Erosion, Layers of Earth, and Plate Tectonics

- Know that smaller rocks come from the breakage and weathering of bedrock and layer rocks.
- Know the composition and properties of soils (e.g., components of soil such as weathered rock, living organism, products of plants and animals, properties of soil such as color, texture, capacity to retain water, ability to support plant growth.).
- Describe how wind, and water in various forms, shape the Earth's surface, including the processes of erosion and deposits.
- Know how features of the Earth's surface are constantly changed by a combination of slow and rapid processes (e.g., weathering, erosion, and deposition of sediment caused by waves, wind, water, and ice, sudden changes in the landscape caused by landslides volcanic eruptions, and earthquakes).

- Know that fossils provide evidences about the plants and animals that lived long ago and the nature of the environment at that time.

Knowledge

1. Distinguish between erosion and deposition.
2. Explain how Earth's crust is broken down into soil.
3. Describe how water, wind, and ice change landforms.
4. Describe the three layers of Earth.
5. Explain how mountains form.
6. Describe what causes volcanoes and earthquakes.
7. Explain the theory of continental drift/plate tectonics.
8. Describe how features of Earth's surface have changed over millions of years.
9. Explain how fossils help scientists learn about plants and animals of the past.
10. Define natural resources.
11. Distinguish between renewable and non-renewable resources.
12. Explain why some natural resources might get used up
13. Compare the three types of fossil fuels.
14. Describe the formation of coal.
15. Explain where petroleum and natural gas are found.
16. Describe how people use natural resources.
17. Explain why conserving natural resources is necessary.
18. Tell how people can conserve natural resources.
19. Describe examples, in the home and at school, of tools, techniques, and materials that can be used to respond to their needs.
20. Provide examples of how science and technology have been used to solve problems in the home and at school.
21. Identify positive and negative effects of familiar technologies

Grade 5 Life Science

- Understand the basic process of the human body.
- Know the general structure and function of cells in organisms.
- Understand how species depend on one another and on the environment for survival.

Characteristics of Organisms

- Know that plants and animals have different structures which serve different functions in growth, survival and reproduction.
- Know that many characteristics of an organism are inherited from parents of the organism (e.g. eye color in human beings, fruit or flower color in plants and other characteristics result from an individual's interaction with the environment (e.g. people's table manners, ability to ride a bicycle).

Cells

- Identify the cell as the fundamental unit of living organism and recognizing that some organisms are unicellular while others are multicellular.
- Know the levels of organization in living organisms, including cells, tissues, organs, and organ systems.
- Know that cells continually divide to make more cells for growth and repair.

Human Body Circulatory System

- **Describe the circulatory process.**

Knowledge

1. Explore the make up of blood and the structure of the circulatory system.
2. Examine how nutrients, carbon dioxide, and wastes travel through and leave the body.
3. Relate diet and exercise to the health of the transplant system.

Human Body Nervous System

- **Describe how the brain gets signals from all parts of the body telling what is going on throughout the body and sends signals to parts of the body to influence what they do.**

Knowledge

1. Observe how the senses gather information and identify objects.
2. Observe the workings of the nervous system.
3. Discover how the brain controls and coordinates nearly all activities of the body.
4. Observe how the memory works.
5. Observe ways to protect and keep the nervous system healthy.
6. Investigate how drugs affect the body.

Environment

6 Land Biomes

- Know that an organism's patterns of behavior are related to the nature of that organism's environment (e.g., kinds and numbers of other organisms present, availability of foods and resources, physical characteristics of environment.)
- Know that changes in the environment can have different effects of different organisms (e.g., some organisms move in, others move out, some organisms survive and reproduce, other die.)
- Know that all organisms (including humans) cause changes in their environments and these changes can be beneficial and detrimental.

Grade 5 Health

- Know how to maintain and promote personal health.
- Understand the fundamental concepts of growth and development.
- Know essential concepts and practices concerning injury prevention and safety.
- Understand aspects of substance use and abuse.
- Know how to maintain mental and emotional health.

Personal Health

- Set a personal health goal and make progress towards its achievement.
- Know the basic structure and functions of the human body systems (e.g., how they are interrelated, how they function to fight disease).
- Describe the importance of personal hygiene following puberty.

Growth and Development

- Describe basic changes in growth and development from birth to childhood.
- Describe physical changes at puberty.
- Describe the process of menstruation and spermatogenesis.

Injury Prevention and Safety

1. Know the differences between positive and negative behaviors used in conflict situations.
2. Know non-violent strategies to resolve conflicts.

Substance Use and Abuse

- Define the term drug and identify a variety of legal and illegal drugs.
- Identify nicotine, caffeine, and alcohol as drugs.
- Describe the short and long term effects of alcohol and other drug use and abuse.
- Know influences that promote alcohol, tobacco, and other drug use (e.g., peer pressure and adult modeling, advertising, overall availability, cost).
- Recognize high-risk substance abuse situations that pose an immediate threat to oneself or one's friends or family (e.g., drunk and drugged during violent arguments) as well as how and where to obtain help.
- Know ways to avoid, recognize, and respond to negative, social influences and pressure to use alcohol, tobacco, or other drugs (e.g., refusal skills, self-control).

Mental and Emotional Health/Character Education

- Explain how people's actions can affect feelings and reactions of others.
- Identify ways of avoiding violent conflict.
- Know strategies for resisting negative peer pressure.
- Use listening skills to build and maintain healthy relationships
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Grade 5 Scientific Inquiry

- **Students will demonstrate their understanding of the importance of curiosity, honesty, open-mindedness, and skepticism in their own efforts to understand how and why universal phenomena exist and occur.**

- Keep records of investigations and observations and not alter the records.
- Distinguish observations from ideas and speculations and predications about observations.
- Offer reasons for findings and also consider reasons suggested by others.
- Support statements with facts found in books, articles, and other resources.
- Identify when comparisons might not be accurate or appropriate because some conditions are different.
- Question scientific claims based on vague attributions (such as "Leading doctors say...") or on statements made by people outside the area of their particular expertise.

Skills:

1. Identify new questions that arise from what was learned.
2. Propose questions to investigate and practical problems to solve.
3. Follow a given set of procedures.
4. Make observations and collect information that is relevant to a given question or problem.
5. Identify and use a variety of sources of science information and ideas.

- **Students will communicate scientific ideas and activities clearly.**

- Know how to write instructions that others can follow in carrying out a scientific procedure.
- Know how to use numerical data in describing and comparing objects and events.
- Know how to make sketches or models to aid in explaining scientific procedures or ideas.

Skills:

1. State a prediction and a hypothesis based on an observed pattern of events.
2. Record observations using a single word, notes in point form, sentences, and charts.
3. Define objects and events in their investigations.
4. Communicate questions, ideas, and intentions, and listen to others while conducting investigations.
5. Communicate procedures and results, using drawings, demonstrations, and written and oral descriptions.

➤ **Students will be familiar with the character of scientific knowledge and inquiry and how it is achieved.**

- Describe some of the many different forms of scientific investigation.
- Offer justifiable explanations when similar scientific investigations do not produce exactly the same results.
- Explain why clear and active communication is an essential part of doing science, including informing others about scientific work and exposing ideas to criticism.
- Explain why scientists use technology in investigations, including to increase their power of observation and to measure and compare accurately.
- Offer some examples of old scientific knowledge that is still applicable today, and explain that new scientific knowledge is still being discovered.

Skills:

1. Plan a set of steps to solve a practical problem and to carry out a fair test of a science-related idea.
2. Identify and control major variables in their investigations.
3. Carry out procedures to explore a give problem and to ensure a fair test of proposed idea, controlling major variables.

➤ **Students will be able to select and use tools and instruments to conduct scientific activities.**

- Use technology, including cameras, tape recorders, and computers, to store and retrieve verbal and graphic information and data.
- Use a variety of scientific tools to collect data.

Skills:

1. Select and use tools in manipulating materials in building models.

➤ **Students will understand and demonstrate the ideas of system, mode, change, and scale in exploring scientific and technological matters.**

- Understand how parts influence one another in systems with many parts.
- Identify patterns of change, such as steady, repetitive, or irregular change, using records, tables, or graphs of measurements where appropriate.
- Identify the least and greatest possible values of certain events or conditions.

Skills:

1. Suggest improvements to a design or constructed object.

➤ **Students will demonstrate the understanding of safety procedures and explain why they are needed.**

- Follow given safety procedures and rules and explain why they are needed.

Grade 5 Social Studies

- **(Time, Continuity and Change)** Students will understand patterns of change and continuity, relationships between people and events through time and various interpretations of these relationships.
 - Understand the concept of cause and effect and multiple causation in history.
 - Know that people in different times and places view the world differently and why they held these views.
 - Examine and interpret Roman history through museum and archeological field trips.
 - Investigate the ways historians learn about the past if there are no written records.
 - Understand and analyze major historical periods and trends in the ancient world.
- **(Connections & Conflict)** Students will understand causes and effects of interaction among societies, including trade, systems of international exchange, war and diplomacy.
 - Explain causes and consequences of conflict and cooperation among individuals, groups, societies and nations of ancient Middle Eastern civilization in the following categories: environment, belief systems (i.e., religion, politics), economics, geography/land, ethnicity/race/gender, culture.
 - Understand the changes in political geography (territorial discussion) necessitated by historical events and moments.
- **(People, Places and Environment)** Students will understand the concepts of geography and demography and how geography and demography influence and are influenced by human history.
 - Understand and identify the major physical features and territorial divisions of the world.
 - Recognize the importance of the environment's role in shaping ancient human societies.
 - Use appropriate resources and geographic tools to generate and interpret information about the earth.
 - Describe ways the earth's physical and human features have changed over time.
 - Describe geographic factors that influence human migration.
- **(Culture)** Students will understand cultural and intellectual developments and interactions among and within societies.
 - Understand the principals of sequential development of ideas and chronological patterns.
 - Illustrate or retell the main ideas in folktales, legends, songs, myths, and stories of heroism that describe the history and traditions of various cultures.
 - Describe the influence of arts, crafts, music and language on various early cultures
- **(Society and Identity)** Students will understand social systems and structures and how these influence individuals.
 - Understand how early groups and cultures were similar and different in meeting needs and concerns of their members.
 - Identify and describe ways that ethnicity and cultures influence people's daily lives.
- **(Governance and Citizenship)** Students will understand why societies create and adopt systems of governance and how these systems address human needs, rights and citizen responsibility.
 - Understand the principals, function, structures and goals of various forms of government used in the past and today.
 - Examine how people create and change structures of power, authority, governance and law.
 - Know the elements of major political systems (i.e., monarchy, democracy, dictatorship).
- **(Production, Distribution and Consumption)** Students will understand fundamental economic principles and ways in which economics are shaped by geographic and human factors.
 - Understand the role of resources in the economy and issues of scarcity and surplus.
 - Explain relationship between the locations of resources and patterns of population distribution in early civilization.
 - Describe how trade affected the way people earned their living in early civilization.
 - Describe changes in division of labor within early civilization.

- **(Science, Technology & Society)** Students will understand how societies have influenced and been influenced by scientific developments and technological developments.
 - Describe changes in early societies brought about by knowledge and tools.



ACS is in the process of adapting AERO standards for all grade levels.
http://www.projectaero.org/aero_standards/AEROhomepage.html