Appendix A: Georgia Performance Standards

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These activities have been aligned to the Georgia Standards of Excellence (GSE) for Science (S), English Language Arts (ELA), Visual Arts (A) and the Next Generation of Science Standards (NGSS), and range from grades 3-7. The Science curriculum is designed to provide students with the knowledge and skills for proficiency in science. Relationships between science, our environment, and our everyday world are crucial to each student's scientific literacy. To become literate in science, therefore, students need to acquire understanding of "how to do science" (the Characteristics of Science Standards), and of "scientific concepts" (the Content Standards.)

The following standards are targeted in these activities:

GRADE 3

Science Georgia Standards of Excellence

S3E1. Obtain, evaluate, and communicate information about the physical attributes of rocks and soils.

b. Plan and carry out investigations to describe properties (color, texture, capacity to retain water, and ability to support growth of plants) of soils and soil types (sand, clay, loam).

c. Make observations of the local environment to construct an explanation of how water and/or wind have made changes to soil and/or rocks over time. (Clarification statement: Examples could include ripples in dirt on a playground and a hole formed under gutters.)

S3L1. Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia.

a. Ask questions to differentiate between plants, animals, and habitats found within Georgia's geographic regions.

b. Construct an explanation of how external features and adaptations (camouflage, hibernation, migration, mimicry) of animals allow them to survive in their habitat.

c. Use evidence to construct an explanation of why some organisms can thrive in one habitat and not in another.

Next Generation Science Standards (NGSS)

3-LS1-1 From molecules to Organisms: Structures and Processes

Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

3-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Construct an argument that some animals form groups that help members survive.

3-LS3-2 Heredity: Inheritance and Variation of Traits

Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-2 Biological Evolution: Unity and Diversity

Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

3-LS4-4 Biological Evolution: Unity and Diversity

Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

3-ESS2-1 Earth's Systems

Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

3-ESS3-1 Earth and Human Activity

Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

English Language Arts Georgia Standards of Excellence (ELAGSE)

<u>GSE: READING LITERARY (RL)</u>

ELAGSE3RL1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

ELAGSE3RL7: Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting).

ELAGSE3RL10: By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 2-3 text complexity band independently and proficiently.

<u>GSE: READING INFORMATIONAL (RI)</u>

ELAGSE3RI4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.

ELAGSE3RI7: Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

ELAGSE3RI10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2-3 text complexity band independently and proficiently.

Visual Art Georgia Standards of Excellence

VA3.CR.2 Create works of art based on selected themes.

a. Create works of art to express individual ideas, thoughts, and feelings from memory, imagination, and observation.

b. Create works of art emphasizing multiple elements of art and/or principles of design.

GRADE 4

Science Georgia Standards of Excellence

S4L1a-d. Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem.

Next Generation Science Standards (NGSS)

4-LS1-1 From Molecules to Organisms: Structures and Processes

Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS1-2 From Molecules to Organisms: Structures and Processes

Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Structure, Function, and Information

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

English Language Arts Georgia Standards of Excellence (ELAGSE)

GSE: READING LITERARY (RL)

ELAGSE4RL1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

ELAGSE4RL2: Determine a theme of a story, drama, or poem from details in the text; summarize the text.

ELAGSE4RL3: Describe in depth a character, setting, or event in a story or drama, drawing on

specific details in the text (e.g., a character's thoughts, words, or actions).

GSE: READING INFORMATIONAL (RI)

ELAGSE4RI1: Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

ELAGSE4RI2: Determine the main idea of a text and explain how it is supported by key details; summarize the text.

ELAGSE4RI3: Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

ELAGSE4RI4: Determine the meaning of general academic language and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.

ELAGSE4RI5: Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

ELAGSE4RI7: Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

ELAGSE4RI8: Explain how an author uses reasons and evidence to support particular points in a text.

ELAGSE4RI10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range

Visual Art Georgia Standards of Excellence

VA4.CR.1 Engage in the creative process to generate and visualize ideas by using subject matter and symbols to communicate meaning.

GRADE 5

Science Georgia Standards of Excellence

S5E1. Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.

a. Construct an argument supported by scientific evidence to identify surface features (examples could include deltas, sand dunes, mountains, volcanoes) as being caused by constructive and/or destructive processes (examples could include deposition, weathering, erosion, and impact of organisms).

b. Develop simple interactive models to collect data that illustrate how changes in surface features are/were caused by constructive and/or destructive processes.
c. Ask questions to obtain information on how technology is used to limit and/or predict the impact of constructive and destructive processes.
(Clarification statement: Examples could include seismological studies, flood forecasting (GIS maps), engineering/construction methods and materials, and infrared/satellite imagery.)

S5L1. Obtain, evaluate, and communicate information to group organisms using scientific classification procedures.

a. Develop a model that illustrates how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal) using data from multiple sources.
b. Develop a model that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources.

S5L3. Obtain, evaluate, and communicate information to compare and contrast the parts of plant and animal cells.

a. Gather evidence by utilizing technology tools to support a claim that plants and animals are comprised of cells too small to be seen without magnification.

S5L4. Obtain, evaluate, and communicate information about how microorganisms benefit or harm larger organisms. (Clarification statement: Possible microorganisms could include Tardigrades, Lactobacillus, Probiotics, Rotifers, Salmonella, Clostridium botulinum (Botox), E-coli, Algae, etc. Students are not expected to know these specific microorganisms. The list is provided to give teachers examples.)

a. Construct an argument using scientific evidence to support a claim that some microorganisms are beneficial.

Next Generation Science Standards (NGSS)

5-LS1-1 From Molecules to Organisms: Structures and Processes

Support an argument that plants get the materials they need for growth chiefly from air and water.

5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

English Language Arts Georgia Standards of Excellence (ELAGSE)

<u>GSE: READING LITERARY (RL)</u>

ELAGSE5RL7: Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).

ELAGSE5RL10: By the end of the year, read and comprehend literature, including stories, dramas, and poetry, at the high end of the grades 4-5 text complexity band independently and proficiently.

GSE: READING INFORMATIONAL (RI)
ELAGSE5RI1: Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

ELAGSE5RI4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

ELAGSE5RI10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4-5 text complexity band independently and proficiently.

Visual Art Georgia Standards of Excellence

VA5.CR.2 Create works of art based on selected themes.
c. Create representational works of art from direct observation (e.g. landscape, still life, portrait).

GRADE 6

Science Georgia Standards of Excellence

S6E1. Obtain, evaluate, and communicate information about current scientific views of the universe and how those views evolved.
a. Ask questions to determine changes in models of Earth's position in the solar system, and origins of the universe as evidence that scientific theories change with the addition of new information.
d. Develop and use a model to explain the interaction of gravity and inertia that governs the motion of objects in the solar system.

S6E2. Obtain, evaluate, and communicate information about the effects of the relative positions of the sun, Earth, and moon.
a. Develop and use a model to demonstrate the phases of the moon by showing the relative positions of the sun, Earth, and moon.

S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes.
a. Ask questions to determine where water is located on Earth's surface (oceans, rivers, lakes, swamps, groundwater, aquifers, and ice) and communicate the relative proportion of water at each location.
b. Plan and carry out an investigation to illustrate the role of the sun's energy in atmospheric conditions that lead to the cycling of water. (Clarification statement: The

water cycle should include evaporation, condensation, precipitation, transpiration, infiltration, groundwater, and runoff.)
d. Analyze and interpret data to create graphic representations of the causes and effects of waves, currents, and tides in Earth's systems.

S6E4. Obtain, evaluate, and communicate information about how the sun, land, and water affect climate and weather.
c. Develop a model demonstrating the interaction between unequal heating and the rotation of the Earth that causes local and global wind systems.
d. Construct an explanation of the relationship between air pressure, weather fronts, and air masses and meteorological events such as tornadoes and thunderstorms.
e. Analyze and interpret weather data to explain the effects of moisture evaporating from the ocean on weather patterns and weather events such as hurricanes.

S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.
d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition. (Clarification statement: Environments of deposition include deltas, barrier islands, beaches, marshes, and rivers.)

Next Generation Science Standards (NGSS)

MS-ESS1-1. Develop and use a model to describe phenomena of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

MS-ESS2-4 Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MS-ESS2-6 Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.

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

English Language Arts Georgia Standards of Excellence (ELAGSE)

<u>GSE: READING LITERARY (RL)</u>
ELAGSE6RL1: Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

ELAGSE6RL2: Determine a theme and/or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

GSE: READING INFORMATIONAL (RI)

ELAGSE6RI1: Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

ELAGSE6RI2: Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

ELAGSE6RI5: Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.

Vocabulary Acquisition

ELAGSE6L4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.

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.

ELAGSE6L6: Acquire and accurately use grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Visual Art Georgia Standards of Excellence

VA6.CR.1 Visualize and generate ideas for creating works of art.

a. Visualize new ideas by using mental and visual imagery.
b. Explore essential questions, big ideas, and/or themes in personally relevant ways.
c. Incorporate a variety of internal and external sources of inspiration into works of art (e.g. internal inspiration – moods, feelings, self-perception, memory, imagination, fantasy; external inspiration – direct observation, personal experience, events, pop culture, artists and artwork from diverse cultures and periods).

GRADE 7

Science Georgia Standards of Excellence

S7L1. Obtain, evaluate, and communicate information to investigate the diversity of living organisms and how they can be compared scientifically.

a. Develop and defend a model that categorizes organisms based on common characteristics

S7L4a-d. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.

Next Generation Science Standards (NGSS)

MS-LS1-4 Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
Ecosystems: Interactions, Energy, and Dynamics

MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

English Language Arts Georgia Standards of Excellence (ELAGSE)

<u>GSE: READING LITERARY (RL)</u>
ELAGSE7RL1: Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

<u>GSE: READING INFORMATIONAL (RI)</u>
ELAGSE7RI3: 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).

ELAGSE7RI4: 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.

ELAGSE7RI10: 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.