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Georgia Performance Standards Framework for Science – Grade 5

Unit One Organizer:

OVERVIEW: In this unit, students will be introduced to the systems of classification that we use to determine relationships between organisms. Students should be able to group organisms and communicate their system of classification. While the Linnean system of classification is based on the structure of organisms, living things can be classified according to the habitat in which they reside, what they eat, etc. Classification is used to understand interactions between organisms, conservation, and identify and study new species.

STANDARDS ADDRESSED IN THIS UNIT

Focus Standards:

S5L1. Students will classify organisms into groups and relate how they determined the groups with how and why scientists use classification.

- a. Demonstrate how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal).
- b. Demonstrate how plants are sorted into groups.

STANDARDS ADDRESSED IN THIS UNIT

Supporting Standards:

S5CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

- a. Keep records of investigations and observations and do not alter the records later.
- b. Carefully distinguish observations from ideas and speculation about those observations.
- c. Offer reasons for findings and consider reasons suggested by others.
- d. Take responsibility for understanding the importance of being safety conscious.

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S5CS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities.

- a. Choose appropriate common materials for making simple mechanical constructions and repairing things.
- b. Measure and mix dry and liquid materials in prescribed amounts, exercising reasonable safety.
- c. Use computers, cameras and recording devices for capturing information.
- d. Identify and practice accepted safety procedures in manipulating science materials and equipment.

S5CS5. Students will communicate scientific ideas and activities clearly.

- a. Write instructions that others can follow in carrying out a scientific procedure.
- b. Make sketches to aid in explaining scientific procedures or ideas.
- c. Use numerical data in describing and comparing objects and events.
- d. Locate scientific information in reference books, back issues of newspapers and magazines, CD-ROMs, and computer databases.

S5CS6. Students will question scientific claims and arguments effectively.

- a. Support statements with facts found in books, articles, and databases, and identify the sources used.
- b. Identify when comparisons might not be fair because some conditions are different.

S5CS7. Students will be familiar with the character of scientific knowledge and how it is achieved.

Students will recognize that:

- a. Similar scientific investigations seldom produce exactly the same results, which may differ due to unexpected differences in whatever is being investigated, unrecognized differences in the methods or circumstances of the investigation, or observational uncertainties.
- b. Some scientific knowledge is very old and yet is still applicable today.

S5CS8. Students will understand important features of the process of scientific inquiry.

Students will apply the following to inquiry learning practices:

- a. Scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.
- b. Clear and active communication is an essential part of doing science. It enables scientists to inform others about their work, expose their ideas to criticism by other scientists, and stay informed about scientific discoveries around the world.
- c. Scientists use technology to increase their power to observe things and to measure and compare things accurately.
- d. Science involves many different kinds of work and engages men and women of all ages and backgrounds.

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ENDURING UNDERSTANDINGS	
<p>Students will understand that</p> <ul style="list-style-type: none"> living things are grouped based on similarities and differences vertebrates animals are sorted into groups scientists use classification to identify and study new species 	
ESSENTIAL QUESTIONS:	
<p>Why do scientists classify things? How do scientists group organisms? How have classification systems changed? What do scientists do when something doesn't fit in the classification system?</p>	
MISCONCEPTIONS	PROPER CONCEPTIONS
<ol style="list-style-type: none"> 1. Insects are not animals 2. All animals in the aquatic (water) environment are classified as fish 3. Amphibians and reptiles are part of the same group. 4. Toads and frogs are the same. 5. Snakes are not vertebrates. 6. Human beings are not animals. 7. Mushrooms are plants. 8. Grass is not a plant. 	<ol style="list-style-type: none"> 1. Insects are part of the animal kingdom 2. There are aquatic animals that are classified as mammals, invertebrates, etc. 3. Amphibians and reptiles are grouped separately because of their characteristics. Amphibian's eggs do not have a hard shell like reptile eggs. Amphibians have thin skin that has evolved to absorb water through their skin whereas reptiles have a thick, scaly, dry skin to keep moisture in. Amphibians start out in the water then move to land. Most reptiles live all their life on land. Because of their characteristics, sea turtles are reptiles not fish or amphibians. 4. Warts are caused by human viruses not from the skin of a frog or a toad. 5. Snakes skeletal structure is composed of hundreds of vertebrae with a pair of ribs to go along with each. 6. Human beings are classified as mammals which are part of the animal kingdom.

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		<p>7. Mushrooms are not autotrophs (they do not make their own food) therefore they are not part of the plant kingdom.</p> <p>8. Grass has all of the characteristics of a plant therefore it is grouped in the plant kingdom.</p>	
Concept	Know/Do	Language	Evidence
<p>Objects are grouped based on characteristics</p> <p>Data is collected to make a conclusion</p>	<p>Use physical characteristics to describe objects</p> <p>Group objects based on characteristics</p> <p>Create a graph</p> <p>Evaluate data to make a conclusion</p>	<p>Group</p> <p>Classify</p> <p>Conclude</p> <p>Graph</p> <p>Characteristics</p> <p>Similarities</p> <p>Differences</p>	<p>Completed correct bar graph</p> <p>Conclusion that is based on the data collected</p> <p>Definition of classification</p>
<p>Animals are grouped by their characteristics</p>	<p>Evaluate differences and similarities of animals to group them</p>	<p>Vertebrate</p> <p>Invertebrate</p> <p>classify</p> <p>Characteristics</p>	<p>Presentation of group classifications</p> <p>Frayer models of vertebrate and invertebrate</p>
<p>Vertebrates are sorted into groups</p>	<p>Use research materials to determine criteria of vertebrate groups of birds, fish, reptiles, amphibians, and mammals</p> <p>Use criteria to determine grouping for imaginary animal and explain reasoning</p>	<p>Vertebrate</p> <p>Invertebrate</p> <p>Fish</p> <p>Mammal</p> <p>Bird</p> <p>Reptile</p> <p>Amphibian</p> <p>Consumer</p>	<p>Grouping of imaginary animal and paragraph explaining why the animal is placed in the group</p>

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Compare and Contrast different animal groups Understanding of vocabulary	Evaluate similarities and differences among animal groups Understand vocabulary to complete assessment task		Magic Square Vocabulary task Compare and Contrast graphic organizer
Plants are living things Grass, trees, moss, etc are plants and mushrooms are not plants	Determine a definition of plants	Plant Photosynthesis Producer Consumer Decomposer	Definition of plant
Plants are sorted in groups based on characteristics	Recognize differences in plants leaves, height, color, etc. Group plants based on similarities/differences	Roots Leaves Stem Seed Flower Vascular Nonvascular Deciduous Coniferous	Classification of leaves, stems, height Reasons why scientists would classify plants

EVIDENCE OF LEARNING:

By the conclusion of this unit, students should be able to demonstrate the following competencies:

Culminating Activity: GRASPS

Goal: Students will classify “imaginary” animals and plants into groups with existing animals and plants and give explanations as to the chosen groupings.

Role: Author

Audience: 1st and 2nd graders

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Scenario: A publisher has contacted you to write a children’s book about animals and plants and how they co-exist in different environments. The publisher has given you a specific animal and plant to write your book about. Your book should include the name of your animal, what animal group it belongs to, why it belongs to that group, what are some other animals that also belong to that group, what does your animal eat, what type of environment does it live in, etc. The book should also include the plant, is it vascular or nonvascular and why, what type of environment does it live in, what are some other plants that are like it, etc. The book should include illustrations and words that first and second graders can understand.

Product: Children’s Book

Standard: The book rubric is based on characteristics listed, description of habitat, illustrations of relationships and explanation of classification.

Children’s Book

A publisher has contacted you to write a children’s book about animals and plants and how they are related to other organisms as well as how their physical characteristics allow them to survive in their habitats. The publisher has given you a specific animal and plant to write about in your book. Your book should include the name of your animal, what animal group it belongs to, why it belongs to that group, what are some other animals that also belong to that group, what does your animal eat, what type of environment does it live in, etc. The book should also include the plant, is it vascular or nonvascular and why, what type of environment does it live in, what are some other plants that are like it, etc. The book should include illustrations and words that first and second graders can understand.

You may use the attached sheet to help you organize your information. A scoring rubric is also included so that you can determine if your book meets all of the standards. Your book should demonstrate your understanding of how organisms are classified. It should also demonstrate understanding of why living things are classified.

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Book Information Organization Page

	Animal	Plant
Name		
Physical Characteristics		
How physical characteristics help the organism survive		
Picture		
Description of Habitat		
Physical Locations		
Other organisms classified like mine and why they are classified together		
Pictures of other organisms that are classified with mine		
Other interesting facts about my organisms		

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Children's Book Rubric

Standard	4	3	2	1
Animal and plant are named	Both the animal and plant are named in the story	Only the animal or plant is named in the story		Neither the plant or the animal is named in the story
Physical characteristics of animal are described	Physical Characteristics of the animal are described and an explanation is given for how the physical characteristics help the animal survive	Physical Characteristics of the animal are described with little explanation for how the physical characteristics help the animal survive	Physical Characteristics of the animal are described but no explanation is given for how the characteristics help the animal survive	No physical characteristics are described
Animal habitat is described	Habitat of the animal is described and physical locations are included	Habitat is described but no physical location is included		No Habitat is described
Explanation of other animals classified in the same group	Other animals that would be classified with the assigned animal are included with an explanation of why they are classified together	Other animals that would be classified with the assigned animal are included with no explanation of why they are classified together	Other animals that would be classified with the assigned animal are included but the connection between them is not clear	No other animals are identified that would be classified with the assigned animal.
Physical characteristics of plant are described	Physical Characteristics of the plant are described and an explanation is given for how the physical characteristics help the plant survive	Physical Characteristics of the plant are described with little explanation for how the physical characteristics help the plant survive	Physical Characteristics of the plant are described but no explanation is given for how the characteristics help the plant survive	No physical characteristics are described
Plant habitat is described	Habitat of the plant is described and physical locations are included	Habitat is described but no physical location is included		No Habitat is described
Explanation of other plants classified with named plant	Other plants that would be classified with the assigned plant are included with an explanation of why they are classified together	Other plants that would be classified with the assigned plant are included with no explanation of why they are classified together	Other plants that would be classified with the assigned plant are included but the connection between them is not clear	No other plants are identified that would be classified with the assigned plant.

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Illustrations showing relationships between organisms	There are multiple illustrations of the assigned animal and plant as well as other animals and plants and the illustrations show connections between like organisms.	There are illustrations of the assigned animal and plant as well as other animals and plants but not relationship between them can be determined	There are illustrations of the assigned animal and plant.	There are illustrations of the assigned plant or animal
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