

Kindergarten

The Georgia Performance Standards are designed to provide students with the knowledge and skills for proficiency in science at the kindergarten level. The Project 2061's *Benchmarks for Science Literacy* is used as the core of the curriculum to determine appropriate content and process skills for students. The GPS are also aligned to the National Research Council's *National Science Education Standards*. Technology is infused into the curriculum. The relationship between science, our environment, and our everyday world is crucial to each student's success and should be emphasized.

The performance standards should drive instruction. Hands-on, student-centered, and inquiry-based approaches should be the emphases of instruction. This curriculum is intended as a required curriculum that would show proficiency in science, and instruction should extend beyond the curriculum to meet student needs. Safety of the student should always be foremost in science instruction.

Science consists of a way of thinking and investigating, as well a growing body of knowledge about the natural world. To become literate in science, therefore, students need to acquire an understanding of both the **Characteristics of Science** and its **Content**. The Georgia Performance Standards for Science require that instruction be organized so that these are treated together. Therefore, **A CONTENT STANDARD IS NOT MET UNLESS APPLICABLE CHARACTERISTICS OF SCIENCE ARE ALSO ADDRESSED AT THE SAME TIME**. For this reason they are presented as co-requisites.

An explanation of the coding of the science GPS is attached.

This Performance Standards document includes four major components. They are

The Standards for Georgia Science Courses. The Characteristics of Science co-requisite standards are listed first, followed by the Content co-requisite standards. Each Standard is followed by elements that indicate the specific learning goals associated with it.

Tasks that students should be able to perform during or by the end of the course. These are keyed to the relevant Standards. Some of these can serve as activities that will help students achieve the learning goals of the Standard. Some can be used to assess student learning, and many can serve both purposes.

Samples of student work. As a way of indicating what it takes to meet a Standard, examples of successful student work are provided. Many of these illustrate how student work can bridge the Content and Characteristics of Science Standards. The Georgia DOE Standards web site will continue to add samples as these domains are identified, and teachers are encouraged to submit examples from their own classroom experiences.

Teacher Commentary. Teacher commentary is meant to open the pathways of communication between students and the classroom teacher. Showing students why they did or did not meet a standard enables them to take ownership of their own learning.

Georgia Performance Science Standards-- Explanation of Coding

Characteristics of Science Standards

SKCS1

Science Kindergarten Characteristics of Science Standard #1****

S8CS2

Science Grade **8 Characteristics of Science Standard #**2****

SCSh8

Science Characteristics of Science high school Standard #8****

Content Standards

S5P3

Science Grade **5 Physical Science Standard #**3****

S4E2

Science Grade **4 Earth Science Standard #**2****

S7L4

Science Grade **7 Life Science Standard #**4****

SC1

Science Chemistry Standard #1****

SB4

Science Biology Standard #4****

SPS6

Science Physical Science Standard #6****

SP3

Science Physics Standard #3****

Kindergarten students raise questions about the world around them. They learn to use whole numbers to describe scientific data and how to identify parts of things (i.e. tools and toys). Kindergarteners describe, compare, and sort items according to physical attributes (i.e. number, shape, texture, size, weight, color, and motion). They use their senses (sight, smell, taste, touch, and sound) to group objects. They learn to follow rules to stay safe.

My World and Me

Kindergarten students have a natural interest in the world around them. Though not developmentally ready for in-depth explanations, they wonder why things move and note the various patterns. They notice that the sun and moon appear and disappear in the sky. The kindergarteners use their senses to make observations about physical attributes and are aware of similarities and differences.

Major Concepts/ Skills:	Concepts/Skills to Maintain:
Earth Science	Habits of Mind:
Day and night sky	Ask questions
Sorts rocks and soils	Use numbers to quantify
Physical Science	Use tools to measure and view
Physical Attributes--	
as observed using the 5 senses	Look at parts of things
Composition of materials	Describe and compare using
Motion	physical attributes
Life Science	Observe using their senses and
Living/nonliving	describe observation
Animals/Plants	
Parents and offspring	

Co-Requisite - Characteristics of Science

Habits of Mind

SKCS1. 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. Raise questions about the world around you and be willing to seek answers to some of the questions by making careful observations (5 senses) and trying things out.

SKCS2. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

- a. Use whole numbers for counting, identifying, and describing things and experiences.
- b. Make quantitative estimates of nonstandard measurements (blocks, counters) and check by measuring.

SKCS3. Students will use tools and instruments for observing, measuring, and manipulating objects in scientific activities.

- a. Use ordinary hand tools and instruments to construct, measure (for example: balance scales to determine heavy/light, weather data, nonstandard units for length), and look at objects (for example: magnifiers to look at rocks and soils).
- b. Make something that can actually be used to perform a task, using paper, cardboard, wood, plastic, metal, or existing objects. (For example: paper plate day and night sky models)

SKCS4. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.

- a. Use a model—such as a toy or a picture—to describe a feature of the primary thing.
- b. Describe changes in size, weight, color, or movement, and note which of their other qualities remains the same. (For example, playing “Follow the Leader” and noting the changes.)
- c. Compare very different sizes (large/small), ages (parent/baby), speeds (fast/slow), and weights (heavy/light) of both manmade and natural things.

SKCS5. Students will communicate scientific ideas and activities clearly.

- a. Describe and compare things in terms of number, shape, texture, size, weight, color, and motion.
- b. Begin to draw pictures that portray features of the thing being described.

Nature of Science

SKCS6. Students will understand the important features of the process of scientific inquiry.

Students will apply the following to inquiry learning practices:

- a. In doing science, it is often helpful to work with a team and to share findings with others.
- b. Tools such as rulers, magnifiers, and balance scales often give more information about things than can be obtained by just observing things without help.
- c. Much can be learned about plants and animals by observing them closely, but care must be taken to know the needs of living things and how to provide for them.
(Classroom pets)

Co-Requisite - Content

Earth Science

SKE1. Students will describe time patterns (such as day to night and night to day) and objects (such as sun, moon, stars) in the day and night sky.

- a. Describe changes that occur in the sky during the day, as day turns into night, during the night, and as night turns into day.
- b. Classify objects according to those seen in the day sky and those seen in the night sky.
- c. Recognize that the Sun supplies heat and light to Earth.

Sample Tasks:

- A) Describe changes that occur in the sky during the day, as day turns into night, during the night, and as night turns into day.
- B) Make a class timeline of things that happen during the day and things that happen during the night. For example, I get up in the morning and eat breakfast...I go to bed at night and sleep until the next day.
- C) Listen to a book about the day sky and/or night sky and draw pictures about the story.
- D) Observe the position of the sun at different times during the day.
- E) Draw and label things you would see in the day sky and things you would see in the night sky.
- F) Create a pictorial representation to show objects seen in the daytime, at nighttime, and seen both in the day and night sky.

SKE2. Students will describe the physical attributes of rocks and soils.

- a. Use senses to observe and group rocks by physical attributes such as large/small, heavy/light, smooth/rough, dark/light, etc.
- b. Use senses to observe soils by physical attributes such as smell, texture, color, particle/grain size.
- c. Recognize earth materials— soil, rocks, water, air, etc.

Sample Tasks:

- A) Use what you know to sort rocks into two or more groups and compare them according to their observable physical attributes. Explain the physical attribute you use to sort the rocks.
- B) Classify rocks into groups by observable physical attributes (large/small, heavy/light, smooth/rough, dark/light, etc.). Challenge a classmate to figure out what physical attribute you chose to classify your groups of rocks.
- C) Put rocks and pebbles in order from largest to smallest and/or smallest to largest.
- D) Discuss how earth's materials are used and where they are found.

Physical Science

SKP1. Students will describe objects in terms of the materials they are made of and their physical properties.

- a. Compare and sort materials of different composition (common materials include clay, cloth, paper, plastic, etc.).
- b. Use senses to classify common materials, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, texture, buoyancy, flexibility).

Sample Tasks:

- A) List your senses and how you use them: Eyes to see, ears to hear, mouth to taste, fingers to feel, nose to smell.
- B) Compare, describe, and sort materials of different composition (common materials include clay, cloth, paper, plastic, etc.). For example, put all of the green pieces of clay together or the piece of cloth with flowers printed on it is larger than the piece of cloth with stars printed on it.

- C) Classify common materials (such as buttons or swatches of cloth) according to their physical attributes. Graph numbers of items that have the same physical attributes. (i.e. buttons with two holes, three holes, etc. or red cloth, green cloth, etc., versus those attributes)
- D) Use various containers to observe the “shape” of water.
- E) Use your senses of sight, taste and smell to sort various fruits and vegetables.
- F) Use your sense of hearing to sort objects that you drop into a box. Listen to hear bouncy objects, soft objects, hard objects, etc.
- G) Determine objects that float and objects that sink in water. Make a pictograph to show common objects that float and common objects that sink.

SKP2. Students will investigate different types of motion.

- a. Sort objects into categories according to their motion. (straight, zigzag, round and round, back and forth, fast and slow, and motionless)
- b. Push, pull, and roll common objects and describe their motions.

Sample Tasks:

- A) Push, pull, and roll common objects in the classroom and describe their movement.
- B) Sort objects into categories according to their motion. (straight, zigzag, round and round, back and forth, fast and slow, and motionless) For example, the chair does not move unless I push it so it is motionless or still; the ball rolls in a straight line; the wheels on the bus go round and round, etc.
- C) Investigate the movement of spinning tops and the factors that affect the spinning. Draw the path of the top as it spins.
- D) Play “Follow the Leader” using different ways of moving.

SKP3. Students will observe and communicate effects of gravity on objects.

- a. Recognize that some things, such as airplanes and birds, are in the sky, but return to earth.
- b. Recognize that the sun, moon, and stars are in the sky, but don’t come down.
- c. Explain why a book does not fall down if it is placed on a table, but will fall down if it is dropped.

Sample Tasks:

- A. Make a class pictograph of things that fall to the ground and things that don’t.
- B. Listen to stories about things that float in the air.

Life Science

SKL1. Students will sort living organisms and non-living materials into groups by observable physical attributes.

- a. Recognize the difference between living organisms and nonliving materials.
- b. Group animals according to their observable features such as appearance, size, motion, where it lives, etc. (Example: A green frog has four legs and hops. A rabbit also hops.)
- c. Group plants according to their observable features such as appearance, size, etc.

Sample Tasks:

- A. Explain the difference between living organisms and nonliving objects. Sort pictures or drawings into two columns-- Living and Nonliving and explain your reasons for choosing the nonliving column or the living column. Tell how you know something is living and how you know something is nonliving.
- B. Some animals and plants are alike in the way they look and the things they do. Some animals and plants are very different from one another. Sort pictures and drawings of plants and animals. Explain how plants and animals are alike and how they are different.
- C. Group pictures and drawings of animals in various ways according to their observable features. Choose two physical attributes to sort the pictures, such as appearance (These plants all have flowers.), size (These are big animals and these are small animals.), movement (Animals can hop, swim, walk, and run.), resemblance to parent, where they live, etc.
- D. Group pictures and drawings of plants according to their observable features such as appearance, size, where they live, etc.
- E. Collect seeds. Describe them. Compare seeds according to their similarities and differences. Make a picture by gluing seeds in a pattern around the border of a drawing.
- F. Pour beans into a cup or container. As a class, count the beans in the cup. Pour the same beans into different containers and count them again.

SKL2. Students will compare the similarities and differences in groups of organisms.

- a. Explain the similarities and differences in animals. (color, size, appearance, etc.)
- b. Explain the similarities and differences in plants. (color, size, appearance, etc.)
- c. Recognize the similarities and differences between a parent and a baby.
- d. Match pictures of animal parents and their offspring explaining your reasoning. (Example: dog/puppy; cat/kitten; cow/calf; duck/ducklings, etc.)
- e. Recognize that you are similar and different from other students. (senses, appearance)

Teacher note: Be sensitive to the fact that some children have parents who are not their biological parents.

Sample Tasks:

- A. Compile a class book of drawings and/or pictures of common animals such as dogs, cats, fish, birds, etc. Example: If the class book is about dogs, it would show that there are many different breeds, sizes, and colors of dogs.
- B. Group pictures of animals showing their similarities and differences. (color, sounds they make, size, appearance, etc.)
- C. Write and include drawings in a “Me” book to discover how you are an individual—size, features, names, where you live, parents, etc.
- D. Compile a class book of drawings and/or pictures of plants such as grass, trees, flowers, fruits, and vegetables. Example: If the class book is about plants we eat, it would show that there are many different sizes, colors, shapes of plants that are food.
- E. Sort various fruits and vegetables using your senses: how they taste, how they smell, how they look, and how they feel.
- F. Group pictures of plants and/or flowers showing their similarities and differences. (color, shape, size, appearance, etc.)
- G. Observe different flowers and plants. Use your senses to compare them. Smell them, taste foods that are plants, compare the colors, count petals, etc.

- H. Collect different leaves. Sort the leaves into groups according to size, color, shape, etc. Explain how even though the leaves come from a tree, there are different kinds of leaves.
- I. Match pictures of animal parents and their offspring explaining the observable features that helped you know what to match. (Example: dog and puppy; cat and kitten; cow and calf; duck and ducklings, etc.)
- J. Explain how you can tell the difference between a parent and a baby. Make a collage of pictures and/or drawings of parents and their babies.