

First Grade Science Curriculum

The Georgia Performance Standards are designed to provide students with the knowledge and skills for proficiency in science at the first grade 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 is 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 the 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.

This Performance Standards include 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 they 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****

First grade students raise questions about the world around them and seek answers by making observations. They use whole numbers to analyze scientific data. They identify what things can do when put together and what cannot be done when things are not put together. First graders create drawings that correctly depict something being described. They follow safety rules.

Patterns

First grade students make observations, ask questions about, and investigate patterns. They learn best from their own actions. Therefore, they make predictions and plan simple investigations in order to understand the world around them. They notice repeating patterns in shadows, weather, and daily needs of plants and animals.

Major Concepts/ Skills:	Concepts/Skills to Maintain:
Earth Science	Habits of Mind
Weather patterns	Asks questions
Seasons	Uses numbers to quantify
Physical Science	Works in a group
Sound	Uses tools to measure and view
Shadows	Looks at how parts of things are needed
Magnets	Describes and compares using
Life Science	physical attributes
Characteristics of living things	Observes using senses
Basic needs of living things	Draws and describes observations

Co-Requisite - Characteristics of Science

Habits of Mind

S1CS1. 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 them and be willing to seek answers to some of the questions by making careful observations and measurements and trying to figure things out.

S1CS2. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

- a. Use whole numbers in ordering, counting, identifying, measuring, and describing things and experiences.
- b. Readily give the sums and differences of single-digit numbers in ordinary, practical contexts and judge the reasonableness of the answer.
- c. Give rough estimates of numerical answers to problems before doing them formally.
- d. Make quantitative estimates of familiar lengths, weights, and time intervals, and check them by measuring.

S1CS3. 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, and look at objects.
- b. Make something that can actually be used to perform a task, using paper, cardboard, wood, plastic, metal, or existing objects.
- c. Identify and practice accepted safety procedures in manipulating science materials and equipment.

S1CS4. 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 the size, weight, color, or movement of things, and note which of their other qualities remain the same during a specific change.
- c. Compare very different sizes, weights, ages (baby/adult), and speeds (fast/slow) of both human made and natural things.

S1CS5. 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. Draw pictures (grade level appropriate) that correctly portray features of the thing being described.
- c. Use simple pictographs and bar graphs to communicate data.

The Nature of Science

S1CS6. Students will be familiar with the character of scientific knowledge and how it is achieved.

Students will recognize that:

- a. When a science investigation is done the way it was done before, we expect to get a similar result.
- b. Science involves collecting data and testing hypotheses
- c. Scientists often repeat experiments multiple times, and subject their ideas to criticism by other scientists who may disagree with them and do further tests.
- d. All different kinds of people can be and are scientists.

S1CS7. Students will understand important features of the process of scientific inquiry.

Students will apply the following to inquiry learning practices:

- a. Scientists use a common language with precise definitions of terms to make it easier to communicate their observations to each other.
- b. In doing science, it is often helpful to work as a team. All team members should reach individual conclusions and share their understandings with other members of the team in order to develop a consensus.

- c. Tools such as thermometers, rulers and balances often give more information about things than can be obtained by just observing things without help.
- d. 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. Advantage can be taken of classroom pets.

Co-Requisite - Content

Earth Science

S1E1. Students will observe, measure, and communicate weather data to see patterns in weather and climate.

- a. Identify different types of weather and the characteristics of each type.
- b. Investigate weather by observing, measuring with simple weather instruments (thermometer, wind vane, rain gauge), and recording weather data (temperature, precipitation, sky conditions, and weather events) in a periodic journal or on a calendar seasonally.
- c. Correlate weather data (temperature, precipitation, sky conditions, and weather events) to seasonal changes.

S1E2. Students will observe and record changes in water as it relates to weather.

- a. Recognize changes in water when it freezes (ice) and when it melts (water).
- b. Identify forms of precipitation such as rain, snow, sleet, and hailstones as either solid (ice) or liquid (water).
- c. Determine that the weight of water before freezing, after freezing, and after melting stays the same.
- d. Determine that water in an open container disappears into the air over time, but water in a closed container does not.

Physical Science

S1P1. Students will investigate light and sound.

- a. Recognize sources of light.
- b. Explain how shadows are made.
- c. Investigate how vibrations produce sound.
- d. Differentiate between various sounds in terms of (pitch) high or low and (volume) loud or soft.
- e. Identify emergency sounds and sounds that help us stay safe.

S1P2. Students will demonstrate effects of magnets on other magnets and other objects.

- a. Demonstrate how magnets attract and repel.
- b. Identify common objects that are attracted to a magnet.
- c. Identify objects and materials (air, water, wood, paper, your hand, etc.) that do not block magnetic force.

Life Science

S1L1. Students will investigate the characteristics and basic needs of plants and animals.

- a. Identify the basic needs of a plant.
 1. Air
 2. Water
 3. Light
 4. Nutrients
- b. Identify the basic needs of an animal.
 1. Air
 2. Water
 3. Food
 4. Shelter
- c. Identify the parts of a plant—root, stem, leaf, and flower.
- d. Compare and describe various animals—appearance, motion, growth, basic needs.