

## **Second Grade Science Curriculum**

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

The 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

**Second grade** students raise questions about the world around them and seek answers by making observations and exploring. At the appropriate times, students will ask, "How do you know?" and will attempt to answer the question. They will use whole numbers as well as basic fractions (such as one-half and one-fourth) to identify and analyze scientific data. Second graders will find sums and differences of single digit numbers and then justify the answer. They will give rough estimates to problems and estimate lengths, weights, and time intervals. They will explain to others how to solve numerical problems related to a science activity. Second grade students know to follow safety rules.

### **Change**

Second grade students apply ideas to things in the world. They push, pull, and manipulate things to see what will happen. They observe changes of plants and animals as they grow and change. They observe the changing patterns of the moon and stars. As a result, second grade students become aware of changes that take place. They form ideas as to whether the changes are natural or manipulated.

<b>Major Concepts/ Skills:</b>	<b>Concepts/Skills to Maintain:</b>
Earth Science	Habits of mind
Motion/patterns of celestial bodies	Asks questions and seeks answers by observation
Changes of the earth's surface	Uses numbers to quantify
Physical Science	Estimates
Changing attributes of materials	Assembles and takes apart
States of matter (solid, liquid, gas)	Describes changes in materials
Energy to keep things going (motion), pushes and pulls	Communicates ideas
Life Science	Questions and attempts answers
Life Cycles	Can repeat an activity and get similar results
	Uses tools to gather data
	Gives accurate descriptions

## **Co-Requisite - Characteristics of Science**

### **Habits of Mind**

**S2CS1. 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.

**S2CS2. 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.
- S2CS3. 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. Assemble, describe, take apart, and reassemble constructions using interlocking blocks, erector sets and other things.
  - c. Make something that can actually be used to perform a task, using paper, cardboard, wood, plastic, metal, or existing objects.
- S2CS4. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.**
- a. Identify the parts of things, such as toys or tools, and identify what things can do when put together that they could not do otherwise.
  - b. Use a model—such as a toy or a picture—to describe a feature of the primary thing.
  - c. 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.
  - d. Compare very different sizes, weights, ages (baby/adult), and speeds (fast/slow) of both human made and natural things.
- S2CS5. 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**

- S2CS6. 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.

- S2CS7. 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 their own 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**

**S2E1. Students will understand that stars have different sizes, brightness, and patterns.**

- a. Describe the physical attributes of stars—size, brightness, and patterns.

**S2E2. Students will investigate the position of sun and moon to show patterns throughout the year.**

- a. Investigate the position of the sun in relation to a fixed object on earth at various times of the day.
- b. Determine how the shadows change through the day by making a shadow stick or using a sundial.
- c. Relate the length of the day and night to the change in seasons (for example: Days are longer than the night in the summer.).
- d. Use observations and charts to record the shape of the moon for a period of time.

**S2E3. Students will observe and record changes in their surroundings and infer the causes of the changes.**

- a. Recognize effects that occur in a specific area caused by weather, plants, animals, and/or people.

### **Physical Science**

**S2P1. Students will investigate the properties of matter and changes that occur in objects.**

- a. Identify the three common states of matter as solid, liquid, or gas.
- b. Investigate changes in objects by tearing, dissolving, melting, squeezing, etc.

**S2P2. Students will identify sources of energy and how the energy is used.**

- a. Identify sources of light energy, heat energy, and energy of motion.
- b. Describe how light, heat, and motion energy are used.

**S2P3. Students will demonstrate changes in speed and direction using pushes and pulls.**

- a. Demonstrate how pushing and pulling an object affects the motion of the object.
- b. Demonstrate the effects of changes of speed on an object.

## **Life Science**

Teacher note: Instruct students not to touch wild plants and animals when they observe them. Always wash hands after handling any plants or animals. Caution students not to eat wild plants they find.

### **S2L1. Students will investigate the life cycles of different living organisms.**

- a. Determine the sequence of the life cycle of common animals in your area: a mammal such as a cat or dog or classroom pet, a bird such as a chicken, an amphibian such as a frog, and an insect such as a butterfly.
- b. Relate seasonal changes to observations of how a tree changes throughout a school year.
- c. Investigate the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.
- d. Identify fungi (mushroom) as living organisms.