Kindergarten
Science

Key Instructional Activities

The Kindergarten Georgia Standards of Excellence for science engage students in raising questions about the world around them. Though not developmentally ready for in-depth explanations, kindergarten students wonder why things move and note the various patterns in their movement (e.g., the sun and the moon appear and disappear in the sky). Students learn to use whole numbers to describe scientific data and how to identify parts of things (i.e. tools and toys). Kindergarteners use their senses (sight, smell, taste, touch, and sound) to group objects and to make observations about the physical world by describing, comparing, and sorting items according to physical attributes (i.e. number, shape, texture, size, weight, color, and motion). They learn to follow rules to stay safe.

These science standards complement our English/Language Arts and mathematics standards, enabling classroom instruction to reflect a clearer picture of the real world, where solving problems often requires skills and knowledge from multiple disciplines. Further, these standards are designed to provide an equitable, high-quality science education to all of our students.

HOUSTON COUNTY BOARD OF EDUCATION
HIGH-ACHIEVING STUDENTS

As the current science standards are implemented in schools, they will enable students to:

- *Develop a deeper understanding of science beyond memorizing facts, and*
- *Experience similar scientific and engineering practices as those used by professionals in the field.*

HOW WILL STUDENTS LEARN SCIENCE IN THE CLASSROOM?

Each year, students in Georgia should be able to demonstrate greater capacity for connecting knowledge across, and between, the physical sciences, life sciences, earth and space sciences, and engineering design.

During grades K–2, your child will begin to form connections between concepts and skills such as understanding relationships between objects, planning and carrying out investigations, and constructing explanations.

Classroom activities in Elementary School will look less like this:	And look more like this:
Students have infrequent exposure to science instruction or related activities.	Students engage with science concepts as a core part of instruction and are encouraged to connect lessons to their own personal experiences.
Students memorize the general structure and properties of matter.	Students use water and butter to investigate how some changes caused by heating or cooling can be reversed while others cannot.
Students learn that matter is made of particles.	Students collect data through activities, such as compressing air in a syringe, in order to create cognitive models of matter.
Students draw food webs for particular environments.	Students construct scientific arguments about how matter and energy move through ecosystems in different ways.
Students examine insects or bugs on the playground or during special events such as science fairs.	Students observe the life cycles of beetles, butterflies, and pea plants to identify patterns that are common to all living things.
Students draw static pictures of the sun to demonstrate where it is at different times of the day.	Students support claims about the movement of the sun by identifying an outdoor object that receives direct sunlight, then tracing an outline of its shadow at three different times during the day.
Students review the characteristics of various rocks and minerals.	Students gather evidence from rock formations to help determine the order in which rock layers were formed.
Students have infrequent exposure to discussions or activities related to engineering design.	Students consider or apply engineering design principles throughout each grade level.
Student discussions and activities are disconnected from mathematics or English/Language Arts instruction.	Student discussions and activities are thoughtfully integrated with mathematics and English/Language Arts instruction.

HOW CAN YOU SUPPORT YOUR CHILD'S SUCCESS?

With the adoption of more rigorous standards and changes in the way that science is being taught in the classroom, you will notice a change in how you will support your students at home.

Science instruction will occur as the students engage in the lessons and activities. In the past, you may have helped your child study using a textbook. Students will no longer be assigned a textbook but should come home with notes or worksheets from the lessons, which can be used to review concepts and start conversations about how they are applying these concepts.

Although Georgia's approach to teaching and learning K–12 science is different than the past, you can still actively support your child's success in the classroom!

1. Speak to your child's teacher(s) about how these important changes affect your school.
2. Ask your child's teacher thoughtful questions based on the information provided in this brochure.
3. Learn how you can help the teacher(s) reinforce classroom instruction at home.
4. Visit www.georgiastandards.org for more information.

Kindergarten Science System Pacing Overview

This guide provides an overview of what your student will learn in his or her Kindergarten science course. It focuses on the key skills your student will learn, which will build a strong foundation for success in science studied throughout elementary, middle, and high school. This guide is based on the state-adopted Georgia Standards of Excellence.

August - September

Unit 1: Patterns in the World Around Us (Living/Nonliving)

Students will obtain, evaluate, and communicate information about how organisms (alive and not alive) and non-living objects are grouped. Students will construct an explanation based on observations to recognize the differences between organisms and nonliving objects. Students will develop a model to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes.

September - November

Unit 2: Patterns in Everyday Objects (Attributes of Matter)

Students will obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes. Students will ask questions to compare and sort objects made of different materials. (Common materials include clay, cloth, plastic, wood, paper, and metal.) Students will use their senses and science tools to classify common objects, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, and texture). Students will plan and carry out an investigation to predict and observe whether objects, based on their physical attributes, will sink or float.

November - December

Unit 3: Patterns in Motion (Force and Motion)

Students will obtain, evaluate, and communicate information to compare and describe different types of motion. Students will plan and carry out an investigation to determine the relationship between an object's physical attributes and its resulting motion (straight, circular, back and forth, fast and slow, and motionless) when a force is applied. (Examples could include toss, drop, push, and pull.) Students will construct an argument as to the best way to move an object based on its physical attributes.

December - January

Unit 4: Patterns in the Sky (Day/Night Sky Objects)

Students will obtain, evaluate, and communicate observations about time patterns (day to night and night to day) and objects (sun, moon, stars) in the day and night sky. Students will ask questions to classify objects according to those seen in the day sky, the night sky, and both. Students will develop a model to communicate the changes that occur in the sky during the day, as day turns into night, during the night, and as night turns into day using pictures and words. (*Clarification statement:* Students are not expected to understand tilt of the Earth, rotation, or revolution.)

February - March

Unit 5: Patterns in Earth Materials (Earth Materials)

Students will obtain, evaluate, and communicate information to describe the physical attributes of earth materials (soil, rocks, water, and air). Students will ask questions to identify and describe earth materials—soil, rocks, water, and air. Students will construct an argument supported by evidence for how rocks can be grouped by physical attributes (size, weight, texture, color). Students will use tools to observe and record physical attributes of soil such as texture and color.

March - April

Unit 6: Patterns in Living Things (Animals)

Students will obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms. Students will construct an argument supported by evidence for how animals can be grouped according to their features. Students will ask questions and make observations to identify the similarities and differences of offspring to their parents and to other members of the same species.

April

Unit 7: Patterns in Living Things (Plants)

Students will obtain, evaluate, and communicate information to compare the similarities and differences in groups of organisms. Students will construct an argument supported by evidence for how plants can be grouped according to their features.

May

Unit 8: Patterns in Living Things (Organisms)

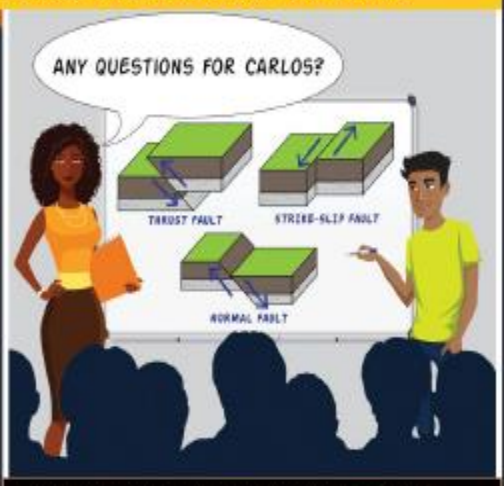
Building on standards from units six and seven, students will organize data from observations to group animals and plants. Students will identify and describe patterns in the organized data to create models.

How today's students learn SCIENCE

OBSERVING, POSING QUESTIONS MAKING SENSE OF REAL-WORLD OBJECTS AND EVENTS (PHENOMENA)

IN PHYSICS CLASS, JENNY DISCOVERS WHY STATIC ELECTRICITY MAKES HER HAIR STAND UP.

DEVELOPING MODELS TO EXPLAIN A REAL-WORLD OBJECT OR EVENT



MEANWHILE, IN MS. STURGEON'S EARTH SCIENCE CLASS, CARLOS EXPLAINS WHY CALIFORNIA HAS SO MANY EARTHQUAKES.

PLANNING AND CARRYING OUT INVESTIGATIONS AND ANALYZING DATA

STUDENTS INVESTIGATE THE QUALITY OF WATER IN A NEARBY POND.

DESIGNING SOLUTIONS USING ENGINEERING AND TECHNOLOGY

AFTER MANY DESIGNS, DEJA BUILT THE STRONGEST BRIDGE IN THE CLASS.

DISCUSSING, EXPLAINING, AND USING EVIDENCE FOR IDEAS

IN THE GYM, BOBBY DEMONSTRATES AND EXPLAINS HIS IDEAS ABOUT ENERGY TRANSFER

Adapted from NGSS@NSTA