

Color-coded Georgia Standards of Excellence

Each standard in K-12 science courses begin with “Obtain, evaluate, and communicate...” The common language was intended by writers to provide consistency throughout courses, highlight the science practices, and incorporate scientific literacy. Simply put, it is what scientists do.

Science and engineering practices:

- Asking questions (science) and defining problems (engineering)
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics, information and computer technology, and computational thinking
- Constructing explanations (science) and designing solutions (engineering)
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

The color-coded standards are a visual of how the specific elements of science standards engage *students* in obtaining, evaluating, and communicating information.

	Obtain • Obtain Information • Ask Questions/Define Problems • Plan & Carry Out Investigations • Use Models to Gather Data • Use Mathematics and Computational Thinking
	Evaluate • Evaluate Information • Analyze Data • Use Mathematics and Computational Thinking • Construct Explanations/Solve Problems • Developing Arguments from Evidence • Use Models to Predict & Develop Evidence
	Communicate • Communicate Information • Using Argue from Evidence (written/oral) • Use Models to Communicate

Various practices require students to obtain, evaluate, and communicate information simultaneously; see the following example of 7th grade life science:

S7L4c. Analyze and interpret data to provide evidence for how resource availability, disease, climate, and human activity affect individual organisms, populations, communities, and ecosystems.

The first part of the science practice involves *evaluating* information as students analyze and interpret data; in addition, since they are providing evidence, this practice also requires students to *communicate* their findings and analysis.

Earth and Space Science

S5E1. Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.

- Construct an argument** supported by scientific evidence to identify surface features (examples could include deltas, sand dunes, mountains, volcanoes) as being caused by constructive and/or destructive processes (examples could include deposition, weathering, erosion, and impact of organisms).
- Develop simple interactive models** to collect data that illustrate how changes in surface features are/were caused by constructive and/or destructive processes.
- Ask questions to obtain information** on how technology is used to limit and/or predict the impact of constructive and destructive processes.
(*Clarification statement:* Examples could include seismological studies, flood forecasting (GIS maps), engineering/construction methods and materials, and infrared/satellite imagery.)

Physical Science

S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.

- Plan and carry out investigations** of physical changes by manipulating, separating and mixing dry and liquid materials.
- Construct an argument** based on observations to support a claim that the physical changes in the state of water are due to temperature changes, which cause small particles that cannot be seen to move differently.
- Plan and carry out an investigation** to determine if a chemical change occurred based on observable evidence (color, gas, temperature change, odor, new substance produced).

S5P2. Obtain, evaluate, and communicate information to investigate electricity.

- Obtain and combine information** from multiple sources to explain the difference between naturally occurring electricity (static) and human-harnessed electricity.
- Design** a complete, simple electric circuit, **and explain** all necessary components.
- Plan and carry out investigations** on common materials to determine if they are insulators or conductors of electricity.

S5P3. Obtain, evaluate, and communicate information about magnetism and its relationship to electricity.

- Construct an argument** based on experimental evidence to communicate the differences in function and purpose of an electromagnet and a magnet.
(*Clarification statement:* Function is limited to understanding temporary and permanent magnetism.)

- b. [Plan and carry out an investigation](#) to observe the interaction between a magnetic field and a magnetic object.

(Clarification statement: The interaction should include placing materials of various types (wood, paper, glass, metal, and rocks) and thickness between the magnet and the magnetic object.)

Life Science

S5L1. [Obtain](#), [evaluate](#), and [communicate](#) information to group organisms using scientific classification procedures.

- a. [Develop a model](#) that illustrates how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal) using data from multiple sources.
- b. [Develop a model](#) that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources.

S5L2. [Obtain](#), [evaluate](#), and [communicate](#) information showing that some characteristics of organisms are inherited and other characteristics are acquired.

- a. [Ask questions](#) to compare and contrast instincts and learned behaviors.
- b. [Ask questions](#) to compare and contrast inherited and acquired physical traits.

(Clarification statement: Punnett squares and genetics are taught in future grades.)

S5L3. [Obtain](#), [evaluate](#), and [communicate](#) information to compare and contrast the parts of plant and animal cells.

- a. [Gather evidence](#) by utilizing technology tools to support a claim that plants and animals are comprised of cells too small to be seen without magnification.
- b. [Develop a model](#) to identify and label parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus).
- c. [Construct an explanation](#) that differentiates between the structure of plant and animal cells.

S5L4. [Obtain](#), [evaluate](#), and [communicate](#) information about how microorganisms benefit or harm larger organisms.

(Clarification statement: Possible microorganisms could include Tardigrades, Lactobacillus, Probiotics, Rotifers, Salmonella, Clostridium botulinum (Botox), E-coli, Algae, etc. Students are not expected to know these specific microorganisms. The list is provided to give teachers examples.)

- a. [Construct an argument](#) using scientific evidence to support a claim that some microorganisms are beneficial.
- b. [Construct an argument](#) using scientific evidence to support a claim that some microorganisms are harmful.