

# GRADE 2 OVERVIEW

In kindergarten through grade two, the standards and performance indicators for the science and engineering practices and core science content emphasize students making observations and explanations about phenomena they can directly explore and investigate. Student experiences should be structured as they begin to learn the features of a scientific investigation and engage in the practices of science and engineering. The seven core concepts (patterns; cause and effect; scale, proportion, and quantity; systems and system models; energy and matter; structure and function; and stability and change) are reinforced in the appropriate context of the core science content through hands-on instruction in the classroom.

These academic standards and performance indicators establish the practices and core content that South Carolina’s students should know and be able to do by the end of grade two.

The four core areas of the grade two standards include:

- Weather
- Properties of Solids and Liquids
- Exploring Pushes and Pulls
- Animals and Their Environments

The eight science and engineering practices describe how students should learn and demonstrate knowledge of the content outlined in the content standards. Engaging in these practices will help students become scientifically literate and astute consumers of scientific information.

Students should engage in scientific and engineering practices as a means to learn about the specific topics identified for their grade level. It is critical that educators understand the Science and Engineering Practices are *not* to be taught in isolation. There should *not* be a distinct “Inquiry” unit at the beginning of each school year. Rather, the practices need to be employed *within the content* for each grade level.

Teachers, schools, and districts should use these standards and indicators to provide a wide variety experiences, materials, and instructional strategies that accommodate a broad range of individual differences. These standards support active engagement in learning. Classrooms will need to be supplied with the materials and equipment necessary to complete scientific investigations.

The academic standards and performance indicators for grade two should be the basis for the development of classroom and grade-level assessments. Students must demonstrate knowledge of the science and engineering practices and core content ideas in preparation for future science learning when students will be formally assessed at the state-level.

## GRADE TWO

### SCIENCE AND ENGINEERING PRACTICES

**NOTE:** Scientific investigations should always be done in the context of content knowledge expected at this grade level. The standard describes how students should learn and demonstrate knowledge of the content outlined in the other standards.

**Standard 2.S.1:** The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.

**2.S.1A. Conceptual Understanding:** The practices of science and engineering support the development of science concepts, develop the habits of mind that are necessary for scientific thinking, and allow students to engage in science in ways that are similar to those used by scientists and engineers.

**Performance Indicators:** Students who demonstrate this understanding can:

- 2.S.1A.1** Ask and answer questions about the natural world using explorations, observations, or structured investigations.
- 2.S.1A.2** Develop and use models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.
- 2.S.1A.3** With teacher guidance, conduct structured investigations to answer scientific questions, test predictions and develop explanations: (1) predict possible outcomes, (2) identify materials and follow procedures, (3) use appropriate tools or instruments to collect qualitative and quantitative data, and (4) record and represent data in an appropriate form. Use appropriate safety procedures.
- 2.S.1A.4** Analyze and interpret data from observations, measurements, or investigations to understand patterns and meanings.
- 2.S.1A.5** Use mathematical and computational thinking to (1) express quantitative observations using appropriate English or metric units, (2) collect and analyze data, or (3) understand patterns, trends and relationships.
- 2.S.1A.6** Construct explanations of phenomena using (1) student-generated observations and measurements, (2) results of scientific investigations, or (3) data communicated in graphs, tables, or diagrams.
- 2.S.1A.7** Construct scientific arguments to support claims or explanations using evidence from observations or data collected.
- 2.S.1A.8** Obtain and evaluate informational texts, observations, data collected, or discussions to (1) generate and answer questions about the natural world, (2) understand phenomena, (3) develop models, or (4) support explanations. Communicate observations and explanations using oral and written language.

**GRADE TWO**  
**SCIENCE AND ENGINEERING PRACTICES** *(CONTINUED)*

**2.S.1B. Conceptual Understanding:** Technology is any modification to the natural world created to fulfill the wants and needs of humans. The engineering design process involves a series of iterative steps used to solve a problem and often leads to the development of a new or improved technology.

**Performance Indicators:** Students who demonstrate this understanding can:

**2.S.1B.1** Construct devices or design solutions to solve specific problems or needs: (1) ask questions to identify problems or needs, (2) ask questions about the criteria and constraints of the devices or solutions, (3) generate and communicate ideas for possible devices or solutions, (4) build and test devices or solutions, (5) determine if the devices or solutions solved the problem, and (6) communicate the results.

## GRADE TWO

### EARTH SCIENCE: WEATHER

**Standard 2.E.2:** The student will demonstrate an understanding of the daily and seasonal weather patterns.

**2.E.2A. Conceptual Understanding:** Weather is the combination of sunlight, wind, precipitation (rain, sleet, snow, and hail), and temperature in a particular region at a particular time. Scientists measure and record these conditions to describe the weather and to identify patterns over time. Weather scientists (meteorologists) forecast severe weather so that communities can prepare for and respond to these events.

**Performance Indicators:** Students who demonstrate this understanding can:

- 2.E.2A.1** Analyze and interpret data from observations and measurements to describe local weather conditions (including temperature, wind, and forms of precipitation).
- 2.E.2A.2** Analyze local weather data to predict daily and seasonal patterns over time.
- 2.E.2A.3** Develop and use models to describe and compare the effects of wind (moving air) on objects.
- 2.E.2A.4** Obtain and communicate information about severe weather conditions to explain why certain safety precautions are necessary.

## GRADE TWO

### PHYSICAL SCIENCE: PROPERTIES OF SOLIDS AND LIQUIDS

**Standard 2.P.3:** The student will demonstrate an understanding of the observable properties of solids and liquids and the special properties of magnets.

**2.P.3A. Conceptual Understanding:** Solids and liquids are two forms of matter that have distinct observable properties. Some matter can be mixed together and then separated again. Solids and liquids can be changed from one form to another when heat is added or removed.

**Performance Indicators:** Students who demonstrate this understanding can:

**2.P.3A.1** Analyze and interpret data from observations and measurements to describe the properties used to classify matter as a solid or a liquid.

**2.P.3A.2** Develop and use models to exemplify how matter can be mixed together and separated again based on the properties of the mixture.

**2.P.3A.3** Conduct structured investigations to test how adding or removing heat can cause changes in solids and liquids.

**2.P.3A.4** Construct scientific arguments using evidence from investigations to support claims that some changes in solids or liquids are reversible and some are not when heat is added or removed.

**2.P.3B. Conceptual Understanding:** Magnets are a specific type of solid that can attract and repel certain other kinds of materials, including other magnets. There are some materials that are neither attracted to nor repelled by magnets. Because of their special properties, magnets are used in various ways.

**Performance Indicators:** Students who demonstrate this understanding can:

**2.P.3B.1** Conduct structured investigations to answer questions about how the poles of magnets attract and repel each other.

**2.P.3B.2** Analyze and interpret data from observations to compare the effects of magnets on various materials.

**2.P.3B.3** Obtain and communicate information to exemplify the uses of magnets in everyday life.

## GRADE TWO

### PHYSICAL SCIENCE: EXPLORING PUSHES AND PULLS

**Standard 2.P.4:** The student will demonstrate an understanding of the effects of pushes, pulls, and friction on the motion of objects.

**2.P.4A. Conceptual Understanding:** An object that is not moving will only move if it is pushed or pulled. Pushes and pulls can vary in strength and direction and can affect the motion of an object. Gravity is a pull that makes objects fall to the ground. Friction is produced when two objects come in contact with each other and can be reduced if needed.

**Performance Indicators:** Students who demonstrate this understanding can:

- 2.P.4A.1** Analyze and interpret data from observations and measurements to compare the effects of different strengths and directions of pushing and pulling on the motion of an object.
- 2.P.4A.2** Develop and use models to exemplify the effects of pushing and pulling on an object.
- 2.P.4A.3** Construct explanations of the relationship between the motion of an object and the pull of gravity using observations and data collected.
- 2.P.4A.4** Conduct structured investigations to answer questions about the relationship between friction and the motion of objects.
- 2.P.4A.5** Define problems related to the effects of friction and design possible solutions to reduce the effects on the motion of an object.

## GRADE TWO

### LIFE SCIENCE: ANIMALS AND THEIR ENVIRONMENTS

**Standard 2.L.5:** The student will demonstrate an understanding of how the structures of animals help them survive and grow in their environments.

**2.L.5A. Conceptual Understanding:** There are many different groups of animals. One way to group animals is by using their physical characteristics. Animals have basic needs that provide for energy, growth, reproduction, and protection. Animals have predictable characteristics at different stages of development.

**Performance Indicators:** Students who demonstrate this understanding can:

**2.L.5A.1** Obtain and communicate information to classify animals (such as mammals, birds, amphibians, reptiles, fish, or insects) based on their physical characteristics.

**2.L.5A.2** Construct explanations for how structures (including structures for seeing, hearing, grasping, protection, locomotion, and obtaining and using resources) of different animals help them survive.

**2.L.5A.3** Construct explanations using observations and measurements of an animal as it grows and changes to describe the stages of development of the animal.

**2.L.5B. Conceptual Understanding:** Animals (including humans) require air, water, food, and shelter to survive in environments where these needs can be met. There are distinct environments in the world that support different types of animals. Environments can change slowly or quickly. Animals respond to these changes in different ways.

**Performance Indicators:** Students who demonstrate this understanding can:

**2.L.5B.1** Obtain and communicate information to describe and compare how animals interact with other animals and plants in the environment.

**2.L.5B.2** Develop and use models to exemplify characteristics of animals that help them survive in distinct environments (such as salt and freshwater, deserts, forests, wetlands, or polar lands).

**2.L.5B.3** Analyze and interpret data from observations to describe how animals respond to changes in their environment (such as changes in food availability, water, or air).

**2.L.5B.4** Construct scientific arguments to explain how animals can change their environments (such as the shape of the land or the flow of water).