

PRIMARY SCIENCE CORE

Kindergarten, First and Second Grade ILOs

The Intended Learning Outcomes (ILOs) describe the skills and attitudes students should learn as a result of science instruction. They are an essential part of the Science Core Curriculum and provide teachers with a standard for evaluation of student learning in science. At each grade level, student learning should include instruction and practice of the ILOs listed for that grade. Students should attain mastery of these skills by the end of the grade level specified.

The main intent is that students will value and use science as process of obtaining knowledge based upon observable evidence.

- 1. Use Science Processes and Thinking Skills**
 - a. Observe simple objects and patterns to report their observations with pictures and sentences.
 - b. Collect objects, make and record observations
 - c. Classify and sequence data according to a given criterion.
 - d. Use instruments to measure length, weight and volume.
 - e. Use Instruments to enhance their senses.

- 2. Manifest Scientific Attitudes and Interests**
 - a. Demonstrate a sense of curiosity about nature.
 - b. Show interest in science activities in the classroom.
 - c. Use emergent to transitional readers and resource books to investigate and gather information.

- 3. Understand Science Concepts and Principles**
 - a. Know science information specified for their grade level.
 - b. Distinguish between examples and non-examples of concepts.

- 4. Communicate Effectively Using Science Language and Reasoning**
 - a. Describe observations carefully and report their observations with pictures and sentences.
 - b. Use appropriate science vocabulary to describe observations.

Units for K

Five Senses
Animals Variation
Seasons
Magnets

Units for Grade 1

Air and Weather
Water
Ocean and Undersea Life
Plants

Units for Grade 2

Changes in Plants and Animals
Energy
Matter
Rocks
Solar System

SCIENCE LEVEL K

Standard 1: Students will make observations using the five senses.

Objective 1: Identify the five senses God gave us.

- a. Observe common objects and living things from their surroundings using each of the five senses.
- b. Use appropriate language to report observations made through the senses.
- c. Identify, compare, and discuss the location and function of each sense organ.
- d. Discuss how individuals compensate for a missing sense.

Objective 2: Use instruments to extend the senses.

- a. Make observations using tools (e.g., glasses, binoculars, hearing aides, stethoscopes, etc.) to extend the senses.
- b. Record and compare observations made using the senses alone and observations made assisted by instruments and experiments. (e.g.: colors mixed, loud/soft, high/low sounds).

Standard 2: Students will use their senses to observe, describe and categorize animals.

Objective 1: Observe, describe and categorize God's creation of animals according to unique characteristics

- a. Observe characteristics of animals (e.g., shape, size, color, body coverings, where they live, how they move, etc.)
- b. Analyze and communicate different ways animals can be categorized.

Objective 2: Identify the basic needs of animals.

- a. Name the basic needs of animals
- b. Identify an animal's needs for food, air, water, space and shelter.
- c. Identify different animal habitats (eg: Antarctica).

Objective 3: Compare and contrast young animals with mature animals of the same species.

- a. Observe and report changes that occur as baby animals mature.
- b. Describe how animals grow and develop.
- c. Describe how animals care for their young.

Objective 4: Describe and compare the use of the senses in animals.

- a. Identify senses animals use.
- b. Compare and contrast how animals and humans use their senses.

Objective 5: Classify animals as they interact with people.

- a. Identify animals that people rely on for food, clothing, companionship, transportation, etc.
- b. Distinguish between wild and domestic animals.
- c. Compare characteristics of animals that are good pets.
- d. Observe and describe animals in the local environment.

Standard: 3 Students will observe weather and describe how seasonal changes affect living things.

Objective 1: Observe and record different weather conditions.

- a. Use the senses to observe the weather each day over a period of time and measure the temperature.
- b. Graph changes in weather over a period of time.
- c. Describe the different types of weather observed as the seasons change.

Objective 2: Observe and describe seasonal changes and communicate how those changes effect living things.

- a. Collect and observe plant evidence and compare changes in seasons.
- b. Observe how people dress and behave differently based upon seasonal changes.
- c. Describe how plants, animals, and people respond to changes in seasons.
- d. Generalize from data the typical weather for a season.

STANDARD: 4 Students will determine the effects of magnets on objects in the environment.

Objectives 1: Identify, describe, and demonstrate the characteristics of magnets.

- a. Predict, observe, and report which object magnets will attract.
- b. Identify materials through which magnetism will pass (e.g., air, water, wood, and paper).

Objectives 2: Sort magnets by visible characteristics.

- a. Compare and contrast physical properties of a given set of magnets (e.g., size, shape, color, etc.).
- b. Correctly categorize an additional magnet that is not part of the original set. Infer that there may not be any relationship between visible characteristics and strength.

Objective 3: Identify and communicate uses for magnets at school and at home .

- a. Observe and describe how magnets are used in the home and school settings.
- b. Discover new uses for magnets.

SCIENCE LEVEL 1

STANDARD: 1 Students will identify the characteristics and uses of air.

Objective 1: Observe and measure the characteristics of air.

- a. Measure the temperature of the air using U.S. and metric standards.
- b. Determine, through observation and describe how air takes up space.

Objective 2: Demonstrate and explain the effects of air on plants and animals.

- a. Provide evidence that people need air.
- b. Predict what will happen to plants if air is too hot or too cold.
- c. Compare how different animals get air.

Objective 3: Explain the effects and uses of wind on people.

- a. Explain in their own words that wind is moving air.
- b. Provide examples of the destructive effects of wind on structures.
- c. Construct a device that uses moving air (wind) to function.
- d. Give examples of the ways people use wind.

Objective 4: Observe and record the daily changes and seasonal patterns in the weather.

- a. Observe and describe the basic components of weather.
- b. Record characteristics of weather that are observed.
- c. Graph changes in weather over a period of time.

Objective 5: Investigate the effect of weather on the daily life of plants, animals, and people.

- a. Describe how plants and animals respond to changes in seasons and weather.
- b. Compare and contrast activities of people and animals in your community during different weather conditions.
- c. Show how people and animals adapt to changes in the weather (e.g., draw a picture, write a report, make a collage, etc.)

STANDARD: 2 Students will describe the characteristics and uses of water.

Objective 1: Observe and measure the characteristics of water.

- a. Measure and compare the temperature of water using U.S. and metric standards.
- b. Demonstrate in some way that water has weight using U.S. and metric standards.
- c. Use senses and then describe how water feels, looks or tastes.
- d. Compare objects that float and sink in water.
- e. Measure and predict the motion of objects in water.

Objective 2: Demonstrate the effects of water on plants, animals, and people.

- a. Plan and experiment to show that plants need water.
- b. Provide evidence that animals need water.
- c. Give examples of ways people use or need water.
- d. Provide examples of destructive effects of water.

Objective 3: Compare the liquid, solid and gas states of water.

- a. Compare the physical properties of ice, liquid water, and water vapor.
- b. Describe in their own words the similarities and differences between ice, liquid water, and water vapor.
- c. Contrast the behavior of water when placed in containers of various shapes.

Objective 4: Describe the relationships between the three states of water.

- a. Predict changes that will occur when ice or liquid water is heated or cooled, or water vapor is cooled.
- b. Determine the freezing point of water using both U.S. and metric standards.

STANDARD: 3	Students will identify and describe ocean and undersea life.
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Objective 1: Realize that most of the earth is covered with water.

Objective 2: Locate oceans: Pacific, Atlantic, Indian and Arctic.

Objective 3: Identify that oceans are salt water (unlike fresh water rivers and lakes).

Objective 4: Identify coast, shore, waves, and tides (high and low).

Objective 5: Recognize the diversity of ocean life: from organisms too small for the eye to see (plankton), to giant whales.

Objective 6: Identify the dangers to ocean life (for example, over fishing, pollution, oil spills).

STANDARD: 4	Students will observe and categorize plant parts according to similarities and differences.
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Objective 1: Investigate and report conditions that affect plant growth.

- a. Experiment to identify conditions that influence plant growth (e.g., amount of water, light, temperature, and type of soil).
- b. Draw a picture that reflects conditions for plant growth.
- c. Describe the way seeds may be carried through the environment (eg: space, wind, water, animals).

Objective 2: Observe and describe basic functions of plant parts in relation to each other.

- a. Draw a plant.
- b. Explain the function of the plant parts (i.e., stem, root, leaf, flower, seed) in their own words.
- c. Observe and describe plants as they grow from seeds.

Objective 3: Categorize leaves, flowers or seeds from a variety of plants and compare their characteristics.

- a. Develop and use ways of grouping leaves, flowers, and seeds.
- b. Justify choices for grouping.
- c. Add a new leaf, flower or seed to an existing group.
- d. Compare and record different ways to group plants.

Objective 4: Compare plants according to different ways they are used at home and at school.

- a. Observe and describe common uses of plants.
- b. Group several plants according to how people use them.
- c. Compare and record several ways to classify plants.

SCIENCE LEVEL 2

STANDARD: 1	Students will compare changes and adaptations of plants, animals, and people.
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Objective 1: Identify and compare changes plants and animals make that are related to the seasons.

- a. Communicate ways animals adapt to seasonal changes.
- b. Model seasonal changes in plants.
- c. Describe a relationship between a seasonal change in plants and a seasonal change in animals.

Objective 2: Compare ways that animals care for their young.

- a. Identify how some mammals, insects, birds, reptiles, etc., care for their young.
- b. Determine a general relationship between the number of offspring and parental behavior.

Objective 3: Observe and describe how plants and animals change during their lives.

- a. Compare and contrast the life cycles of different plants.
- b. Compare and contrast the life cycles of different animals.
- c. Explain how plants and animals rely on their habitat to survive.

Objective 4: Relate the structure of seeds to the ways they are dispersed.

- a. Compare and describe different seeds.
- b. Describe seeds that are dispersed by animals.
- c. Describe seeds that are dispersed by weather.
- d. Explain the role of seed dispersal in agriculture.
- e. Predict the way a seed would be dispersed based upon its structure.
- f. Compare seed size using U.S. standard and metric measurements.

Objective 5: Animals and plants of the past.

- a. Give examples of plants and animals that once were part of our earth.
- b. Explain what caused some organisms to become extinct.

STANDARD: 2	Students will gather data about properties of heat and communicate observations.
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Objective 1: Measure temperature and communicate observations.

- a. Use a Celsius thermometer to measure temperature.
- b. Observe, record, and graph temperature changes in local weather over time.

Objective 2: Observe and describe the flow of heat.

- a. Relate experiences that illustrate the movement of heat from one object to another.
- b. Predict what will happen when a hot object and a cold object are in contact.

STANDARD: 3 **Students will gather data about properties of light and communicate observations.**

Objective 1: Observe and describe different colors of light.

- a. Observe and communicate colors of rainbows, sunsets, and sunrises.
- b. Communicate patterns of color that occur in nature.
- c. Explain how humans use colored lights to communicate.

Objective 2: Describe how objects block light.

- a. Demonstrate that light appears to travel in straight lines.
- b. Create shadows of various sizes and shapes.
- c. Describe changes in a shadow during a day.
- d. Describe different ways to change the shapes and sizes of shadows.
- e. Measure the change in the size of a shadow over several hours using standard and metric measurements.

STANDARD: 4 **Students will investigate and describe the effect of light by heating objects of various colors.**

Objective 1: Compare and graph the heating by light of different colored objects.

- a. Measure and record temperatures of objects placed in light, in U.S. standard and metric measurement.
- b. Graph and communicate temperature measurements of objects heated by light.
- c. Communicate conclusions about the effect of color and heating by light.

Objective 2: Observe and communicate the effect of changing the distance from a light source.

- a. Predict the relative heating effect by light on objects located at different distances from a light source.
- b. Measure, graph, and record temperatures of objects placed at different distances from a light source using metrics and U.S. standard measurements.
- c. Communicate observations from heating objects at different distances from a light source.

STANDARD: 5 **Students will identify and describe the properties of sound.**

Objective 1: Explore and observe how sounds are made.

Objective 2: Identify changes in volume and pitch.

Objective 3: Identify and describe how sounds are made when an object is moved.

- a. Observe how sounds move or vibrate through the air.
- b. Describe how sounds move or vibrate through written or visual form.

STANDARD: 6 Students will analyze objects in terms of the materials of which they are made.

Objective 1: Compare and contrast objects that are made mostly of one kind of material.

- a. From personal experience, generate a list of objects that are made mostly of one kind of material such as paper, glass, wood, metal, plastic, etc.
- b. Describe the physical properties (e.g., weight, flexibility, texture, size, shape) of objects.
- c. Describe the effects of physically changing objects such as by cutting, bending, heating, freezing, adding water, etc.
- d. Compare and contrast the effects of different physical manipulations on objects of mostly one kind of material.
- e. Compare and contrast the weight of different objects of similar size, using U.S. standard and metric measurements.

Objective 2: Compare and contrast objects that are made of more than one kind of material.

- a. From personal experience, generate a list of objects that are made of more than one kind of material (complex objects).
- b. Describe the different materials that are present in a complex object.
- c. Construct a complex object from simple materials.
- d. Compare and contrast the effects of different physical manipulations on complex objects.

STANDARD: 7 Students will investigate changes in rocks.

Objective 1: Examine and discuss observable characteristics of rock.

- a. Collect a variety of rocks from different locations and record where they were found. Sort rocks (e.g., color, hardness, texture, layering, particle size).
- b. Make an illustration of a rock that shows two characteristics.
- c. Identify fossil and non fossil rocks.

Objective 2: Relate properties of rock to the uses of rock.

- a. Discuss the uses of various types of rock.
- b. Discover and report an unusual use for rocks.

Objective 3: Observe and list how rocks change due to elements in the environment (water, temperature, wind, pressures, etc.)

Demonstrate how rocks are naturally broken down into smaller rocks.

- a. Explain how small rocks become bigger rocks by natural processes.
- b. Explain how heat and pressure change some small rocks into larger rocks.
- c. Illustrate a simple rock cycle.

STANDARD: 8 **Students will identify our Solar system as being uniquely created by God.**

Objective 1: Describe how the rotation of the earth causes day and night.

Objective 2: Describe the phases of the moon.

Objective 3: Identify the sun and planets of the Solar System, understanding that each planet has unique characteristics.

Objective 4: Understand the affect of sunlight on plants and animals.

Objective 5: Identify space exploration as a way we have learned about the Solar System.