



Science - Fifth Grade

Life Science

Content Standard: 1. 0 Cell Structure and Function

The student will investigate the structure and function of plant and animal cells.

Learning Expectations:

- 1.1 Know that all organisms are made of one or more cells.

Accomplishments

Cell Structure and Function:

5.1.1 Know that all organisms are made of one or more cells.

- a. Draw and label the basic structures of plant and animal cells (i.e., cell wall, cell membrane, cytoplasm, nucleus, chloroplasts).
- b. Compare and contrast the basic structures of plant and animal cells (i.e., cell membrane, cytoplasm, and nucleus).
- c. Differentiate among cells, tissues, organs and systems.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

- 5.1.spi.1 identify *basic* structures of plant and animal cells.

at level 2, the student is able to

- 5.1.spi.2 compare and contrast *basic* structures and functions of plant and animal cells.

at Level 3, the student is able to

- 5.1.spi.3 distinguish between single cell and multicellular organisms.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

- 5.1.tpi.1 use simple microscopes to identify parts of living things.
- 5.1.tpi.2 draw and label *basic* structures of animal and plant cells.

at Level 2, the student is able to

- 5.1.tpi.3 use a simple microscope to identify the *basic* structures of plant and animal cells (i.e., nucleus, cell wall, cell membrane, cytoplasm).
- 5.1.tpi.4 examine and describe single-celled and multicellular organisms using a simple microscope.
- 5.1.tpi.5 explain the difference between single cell and multicellular organisms.

at Level 3, the student is able to

- 5.1.tpi.6 identify an unknown cell as plant or animal.

5.1.tpi.7 differentiate among cells, tissues, organs and systems.

Content Standard: 2.0 Interactions Between Living Things and Their Environment.

The student will investigate how living things interact with one another and with non-living elements of their environment.

Learning Expectations:

- 2.1 Investigate the relationships among organisms in a specific ecosystem.
- 2.2 Recognize that organisms are able to change their environment.

Accomplishments

Interactions Between Living Things and Their Environment:

5.2.1 Investigate the relationships among organisms in a specific ecosystem.

- Classify specific kinds of relationships among plants and animals within an ecosystem.

5.2.2 Recognize that organisms are able to change their environment.

- Predict the consequences of a human action on the environment.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.2.spi.1 identify environmental changes caused by living things.

at Level 2, the student is able to

5.2.spi.2 determine various types of plant and animal relationships within an ecosystem.

at Level 3, the student is able to

5.2.spi.3 predict the effects of human actions and/or natural disasters on the environment.

Performance Indicators Teachers:

As documented through teacher observations,

at Level 1, the student is able to

- 5.2.tpi.1 examine and describe the relationships between plants and animals within a specific environment.
- 5.2.tpi.2 determine how organisms may be affected by environmental factors.

at Level 2, the student is able to

- 5.2.tpi.3 differentiate between the populations and communities that comprise an ecosystem.
- 5.2.tpi.4 explain how human disasters affect specific environments.

at Level 3, the student is able to

- 5.2.tpi.5 evaluate how the loss of an organism affects an environment.
- 5.2.tpi.6 research examples of how environmental changes affect the organisms inhabiting an ecosystem.

Content Standard: 3.0 Food Production and Energy for Life

The student will study the basic parts of plants, investigate how plants produce food, and discover that plants and animals use

food to sustain life.

Learning Expectations:

- 3.1 Realize that plants and animals use food for energy.
- 3.2 Recognize the function of specific structures in organisms that allow them to obtain and use energy.

Accomplishments**Food Production and Energy for Life:**

5.3.1 Realize that plants and animals use food for energy.

- Explain how plants produce their own food.

5.3.2 Recognize the function of specific structures in organisms that allow them to obtain and use energy.

- Describe how various plant structures are associated with food production (i.e., stems, leaves, stomata).

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.3.spi.1 match plant structures with their functions.

at Level 2, the student is able to

5.3.spi.2 identify photosynthesis as the food manufacturing process in plants.

at Level 3, the student is able to

5.3.spi.3 identify what plants need (i.e. water, sunlight, carbon dioxide) to manufacture food.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

- 5.3.tpi.1 explain how plants produce their own food.
- 5.3.tpi.2 compare plant structures with their functions.

at Level 2, the student is able to

- 5.3.tpi.3 classify the nutritional relationships among organisms in an ecosystem.
- 5.3.tpi.4 recognize the essential components of photosynthesis (i.e., sunlight, water, and carbon dioxide).
- 5.3.tpi.5 explain the connection between plant structures and food production.

at Level 3, the student is able to

5.3.tpi.6 describe the importance of photosynthesis and list the *basic* components of the process.

Content Standard: 4.0 Heredity and Reproduction

The student will understand the basic principles of inheritance.

Learning Expectations:

- 4.1 Realize that certain characteristics are passed from parent to offspring.

- 4.2 Realize that reproduction is necessary for the survival of species.
- 4.3 Investigate the life cycles of different organisms.

Accomplishments

Heredity and Reproduction:

5.4.1 Realize that certain characteristics are passed from parents to offspring.

- a. Explain the function of the flower in plant reproduction.
- b. Observe specific plants and explain how they grow from and produce seeds (i.e. sunflowers, beans).
- c. Compare and contrast how different plants reproduce (i.e. flowers, spores).

5.4.2 Realize that reproduction is necessary for the survival of the species.

- a. Recognize that new generations of living things arise through reproduction.
- b. Explain that the continuation of a species is dependent upon the reproduction of its members.

5.4.3 Investigate the life cycles of different organisms.

- Describe the life cycle of a fast growing plant.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.4.spi.1 compare the traits of parents and their offspring.

at Level 2, the student is able to

5.4.spi.2 infer the importance of reproduction in the survival of a species.

at Level 3, the student is able to

5.4.spi.3 recognize the difference between complete and incomplete metamorphosis.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.4.tpi.1 compare and contrast the characteristics of organisms and show how these are related to the parental traits.

at Level 2, the student is able to

- 5.4.tpi.2 compare and contrast the ways that plants reproduce and are pollinated.
- 5.4.tpi.3 observe and graph the growth of an organism as it matures.

at Level 3, the student is able to

5.4.tpi.4 differentiate between organisms that undergo complete and incomplete metamorphosis.

Content Standard: 5.0 Diversity and Adaptation Among Living Things

The student will understand that living things have characteristics that enable them to survive in their environment.

Learning Expectations:

- 5.1 Realize that plants and animals can be grouped according to similarities and difference in their characteristics.
 5.2 Determine that adaptations help organisms to survive in their environments.

Accomplishments

Diversity and Adaptation Among Living Things:

5.5.1 Realize that plants and animals can be grouped according to similarities and differences in their characteristics.

- Classify plants according to their characteristics.

5.5.2 Determine that adaptations help organisms to survive in their environments.

- Compare how plants are adapted to different environments (e.g., palm tree, fir tree, cactus).

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

- 5.5.spi.1 compare how organisms adapt to different environments.
 5.5.spi.2 match the form with the function of structures in living things.

at Level 2, the student is able to

- 5.5.spi.3 identify characteristics that enhance the survival of organisms in an environment.

at Level 3, the student is able to

- 5.5.spi.4 determine which organisms are likely to survive in a particular environment.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

- 5.5.tpi.1 investigate and explain how organisms have adaptations that allow for survival in their environment. /p>

at Level 2, the student is able to

- 5.5.tpi.2 provide examples of adaptations that allow animals to avoid predation.
 5.5.tpi.3 explain how the form of specific structures relates to their function (e.g., flower shape to pollination, teeth shape to food selection).

at Level 3, the student is able to

- 5.5.tpi.4 describe how specific characteristics help an organism to survive in a particular environment.
 5.5.tpi.5 design an organism with adaptations necessary for surviving in a particular (imaginary) habitat.

Content Standard: 6.0 Biological Change

The student will understand that living things have changed over time.

Learning Expectations:

- 6.1 Realize that fossils show connections between organisms that lived in the past and those that live in the present.
 6.2 Recognize that extinction has occurred in the past and continues today.

Accomplishments

Biological Change:

5.6.1 Realize that fossils show connections between organisms that lived in the past and those that live in the present.

- Explain how fossils provide information about the past.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.6.spi.1 compare the causes that led to the extinction of various organisms.

at Level 2, the student is able to

5.6.spi.2 analyze how fossils provide information about the past.

at Level 3, the student is able to

5.6.spi.3 compare the relative age of fossils in rock layers.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.6.tpi.1 evaluate factors that might cause the extinction of a species.

at Level 2, the student is able to

5.6.tpi.2 explain how fossils form and how they provide information about the past.

5.6.tpi.3 compare the characteristics of fossil imprints and fossil remains.

at Level 3, the student is able to

5.6.tpi.4 determine the relative age of fossils based upon their position in sedimentary rock.

5.6.tpi.5 evaluate how human decisions have affected the survival of some species.

Earth and Space Science**Content Standard: 7.0 Earth and Its Place in the Universe**

The student will investigate the structure of the universe.

Learning Expectations:

7.1 Know that objects in space have identifiable characteristics, such as appearance, location, and apparent motion.

7.2 Investigate the patterns and movement of objects in space.

Accomplishments**Earth and Its Place in the Universe:**

5.7.1 Know that objects in space have identifiable characteristics (e.g., appearance, location, and apparent motion).

- Compare and contrast characteristics of the planets.

5.7.2 Investigate the patterns and movement of objects in space.

- Demonstrate how moon phases occur.
- Explain why the moon appears to change shape.
- Explain the difference between rotation and revolution in the solar system.

Performance Indicator State:

As documented through state assessment,

at Level 1, the student is able to

5.7.spi.1 identify and arrange the phases of the moon in the correct sequence.

at Level 2, the student is able to

5.7.spi.2 distinguish among the planets according to specific characteristics.
5.7.spi.3 identify the force that pulls object toward the Earth.
5.7.spi.4 differentiate between the Earth's rotation and its revolution.

at Level 3, the student is able to

5.7.spi.5 recognize that the appearance of an object in the sky is affected by its size, motion, and distance from the earth.

Performance Indicator Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.7.tpi.1 observe, draw, label, and sequence the phases of the moon.

at Level 2, the student is able to

5.7.tpi.2 demonstrate the difference between rotation and revolution in the solar system.

at Level 3, the student is able to

5.7.tpi.3 design a model that illustrates how the appearance of an object in the sky is affected by its size, motion, and distance from the earth.

Content Standard: 8.0 Atmospheric Cycles

The student will investigate the relationships among atmospheric conditions, weather, and climate.

Learning Expectations:

- 8.1 Recognize that atmospheric conditions vary and can be measured.
- 8.2 Recognize that landforms and bodies of water affect weather and climate.
- 8.3 Recognize the basic features of the water cycle.

Accomplishments

Atmospheric Cycles:

5.8.1 Recognize that atmospheric conditions vary and can be measured.

- Analyze data obtained from studies of atmospheric conditions (i.e., air pressure, temperature, wind speed, precipitation).

5.8.2 Recognize that landforms and bodies of water affect weather and climate.

- Explain the effects of landforms on weather and climate.

5.8.3 Recognize the basic features of the water cycle.

- a. Demonstrate the components and processes of the water cycle.
- b. Analyze how temperature affects evaporation, condensation and precipitation.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.8.spi.1 distinguish between weather and climate.

at Level 2, the student is able to

5.8.spi.2 identify the basic features of the water cycle.

5.8.spi.3 predict weather conditions based on an analysis of atmospheric data.

at Level 3, the student is able to

5.8.spi.4 identify how various geographic features affect weather and climate.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.8.tpi.1 investigate and describe the differences between weather and climate.

at Level 2, the student is able to

5.8.tpi.2 create a model of the water cycle and identify its major components.

at Level 3, the student is able to

5.8.tpi.3 relate the type of weather and climate associated with specific landforms.

Content Standard: 9.0 Earth Features

The student will understand that the earth has many geological features that are constantly changing.

Learning Expectations:

- 9.1 Recognize that the earth's geological features change.
- 9.2 Know that the earth is composed of different layers.

Accomplishments

Earth Features:

5.9.1 Recognize that the earth's geological features change.

- Explain how certain forces cause changes in the earth's geological features (i.e., wind, water, plate tectonics).

5.9.2 Know that the earth is composed of different layers.

- Construct a model that depicts the layers of the earth.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.9.spi.1 identify forces that cause geological change.

at Level 2, the student is able to

5.9.spi.2 recognize that the age of Earth materials can be determined by their position in rock layers.

at Level 3, the student is able to

5.9.spi.3 identify characteristics of the Earth's layers.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.9.tpi.1 illustrate how various forces contribute to geological change.

at Level 2, the student is able to

5.9.tpi.2 create a cross section model of the earth's crust.

at Level 3, the student is able to

5.9.tpi.3 design and describe a model of a fault.

5.9.tpi.4 research the characteristics of materials within the earth's layers.

Content Standard: 10.0 Earth Resources

The student will investigate the properties, uses, and conservation of earth's resources.

Learning Expectations:

10.1 Recognize that earth materials have a variety of practical uses.

10.2 Know the basic characteristics of soils.

10.3 Realize the difference between renewable and non-renewable resources.

Accomplishments**Earth Resources:**

5.10.1 Recognize that earth materials have a variety of practical uses.

- Choose the appropriate use for an earth material (e.g., fuel, monument, house foundation).

5.10.2 Know the basic characteristics of soils.

- a. Describe the process of soil formation.
- b. Identify soil characteristics that best support plant growth.

5.10.3 Realize the difference between renewable and non-renewable resources.

- Explain the implications of society's dependence on non-renewable resources.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.10.spi.1 select a diagram that illustrates the most appropriate use of an earth material.

at Level 2, the student is able to

5.10.spi.2 select the soil characteristics that best support plant growth.

at Level 3, the student is able to

5.10.spi.3 recognize the impact of society's use of nonrenewable resources over time.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.10.tpi.1 describe methods for conserving natural resources.

at Level 2, the student is able to

5.10.tpi.2 test the suitability of soils for a variety of purposes.

at Level 3, the student is able to

5.10.tpi.3 write a story indicating how the various types of coal were created.

5.10.tpi.4 debate the implications of society's dependence on fossil fuels.

Physical Science**Content Standard: 11.0 Forces and Motion**

The student will investigate the characteristic properties of matter.

Learning Expectations:

11.1 Recognize that gravity is the force that pulls objects toward the earth.

11.2 Recognize the relationship between force and motion.

11.3 Recognize that the motion of objects is affected by friction.

Accomplishments**Forces and Motion:**

5.11.1 Recognize that gravity is the force that pulls objects toward the earth.

- Explain the effect that gravity has on objects found on earth.

5.11.2 Recognize the relationship between force and motion.

- a. Explain the relationships among mass, force, and distance traveled.
- b. Explain how slope affects the amount of force.
- c. Explore and explain the use of simple machines.

5.11.3 Recognize that the motion of objects is affected by friction.

- Explore and explain how friction affects motion.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.11.spi.1 identify the effect that gravity has on objects found on or near the earth's surface.

at Level 2, the student is able to

5.11.spi.2 determine the effect of slope and friction on the speed of an object.

at Level 3, the student is able to

5.11.spi.3 match simple machines with their uses.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.11.tpi.1 investigate and describe gravity as a force in nature.

5.11.tpi.2 describe the effect that gravity has on objects found on or near the earth's surface.

at Level 2, the student is able to

5.11.tpi.3 investigate how slope affects the amount of force required to move an object along a ramp.

at Level 3, the student is able to

5.11.tpi.4 construct a simple machine.

5.11.tpi.5 investigate how simple machines change the direction of a force

Content Standard: 12.0 Structure and Properties of Matter

The student will investigate the characteristic properties of matter

Learning Expectations:

12.1 Recognize that matter has predictable properties and is composed of basic units, some too small to be seen with the naked eye.

12.2 Recognize conditions that are associated with different states of matter

Accomplishments

Structure and Properties of Matter:

5.12.1 Recognize that matter has predictable properties and is composed of basic units, some too small to be seen with the naked eye.

- Explain the law of conservation of matter.

5.12.2 Recognize conditions that are associated with different states of matter.

- Describe how evaporation and condensation occur as a result of temperature change.
- Explain why different types of matter freeze, melt, and/or evaporate at different rates.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.12.spi.1 select a material according to a description of its physical properties.

at Level 2, the student is able to

5.12.spi.2 recognize the law of conservation of matter.

5.12.spi.3 recognize how temperature is associated with a change in the state of matter.

at Level 3, the student is able to

5.12.spi.4 determine the appropriate metric unit of measurement for specific properties of matter.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.12.tpi.1 compare the properties of materials and infer their state.

5.12.tpi.2 describe a material according to its physical properties.

at Level 2, the student is able to

5.12.tpi.3 use appropriate tools and metric units to measure and compare the mass, volume and length of various objects.

5.12.tpi.4 investigate and explain the law of conservation of matter.

5.12.tpi.5 recognize that evaporation and condensation occur as a result of temperature changes.

at Level 3, the student is able to

5.12.tpi.6 compare the difference between physical and chemical properties of matter.

Content Standard: 13.0 Interactions of Matter

The student will investigate the interactions of matter.

Learning Expectations:

13.1 Describe the types of changes that result from interactions of matter.

Accomplishments**Interactions of Matter:**

5.13.1 Describe the types of changes that result from interactions of matter.

- a. Identify conditions associated with a chemical change.
- b. Distinguish between physical and chemical changes.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

5.13.spi.1 distinguish between physical and chemical changes.

at Level 2, the student is able to

5.13.spi.2 compare the effect of physical and chemical changes on matter.

at Level 3, the student is able to

5.13.spi.3 identify a substance as an acid (i.e. vinegar or lemon juice) or a base (i.e. soap or baking soda).

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

5.13.tpi.1 investigate and describe various physical changes in matter.

at Level 2, the student is able to

5.13.tpi.2 compare and contrast the characteristics of physical and chemical changes.

at Level 3, the student is able to

5.13.tpi.3 describe how temperature changes affect the behavior of a substance.

Content Standard:14.0 Energy

The student will investigate energy and its uses.

Learning Expectations:

- 14.1 Know that energy exists in many forms.
- 14.2 Recognize the characteristics of light energy and sound energy.
- 14.3 Recognize the properties and uses of magnets.
- 14.4 Recognize the basic concept of electricity.

Accomplishments

Energy:

5.14.1 Know that energy exists in many forms.

- a. Demonstrate and explain how energy can change form.
- b. Differentiate between potential and kinetic energy.

5.14.2 Recognize the characteristics of light energy and sound energy.

- Observe and describe how lenses affect a beam of light.

5.14.3 Recognize the properties and uses of magnets.

- a. Explore and describe the uses of magnets.
- b. Demonstrate and describe a magnetic field.

5.14.4 Recognize the basic concept of electricity.

- a. Construct and explain a parallel circuit.
- b. Compare series and parallel circuits.
- c. Explain the use of a specific type of electrical circuit.

Performance Indicators State:

As documented through state assessment,

at Level 1, the student is able to

- 5.14.spi.1 identify the poles of a magnet.
- 5.14.spi.2 recognize how various materials conduct heat.

at Level 2, the student is able to

- 5.14.spi.3 identify the description of a magnetic field.
- 5.14.spi.4 identify ways that energy is transferred.
- 5.14.spi.5 differentiate between potential and kinetic energy.

at Level 3, the student is able to

- 5.14.spi.6 distinguish between series and parallel circuits.
- 5.14.spi.7 select the illustration that depicts how lenses refract light.

Performance Indicators Teacher:

As documented through teacher observation,

at Level 1, the student is able to

- 5.14.tpi.1 demonstrate and explain the relationship between two magnets and identify their poles.
- 5.14.tpi.2 demonstrate how different kinds of materials conduct heat.

at Level 2, the student is able to

- 5.14.tpi.3 explore and describe a magnetic field.
- 5.14.tpi.4 describe the difference between potential and kinetic energy.
- 5.14.tpi.5 investigate and describe ways energy is transferred.
- 5.14.tpi.6 investigate and describe ways that the sun's energy is used in everyday life.

at Level 3, the student is able to

- 5.14.tpi.7 demonstrate and explain the difference in series and parallel circuits.
- 5.14.tpi.8 distinguish between translucent, opaque, and clear materials.