

Snapshots: Grade 6 Science

Snapshots are ideas for classroom activities that address the intent of the Texas Essential Knowledge and Skills for Science. Snapshots may cover part of a TEKS statement, but not necessarily the whole statement. Snapshots represent one way, out of many possible ways, of addressing specific TEKS statements.

The TEKS for Science listed here are from *Chapter 112. Texas Essential Knowledge and Skills for Science. Subchapter B. Middle School. §112.22. Science, Grade 6. (a) Introduction and (b) Knowledge and skills.* The middle school TEKS for Science can be viewed and downloaded on the Texas Education Agency website or purchased in book form through our [online catalog](#).

(a) Introduction.

(1) In Grade 6, the study of science includes conducting field and laboratory investigations using scientific methods, analyzing data, making informed decisions, and using tools such as beakers, test tubes and spring scales to collect, analyze, and record information. Students also use computers and information technology tools to support scientific investigations.

(2) As students learn science skills, they identify components of the solar system including the Sun, planets, moon, and asteroids and learn how seasons and the length of the day are caused by the tilt and rotation of the Earth as it orbits the Sun. Students investigate the rock cycle and identify sources of water in a watershed. In addition, students identify changes in objects including position, direction, and speed when acted upon by a force.

(3) Students classify substances by their chemical properties and identify the water cycle and decay of biomass as examples of the interactions between matter and energy. They identify life processes and the relationships between structure and function of organisms.

(4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(5) A system is a collection of cycles, structures, and processes that interact. Students should understand a whole in terms of its components and how these components relate to each other and to the whole. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems and can be observed and measured as patterns. These patterns help to predict what will happen next and can change over time.

(6) Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(b) Knowledge and skills.

(6.1) Scientific processes. The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.

The student is expected to:

- a. demonstrate safe practices during field and laboratory investigations; and
- b. make wise choices in the use and conservation of resources and the disposal or recycling of materials.

(6.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations.

The student is expected to:

- a. plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;
- b. collect information by observing and measuring;
- c. analyze and interpret information to construct reasonable explanations from direct and indirect evidence;
- d. communicate valid conclusions; and
- e. construct graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information.

(6.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions.

The student is expected to:

- a. analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;
- b. draw inferences based on data related to promotional materials for products and services;
- c. represent the natural world using models and identify their limitations;
- d. evaluate the impact of research on scientific thought, society, and the environment; and
- e. connect Grade 6 science concepts with the history of science and contributions of scientists.

(6.4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry.

The student is expected to:

- a. collect, analyze, and record information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, timing devices, hot plates, test tubes, safety goggles, spring scales, magnets, balances, microscopes, telescopes, thermometers, calculators, field equipment, compasses, computers, and computer probes; and
- b. identify patterns in collected information using percent, average, range, and frequency.

(6.5) Scientific concepts. The student knows that systems may combine with other systems to form a larger system.

The student is expected to:

- a. identify and describe a system that results from the combination of two or more systems such as in the solar system; and

Snapshot:

- Explore a variety of systems in and around the school campus, such as a computer, a band instrument, a microscope, or fish in an aquarium. Identify the systems within the larger system.

- b. describe how the properties of a system are different from the properties of its parts.

Snapshot:

- Explore several types of toys and describe their parts. Recognize the toys as systems with components. Describe how the properties of the toys are different from the properties of their parts.

(6.6) Science concepts. The student knows that there is a relationship between force and motion.

The student is expected to:

- a. identify and describe the changes in position, direction of motion, and speed of an object when acted upon by force;

Snapshot:

- Prepare six stations with the following: (1) a straw and a Ping Pong ball, (2) a paper airplane, (3) a pinwheel, (4) marbles, (5) a pendulum apparatus with varied weights, and (6) a spinning top. Ask students the following questions: How can each object be made to move? How would you know if the object moved? How could you measure this movement? What will happen if different forces are applied to the objects?

- b. demonstrate that changes in motion can be measured and graphically represented; and
- c. identify forces that shape features of the Earth including uplifting, movement of water, and volcanic activity.

Snapshot:

- View a DVD or video of mountain formation, volcanic eruptions, and other natural forces like hurricanes and earthquakes to observe uplifts, movements of water, and volcanic activity. Ask students how these natural forces shape features of the Earth.

(6.7) Science concepts. The student knows that substances have physical and chemical properties.

The student is expected to:

- a. demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substances; and
- b. classify substances by their physical and chemical properties.

(6.8) Science concepts. The student knows that complex interactions occur between matter and energy.

The student is expected to:

- a. define matter and energy;
- b. explain and illustrate the interactions between matter and energy in the water cycle and in the decay of biomass such as in a compost bin; and
- c. describe energy flow in living systems including food chains and food webs.

Snapshot:

- Design a variety of food-web collages that illustrate the energy flow within living systems found in the schoolyard, in an ocean, or in a classroom aquarium or terrarium.

(6.9) Science concepts. The student knows that obtaining, transforming, and distributing energy affects the environment.

The student is expected to:

a. identify energy transformations occurring during the production of energy for human use such as electrical energy to heat energy or heat energy to electrical energy;

Snapshot:

- Visit a local power plant or use the web to learn about the transformation of energy to produce electricity. Create a diagram illustrating the energy transformations for supplying electricity to a home or school. Students should also identify other ways of creating the electricity that supplies homes and schools.

b. compare methods used for transforming energy in devices such as water heaters, cooling systems, or hydroelectric and wind power plants; and

Snapshot:

- Create and present an advertisement for an energy transformation device like a water heater, a cooling system, or hydroelectric or wind power plants. Use a chart to identify the advantages and disadvantages of each method of transformation.

c. research and describe energy types from their source to their use and determine if the type is renewable, non-renewable, or inexhaustible.

Snapshot:

- Research and describe energy types, sources, and uses. Determine whether each energy type is renewable, nonrenewable, or inexhaustible.

(6.10) Science concepts. The student knows the relationship between structure and function in living systems.

The student is expected to:

a. differentiate between structure and function;

Snapshot:

- Compare and contrast the physical structure of various animals with their corresponding function, such as the needle-like beak of a hummingbird to gather nectar from flowers or the prehensile tail of a gibbon for moving through a forest.

b. determine that all organisms are composed of cells that carry on functions to sustain life; and

Snapshot:

- Use a microscope to observe slides of various prepared plant and animal tissues. Identify and draw the cells observed in each slide. Describe the similarities and differences between cell types.

c. identify how structure complements function at different levels of organization including organs, organ systems, organisms, and populations.

Snapshot:

- Identify how the structure of various organs in the reproductive system of a flowering plant enables the plant to reproduce. Investigate other systems within plants and animals. Make a chart of the different organs and determine how the organ structure complements its function.

(6.11) Science concepts. The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms.

The student is expected to:

a. identify some changes in traits that can occur over several generations through natural occurrence and selective breeding;

Snapshot:

- Collect information about breeds of plants and animals like cattle, dogs, apples, and corn. Compare traits of newer species with those of past generations, and identify traits that may have been altered through time.

b. identify cells as structures containing genetic material; and

Snapshot:

- Use the cell drawings made in the Snapshot for 6.10(b) and have students identify the location of the cell's nucleus.

c. interpret the role of genes in inheritance.

(6.12) Science concepts. The student knows that the responses of organisms are caused by internal or external stimuli.

The student is expected to:

a. identify responses in organisms to internal stimuli such as hunger or thirst;

Snapshot:

- Have students design and conduct a simple experiment to illustrate a plant's response to sunlight. Students should observe the plant for several days, make illustrations of it, record observations in a lab journal, and identify the stimulus that caused the plant's movement.

b. identify responses in organisms to external stimuli such as the presence or absence of heat or light; and

Snapshot:

- Observe and identify pillbug responses to food sources, light, temperature, moisture, and other external stimuli. Record and report findings.

c. identify components of an ecosystem to which organisms may respond.

Snapshot:

- Visit a nearby ecosystem such as a vacant lot, athletic field, or park. Observe and identify the plants, animals, and resources within the ecosystem. Record the interaction among the organisms observed.

(6.13) Science concepts. The student knows components of our solar system.

The student is expected to:

a. identify characteristics of objects in our solar system including the Sun, planets, meteorites, comets, asteroids, and moons; and

Snapshot:

- Investigate objects in the solar system like the moons, sun, planets, meteorites, comets, and asteroids. Create a presentation that identifies characteristics of objects in the solar system, such as size, shape, composition, and surface features.

b. describe types of equipment and transportation needed for space travel.

Snapshot:

- Design and construct a model of a transportation device for space exploration. Prepare a presentation of the model, including a description of the equipment necessary to support a successful space travel event and how that equipment enables humans to survive in space.

(6.14) Science concepts. The student knows the structures and functions of Earth systems.

The student is expected to:

a. summarize the rock cycle;

Snapshot:

- Write a narrative from the perspective of a sedimentary, metamorphic, or igneous rock moving through the processes of the rock cycle. Include reasons for changes as related to the rock cycle.

b. identify relationships between groundwater and surface water in a watershed; and

c. describe components of the atmosphere, including oxygen, nitrogen, and water vapor, and identify the role of atmospheric movement in weather change.

Snapshot:

- Prepare a Texas weather report to highlight the relationship between atmospheric movement and weather changes across the state.