

4th Grade Science

Week 7

Your Week at a Glance
<ul style="list-style-type: none">• Changes from Energy• NGSSS: SC.4.P.10.2; SC.4.P.10.4

- Changes from Energy
- NGSSS: SC.4.P.10.2; SC.4.P.10.4

Student Name: _____

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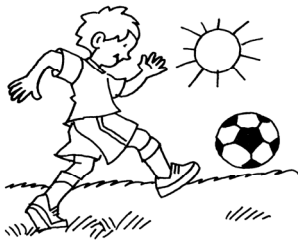
SC.4.P.10.2 Investigate and describe that energy has the ability to cause motion or create change. **SC.4.P.10.4** Describe how moving water and air are sources of energy and can be used to move things.

Changes From Energy

Energy is the ability to cause change in matter. Lifting boxes, making muffins, running a race, and riding a bicycle all take energy.

Motion

Position is the location of an object. If you change the position of the object, you have put the object in motion. Kinetic energy is the energy of motion, so it can cause change in position. For example, the kinetic energy of a person's foot causes it to move a soccer ball. When the ball is kicked, its kinetic energy causes it to move, changing its position. Kinetic energy causes a bat to swing and the ball it hits to change speed and direction.



Electricity

Electrical energy flowing through wires can also cause change. Electricity causes a light bulb to light up and a computer to power on. Electricity allows you to call your friends, do research on the Internet, and see in the dark.

Temperature

Temperature is a measure of how hot or cool something is. It takes energy to raise the temperature of objects and substances. Think of sitting by a campfire, toasting a marshmallow on a stick. Heat energy given off by the fire will cause changes in the marshmallow. It will change from spongy and white to gooey and brown.



Light energy from the sun can also cause temperature to rise. When light from the sun reaches Earth, it warms up the land and water. Have you ever been to the beach on a sunny day? The sand can become very hot in the sunlight!

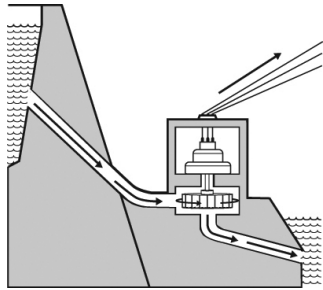
A temperature change can cause a change in state. Place an ice cube in a sunny spot, and it will melt—changing from a solid to a liquid. Adding heat energy to liquid water can cause it to boil or evaporate. Melting, boiling, and evaporating are all changes that are caused by energy.



Water Energy

A surfer rides the ocean waves as they move toward the beach. The kinetic energy of the ocean's waves can move people and objects. Water energy can carry away sand from a beach or soil and rock from the banks of a river. People have long used water's energy to move people and things. Before boats had engines, they could use the motion of flowing rivers to help carry people and goods from place to place.

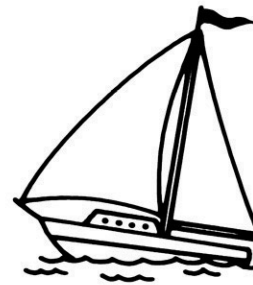
At a hydroelectric station, the energy of moving water can be changed into electrical energy. The flowing water rotates a generator, which produces electricity.



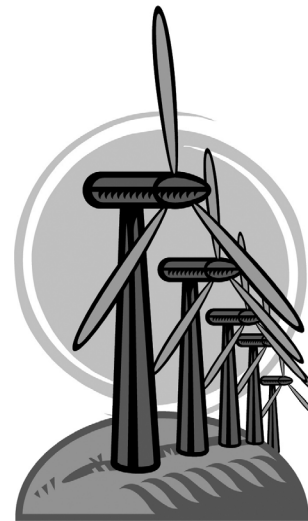
Hydroelectric stations can also use the motion of the tides to produce electricity. Tides are the regular rise and fall of ocean levels. Tidal power plants use this motion to generate electricity.

Wind Energy

Wind energy is energy produced by moving air. Like water, wind can cause erosion when it blows sand or soil from place to place. Like flowing water, wind can move a boat. It can push against the sails of a sailboat to move it across the surface of a lake.

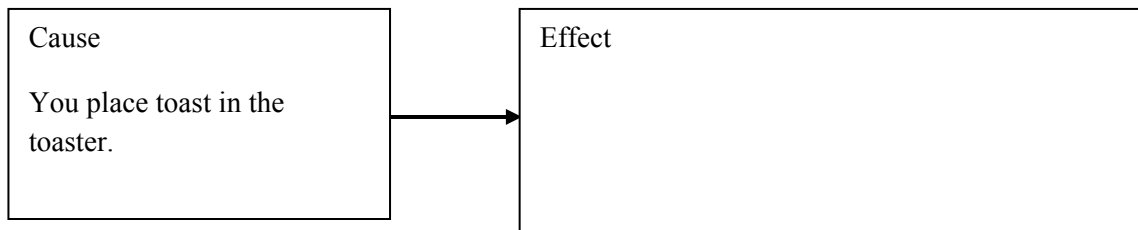
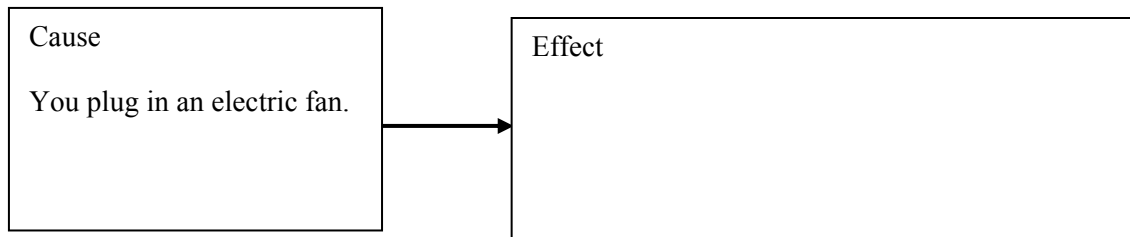
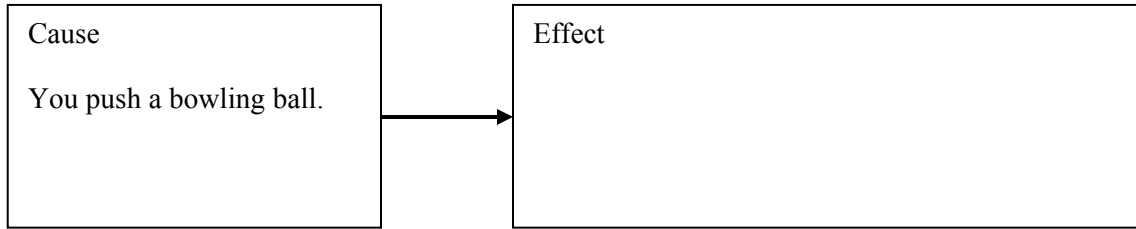


Like a hydroelectric station, a wind turbine changes kinetic energy to electrical energy. This time, the kinetic energy is the energy of moving air. The wind's kinetic energy causes the turbine's blades to rotate. A generator changes this energy of motion into electrical energy.



Student-Response Activity

1 Complete the cause-and-effect graphic organizer to show how energy causes change.



2 Identify a way each form of energy causes motion or change.

Form of Energy	Change It Causes
Light	
Heat	
Wind Energy	
Water Energy	

Benchmark Assessment SC.4.P.10.2, SC.4.P.10.4

Fill in the letter of the best choice.

- 1 Which is **not** an example of energy causing a change in motion?
 - (A) A child pulls a wagon full of packages.
 - (B) A car burns gasoline so it can move.
 - (C) A library book rests on a high bookshelf.
 - (D) A student uses a pencil to write a letter.

- 2 How does light from the sun cause change on Earth?
 - (F) It causes Earth to spin.
 - (G) It causes Earth to warm.
 - (H) It causes Earth to stay in orbit.
 - (I) It causes Earth to make its own light.

- 3 Which tool can you use to measure the changes heat energy makes?
 - (A) barometer
 - (B) pan balance
 - (C) scale
 - (D) thermometer

- 4 Which form of energy does a river use to move a raft?
 - (F) heat
 - (G) kinetic
 - (H) potential
 - (I) sound

- 5 Which prediction can you make about how energy from the sun will change the puddle?
 - (A) The sun's energy will cause the puddle to grow.
 - (B) The sun's energy will cause the puddle to shrink.
 - (C) The sun's energy will cause the puddle to boil.
 - (D) The sun's energy will cause the puddle to freeze.

