



What Does Energy Do?



Mario

Energy is so cool to learn about! I think energy causes motion. 🤔



Kelly

I think energy can change things.



Hugo

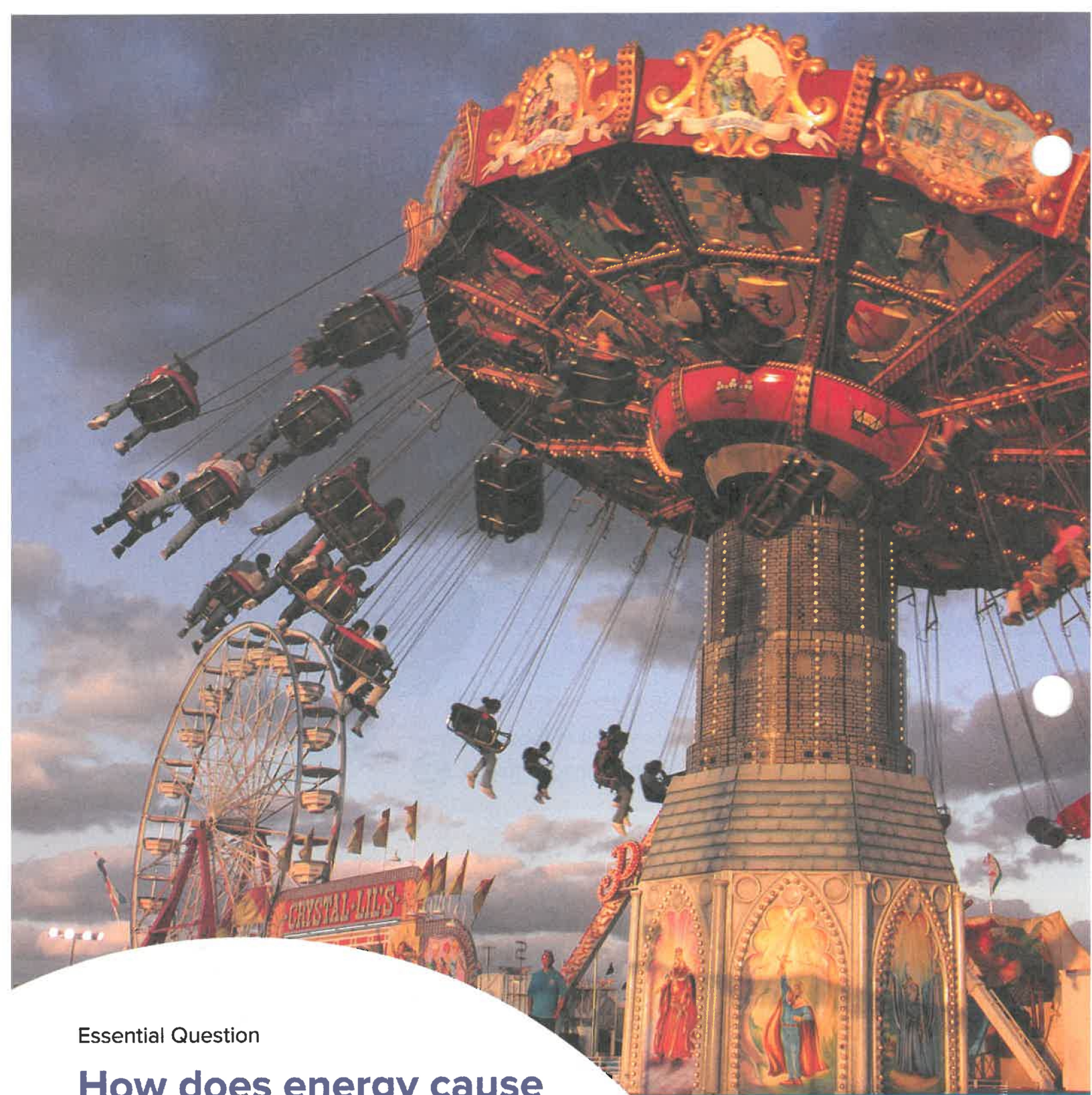
I think energy does both of those things. It causes motion and changes things. 😎

I disagree with all of you. I think it does something else.



Arya

Who do you think has the best idea? Explain your thinking.



Essential Question

How does energy cause change and create motion?



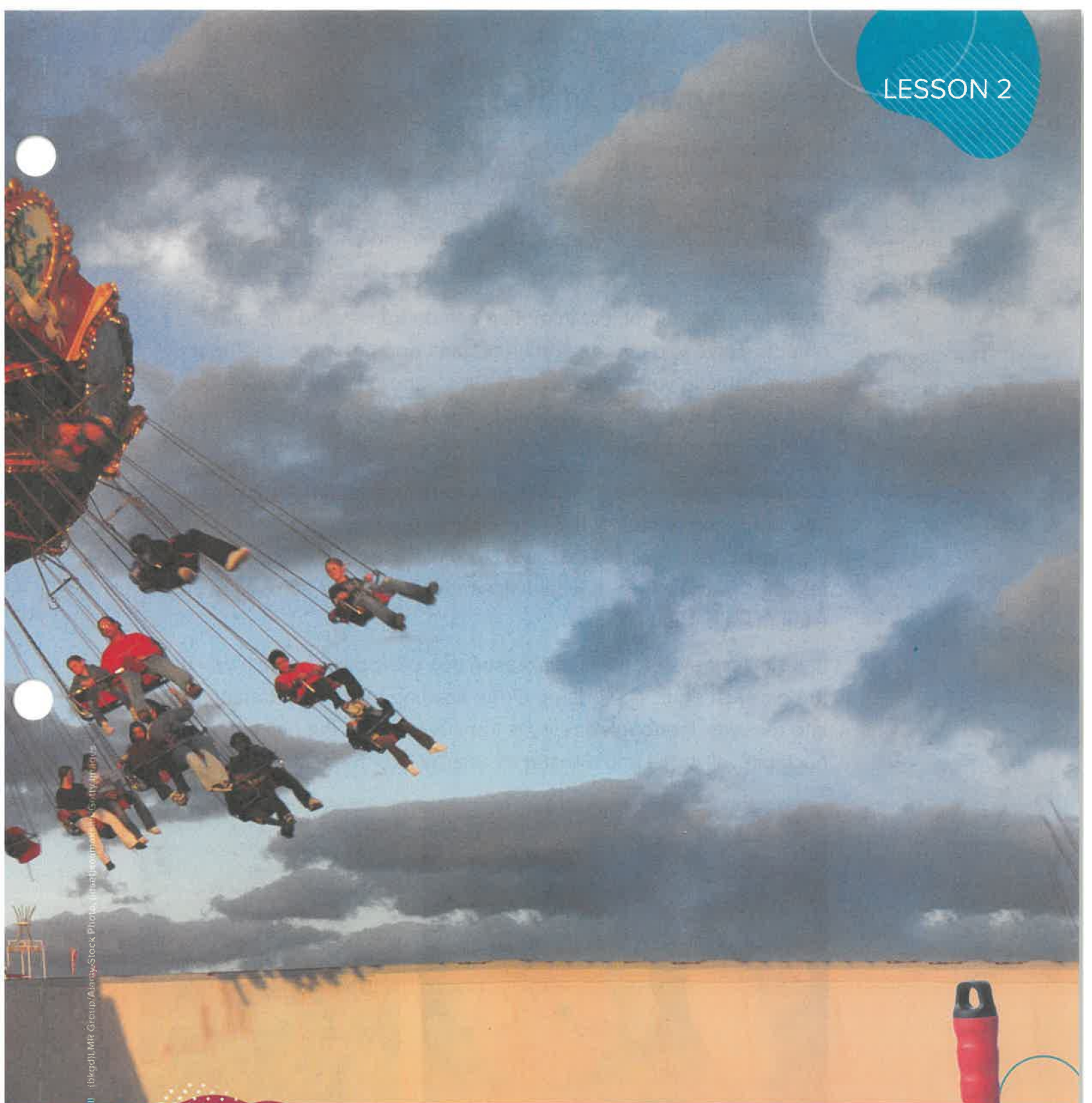
Watch *Energy on the Move*.



How does energy make things move?



What do you wonder about how energy causes change or creates motion? Write it down.



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Hands-On Investigation

Make Your (River) Bed

SC.5.N.1.2



Get your notebook and go explore!



kinetic energy

potential energy

Energy and Motion



Claim, Evidence, Reasoning



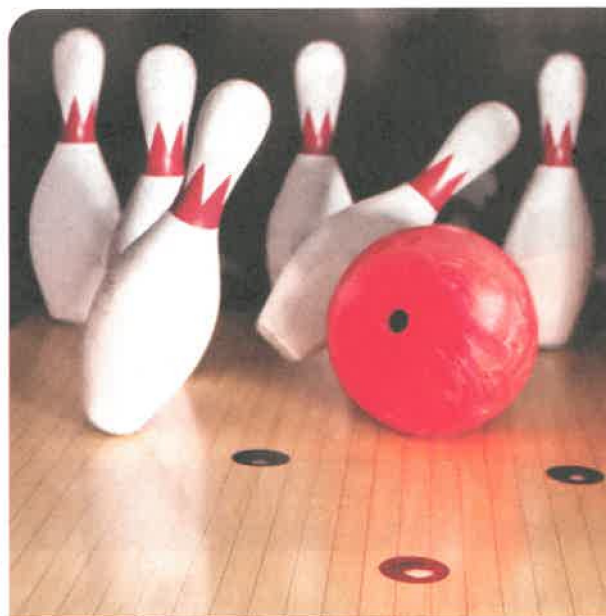
How did energy cause change in the landscape?

Can you back it up? Keep reading and underline evidence.

The energy of one object in motion can be transferred into other objects. Have you ever folded an origami boat? To make the boat shape, you use your hands to move the paper in different directions. Your body is using energy stored in the food you ate to create motion. Your motion is creating motion in the paper as you fold it.

Energy can also move things like a water wheel. As moving water falls onto the paddles of the wheel, some of the water's energy is transferred to the wheel causing it to move. If something were attached to the wheel, it would also move and could be used to create even more motion.

In a similar way, energy is the reason you can bowl a strike if you hit the pins just right. The energy of the bowling ball will be transferred into the pins. If enough energy is transferred from the ball to the pins, each pin will move and transfer its energy into the next pin it hits.



Moving objects can transfer their energy into other objects. A bowling ball and a water wheel can use their energy of motion to cause other objects to move.



Mechanical energy helps pull the cart up the hill at location 1. Gravity pulls the cart down the hill at location 2. Friction stops the cart in the station at location 3.

Have you ever ridden a roller coaster? A roller coaster uses electrical energy to pull the cart to the top of the first hill. Since the cart is moving farther away from the ground, it is gaining **potential energy**, or energy stored in an object because of its position or state.

At the top of the first hill, the cart has more potential energy than at any other time on the roller coaster. This is because it is the farthest off the ground that it will be. Gravity will have the most time to change the cart's potential energy into **kinetic energy**, or the energy an object has because of its motion, as it moves down the other side of the hill. The cart's total amount of mechanical energy is a combination of the potential and kinetic energy in the cart at any given time.

As the cart moves along the track, some of the mechanical energy will be transferred into heat and sound energy. Eventually, the cart will stop back at the station when all of its kinetic energy is gone, and it has no more potential energy.



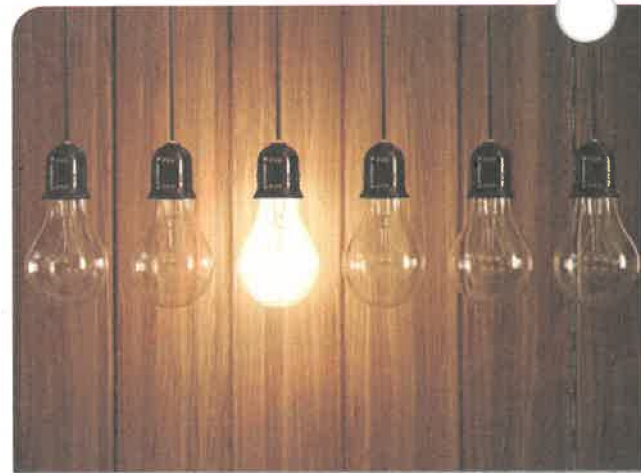
Investigation Connection



What role did gravity have in creating the energy of motion needed to change the land? Discuss with a partner.

Energy and Change

Have you ever walked into a dark room and flipped on a light bulb? What changes did you notice in the room around you? Because energy can be transferred to other objects, it also has the ability to create change in those objects. Electrical energy began moving through the light bulb as soon as you turned the bulb on. Some of the changes are noticeable right away. You can immediately see things in the room because the light energy is reflecting off objects in the room.



Only the bulb with electricity is lighting up the room.

Another change you might notice is that the bulb has a part of it glowing. Energy is changing this part of the bulb and making it heat up. When some objects are heated enough, like the filament in a light bulb, they will begin to produce light.

A toaster uses a similar change of energy to create change in the bread you toast. Electricity moving through the toaster is producing heat that is changing the bread by drying it out and making it crispy. The glow of the coils is another example of electricity heating an object so much that it glows.

WORD LAB



Do you need practice?

Interactive

Word

Wall

Remember to update your graphic organizer!

When a toaster is used, the electricity causes the bread inside to undergo changes and become toasted.



How does energy help you eat?



Blowing Rocks
Preserve, FL

The mechanical energy that is found in other moving objects sometimes makes changes in the world around you. Moving water and wind are examples of energy at work shaping the Earth.

Moving water has kinetic energy. The constant flow of the water in the Colorado River transfers some of that energy into the riverbed it moves through. This energy has slowly worn away the rock and soil of the Arizona landscape into the iconic shapes seen in Horseshoe Bend. Moving water, like the Colorado River, has created changes in the landscape of places all over Earth and beyond. Scientists believe they have discovered signs of moving water on other planets, like Mars!

Moving air, or wind, also has the ability to create changes in your world. If you have ever stood on the shore of a Florida beach, you have experienced how wind can cause motion in the ocean water and create waves that change the shape of the beach. The crashing waves on the shore transfer large amounts of energy into the sand and rocks along the shore. This energy breaks apart the rocks, washes away the sand, and leaves things just a little different than they were before. The energy of motion is at work shaping the Earth.



What are some other ways that energy changes the world around you?



Claim, Evidence, Reasoning



Now that you've gathered evidence, write your reasoning.
Discuss it!

Observe Your World

Rube Goldberg Machines on the Go!

Rube Goldberg machines are named after their inventor, Rube Goldberg. These machines are a perfect example of how energy can change or cause motion. Many of these machines start by pushing an object such as a ball through a series of obstacles. The goal is to cause enough chain reactions to get the ball to the end goal. One simple push on these inventive machines can cause many different energy changes and changes in motion!



Write About It! ELA.K12.EE.1.1

Research different types of Rube Goldberg machines or design your own. List and label how energy changes from start to finish.

The boxing glove created a chain of motion changes!

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