

Reflect

Take a moment to think about three common objects: a flashlight, a computer, and a toaster. A flashlight provides light. A computer stores information and displays it on a screen. A toaster cooks food. They each do a different job. However, these items have something in common: each uses at least one type of energy. You use energy every day, but what exactly is energy?

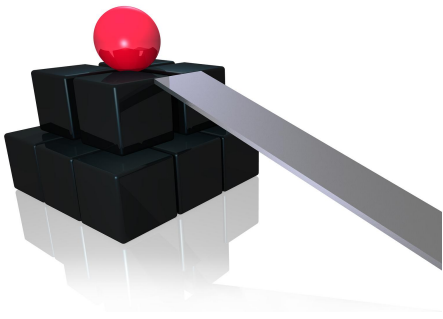
What is energy? What are some different forms of energy?

Sometimes it is easier to explain what energy does than to define what it is. Energy is the ability to do work or cause change. All matter has some form of energy. Whenever a flashlight is lit, a computer is turned on, or a toaster cooks food, you can be sure that energy made it happen.

An object can have energy based on its motion. Any object that is in motion has *energy of motion*. Think about a ball rolling down a ramp or the cars speeding around a roller coaster. The ball and the cars have energy of motion.



On the other hand, some objects have stored energy. Sometimes stored energy is based on an object's position. If a ball is placed at the top of a ramp and is not moving, it has stored energy. If the ball is sitting still at the bottom of the ramp, it still has stored energy. However, it has less stored energy than it did at the top of the ramp. It is often helpful to think of stored energy as what could happen.



Because of their positions above the ground, these balls have a large amount of stored energy.



These two main forms of energy cover most types of energy, such as mechanical, thermal, electrical, light, and sound energy. You will learn more about these types of energy next.

How do we use energy of motion and stored energy?

Mechanical energy is the energy that an object (or group of objects) has because of its motion and its position. Mechanical energy includes both the stored energy and the energy of motion of an object. As different parts of the object switch between moving and sitting still, the form of energy in the object cycles between stored energy and energy of motion. One example of mechanical energy can be seen when a person is riding a bike. The mechanical energy of the bike helps the person travel from one place to another. Other examples include a spinning top, a moving car, and flowing water. In a world full of motion, mechanical energy is all around us!



Look Out!



Looking to the Future: How do we store energy?

We use many types of energy every day. As the number of people living on Earth grows, our need for energy grows, too. Scientists are always looking for new ways to use different types of energy or to change one type of energy to another. What happens when we find a way to produce more energy? How do we “store” that energy for use in the future?

Make a list of ideas and thoughts about how we store energy today.

Reflect

Possibly, some of the devices you use during the day aren't plugged into an electrical socket all the time. Devices such as a cell phone or a tablet use batteries as their energy source.

Batteries are excellent tools for stored energy. The battery contains a chemical paste or liquid and different metal rods. When it is charged, a chemical reaction takes place inside the battery's cells, or sections. When the batteries are put into a device and it gets turned on, the energy that was stored because of the chemicals in the battery moves from the battery through the device. The device converts the energy into light energy, heat energy and/or sound energy.



Batteries are very useful energy storage devices. Cars and trucks use batteries to start their engines. Wind farms and solar panels store unused energy in batteries. The energy is stored for use on calm or cloudy days or at night, when the Sun isn't shining. Some of the energy is sold to nearby towns and cities. It is important to store energy so we can use it later when we need it.



What Do You Think?

Look at the pictures below. The picture on the left shows thermal and light energy. The picture in the center shows electrical, light, and sound energy. The picture on the right shows electrical and light energy. What are some objects you depend on every day that use these forms of energy? Where was the energy originally stored?

