What Are the Different Forms of Potential and Kinetic Energy?

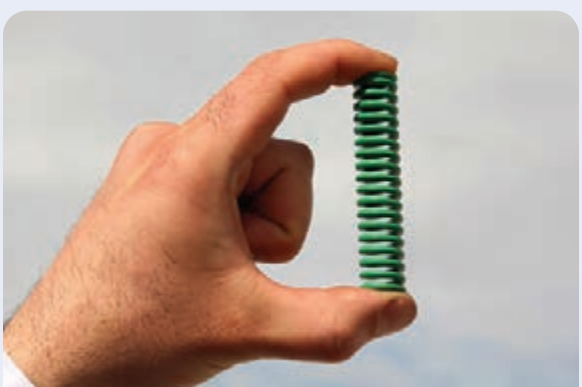
Activity 6

Analyze Like a Scientist

Forms of Potential and Kinetic Energy

What happens when you turn on a light? Energy can be stored in many different forms. Energy can also change from one form to another form. **Read** the text that follows. Use what you learn to **answer** the questions.

Forms of Potential and Kinetic Energy



Spring

Potential energy is energy that is stored in an object. You could say that an object with potential energy is not doing anything right now, but it has the "potential" to do work in the future. You have already learned about several types of potential energy. For example, a ball at the top of a hill has a type of potential energy, called **gravitational potential energy**, because it could roll down the hill. Batteries have potential energy in the form of stored **chemical energy** that is not used until the battery is connected to something. A compressed spring has potential energy that could suddenly be released if you are not careful.

Kinetic energy is the movement of something. When you ride in a car, the car's motion is kinetic energy. Sometimes it is not so obvious that something is moving. Kinetic energy also exists in:

- Sound or light waves moving through the air
- Movement of electricity though a wire
- Vibrations of particles in a substance as it heats up

This means that sound, electrical energy, and **thermal energy** are all types of kinetic energy.

Energy is transformed easily from one form into another. For example, a child at the top of a playground slide has potential energy. As the child moves down the slide, the potential energy is changed into kinetic energy. A car has potential energy when parked on a ramp and kinetic energy when it is moving down a ramp.

The following table contains examples of potential energy and kinetic energy.

Forms of Potential and Kinetic Energy, *continued*

Anything can have potential energy. How much potential energy an object has depends on a few things, including how massive the object is and how high up it is.

Can you think of a time when energy was changed from one form to another? A fan uses electrical energy that changes, or transforms, into kinetic energy when the blades of the fan move.

Potential Energy	Kinetic Energy
• Chemical • Gravitational	• Solar • Thermal • Electrical • Light • Sound

A roller coaster gains potential energy in the cars as it drags them up the first hill. What form of potential energy is it creating?

When the roller coaster goes down the hill, what form of energy is the potential energy converted into?

If an egg drops from your hand, what force pulls it to the ground? What kind of energy does the egg have as it falls? Where did the egg get the energy to fall?

Activity 7

Observe Like a Scientist

Types of Energy

Let's explore more examples of potential energy, kinetic energy, and how energy can be transformed from one to the other. **Read** the text that follows and **identify** two examples of potential energy and how they change. Can you think of other everyday examples?

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Energy is all around us and is constantly changing and transforming from one form to another. Energy can also be transferred. When you kick a ball, energy moves from your leg into the ball. No matter how it changes or moves, new energy cannot be created and existing energy cannot be destroyed.

All forms of energy are either potential or kinetic. Potential energy is energy waiting to happen. This is also called stored energy. Energy can be stored in many different forms. Kinetic energy is energy in motion. Potential energy can easily transform into kinetic and kinetic can transform into potential.

Have you ever used a flashlight that required batteries? There is chemical energy stored in a battery. This is one type of potential energy. When the flashlight is turned on, the potential energy is transformed into radiant energy (light) and thermal energy (heat). A gas oven turns the chemical energy stored in natural gas into thermal energy that cooks your food. The food you eat also stores another type of chemical energy. Your digestive system breaks down the food you eat into energy it can store.

If you have ever used a spring-powered car, you might have noticed that its spring wire stores kinetic energy. When you let go, the spring wire unwinds and transforms into kinetic energy to make the car move. A real car transforms chemical energy into mechanical, sound, and thermal energy that are all kinetic as it drives down the road. The engine is where this transformation takes place, but can you guess what the source of the potential energy is in this example?

Discuss with your partner the enrgy transformation when the spring is compressed and then released

Complete the following table

	Examples	The energy converts from ...	The energy converts to ...
1	Kick the ball		
2	flash light		
3	A gas oven		
4	The food to eat		
5	A car works with fuel		

Talk Together In pairs, discuss two examples of potential energy being converted into kinetic energy from the passage. Identify the types of energy involved. Then, share a new example of this transformation from your daily life.