

Types of Potential Energy

Elastic Potential Energy – the energy of tension and compression. Rubber bands, springs and other objects that can be stretched or compressed have stored energy, like in the *Stretching Forward* activity.

Chemical Potential Energy – the energy of atoms and molecules. This energy is released when bonds between atoms or between molecules are broken apart. Gasoline is one source of chemical potential energy.

Nuclear Energy – the energy of the nucleus of an atom. Nuclear energy is released when nuclei are broken apart, during fission, or when a new nucleus is made through fusion.

Gravitational Potential Energy – the energy of position. This type of energy is determined by the mass of an object and its height off of the ground. A ball about to be dropped, like in the *Bouncing Back* activity, is one example.

Types of Kinetic Energy

Electrical Energy – the energy of electrons. It is the flow of electrons that produces electricity and transfers energy.

Thermal Energy – heat. This is the energy that comes from vibration of electrons, atoms and molecules inside of a material. As the atoms inside the material move faster and collide with each other more often, it causes the temperature of the material to rise.

Light or Radiant Energy – the energy of light. Light is both a particle and a wave. Light is also known as electromagnetic radiation. Shorter wavelengths have more energy than longer wavelengths.

Sound Energy – the energy of sound. Sound is produced by the vibration of objects, like the salt moves in the *Sounding Off* activity. Sound moves through matter in waves called longitudinal waves.

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Unplugged: Energy Basics

What is Energy?

Energy means the ability to do work. Work is done on an object when an applied force moves the object a distance. Picking up a box is considered work, while just holding the box is not.

Law of Conservation of Energy

This law states that the total energy of a system stays the same. In other words, energy can not be created or destroyed. Energy is instead transferred between types within the system.

Playing Around

How do the toys around your house show transfer of energy?

- Wind-up toys change elastic potential energy into kinetic energy. Can you think of toys that show energy changing form? Hint: Think about what power a moving toy uses.
- Rube Goldberg machines show energy transfer. Visit rube.iscool.net and find out how to build one yourself.

Types of Energy

There are two major types of energy -- potential and kinetic. Potential energy is stored energy, meaning it has the capability to do work. A stretched rubber band is an example of potential energy. It isn't moving now, but it could. Kinetic energy is the energy of motion or objects that are moving. If you let go of the stretched rubber band, the rubber band moves. This is kinetic energy.

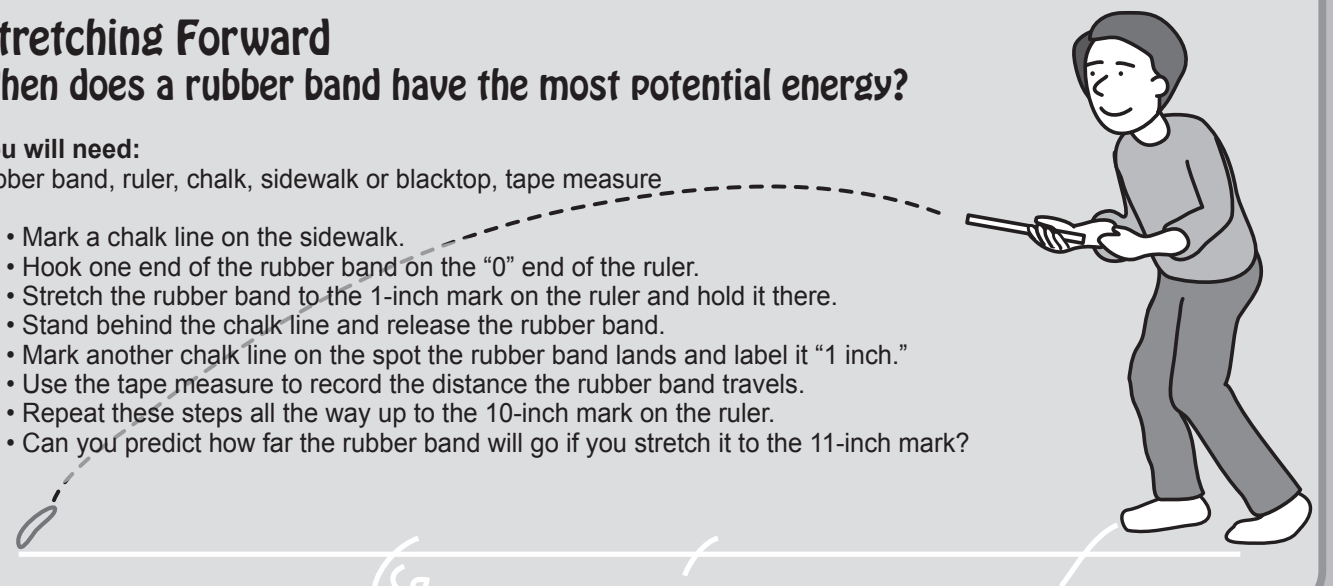
Stretching Forward

When does a rubber band have the most potential energy?

You will need:

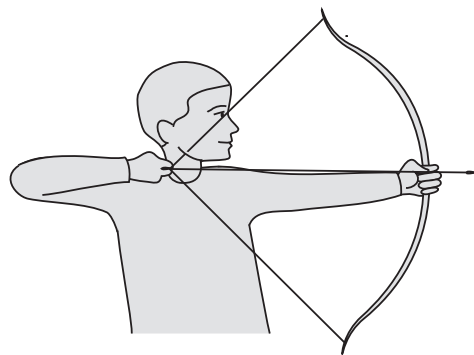
rubber band, ruler, chalk, sidewalk or blacktop, tape measure

- Mark a chalk line on the sidewalk.
- Hook one end of the rubber band on the "0" end of the ruler.
- Stretch the rubber band to the 1-inch mark on the ruler and hold it there.
- Stand behind the chalk line and release the rubber band.
- Mark another chalk line on the spot the rubber band lands and label it "1 inch."
- Use the tape measure to record the distance the rubber band travels.
- Repeat these steps all the way up to the 10-inch mark on the ruler.
- Can you predict how far the rubber band will go if you stretch it to the 11-inch mark?

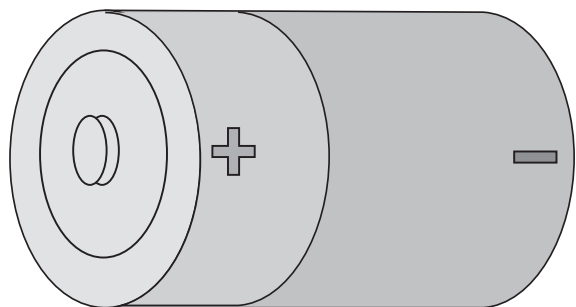


Look inside to find out more about all the different types of energy

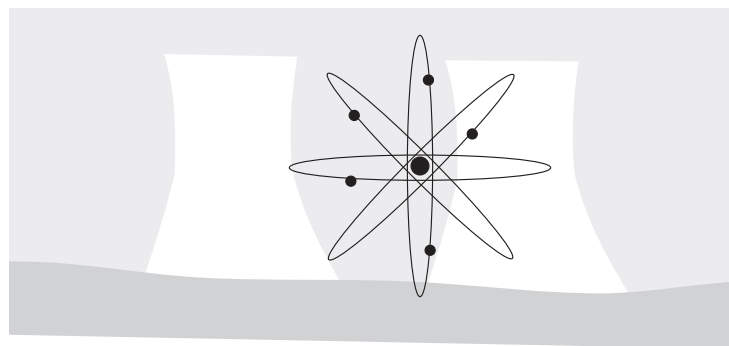
Elastic Potential Energy



Chemical Potential Energy



Nuclear Energy



Gravitational Potential Energy



Bouncing Back

How does gravity make a ball bounce?



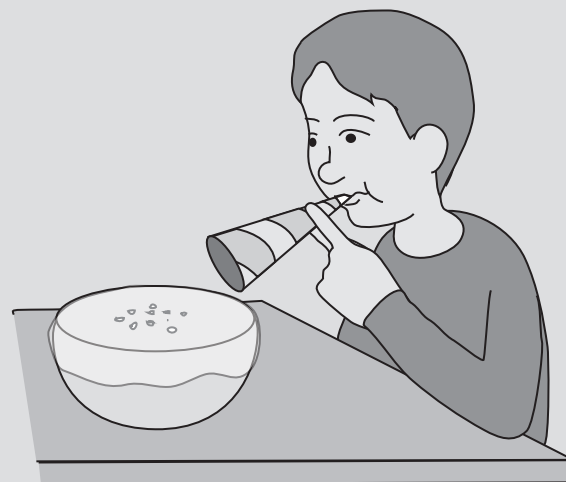
You will need:

basketball, 4 tennis balls, pencil, paper

- Drop the basketball and the tennis ball from the same height. Observe how high each one bounces back and how many times it bounces.
- Set the tennis ball on top of the basketball and drop them together. What happens when they hit the floor?
- Put the four tennis balls in a row, so that they are touching. How can you transfer energy from one ball to the other?
- Draw a diagram of one of the ball activities, labeling it to explain potential and kinetic energy.

Sounding Off

Can you show that sound is produced by vibration?

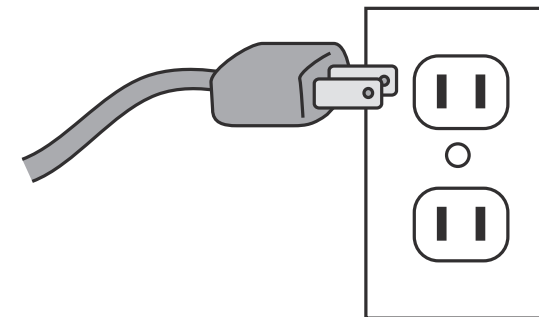


You will need:

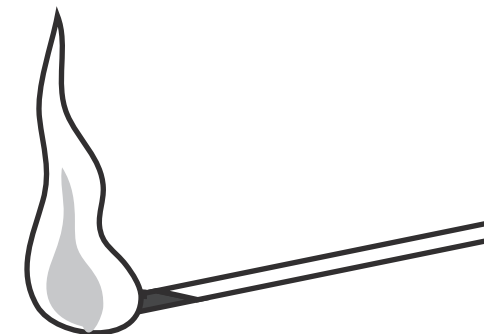
bowl, stretchy plastic wrap, salt, noise makers

- Stretch the plastic wrap tightly across the bowl.
- Sprinkle salt on top of the plastic.
- Try different noise makers using high and low, and loud and soft sounds.
- Make the noises near the bowl and observe what happens to the salt. What happens as you move farther from or closer to the bowl?

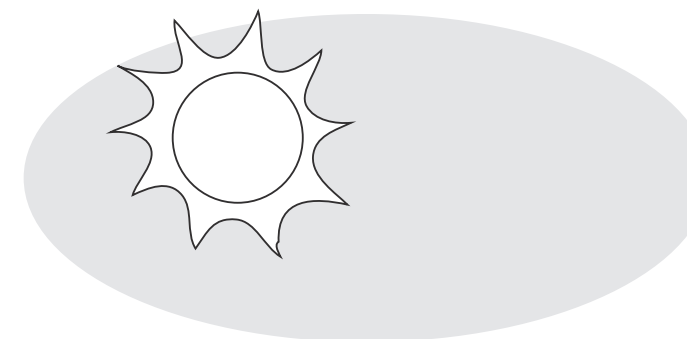
Electrical Energy



Thermal Energy



Light or Radiant Energy



Sound Energy

