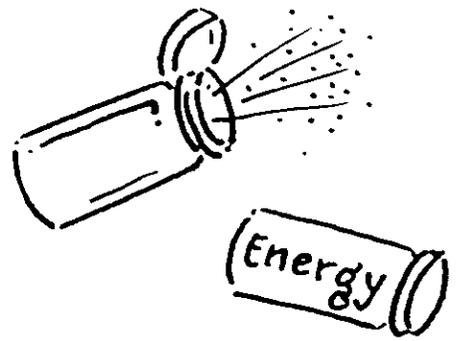


Can It!

Grades 4-5



Overview

The students will explore different examples of potential energy. They will build a rolling can. The roller works by storing and then releasing energy.

Objectives

- To help students understand the way things store energy.
- To help students understand the meaning of potential energy.

Materials

For presenter:

- some examples of potential energy
- a couple of different kinds of food
- a battery
- a piece of coal
- wood
- water
- a plant
- a wind-up toy
- shoe box
- **Potential Energy** written on a large strip of paper
- a sample **Rolling Can** to use for a demonstration

For each group of 4 students:

- 1 wide mouth plastic jar with lid or tin can with lid
- 1 long heavy duty rubber band
- 2 large metal nuts
- scissors or a can "punch" opener
- short pieces of string
- 2 used match sticks or other small wooden sticks

Getting Ready

Put the strip with the words, *Potential Energy*, in the shoebox. Put it, along with the examples of potential energy, on a table in an area where all the student will be able to see. Put together an example of a Rolling Can. It will be used to demonstrate how the Rolling Can looks and works. Put the materials that the students will need for their project on a table that has easy access by the students.

Procedures

Activity 1: Boxed Up

Review with the students what they know about energy. They should be familiar with sources of energy and how things use energy. Hold up the shoebox. Tell the students that when you are not using your favorite basketball shoes, you store them in a box so they will be in good shape when you need them.

Questions

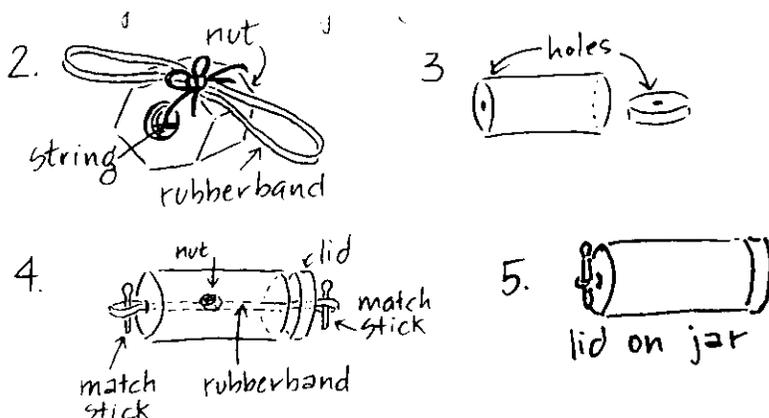
“What other things are stored until you are ready to use them?” Tell the students that energy is just like your shoes. It also is stored until someone or something is ready to use it. Lift up the lid of the box and take out the words *Potential Energy*. Hold it up and have someone read it for you. Tape it on the chalkboard for future reference. Ask the students if anyone knows what it means. If not, tell them that it is a word for stored energy. Ask the students: “Do you know any examples of stored energy?” Wait for responses and then share with the students the examples of potential energy you brought. Ask questions that will invite thinking: “What is stored energy? How is it used? When is it no longer potential energy? Can you think of any other examples of potential energy?”

Activity 2: Let It Roll

Tell the students that they will be building a toy today that stores its own energy. They will work in partners. Before handing out any materials, show the student the model that you made. As they watch you demonstrate the rolling can, tell them to try to figure out where it gets its energy. Where does the toy store its energy? After a short discussion, tell the students that you will hand out the materials and build the rolling can together. Remind each group that they will need to take turns during building.

Hand out materials to each pair of students and then give the following instructions:

1. "Tie the nuts to the middle rubber band with string. Thread the string through the center of the nuts and tie the rubber band on top."
2. "Carefully, with the point of your scissors make a small hole in the lid and the bottom of your jar." (You may need to help with this depending upon the types of plastic jars the students are using.)
3. "Thread the rubber band through the hole in the bottom of the jar. Stick a matchstick through the rubber band on the outside of the jar, to keep the rubber band from pulling back through the hole. Push the other end of the rubber band through the hole in the lid. Stick another matchstick through the rubber band to prevent it from pulling back through the hole. Now your can is ready to perform." Have each group find a place on the floor or table where they will be able to experiment with their can.
4. Roll the jar across the floor. (As it rolls forward the rubber band is winding up.)
5. As the can becomes harder to push (because the rubber band is tight), let go and the can will roll the opposite direction.



Discussion

Rubber bands can store and release energy. When you stretch or twist a rubber band, the band stores up energy. When you let go of the jar, the energy in the rubber band is released and the jar rolls back.

As you move around the classroom, ask the students to show you where the potential energy is stored (**rubber band**). Ask the students: "What happens when the potential energy is released? Try rolling it down hill and see if it will roll back up hill by itself."

Closure

Point to the strip with the words *Potential Energy*, and have each student tell their group what potential energy is. Ask one student to tell the class.

Clean Up

Each team is responsible for picking up the things they were using to build the rolling cans.