

LAB 31: CONVERSION OF ENERGY

QUESTION

How far can a vehicle go by converting elastic potential energy to kinetic energy?

SAFETY

Soda cans may have sharp edges; be careful not to get cut.

MATERIALS

Rubber band, pencil, empty soda can, bead with hole through center (standard marble size), nail

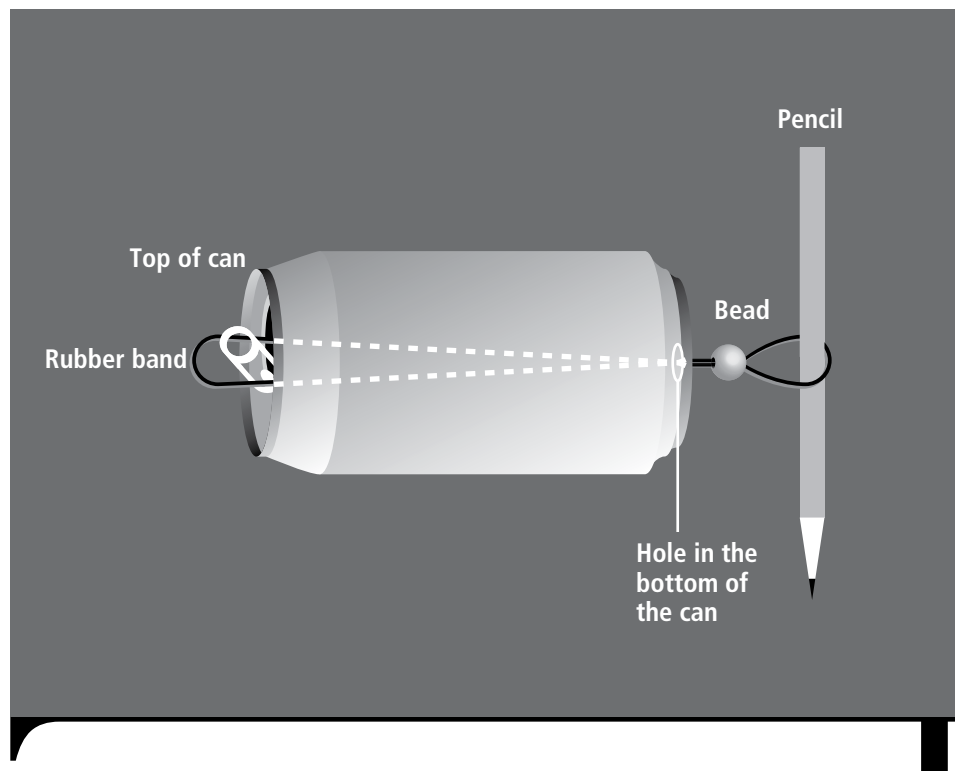
PROCEDURE

You will be making an amazing device that is so simple yet so effective. With just a rubber band, pencil, bead, and aluminum can, you will make a vehicle that can go all the way across a large classroom, sometimes more than once. By winding up the toy, you will be loading it with energy that will be converted into the motion across the floor.

1. Get an empty soda can and leave the tab on the top.
2. Use a nail to carefully punch a hole in the bottom of the can, being sure that the hole is smooth and not sharp.
3. Put one end of the rubber band through the bead and then through the hole in the bottom of the can. Put the pencil through the rubber band to keep it from going inside. Put the rubber band through the can. Use an open paper clip or tweezers to pull the other end of the rubber band through the mouth of the can and wrap it around the tab at the top of the can (see Figure 31.1).

Figure 31.1

The Assembled Device



4. Now spin the pencil 50 to 100 times and put the can on the floor and observe.
5. If the can spins out, you can put a rubber band around the can opposite the end with the pencil to give it more traction. If the pencil spins out, you can use a longer pencil or slide the pencil so that most of it is on one side.
6. Find ways to make the can go faster and farther. You can try things such as using different rubber bands, reducing friction, and using a spool of thread instead of a soda can.

Post-Lab Questions

1. What modifications did you have on your final racer, and how did they help?
2. Explain how the car works. Use the terms *potential energy*, *kinetic energy*, *elastic*, and *conversion* in your explanation.
3. If the car rolls forward once for each turn of the pencil, how far should the car go if you turn it 50 times?

Section 2

Extensions

Build other types of vehicles that convert one type of energy to motion. Use mouse traps, springs, weights, or other objects to make them move. See how many different designs you can think of that use different kinds of energy.