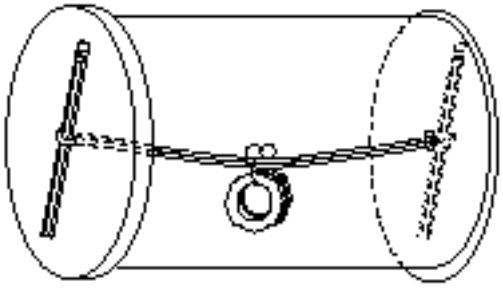
The Come-Back-Bottle[1]

Construction Directions

Materials:

plastic bottle 18" piece of stiff wire (#18 AWG solid) 3 paper clips
tape long rubber band (#18, very thin) lead weight or large nut



1. Drill a 1/4" hole in the cap and bottom of a plastic bottle.
2. Tie a nut or weight to the middle of the rubber band.
3. Push the rubber band through the hole in the bottle cap *from the inside*.
4. From the top of the bottle cap, hook a paper clip to the end of the rubber band coming out of the hole.
5. Tape the paperclip to the top of the bottle cap.
6. Thread the wire through the hole in the bottom of the bottle and out the mouth of the bottle.
7. Hook the other end of the rubber band to the wire.
8. Pull the rubber band through the bottle with the wire.
9. You may need to adjust the rubber band so the weight hangs close to the center of the bottle. **DON'T LET THE WEIGHT HANG IN THE NECK OF THE BOTTLE.** The bottle will roll strangely. If you need to adjust the position of the weight you will have to release the rubber band, and remove it.
10. Once the weight is correctly centered, secure the end of the rubber band with a paper clip.
11. Tape the two paper clips in place so they do not turn.
12. Try rolling the bottle on the table or floor.
13. The weight should NOT flip over in the bottle as the bottle rolls.

Analyze and Conclude (answer on the back of this sheet)

1. When you roll the bottle along the floor, the rubber band twists. What kind of energy is in the twisted rubber band?
2. Why does the bottle stop before it begins to roll back to you?
3. What do you think happens to the rubber band as the the bottle rolls back to you?
4. What kind of energy does the bottle gain as it rolls back to you?
5. What kind of energy are you adding to the bottle and rubber band when you first push the bottle?
6. If you were to push the bottle harder, what effect would this have on the energy in the rubber band?

[1] Nüsret Hisim, Walkersville High School, Frederick County, MD
Adapted from Bill Nye the Science Guy: Energy episode, 4/99