

Build a wind-powered elevator!

The power of the wind

If you are outside in a strong wind, you can feel how powerful it is. For hundreds of years, people have used the power of the wind to run machines, to do things like pump water and grind wheat into flour. Now we use wind turbines to make electricity from the wind! This is a great way to make electricity because it doesn't involve burning oil, natural gas, or coal. Using these fuels (called fossil fuels) releases gases into the air that are heating up our planet, but wind turbines don't pollute in this way.

Activity

In this activity, you will build a machine that uses wind (or your breath) to lift a tiny elevator (a paper cup). You could use this to lift things from the ground floor to the second floor of a house you make from shoe boxes (see Figure 1).

Materials:

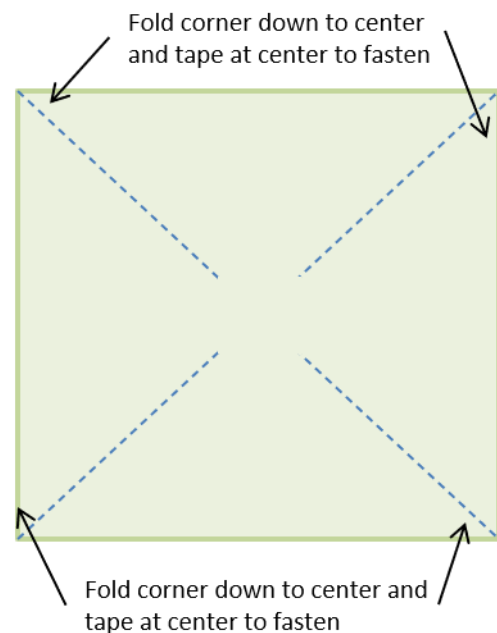
- Paper cut into a square, approximately 4 inch x 4 inch (construction paper or origami paper works well)
- Tape
- Scissors
- Push pin
- Pencil with eraser (round pencils work better than six-sided ones)
- Smoothie straw (large-diameter straw, wide enough to easily fit a pencil through)
- Tall plastic or paper cup
- Small paper cup (bathroom cups work well)
- String



Figure 1. House with wind-powered elevator.

The wind-powered "elevator" uses a rotating pinwheel attached to a pencil to lift a small paper cup. To make the pinwheel (see Figure 2), take a square piece of paper, cut in along the diagonals toward the center (but stopping within about 1 cm from the center), fold one corner of each section into the center, and fasten these corners with tape.

Figure 2. Diagram of paper used to form pinwheel. Cut along the dashed lines toward the center.



Attach the pinwheel to the top of the pencil eraser with a push pin, making sure that the pinwheel and pencil turn together. You might need to use a small piece of tape to attach the pinwheel to the eraser. Cut the straw in half, or to a length so that the ends of the pencil will stick out from it. Turn the tall cup upside down and tape the cut straw to the cup bottom. Insert the pencil into the straw. The straw holds the pencil and allows it to spin freely.

Attach the ends of a small string to the small cup, forming a handle. Tie a longer string to the middle of the handle. Attach the other end of the long string to the open end of the pencil with tape. See Figure 3 for a picture of the completed machine.

Now test the machine! When air makes the pinwheel turn, the pencil spins and the string will wind up and lift the cup. A simple test is to blow on the pinwheel. **You'll need to blow hard!**

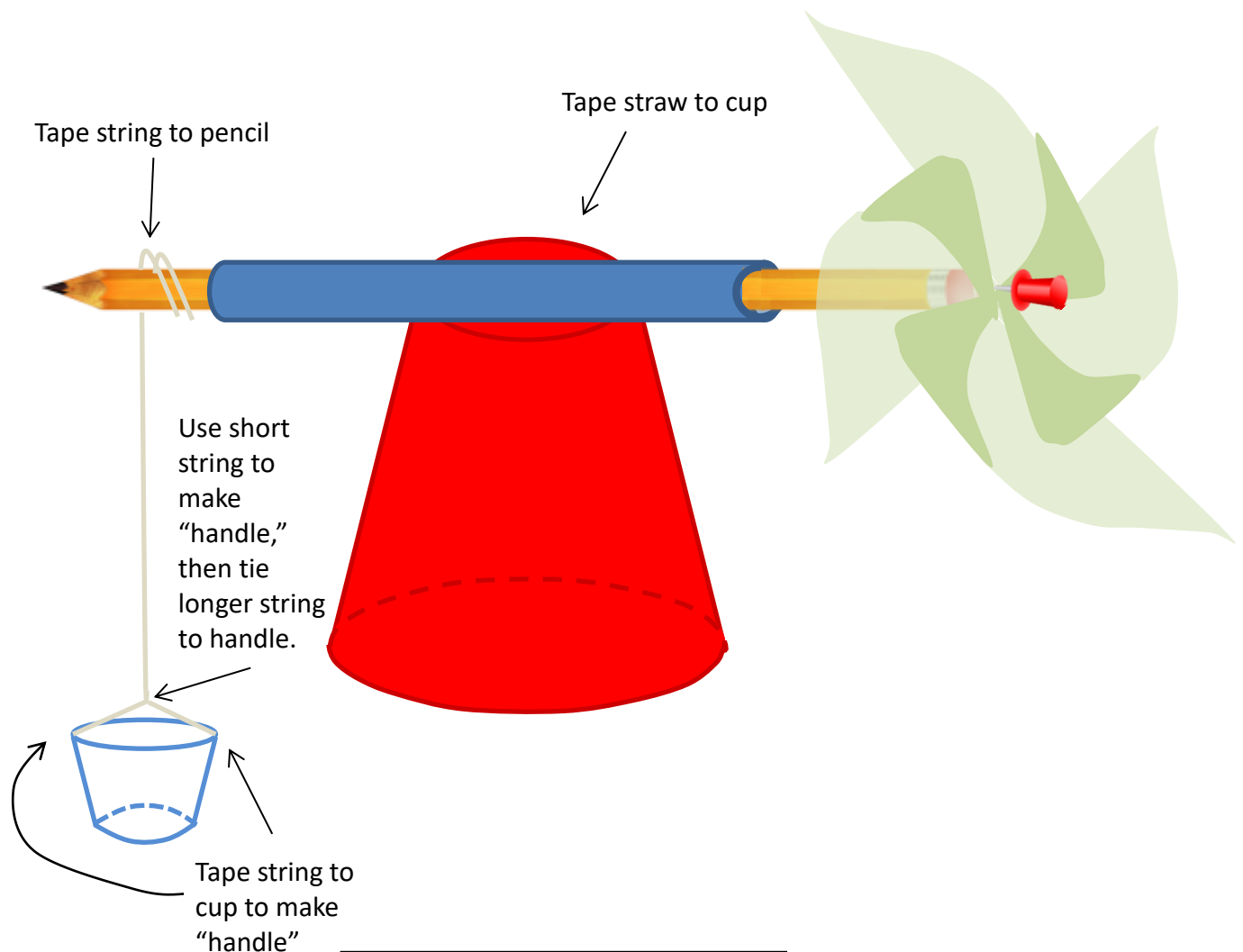


Figure 3. Wind-powered "elevator"