

MINI-WATER TURBINE ACTIVITY

This video will help your students create a mini water turbine.

https://www.youtube.com/watch?v=x8xow_R0YRI

Materials: 2-liter bottle, scissors, box cutter, ruler, safety-razor blade, cork, nail.

1. Cut the two-liter bottle into 3 pieces: the top (around the rim), the middle section (flat section) and the bottom section.
2. Cut the middle flat section into eight equal pieces, which will be trimmed later for the turbine blades.
3. Cut a "V" side section of the base for the water to flow through it.
4. Cut eight equally spaced slits into the cork with the safety razor blade. These slits will hold the turbine blades you created above.
5. Gently push the turbine blades into the slits you cut into the cork with your razor blade. If it seems the turbine blades are too large, this is a good time to resize those.
6. When placing the blades into the cork, make sure all of the blades are facing in the same direction.
7. Push a BBQ skewer through the center of the cork (the skewer can be metal or wooden). It helps if you have predrilled the cork, or use a nail to create the hole in the cork before you try to push the skewer through.
8. Remove the skewer for the time being. Set it aside.
9. Using the bottom base of the 2-liter bottle, punch two holes into the sides of that base. Make sure those holes are evenly spaced from the top and also evenly spaced on the sides. If you don't have a hole punch, an ice pick will work.
10. Remove the skewer for the time being.
11. Push the skewer through one of the holes in the base. Then thread the skewer through the hole in the center of your cork turbine. Now thread the end of the skewer through the punched hole on the other side of the base. (In other words, the skewer should go all the way through the plastic base bottom of the 2-liter bottle. In the middle of that base, the turbine should be hanging from that skewer. It should be secure enough to the skewer that when you spin one of the turbine blades the entire turbine turns.)
12. Tie a length of string to the pointed end of the skewer. Then attach a small weight.
13. Use the funnel (from the bottle top or just use a funnel you have handy).
14. Direct the water into the funnel directly over the top of your turbine.
15. Water should make the turbine spin. As it spins, the string should begin to wind up on the end of the skewer, pulling up the weight in the process. The water that lands in the base should be draining out through the "V" that you cut into the plastic.
16. Change the weights as you test the turbine. How much work can this turbine do? How much weight will it lift? How fast does it lift the weight? Does the length of the string make a difference?
17. Have a competition to see which turbine does the most work. You can incorporate SPEED into the process. Speed is the measure of how quickly an object moves from one place to another. It is equal to the distance traveled divided by the time.