GENERATIONGENIUS
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DIY ACTIVITY

MAKE A HYDROPOWER WATER WHEEL

GRADES 3-5

OBJECTIVES

- Define hydropower
- Develop a design for a waterwheel
- Explain that hydropower is a source of renewable energy
- Describe several ways hydropower is used in the world today

MATERIALS NEEDED

For each water wheel:

- A mixing bowl or plastic container – deep enough for the water wheel to stand upright and not touch the bottom or sides, narrow enough that a skewer or dowel can span the bowl or container.
- Two rulers
- Two paper plates (Styrofoam plates can be used for durability; dessert or sandwich-sized may be fit into bowls or plastic containers more easily)
- Empty egg carton (again, Styrofoam for durability)
- Two rulers or paint sticks
- A dowel or bamboo barbecue skewer
- Two empty spools to slip on the ends of dowel/skewer
- Scissors, tape (duct, if possible), a stapler, and some putty
- A pitcher to pour water into the water wheel cups (the water will be caught in the mixing bowl/container)

Activity Duration: 45–50 minutes

PROCEDURE

WATCH THE DIY WATERWHEEL SEGMENT OF THE GENERATION GENIUS RENEWABLE ENERGY VIDEO.

1. Using scissors, cut out the cups of the egg cartons – enough cups to fit around the edges of a plate.
2. Place the cups facing up and out and staple them along the edge of one of the plates.
3. Once you've finished placing the cups evenly around the first plate, take the second plate and staple it to the other side of the cups, so the cups are situated between the plates.
4. The wheel should have the two plates as the side of the wheel, with the cups secured in the middle, facing out.
5. Poke a hole in the middle of each plate—the sides of the wheel—and push the skewer through both plates. Position the wheel in the middle of the skewer.
6. Slip the spools on the ends of the skewer, one on each side of the wheel.
7. Set your wheel aside, and pick up your two rulers. Place your rulers across the bowl, one on either side, using putty to hold them down on the edges of the bowl.
8. Pick up your wheel and holding it upright place the spools, located at the ends of the skewer, on top of the rulers so the wheel is standing upright in the bowl and the spools are resting on the rulers.
9. Take two long strips of duct tape to secure the spools on the rulers so the spools don't move.
10. Now all we need is a source of renewable energy—moving water!
11. Pour a pitcher of water onto the wheel—it spins!

WHAT IS GOING ON HERE?

When pouring water falls on the cups of the water wheel, the water wheel spins on its axle (the skewer running through the spools). The energy of the moving water is transformed into the mechanical energy of the spinning wheel, which in turn spins the axle.

FURTHER EXPLORATION

Students can:

- Explore the kinds of work that a waterwheel can perform.
- Modify the waterwheel to perform work - add a generator, add a mechanism to lift items.
- Research where and how waterwheels are used in the world.
- Create a windmill using the same or similar construction materials.

