

Water Wheel

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Create your own water wheel

Hydropower is the power derived from the energy of falling water or fast running water. This power can be used for a number of activities, including powering machines and also generating electricity.

Key Topic: Water use

Grade Level: 2 - 5

Duration: 30 - 45 minutes

Objectives:

Learn about water's role in generating energy by using hydropower to lift a small weight.

Items Needed:

- Two paper plates
- One straw
- Seven Dixie cups
- Small magnet
- Masking tape
- Push pin
- Pen
- Scissors
- String
- "Recycle Me" label
- Bucket
- Water



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Activity Steps:

1. Start by placing the two paper plates back to back. You may find it helpful to loosely tape the plates together to keep them even.
2. Use the push pin to punch a hole in the middle of the two paper plates. Increase the size of the hole by pushing the pen tip through the hole. Finally, use the scissors to make the hole large enough to hold a straw.
3. Using the masking tape, tape seven Dixie cups around the edge of the two back to back paper plates. The Dixie cups should have about half an inch between them.
4. Place the "Recycle Me" label on the outside of the water wheel. Explain to the students that in order to recycle the wheel, they will have to separate the pieces and recycle the plates and cups separately.
5. Place a straw through the center hole and secure it with tape.
6. Take a piece of string about three feet long and tie a magnet to the end of the string. You may use the tape to help secure the magnet if necessary. Tie the other end of the string tightly around the straw as close to the center of the plates as possible.
7. Thread a long piece of string through the straw. Have two volunteers hold the string at either end.
8. Place the water wheel over the bucket. Make sure the magnet is not hitting the ground or bottom of the bucket.
9. Pour water into the Dixie cups.
10. Watch as the water wheel spins and the magnet begins to lift off the ground.

Discussion Questions:

- What happens to the wheel when the water flows quickly? [*Answer:* The wheel spins and the magnet begins to lift off the ground.]
- What happens when the rate of the water flow is reduced (when the water is not poured as quickly?) [*Answer:* The wheel does not spin as fast, and the magnet is lifted off the ground slower.]
- What would happen if the weight of the magnet was increased? [*Answer:* More water would be required to cause the wheel to spin and lift the magnet.]
- What are some variables that affect the amount of weight that can be lifted by the water wheel? [*Answer:* 1. The amount of water present. 2. The flow rate of the water (high pressure water flow can lift more weight than low pressure water flow). 3. The size of the wheel. 4. The materials the wheel is made of. The paper wheel is not as durable as a wooden or metal wheel would be.]

