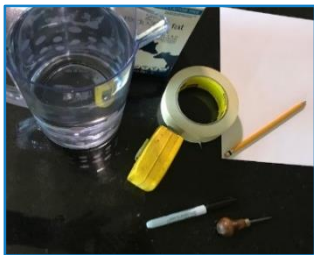


## WHAT YOU WILL NEED:

- Milk carton
- Gallon of water
- 10p nail or awl
- Masking tape
- Ruler
- Marker
- Scissors
- Paper and pencil for notes
- Safety goggles and gloves



# HYDROPOWER

## Overview and Objective

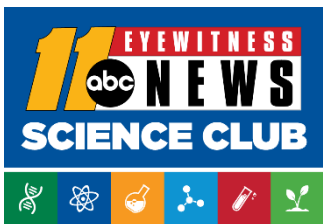
Hydropower, or water power, is power derived from the energy of falling or fast running water, which may be harnessed for useful purposes. Water has been a source of power since the 4th century BC, powering water wheels and mills for the production of flour from grain. Today's technological advances have moved the open water wheel into an enclosed turbine for the generation of electricity.

For this experiment, we're going to test the impact that weight has on the power of water. We will also ask you to take this experiment a step further and test additional variables to learn what impact it has on your water power.

## Process:

1. Cut off the top of the milk carton.
2. Using your ruler and marker, measure spots in a straight line, at  $\frac{1}{2}$  inch, 1 inch, two inches, and 4 inches from the base of the carton.
3. Using your nail or awl, punch holes into the cartons on each of the (4) marks. (holes should be equal in size).
4. Take one long piece of tape to tape all four of the holes.
5. Make a fill line at the top of the carton. Each time you pour water into the carton (testing different variables), make sure you fill to this line. This amount (or weight) of the water will be a **FIXED VARIABLE**.
6. Put your carton at the edge of the sink with the taped holes facing the sink basin. Quickly remove your tape.



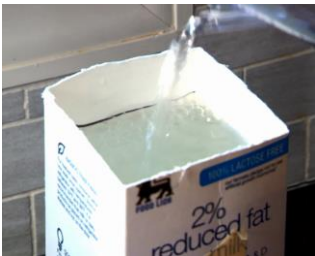


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# HYDROPOWER

7. Watch and measure how far each of the streams travel from the milk carton.
8. What happens to each of the streams when the water level drops?
9. Once empty, re-tape the holes. This time, tape each hole individually (4 short pieces of tape).
10. Refill the carton to the fill line and remove the bottom piece of tape. Measure how far the stream goes.
11. Cover the bottom hole and repeat this process, testing the variance of stream flow on each hole when you uncover the flow individually. What do you find?



## Facts and Ideas

Water has weight. The closer to the bottom of the carton, the more water – and weight from that water – is pressing down from above. This weight creates pressure that increases the speed of water flow.

Try this experiment multiple times testing different variables:

- Change the fill line to test the impact it has on the distance the water flows out.
- Increase the size of the holes in the milk carton. Does this impact the flow from each stream?

**Share Your Results With Us!**

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