



SCIENCE EXPERIMENT

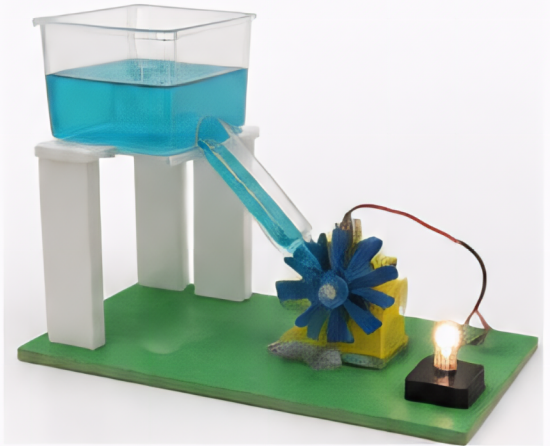
BUILDING A WORKING MODEL OF A HYDROELECTRIC POWER PLANT

You will build a model of a hydroelectric power plant to see how moving water can turn a turbine and generate electricity.

Name: _____

Date: _____

Age/Grade: _____



GOAL

To build a working model that uses the energy of moving water to spin a turbine and light an LED.



MATERIALS

- Plastic container with lid (for the water reservoir)
- Plastic cup or small box
- Plastic tubing or a cut straw (to make the penstock)
- Small water wheel or turbine (plastic) (diameter 3–6 cm)
- DC motor (3–6V)
- LED (any color)
- 2 connecting wires with alligator clips
- Cardboard or foam board (base)
- Hot glue gun or strong tape
- Scissors or craft knife (adult use for knife)
- Water
- Decorating materials (optional)



PROCEDURE

- 1. Build the Reservoir**
Place the plastic container on supports so it is higher than the base. Fill it with water.
- 2. Make the Penstock**
Attach the tubing or straw to a hole or opening near the bottom of the container. Angle it downward toward the turbine location.
- 3. Set Up the Turbine**
Glue or tape the turbine at the end of the penstock so the water hits the blades and can spin it freely.
- 4. Connect the Generator**
Attach the turbine to the shaft of the DC motor. Secure it so they spin together.
- 5. Build the Circuit**
Use the alligator clip wires to connect the motor to the LED. Make sure the connections are tight.
- 6. Test It!**
Open the water flow. Watch the turbine spin and see if the LED lights up.
- 7. Improve Your Model**
Try increasing the height of the water, changing the water flow, or improving the alignment to make the LED brighter.



HOW IT WORKS

Water stored up high has potential energy. When it flows down through the penstock, it has kinetic energy. The moving water spins the turbine. The turbine turns the motor, which generates electrical energy. The electricity flows to the LED and makes it light up.



OBSERVATIONS

What happened when the water started to flow?

What affected how bright the LED was?

What did you change to improve your model?



CONCLUSION

What did you learn from this experiment?



THINK FURTHER

How do real hydroelectric power plants help people? What are some advantages and disadvantages of using water to make electricity?