

Make a Penny Battery

From <http://www.pbs.org/weta/roughscience/discover/powerplant.html>

Some kinds of batteries produce electricity by a chemical reaction between two different metals (electrodes) immersed in acid (electrolyte). Figure out how to make your own batteries in case the limited supply on the island runs out.

You'll need:

- two wires with the ends stripped off
- aluminum foil
- scissors
- small bowl
- warm water
- salt
- tape
- 6 pennies (copper coins)
- paper towels
- 1.5 volt penlight light bulb
- a paper plate

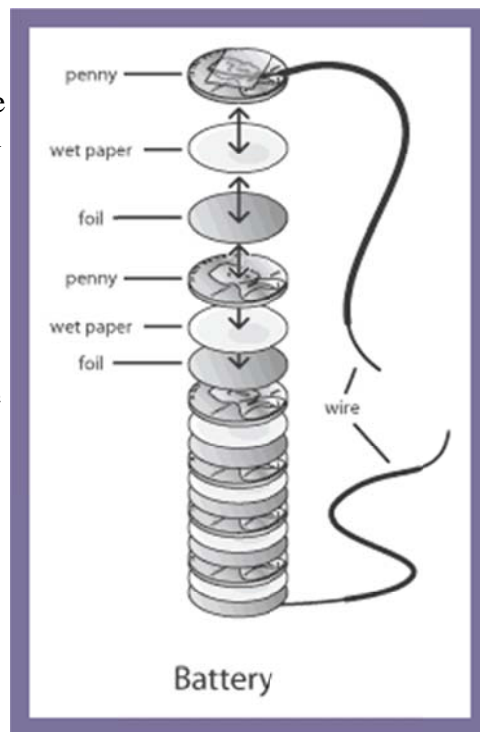
What you do:

Partially dissolve 1 tablespoon of salt in 1 cup of warm water. Some salt should still be evident in the bottom of the bowl. Place a penny on the aluminum foil and draw around it. Repeat five times. Do the same thing with the paper towel. Cut out the circles. You should have six foil circles and six paper ones. Tape the end of one wire to a foil circle. Dip a paper circle in the warm, salty water. Place the foil circle with the wire on the plate, and put a wet paper circle and a penny on top of it. Using all the foil, pennies, and paper circles, build alternate layers. Then tape the other end of the wire to the last coin and put it on top. This is your battery.

Test the battery with the light bulb. Attach the end of one wire to the metal terminal end of the light bulb. Wrap the end of the other wire around the metal shaft of the light bulb. Can you see the bulb light up?

What's going on?

The metal atoms in the foil dissolve into the electrolyte (the warm, salty water) and electrons are left behind. Electricity is created when the electrons flow through a circuit (the foil circles and paper circles soaked in warm, salty water). When the metals eventually dissolve completely into the electrolyte, no more electrons are formed and the battery stops working. The first battery



(Volta's Pile) was developed about 1860 by Alessandro Volta. He stacked discs of copper, zinc, and cardboard soaked in salty water in alternate layers and measured an electronic current.

Activity adapted from Neil Ardley. 101 Great Science Experiments. Dorling Kindersley, 1993.

For instructions on creating a similar battery, see

http://www.exploratorium.edu/snacks/hand_battery.html.

For more information, see **Rough Science** episode 5: "Sun and Sea"