



A PROJECT OF

Discovery Centre 

10¢ BATTERY

Make your own battery
for just a few pennies.
Check it out!



MATERIALS

**Ten pennies, minted
before 1996**

Vinegar

Salt

Paper towel

**A piece of construction
paper**

2 paper clips

Optional:

An LED light

**(from newer Christmas
lights or an electronics store)**

PROCEDURE

1. Fill a glass with vinegar and, while stirring, add salt until the salt stops dissolving and begins to settle on the bottom of the glass (at this point, the solution is said to be saturated). Place all the pennies into the solution for about 30 seconds; this cleans the pennies for use. Rinse the pennies off with water and dry them with paper towel.
2. While stirring, pour salt into a glass of warm water until the water becomes saturated, as you did in step one with the vinegar.
3. Cut 18 pieces of construction paper the same size as a penny. This can be done quickly by folding the paper and cutting several circles at once, using a penny as a guide. Soak the pieces in the salt water for about 20 minutes.
4. Cut 18 pieces of aluminum foil the same size as a penny. This can also be done quickly by "sandwiching" a few layers of foil between two pennies and ripping or cutting away the edges.
5. Cut a piece of aluminum foil about 5cm x 5cm and place a penny in the centre.
6. Take two circles of construction paper and, blotting off the excess liquid (this is important!), place them on top of the penny.
7. Place two circles of aluminum foil on top of the construction paper.
8. Continue stacking the layers in this order (aluminum foil, penny, construction paper, aluminum foil, etc.) until you run out of pennies. Make sure you finish your stack with a penny on top. It is also very important that each layer (penny, foil, or construction paper) touches only the layer right next to it.

Believe it or not, you have now created a type of battery called a voltaic pile! Try touching one end of each paper clip to opposite ends of your battery and the free ends to the front of your tongue. The painless tingle you feel is electricity running through the battery! If you have an LED light, take your battery into a dark room and touch the negative end (the shorter pin) of the LED to the penny on top of your pile. Touch the other pin to the aluminum foil base of your pile, and see the LED light up!

HOW IT WORKS

Chemical reactions between the salt water solution and the different metals produce positive and negative charges. When the ends of the wires are connected in a circuit, the charges flow through the wire as electric current, just like the current that runs through the wires in your house!