



Believe it or not, an ordinary potato can also be a battery! The potato you eat for supper has enough electrochemical energy to power a small watch! Small amounts of acid and salt in the potato make an excellent conductor. Let's set up an experiment and see if it works!

You will need these:

- 2 potatoes (or one potato cut in half)
- 2 short pieces of copper wire
- 2 galvanized nails
- 3 alligator clips
- One simple low-voltage LED clock that functions from a 1- to 2-volt button-type battery

Here's what you do:

Step 1 Remove the battery from the battery compartment of the clock or watch.

Step 2 Number the potatoes as "1" and "2."

Step 3 Insert one nail into each potato. Also insert a stripped end of one of the copper wires in Potato 1 and the end of the other wire in Potato 2, as far away from the nails as possible.

Step 4 Attach the alligator clips to the other end of the wires and use one alligator clip to connect the copper wire in potato number 1 to the positive (+) terminal in the clock's battery compartment.

Step 5 Use the other alligator clip to connect the nail in potato number 2 to the negative (-) terminal in the clock's battery compartment.

Step 6 Use the third alligator clip to connect the nail in potato 1 to the copper wire in potato 2. What happens?

Why it works:

A potato battery is an **electrochemical battery**, also known as an **electrochemical cell**. An electrochemical cell is a cell in which chemical energy is converted to electric energy by a spontaneous electron transfer. In the case of the potato, the zinc in the nail reacts with the copper wire. The potato acts as a sort of buffer between the zinc ions and the copper ions. The zinc and copper ions would still react if they touched within the potato but they would only generate heat. Since the potato keeps them apart, the electron transfer has to take place over the copper wires of the circuit, which channels the energy into the clock. Presto! You have potato power.

Further study:

Do other fruits generate electricity? Try lemons, grapefruit, and limes. Which generates the most electricity? Why?