



Curiosity Guide #310

Electric Batteries

Accompanies Curious Crew, Season 3, Episode 10 (#310)

Human Battery

Investigation #5

Description

You can't be a battery, or can you? Try this!

Materials

2 small pieces of wood, about 2 inches by 4 inches by 10 inches, or substitute 2 plastic trays of about the same size

Copper sheet, 4 by 10 inches

Aluminum sheet, 4 x 10 inches

2 alligator clip cables

Voltmeter

Steel wool, size 0000

Damp paper towel

A friend

Procedure

- 1) Gently rub the surfaces of the copper and aluminum sheets with steel wool.
- 2) Place the pieces of wood or plastic trays side by side on the table.
- 3) Place the aluminum sheet on one piece of wood or tray, and the copper sheet on the second piece of wood or tray.
- 4) Clip an alligator clip from each metal piece to one of the lead wires on the voltmeter.
- 5) Set the meter to read current in milliamps.
- 6) Lightly dampen both hands with a wet paper towel.

- 7) Lay one hand flat on the surface of each metal piece. Make sure that your hands don't touch.
- 8) Is there a change in the voltmeter?
- 9) Is the number negative? Try switching the lead wires between the metal plates.
- 10) What happens if two people hold hands and place their opposite hands on the plates?

My Results

Explanation

Batteries are used to change chemical energy into electrical energy through a redistribution of electrons between different metals and a solution. Every battery has three components. These are an electrolyte and two electrodes--an anode, and a cathode. A chemical reaction happens when two different metals are connected by an electrolyte, which provides a path for electrons to move from one metal to the next.

In this case, the thin layer of sweat and moisture on our hands starts the chemical reaction and carries the electrons from the negatively-charged aluminum to the positively-charged copper. Some current flows through the voltmeter and is registered there. Getting your hands wet reduces the amount of resistance from your skin. So if two people try it, the resistance from our bodies gets higher. We should see a lower number on the voltmeter.

Are you interested in learning more? Electrodes made of different metals lose or gain electrons differently, so you could experiment with other metals to see which creates the biggest difference.

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