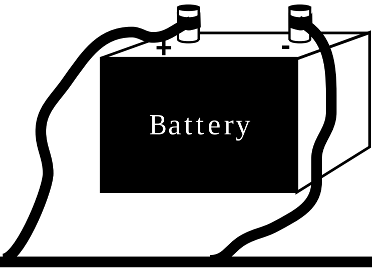


HUMAN BATTERY

Electricity can be made by using two metals and an electrolyte

WHAT TO DO

Put your hands on two different plates - copper and aluminium. Look at the meter.

Q: Does the needle move?
(A: Yes - it will move to the left or right, showing a tiny flow of electricity.)

Q: What happens if you put your hands on two similar plates?
(A: The needle does not move.)

Q: What is the source of electricity in this exhibit?
(A: You are – in combination with the two different plates. There is no battery or main supply in the circuit.)

DESCRIPTION

This exhibit has four hand-shaped pieces of metal – 2 aluminium and 2 copper. They are connected to a meter, which indicates if a current flows. Pupils place their hands on two different plates to create electricity.

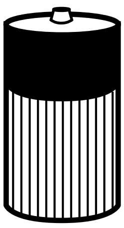
MORE THINGS TO DO

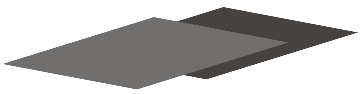
Dampen your hands before putting them on the Plates.

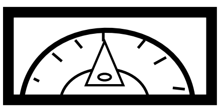
Q: What difference does this make?
(A: It will usually make the needle move further, indicating greater current flow.)

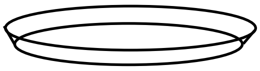
KEY WORDS

Battery, metals, aluminium, copper, plates, electrolyte, current, flow, meter.









THINGS TO THINK ABOUT

What makes the electricity?
A battery works when two different metals are connected by a material called an electrolyte. Conventional batteries have a carbon core surrounded by an electrolyte paste within a zinc case. Rechargeable ones usually use nickel and cadmium. Car batteries have lead and lead peroxide plates with an acid electrolyte. In this case it is aluminium and copper and your bodyfluids are the electrolyte. This is the same effect.

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FURTHER INFORMATION

How batteries work

A battery works when two different metals are connected by a material called an electrolyte. This is a liquid or a paste containing charged ions, e.g. salt (NaCl) which separates into Na+ and Cl particles. Conventional batteries have a carbon core surrounded by an electrolyte paste within a zinc case. Rechargeable ones usually use nickel and cadmium. Car batteries have lead and lead peroxide plates with a liquid sulphuric acid electrolyte.

All batteries have two terminals – one positive (+) and one negative (-). Many like the batteries you put in a torch or remote control have the terminals indicated at each end. Those used in a car have them indicated both on top of the terminals.

Inside the battery the chemicals produce electricity in the form of sub-atomic particles called electrons which flow to the negative terminal. If an appropriate device requiring power is connected to this terminal and then to the positive, a current will flow and the device will work. (The power remains in the battery until it is connected.)

The power is always D.C. – direct current – which flows only in one direction. They are usually low powered (voltage) and therefore not dangerous. You can rarely feel the effect of putting a finger between the terminals, but a wet tongue will definitely feel a tingle!

Human batteries

In this exhibit it is aluminium and copper which are the terminals and your body fluid which is the electrolyte. The same effect can be observed when a bit of silver paper in your mouth gives you a little electric shock. It is acting as one terminal in a battery with the zinc amalgam of your filling as the other and saliva as the electrolyte.

DO NOTE:

If the meter registers a very small current when you have your hands on two similar plates it is probably because there is some small contamination from the other plates that has been transferred by numerous hands.