

# How does electricity flow? – I

Imagine riding a bicycle on a path around a lake. If there are no obstacles on the path, you can easily complete the circuit and end up back where you started. In the same way, if there are no breaks in an electrical circuit, a current will start at a battery and flow around the circuit until it is back at the battery. If when cycling an obstacle falls on the cycle path behind you, it won't stop you completing the circuit because you have already passed that point. However, if a break occurs anywhere in an electric circuit at any time, the electricity stops flowing.

On the bicycle path, there may be a tunnel to ride through or a bridge crossing over a stream, but these won't stop your progress. In an electric circuit, there may be a light globe or a door bell that uses the electricity but, like the tunnel or the bridge, they do not stop the flow of electricity.

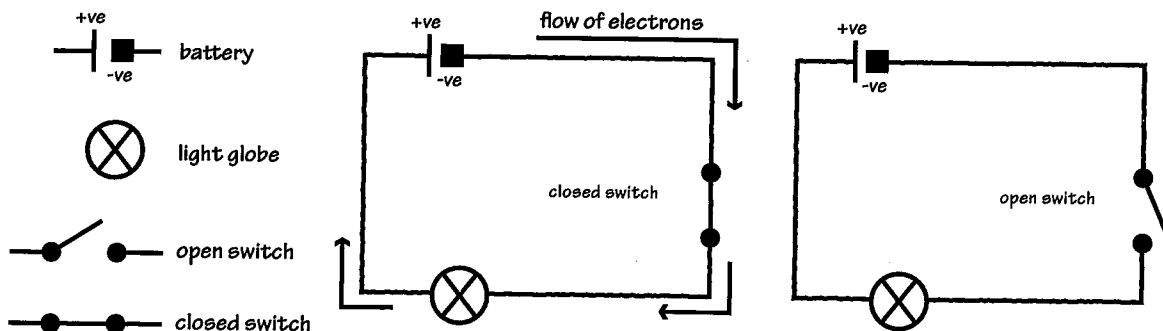
Perhaps a train line crosses the cycle path. When a train is due, warning lights flash and a gate comes down across the path, blocking the way. Until the train has passed and the gate is lifted, you will not be able to continue. A switch in an electric circuit is like that gate. It stops and starts the flow of electricity.

## Electric current

Everything is made up of atoms, each of which has a positively charged core (called a nucleus) and number of concentric shells surrounding it. These shells contain tiny negatively charged particles called electrons. In metals, electricity is the flow of electrons from the outer shell of one atom to the outer shell of another. This flow of electrons is called a current. The path of the current is called a circuit.

## Electric circuit

A simple circuit consists of a battery to provide power, wires to carry the current and a load that uses the electricity; for example, light globe. The wires are connected from the positive end to the negative end of the battery. In between, a light globe is attached. A switch can be added to create or break the circuit so the globe can be switched on and off.



## Voltage

To make the electricity flow, a force is needed to push the electrons around the circuit. This force, which is called the voltage, is provided by the battery. The electrons flow from the negative terminal of the battery, along a wire to the load, then along another wire to the positive end of the battery.

## Resistance

As a current flows through a circuit, the wire exerts a force against the flow of electrons. This force is called resistance. It causes friction by slowing down the movement of electrons.

A thin wire slows the electrons more than a thick wire and creates more resistance. This is the same for the longer wire.

It takes energy for electrons to move against the resistance along a wire.