



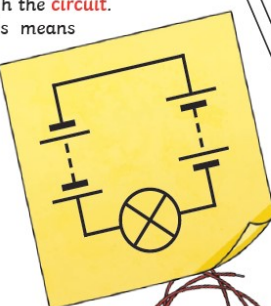
# SCIENCE: ELECTRICITY

## Electrical circuits

- Scientific symbols are used to represent the components (parts) of a circuit.
- In a series circuit, all of the components are joined together and the electricity can only flow in one direction.
- A circuit will not work properly if:
  - the cells are not properly connected (should be + to -, not + to + or - to -);
  - a component is not working;
  - there are gaps in the circuit;
  - one of the components acts as an insulator.

What will make a bulb brighter or a buzzer louder?

- More **batteries** or a higher **voltage** create more power to flow through the **circuit**.
- Shortening the wires means the **electrons** have less **resistance** to flow through.

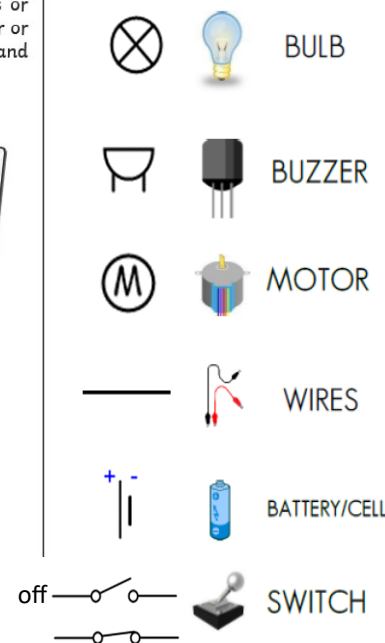
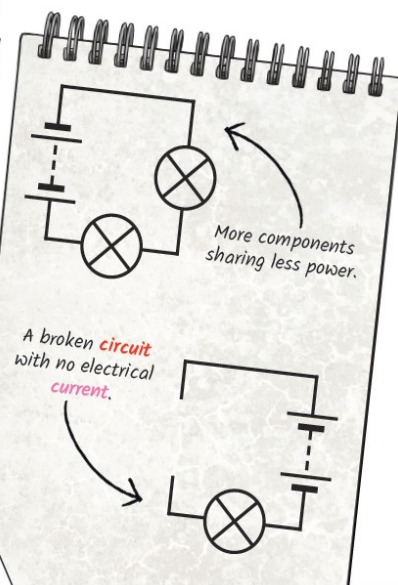


What will make a bulb dimmer or a buzzer quieter?

- Fewer **batteries** or a lower **voltage** give less power to the **circuit**.
- More buzzers or bulbs mean the power is shared by more components.
- Lengthening the wires means the **electrons** have to travel through more **resistance**.

### Series Circuit

A **circuit** that has only one route for the **current** to take. If more bulbs or buzzers are added, the power has to be shared and so they will be dimmer or quieter. If just one part of this series **circuit** breaks, the **circuit** is broken and the flow of **current** stops.

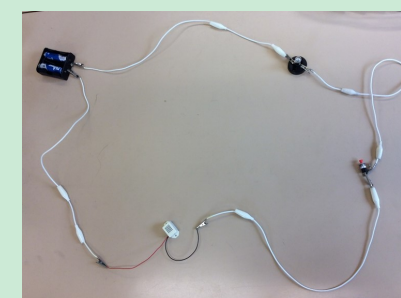


## Resistance

- The **electrical resistance** of an electrical conductor is a measure of the difficulty of passing an electric current through a substance.
- Resistors (wires, bulbs, buzzers, motors, etc.) use energy. The more resistors in a circuit, the less energy there is for each of them to use. Using more cells/batteries will increase the energy available.

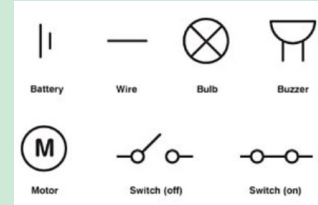
## Vocabulary

**circuit**  
**complete circuit**



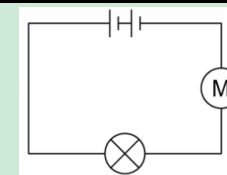
A path around which electricity can flow. It must include a source of electricity, such as a battery. A closed or complete circuit means that the path is unbroken. In an open or broken circuit, there is a break along the line, and the current stops.

**circuit symbols**



Visual pictures that stand for components within a circuit.

**circuit diagram**



A graphical representation of an electrical circuit.

**cell / battery**



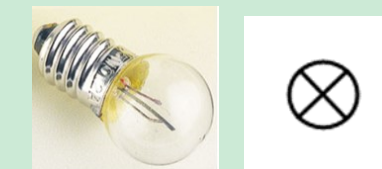
A device that stores energy as a chemical until it is needed. A cell is a single unit and a battery is a collection of cells. The words 'cells' and 'batteries' are now used interchangeably.

**voltage**



The force that pushes electrons through a circuit to produce electricity. Voltage is measured in volts. The higher the voltage, the faster the current (the flow of electrons around a circuit).

**bulb (lamp)**



A component which transfers electrical energy to light energy. It lights up when electricity passes through it in a circuit.

**buzzer**



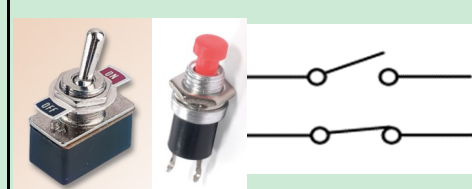
A component which transfers electrical energy to sound energy. It makes a sound when electricity passes through it in a circuit.

**motor**



A component which changes electrical energy into mechanical movement. It spins when electricity passes through it in a circuit.

**switch**



A component which can be opened or closed to control the flow of electric current: it can either complete or break a circuit.

## Scientific method: planning an investigation

**Question:** What are you trying to find out? Record the title for your investigation as a question.

**Prediction:** What do you think will happen, and why? Base this on what you already know.

**Apparatus:** List all of the equipment that you will need to use.

**Method:** Describe the method in order. Explain how it will be a fair test. Choose the independent variable (what you will change) and your dependent variable (what you will measure).

Use formal language, trying to use the passive voice. Would someone else be able to follow your method?

**Results:** What happened during the investigation? Present your results using a table, graph, diagram, photographs and/or observations.

**Conclusion:** What did you find out? Was your prediction correct? Try to explain your findings.