

Current

Electricity is a flow of **electrons**. The current is the amount of electricity flowing in the circuit. The unit for current is the **amp (A)**. Current is measured using an **ammeter**.

Electricity can flow through **conductors** but not through **insulators**. Metals are good conductors of electricity. Plastics are good insulators.

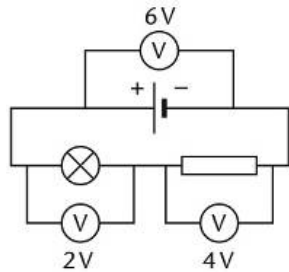
Cells and power packs provide safe, low-voltage electricity. Most appliances use mains electricity.

This can be dangerous if it is not used properly.

Voltage

A circuit must have a cell or power supply to provide a **voltage**. The voltage pushes electrons around the circuit and gives them energy. This electrical energy is transferred to other components in the circuit, which then transfer it to other forms of energy. For instance, a buzzer transfers electrical energy to sound.

Voltage is also called **potential difference**. The voltage of a cell can be measured using a **voltmeter**. The units for voltage are **volts (V)**. The voltage across a component is a way of measuring how much energy the component is transferring.



Models

We can use models to help us to think about electricity and circuits. One model for a circuit is a central heating system. The boiler and pump represent the cell, the pipes represent the wires, and the radiators represent bulbs.

Year 8 Electricity Knowledge Organiser

Resistance

The **resistance** of a circuit is a way of saying how easy or difficult it is for electricity to flow. It is measured in **ohms (Ω)**, and can be calculated by dividing the potential difference by the current. Conductors have low resistance and insulators have high resistance.

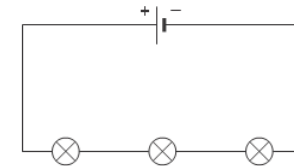
- high resistance = hard for electricity to flow = small current
- low resistance = easy for electricity to flow = large current

Resistance in a wire can be affected by: thickness, material, length and temperature.

- Thinner wires have higher resistances than thicker wires.
- Longer wires have higher resistances than shorter wires.
- Hotter wires have higher resistances than cooler ones.

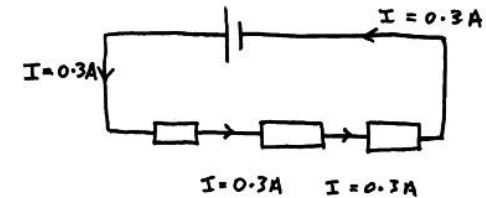
Series circuits

A **series circuit** is a circuit where the current follows one path.



If one bulb breaks, all the others go off.

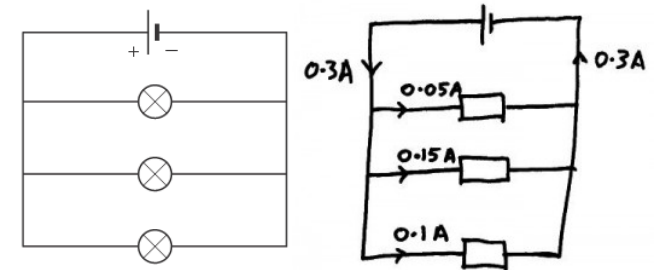
The current is the same everywhere.



If you put more bulbs in they will be dimmer, because it is harder for the electricity to get through. The resistance of the circuit is higher.

Parallel circuits

A **parallel circuit** is a circuit where the current splits amongst more than one path.



If one bulb breaks, the bulbs in the other branches stay on.

The current splits up when it comes to a branch.

The current in all the branches adds up to the current in the main part of a circuit.

If you add more bulbs, they stay bright. It's easier for the current to flow with more branches, as there are more ways for the electrons to go.

Circuit symbols

