

Knowledge Organiser: UKS2 Science—Electricity

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

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

Key Knowledge

Components of a **Circuit** and Their **Symbols**

| | | |
|-----------------------|----------------------|-----------------|
| lamp/bulb (indicator) | lamp/bulb (lighting) | wire |
| motor | buzzer | switch (open) |
| cell | battery | switch (closed) |

These **symbols** can be used to create electrical **circuit** diagrams.

Focus scientist

Mildred S Dresselhaus (1930-2017) was a materials Scientist whose research led to the development of the rechargeable batteries in all modern electronic equipment.

Resistors

Resistors (bulbs, buzzers, motors etc) use energy. The more resistors in a circuit, the less energy there is for each of them to use. E.g. two bulbs will shine less brightly than one bulb. Using more cells or batteries will increase the energy available.

Examples of circuit diagrams

What are electrical conductors and insulators?

An electrical conductor lets electricity pass through it. They are often metal (e.g. iron, copper and gold) but also include carbon and water. As our bodies are 18% carbon, electricity is very dangerous to us and because water is a very good conductor of electricity we mustn't use electrical appliances near it!

An insulator doesn't let electricity pass through it, e.g. wood, leather and plastic. Plastic is used to cover electrical wires because it is a good insulator.

| | |
|------------------------------|------------------------------|
| Electrical Conductors | Electrical Insulators |
| | |

Switches

| | |
|--|--|
| 1. When a switch is open (off) there is a gap in the circuit. | |
| 2. Electricity cannot flow around the circuit. | |
| 1. When a switch is closed (on) it makes the circuit complete. | |
| 2. Electricity can flow around the circuit. | |

Knowledge Organiser: UKS2 Science—Electricity

Vocabulary

Circuit- A closed loop for electricity to travel around.

Component- A part used in an electrical circuit.

Electricity- A form of energy caused by **electrons** moving.

Cell- A single stored source of electricity,

Battery- More than one cell together.

Switch- A switch turns an electrical circuit on or off, completing or breaking a circuit.

Conductor- An object that allows electricity to flow through it easily.

Insulator- An object which does not allow electricity to flow through it easily.

Circuit symbols- scientific illustrations used to represent components in a circuit.

Voltage- A force that makes electricity flow through a wire (it is measured in volts).

Motor- A machine that turns electrical energy into movement.

Buzzer- A machine which turns electrical energy into sound.

Global Goal:

Global Goal 7: Affordable and Clean energy

By understanding the process of how electricity is created, scientists are utilising renewable energy sources to create sustainable energy for all worldwide.

