

Electricity Knowledge Planner: How important is voltage?

What should I already know?

- Which appliances run on electricity
- How to make a simple series circuit and identify and name cells or bulbs, wires, switches and buzzers
- That a switch can open or close a circuit
- Some materials that are conductors or insulators

Being a Scientist

To work scientifically, we must ensure we carry out fair tests.

We will:

- Identify variables
- Know which variables to control to create a fair test
- Make decisions about what and how to observe, and how to record observations



To work scientifically, we must recognise which sources are reliable for research.

We will:

- Choose sources carefully and separate opinion from facts
- Recognise which secondary sources are most useful to our research and ideas.

What will I investigate?

- How could we make the bulb brighter or the buzzer louder?
- How can we change the voltage of a circuit?
- Do all materials conduct electricity?
- What happens to the brightness of the bulb if we increase the amount of wires?



Key Vocabulary

Battery	A battery is a sort of container that stores energy until it is needed.
Bulb	The incandescent light bulb turns electricity into light by sending the electric current through a thin wire called a filament.
Buzzer	A buzzer is a device that creates a buzzing or a beeping sound under the influence of an applied external voltage.
Cell	A device that stores energy as a chemical until it is needed. A cell is a single unit. A battery is a collection of cells.
Circuit	A path that an electrical current can flow around.
Circuit diagram	Circuit diagrams are visual representations of electrical circuits, using lines and symbols.
Circuit Symbol	A visual picture that stands for an electrical component.
Complete circuit	A circuit is a complete path around which electricity can flow. It must include a source of electricity such as a battery.
Conductor	Conductors are made of materials that electricity can flow through easily.
Current	The flow of electrons, measured in amps.
Insulator	An insulator is a material which does not easily allow heat and/or electricity to pass through it.
Motor	An electric motor is a device used to convert electrical energy into mechanical energy.
Switch	A switch is something that changes the flow of an electrical circuit.
Voltage	The force that makes the electric current move through the wires. The greater the voltage, the more current will flow.

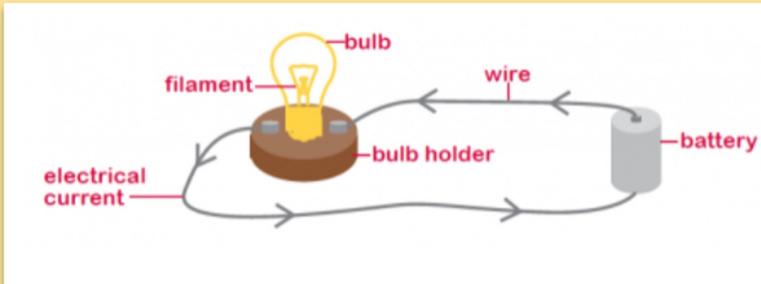
Changing the Power Source

What will make a bulb brighter or a buzzer louder?

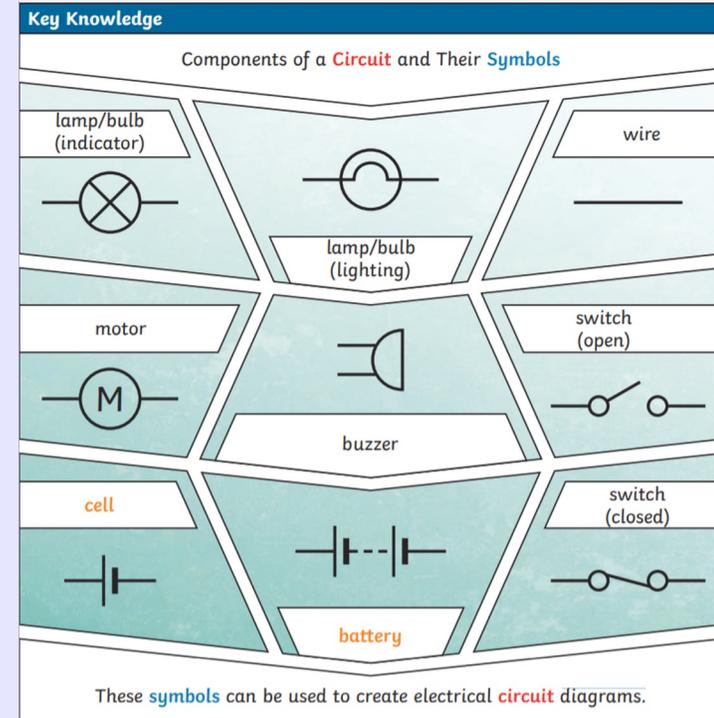
- More batteries or a higher **voltage** create more power to flow through the **circuit**.
- Shortening the wires means the **electrons** have less **resistance** to flow through.

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**.



Circuit Symbols



Circuits

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.

