

## Science: Electricity

**Definition:** A form of energy resulting from the existence of charged particles (such as electrons or protons), either statically as an accumulation of charge or dynamically as a current.

**Physics definition:** Physics is the study of nature and how matter and energy behave.

### POS: Y6 Electricity

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram.

### Prior learning Y4:

- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
  - Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
- Recognise some common conductors and insulators, and associate metals with being good conductors.

Links to other science topics:

Materials and their properties

### Disciplinary concepts:

**Structure:** what are the components of a circuit?

**Cause and effect:** how does changing the number of cells/voltage affect the other components in the circuit?

**Energy:** how is the energy transferred around the circuit? (current)

### Common misconceptions:

- larger-sized batteries make bulbs brighter a complete circuit uses up electricity
- components in a circuit that are closer to the battery get more electricity.
- Batteries store electric charge or electrons

### Core Knowledge:

- Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound.
- If you use a battery with a higher voltage, the same thing happens.
- Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter.
- Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.
- You can use recognised circuit symbols to draw simple circuit diagrams.

### Wider Knowledge:

Scientists famous for their work on electricity: Michael Faraday, Thomas Edison, Nikola Tesla, Alessandro Volta

### Working scientifically:

- Identify everyday objects according to a given property
- Asking simple questions and recognise that they can be answered in different ways
- Observing closely using simple equipment
- Perform simple tests
- Identifying and classifying
- Gathering and recording data to help in answering questions.

### End Goals:

- To make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs, can be changed by increasing or decreasing the number of cells or using cells of different voltages
- To draw circuit diagrams of a range of simple series circuits using recognised symbols

**CPD:** Reach out CPD Science Association / STEM website