

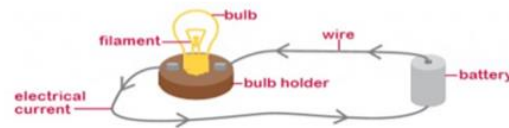
National Curriculum programme of study:

- Pupils should be taught:
- 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.

'Sticky' Knowledge

- Electricity travels at the speed of light. That's more than 186,000 miles per second!
- Electricity comes from the power station, the wind, the sun, water and even an animal's poo!
- Electricity is a type of energy that build up in one place (static), or flow from one place to another (current electricity).
- Coal is the biggest source of energy for producing electricity. Coal is burned in furnaces that boils water and creates steam.
- A popular way of generating electricity is through hydropower. This is a process where electricity is made by water which spins turbines attached to generators.
- A bolt of lightning can measure up to 3,000,000 volts, and it lasts less than one second!
- Electric fields work in a similar way to gravity. Whereas gravity always attracts, electric fields can either attract or repulse.

Electrical symbols		
Component	Symbol	Purpose
Cell (Battery)		Provides electrical energy
Power supply		Alternative to using cells
Wire		Allows current to travel
Bulb/light		Converts electrical energy into heat and light
Motor		Converts electrical energy into movement energy
Buzzer		Converts electrical energy into sound energy
Switch		Allows circuit to be opened or closed



Key Vocabulary

Battery	Two or more cells joined together in a line that provide a source of power for devices. The positive terminal of one cell connects with the negative terminal of another cell.
Cell	Store chemical energy in batteries that is turned into electric energy when the circuit is switched on.
Conductor	A type of material that allows electricity to pass through. Copper is a good conductor.
Insulator	A type of material that does not allow electricity to pass through. Wood, glass and plastic are good insulators.
Brightness	The intensity of light that is given out by an object.
Voltage	The amount of electrical force that makes electricity move through wires.
Series circuit	A circuit where the electric current goes through all the different parts one after the other.
Proton	Tiny particles in the centre (nucleus) of an atom. Protons are positively (+) charged.
Electron	Noun A tiny particle that travels around the nucleus of an atom. Electrons are negatively (-) charged.
Neutron	Neutrons are tiny particles that are found in the nucleus (centre) of an atom. Neutrons have no charge and are neutral. This means that they are not positive or negative.

Prior Knowledge

Prior Learning - Year 4 Statements

Pupils should be taught to:

- Identify common appliances that run on electricity
- 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

Future Learning:

- Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge
- Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current
- Differences in resistance between conducting and insulating components (quantitative)