Science Knowledge Organiser: Electricity (Y6 T1)

Prior knowledge/key knowledge & skills

Y4 prior knowledge: 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.

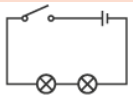
Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

Use recognised symbols when representing a simple circuit in a diagram.

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.

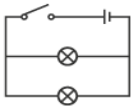
Series and Parallel Circuits

Series



A circuit that only allows electrical energy to travel around one path through all of the components in the circuit. If a component is removed, all components stop working.

Parallel



A circuit that allows electrical energy to travel around multiple paths, meaning that individual components can be removed without stopping other components.

Investigative focus

Pattern-seeking: How many bulbs can be lit from one battery? Can you create a circuit that makes all the bulbs have the same brightness? What do you need to change if more components are added to the circuit?

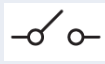
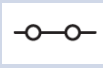
Challenging Perceptions

Can you explain the danger of short circuits? Can you explain what a fuse is? Can you explain the impact of changes in a circuit?

Key People

Benjamin Franklin (1706-1790)	Started studying electricity in 1746 and discovered that charge could be stored. In 1750, he carried out his famous kite experiment to prove that lightning was electricity.
Luigi Galvani (1737-1798)	Italian physician who discovered that the legs of a dead frog twitched when struck by an electrical spark – the early work in recognising electricity in nerves and muscles.
Alessandro Volta (1745-1827)	Italian pioneer of electricity who is credited as the inventor of the electric battery and the discoverer of methane. He proved that electricity could be created chemically.
Michael Faraday (1791-1867)	English scientist who contributed to the study of electromagnetism and electrochemistry. His inventions formed the basis of electric motor technology.
Georges Leclanche (1839-1882)	A French electrical engineer who created the *Leclanche Cell* in 1866 – one of the first electrical batteries and the forerunner of the modern dry cell battery.
Nikola Tesla (1856-1943)	Serbian inventor and engineer who discovered the rotating magnetic field, which formed the basis for the type of motor now used in hairdryers, vacuums and drills.

Circuit Symbols

Cell		A device that generates electrical energy from chemical reactions, used as a source of power.
Battery		A container that holds two or more cells, used as a source of energy.
Lamp/ Bulb		A light source, which generates light as an electrical current passes through a filament (thin wire).
Buzzer		An electrical component that makes a buzzing sound which is often used for signalling.
Motor		An electrical component that converts electrical energy into kinetic (movement) energy.
Open Switch		A device designed to open and close, so that a circuit is complete or broken.
Closed Switch		A device designed to open and close, so that a circuit is complete or broken.
Wire		A thin flexible thread of metal (often copper), encased in an insulator, used to link components
Voltmeter		An instrument used to measure the power of a circuit (in volts).
Ammeter		An instrument used to measure the power of a circuit (in amps).

Vocabulary

Conductor	A material that allows electrical energy (current) to pass through it.
Insulator	A material that stops electrical energy passing through it.
Current	The rate of flow of electrical charge around a circuit.
Resistance	Where the flow of the electrical charge is slowed down (e.g. by a component).
Power Station	An industrial facility where electrical power is generated (e.g. by coal, gas etc)
Pylon	A tall tower structure used for carrying electrical cables high above the ground.
Renewable Energy	Natural energy sources (e.g. wind, solar (sunlight), hydro (water))