Coley Primary School – Knowledge Organiser

SUBJECT FOCUS: Physics strand	Science: Electricity	YEAR 6	TERM 4

WHAT? – Key Knowledge

- 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.
- Construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.
- Learn how to represent a simple circuit in a diagram using recognised symbols.
- Use scientific language: say, read and spell scientific vocabulary

Famous Scientists

Benjamin Franklin
(1791- 1867)
Discovered electricity in 1752



Benjamin Franklin was the first person to study electricity in depth. One of his most important finding was proving that lightening was electrical (it had been thought of as different up until then). He flew a kite during a storm, to which he had attached a key. When the key was indeed hit by lightning, he felt electric sparks from the key. Franklin was the very fortunate not to be electrocuted! ***Warning:This is not an experiment that needs to be repeated!!***

Franklin was the very first to store electricity and knew it consisted of positive and negative charges.

Alessandro Volta
(1745 - 1827)
Invented the battery (Voltaic pile) in 1800.



Alessandro Volta invented the first battery, which was known as the 'voltaic pile' as it was made of layers of zinc and copper, which was either combined with sulphuric acid or saltwater brine to create an electric current.

Volta's name was also the basis for the following word:

- **Voltage:** This is the electric force that causes free electrons to move from one atom to another.
- **Volt:** This known as the unit of measure for voltage (written as V).

Michael Faraday
(1791 -1867)
Built an electric motor and generator in 1821



Michael Faraday was a chemist and physicist who invented the electric motor. He used Volta's discoveries and was able to make an electric current move by using a magnet inside a wired coil. He was able to build an electric motor and generator.

Faraday also made important discoveries in chemistry, such as how to make stronger steel.

Did you know?

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**.
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.

Working Scientifically Challenge:

Let's think like scientists…

Can they…

- identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers)
- compare and give reasons for variation in how components function, including bulb brightness, buzzer volume and on/off position of switches?
- explain how to make changes in a circuit?
- explain the impact of changes in a circuit?
- explain the effect of changing the voltage of a battery?

WHAT? – Key vocabulary

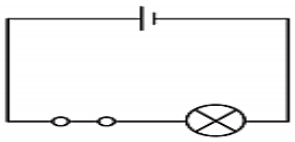
circuits	A path that an electrical current can flow around.
symbols	A visual picture that stands for something else.
cell/ battery	A device that stores energy as a chemical until it is needed. A cell is a single unit. A battery is a collection of cells.
current	The flow of electrons, measured in amps.
amps	How electric current is measured.
voltage	The force that makes the electric current move through the wires. The greater the voltage, the more current will flow.
resistance	The difficulty that the electric current has when flowing around a circuit.
electrons	Very small particles that travel around an electrical circuit.
Electrical conductor	A material/device which allows electricity to pass through.
Electrical insulator	A material/device which does not allow electricity to pass through.

switch, wire, bulb, motor, voltmeter, electricity,

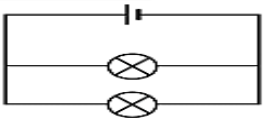
Diagrams and symbols

Drawing Circuits Scientifically

SIMPLE CIRCUIT DIAGRAM



PARALLEL CIRCUIT DIAGRAM



DANGER! HIGH VOLTAGE!

Electricity is everywhere, so always be safe. Be careful of mains switches, open sockets and any signs to do with electricity. The human body is 80% water so it conducts electricity. If someone has had a shock always turn the electricity off first, then call for help!

I wonder… Can I …

- make their own traffic light system or something similar?
- explain the danger of short circuits?
- explain what a fuse is?

Possible experiences: Curious minds…

- **Visit - Benjamin Franklin House, London** – Discover more about Franklin's life and his wonderful scientific work.
- **Electricity,** (Essential Physical Science) by Louise Spilsbury