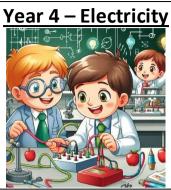


## Lowerhouse Junior School Science Overview Sheet





**Rationale**: Teaching Electricity in Year 4 Science is crucial as it introduces students to fundamental concepts of energy and circuits. It fosters curiosity, critical thinking, and practical skills through hands-on experiments. Understanding electricity's role in daily life empowers students to appreciate technology and promotes safety awareness.

## Substantive Knowledge:

- 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.

## Disciplinary Knowledge:

Classifying	
Overview:	Key Vocabulary:
Lesson 1: What is electricity?	Electricity: A form of energy resulting from the existence of charged particles such as
Lesson 2: What types of energy do	electrons or protons, either statically as an accumulation of charge or dynamically as
we use in daily life?	a current.
Lesson 3: How do we use electricity safely?	<b>Electrical appliance/device</b> : A machine or device that uses electricity to perform a function, such as a toaster, refrigerator, or computer.
Lesson 4: What is a circuit?	Mains: The primary electrical supply to a building, typically referring to the standard
Lesson 5: How does a switch affect a	voltage and frequency of the electricity provided by the utility company.
circuit?	Plug: A device at the end of an electrical cord that connects an appliance to an
Lesson 6: How can we solve	electrical outlet.
problems in circuits?	Electrical circuit: A complete path through which electric current can flow, including a
Lesson 7: What are conductors and	power source, conductors, and a load.
insulators?	Complete circuit: A closed loop that allows electricity to flow from the power source,
	through the components, and back to the power source.
	<b>Component</b> : An individual part of an electrical circuit, such as a resistor, capacitor, or switch.
	<b>Cell</b> : A single unit that converts chemical energy into electrical energy, often used as a power source in batteries.
	Battery: A collection of cells connected together to provide a greater voltage or current than a single cell.
	<b>Positive</b> : The terminal of a battery or power source that has a higher electrical
	potential.
	Negative: The terminal of a battery or power source that has a lower electrical
	potential.
	Connect/connections: The act of joining electrical components together to form a
	circuit.
	Loose connection: A poor or incomplete connection in an electrical circuit that can
	cause intermittent operation or failure.
	Short circuit: An unintended low-resistance connection between two points in an
	electrical circuit, often causing excessive current flow.
	Crocodile clip: A spring-loaded clip with serrated jaws used to make temporary
	electrical connections.

	Bulb: A device that produces light when an electric current passes through it.
	Switch: A device for making and breaking the connection in an electric circuit.
	<b>Buzzer</b> : An electrical device that makes a buzzing sound, often used as an alarm or signal.
	Motor: A device that converts electrical energy into mechanical motion.
	<b>Conductor</b> : A material that allows electric current to flow through it easily, such as copper or aluminium.
	Insulator: A material that resists the flow of electric current, used to protect against
	electric shock and to contain the current within the desired path.
	<b>Metal</b> : A type of material that is typically a good conductor of electricity, such as copper, aluminium, or iron.
	Non-metal: A type of material that is typically a poor conductor of electricity, such as
	rubber, plastic, or glass.
	Symbol: A graphical representation used in circuit diagrams to represent electrical
	components and their connections.
Impact/Assessment	

**Most Children will be able to**: • name the components in a circuit • make electric circuits • control a circuit using a switch • name some metals that are conductors • name materials that are insulators • communicate structures of circuits using drawings which show how the components are connected • Use classification evidence to identify that metals are good conductors and non-metals are insulators • incorporate a switch into a circuit to turn it on and off • connect a range of different switches identifying the parts that are insulators and conductors • Can add a circuit with a switch to a DT project and can demonstrate how it works • give reasons for choice of materials for making different parts of a switch • describe how their switch works