



# Lowerhouse Junior School

## Science Overview Sheet



### Year 4 – Electricity



**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:

**Lesson 1:** What is electricity?

**Lesson 2:** What types of energy do we use in daily life?

**Lesson 3:** How do we use electricity safely?

**Lesson 4:** What is a circuit?

**Lesson 5:** How does a switch affect a circuit?

**Lesson 6:** How can we solve problems in circuits?

**Lesson 7:** What are conductors and insulators?

#### Key Vocabulary:

**Electricity:** 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.

**Electrical appliance/device:** A machine or device that uses electricity to perform a function, such as a toaster, refrigerator, or computer.

**Mains:** The primary electrical supply to a building, typically referring to the standard voltage and frequency of the electricity provided by the utility company.

**Plug:** A device at the end of an electrical cord that connects an appliance to an electrical outlet.

**Electrical circuit:** A complete path through which electric current can flow, including a power source, conductors, and a load.

**Complete circuit:** A closed loop that allows electricity to flow from the power source, through the components, and back to the power source.

**Component:** An individual part of an electrical circuit, such as a resistor, capacitor, or switch.

**Cell:** 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.

**Positive:** 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.  
**Buzzer:** 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.  
**Conductor:** 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.  
**Metal:** 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