

## Medium Term Plan: Supporting Implementation of LTP/Progression Grid

**Subject: Science**      **Year: Y4 - electricity**

### **NC/PoS:**

- 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 a lamp will light in a simple series circuit, based on whether 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 a lamp lights in a simple series circuit.
- Recognise some common conductors and insulators, and associate metals with being good conductors.

### **Prior Learning (what pupils already know and can do)**

Some things need electricity to work by either plugging into a socket or using batteries. Electricity affects various appliances by making them warm/cold, cause movement, produce light, and create sounds. Televisions, fridge/freezers, microwaves, washing machines and lights run using mains electricity. Torches, some toys and phones run on batteries.

### **End Goals (what pupils MUST know and remember)**

- Know the basic parts of a simple circuit – cells, wires, bulbs, switches, buzzers
- Know why a lamp in a simple circuit will (circuit is a complete loop) or will not light (break in the circuit)
- Know that a switch open (will not light a bulb – circuit incomplete), switch closed (will light a bulb – circuit complete)
- Know that conductors easily allow electric to pass through and insulators do not let electricity pass through easily
- Know that an example of a good conductor is aluminium, copper, gold, water, people, and good insulators are rubber, plastics, wood, and paper

**Key Vocabulary:** electricity, appliances, energy, mains, batteries, danger, electric shock, socket, components, cell, buzzer, motor, bulb, bulb holder, wires, battery, crocodile clips, complete, incomplete, open, closed, switch, control, push switch, on/off switch, electrical conductor, electrical insulator

### **Session 1: Recap:**

Children learn electricity is a form of energy and we get electricity from the mains or batteries. Electricity affects various appliances by making them warm/cold, cause movement, produce light, and create sounds. Televisions, fridge/freezers, microwaves, washing machines and lights run using mains electricity. Torches, some toys and phones run on batteries (more than one cell)

Suggested activities:

- Have various objects/ photographs which use electricity – group according to using mains, batteries, or both (Venn diagram)
- <https://www.youtube.com/watch?v=yjzW11HQMYE> What is electricity?
- <https://www.youtube.com/watch?v=t09pAwLICC4> Electricity (up to 1.41)

**Vocabulary:** **electricity, appliances, energy, mains, batteries**

### **Session 2: Recap: What is electricity? Name appliances that use mains, batteries, or both.**

Children learn electricity can be dangerous as an electric shock from a mains socket could cause death

Suggested activities:

<https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/z9gk4xs> 5 rules for staying safe around electricity

**Vocabulary:** danger, electric shock, socket

**Session 3: Recap: Name 5 ways to be safe around electricity.**

Children learn that simple circuits can be set up using components and an electrical circuit needs a cell with wires connected to both the positive and negative ends and an electrical component such as a bulb, a buzzer, or a motor. A cell is the basic unit that produces electricity, and a battery has two or more cells.

Suggested activities:

- Make a simple circuit with a cell, an electrical component and two wire
- Repeat using different components and record

**Vocabulary:** components, cell, buzzer, motor, bulb, bulb holder, wires, battery, crocodile clips

**Session 4: Recap: what components do you need to make a simple circuit?**

Children learn electricity can only travel if there is a complete circuit.

Suggested activities:

- <https://www.youtube.com/watch?v=4e0Y7PgBul8> completing a circuit
- Provide drawings/photos of different circuits; some of which will allow the bulb to light, others which will not. Before constructing each of the circuits, the children must decide what they think will happen. Children draw how they repaired each of the circuits so that the bulb would light.

**Vocabulary:** complete, incomplete, open, closed

**Session 5: Recap: which of these circuits are complete?**

Children learn switches control the flow of electricity in a circuit.

Suggested activities:

- Provide the children with a range of bought switches to turn on and off components in circuits that they have constructed. Encourage the children to try the switches in various places in their circuits.
- <https://www.youtube.com/watch?v=IRo5BGclgb0> making a simple switch
- Use aluminium foil, drawing pins and coins to make switches

**Vocabulary:** switch, control, push switch, on/off switch,

**Session 6: Recap: what is the purpose of a switch?**

Children learn materials are either conductors or insulators. Electrical conductors (metals, graphite, and water) allow electricity to pass through them. Electrical insulators (wood, plastic, glass, and rubber) do not allow electricity to pass through

Suggested activities:

- <https://www.youtube.com/watch?v=XLCiKKZ30I> testing materials
- Have a variety of materials for children to test either in a circuit or use an energy stick

**Vocabulary:** electrical conductor, electrical insulator

Link to careers: electronics engineer, aeronautical engineer

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Scientists who have helped develop understanding in this field: Thomas Edison perfected the light bulb's operation so cities in Europe and the United States were able to install direct current electrical lighting systems.