



## Science Trail

### **Part 1:** Retrieval

What do you already know? Mind map knowledge.

What do you already know about electricity?

- How do we use electricity every day?
- What are some electrical devices you know?
- What do you think happens when you switch something on or off?

Think Pair share: What might happen if there were no electricity?

### **Part 2:** Knowledge Organiser\* Glued in as unit cover

Introduce Knowledge Organiser. Explore facts and information. Allow time for self-revision. Focus upon Tier 1 Vocabulary

Vocabulary Focus:

- Circuit, component, cell, battery, lamp, switch, buzzer, motor, LED, conductor, insulator, voltage, sensor, current

Key Concepts Covered:

1. Electrical Components – Each component in a circuit has a specific job (e.g., a cell provides power, a motor creates movement).
2. Circuits – Electricity flows only in a complete circuit. Incomplete circuits stop the flow.
3. Conductors & Insulators – Metals like copper conduct electricity; materials like plastic insulate.
4. Electrical Safety – Respect electricity's dangers; avoid wet hands, damaged wires, and overloading sockets.
5. Circuit Symbols & Diagrams – Use standard symbols to represent circuit components.
6. Voltage & Current – Voltage is the 'pushing force' measured in volts (V).
7. Sensors and Micro:bits – Devices that respond to environmental changes, linking to real-world applications.

Revision Task:

Pupils explore and revise the Knowledge Organiser independently, focusing on key terminology and factual recall.

### **Part 3:** Timeline/Map

When was this? Where was this? Develop children's knowledge of the wider world.

When was this discovered or used?

- Investigate the history of electricity from early experiments (Benjamin Franklin, Michael Faraday) to modern technology (smart devices).

Where do we see this today?

- Identify everyday uses of circuits and electrical components in the home, school, and wider community.
- Explore sustainable sources of electrical energy and how future technology might change the way we use circuits.

### **Part 4:** New Knowledge (broken down) 5 - 10 sessions

Introduce new knowledge in separate individual sessions. All knowledge to be taken from the Knowledge Organiser and exemplified. Each session to begin with previous lesson recap.

#### Lesson 1 – What is Electricity?

Explore electricity as a form of energy; identify devices that use electricity.

#### Lesson 2 – Components and Circuits

Understand how to build simple circuits and identify complete/incomplete circuits.

#### Lesson 3 – Conductors and Insulators

Test materials to find which conduct or insulate electricity.

#### Lesson 4 – Circuit Diagrams and Symbols

Learn standard circuit symbols and how to draw accurate circuit diagrams.

#### Lesson 5 – Electrical Safety

Investigate potential hazards and create safety posters.

#### Lesson 6 – Voltage and Current

Explore how voltage affects a circuit and use meters for measurement.

#### Lesson 7 – Sensors and Micro:bits

Program Micro:bits to respond to environmental variables using sensors.

Each session includes:

- Recap: Retrieval of prior lesson knowledge.
- New Concept: Direct instruction and modelled examples.
- Practice: Independent or paired application task.
- Review: Quick check for understanding through discussion or quiz.

## **Part 5:** Quiz

10 Questions focused upon knowledge retention from KO

10 Knowledge Retention Questions

1. What are the main components of an electrical circuit?
2. What is the difference between a complete and incomplete circuit?
3. What material is a conductor? Give an example.
4. What is an insulator?
5. What does a cell or battery do in a circuit?
6. Why are circuit symbols used?
7. What happens if too many devices are plugged into one socket?
8. What is voltage measured in?
9. What is the function of a sensor?
10. How can you stay safe when using electrical equipment?

## **Part 6:** Essay

One question which allows children to answer in an extended piece of writing

Essay Question:

“Explain how electrical circuits work and why safety is important when using electricity.”

Writing Prompts:

- Begin with what a circuit is and how electricity flows.
- Describe the job of different components.
- Include examples of conductors and insulators.
- End by explaining ways to stay safe around electricity.

## **Part 7:** Spiritual Reflection

Ow, Wow or Now

Ow: What challenged you or surprised you about learning electricity?

Wow: What amazed you about how electricity makes things work?

Now: How will you use what you've learned about circuits to stay safe and make positive choices in the future?

Encourage pupils to take time to reflect quietly or write a short paragraph responding to one of the statements above.