



Knowledge and Skills Mind Map (Science) - Year 4 Spring Term 2

Knowledge -



Electricity

1. Can I identify common appliances that use electricity?

- **Prior Learning—Science topic before half term:** States of Matter
- **Vocab:** electricity, appliance, power
- Know that electricity is used to power many everyday appliances and devices.
- Know that an appliance is a device that uses electricity to perform a function, (e.g. a television, fridge or lamp).
- Know that some appliances use mains electricity while others use batteries.
- Know that we can group appliances based on how they use electricity and where they are used.

(note for teachers – suggested task: ask children to identify and sort a range of household and classroom appliances (images or real examples) into groups such as battery-powered and mains-powered, then discuss their choices.)

- **Identifying differences, similarities or changes related to simple ideas and processes**

2. Can I construct a simple series circuit and record it using a labelled diagram?

- **Prior Learning (last lesson):** identified common appliances that use electricity
- **Vocab:** circuit, cell, wire
- Know that a circuit is a path that electricity flows around.
- Know a simple series circuit has components such as a cell (battery), wires and a bulb.
- Know that each component has a role, (e.g. the cell provides the energy and the wires connect the parts).
- Know that circuits can be represented using diagrams that show how the components are connected.

(note for teachers – suggested task: provide circuit components; children build a simple circuit to light a bulb, then draw diagram showing how the parts are connected.)

- **Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**
- **Records findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**

3. Can I explain why a circuit needs to be complete for a bulb to light?

- **Prior Learning (last lesson):** constructed a circuit
- **Vocab:** circuit, component, loop, flow
- Know that a circuit must be complete for electricity to flow and power components.
- Know that a complete circuit forms a loop that allows electricity to travel from the cell, through the components, and back again.
- Know that if there is a break in the circuit, electricity cannot flow and the bulb will not light, (e.g. if a wire is disconnected or missing).
- Know that observing whether a bulb lights or not provides evidence about whether a circuit is complete.
- **(note for teachers – suggested task:** show a pre-built and broken circuit and ask children to predict whether the bulb will light, then test and explain their reasoning based on whether the circuit is complete.)
- **Using straightforward scientific evidence to answer questions or to support their findings**

6. Can I observe patterns in circuits and report my findings (using results) to draw conclusions?

- **Prior Learning (last lesson):** created a circuit with a switch and explained how it works
- **Vocab:** pattern, brightness, cells
- Know that changing parts of a circuit can affect how it works, (e.g. adding more cells can make a bulb brighter).
- Know that patterns can be observed when testing circuits with different components or conditions.
- Know that results from investigations can be used to draw conclusions about how circuits behave.
- Know that making predictions helps us to test what might happen next in an investigation.

(note for teachers – suggested task: ask children to build circuits with different numbers of cells and observe how the brightness of the bulb changes, then record results and identify patterns to explain their findings.)

- **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**
- **Identifying differences, similarities or changes related to simple scientific ideas and processes**
- **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**

5. Can I create a circuit with a switch and explain how it works?

- **Prior Learning (last lesson):** explained how a switch works in a circuit
- **Vocab:** conductor, insulator, material
- Know that conductors are materials that allow electricity to pass through them.
- Know that insulators are materials that do not allow electricity to pass through them.
- Know that metals are often good conductors of electricity, (e.g. paperclips or foil).
- Know that a fair test helps us to find out which materials can complete a circuit.
- Know that we can record results to scientific experiments in a diagram

(note for teachers – suggested task: provide a simple circuit with a gap and a range of materials (e.g. metal, plastic, wood) and ask children to test which ones complete the circuit, recording results in a table.)

- **Setting up simple practical enquiries, comparative and fair tests**
- **Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions**

4. Can I create a circuit with a switch and explain how it works?

- **Prior Learning (last lesson):** explained why a circuit needs to be complete for a bulb to light
- **Vocab:** circuit, component, switch, broken circuit,
- Know that a switch is a component that can open or close a circuit.
- Know that when a switch is closed, the circuit is complete and electricity can flow.
- Know that when a switch is open, the circuit is broken and electricity cannot flow, (e.g. the bulb will not light).
- Know that switches allow us to control when a circuit is on or off.
- **(note for teachers – suggested task:** children build a simple circuit with a switch, then ask them to test what happens when the switch is opened and closed, recording their observations.)
- **Identifying differences, similarities or changes related to simple scientific ideas and processes**