

Ashtree Primary School and Nursery Medium Term Plan for Science

Year 6 Spring Term - Electricity Unit

Prior Knowledge – Y4 Electricity

- Step 1** - identify **mains operated and battery operated** devices, describe some of the dangers associated with mains electricity
- Step 2** - name some **components** of a simple **electrical circuit**, know that batteries are sources of electricity - **battery, cell, wires, switch, crocodile clips, buzzer, bulb, circuit**,
- Step 3** - recognise that for a circuit to work it must be complete, construct a working circuit, make drawings of simple working circuits (pictorial only circuit symbols covered in year 6) - **symbols**
- Step 4** - make circuits from drawings provided, describe the effect of making and breaking one of the contacts on a circuit, explain why some circuits work and others do not
- Step 5** - identify materials as **conductors or insulators**, construct simple circuits and use them to test whether materials are electrical conductors or insulators
- Step 6** - describe how **switches** work, construct a home-made switch

Prior Skills – Y4

uses observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases), explains the purposes of a variety of scientific and technological development including those specific to their units of knowledge e.g. electricity, uses relevant scientific language to discuss their ideas and communicate their findings, chooses the type of simple equipment that might be used from a reasonable range, uses appropriate equipment and measurements with increasing accuracy, identifies differences, similarities or changes related to simple scientific ideas and processes, reports on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions, sets up simple practical enquiries, comparative and fair tests, gathers and records data in a variety of ways to help in answering questions, with growing independence, uses results to draw simple conclusions and answers

Key Knowledge

- Step 1** - know that the 'amount' of electricity (**voltage**) depends on the number of batteries
- Step 2** - construct some working **series circuits** with specified components
- Step 3** - recognise conventional **circuit symbols**
- Step 4** - draw **circuit diagrams** and construct **circuits** from diagrams using conventional **symbols**
- Step 5** - explore how to change the brightness of bulbs and the volume of a buzzer
- Step 6** - describe ways of changing the brightness of a bulb in a circuit or the volume of a buzzer, compare different circuits (e.g. for brightness of bulb), recall that the amount of electricity is measured in **voltage**

Key Vocabulary **Voltage, current, series, component, circuit, conductor, positive/negative terminal, complete circuit, battery, cell**

Key Skills

- Step 1** - uses their scientific experiences to explore and generate ideas and raise different types of questions
- Step 2** - **recognises and controls variables where necessary** (e.g. explains which variables need to be controlled and why)
- Step 3** - **records and presents findings using the most appropriate method.**
- Step 4** - **records and presents findings using the most appropriate method.**
- Step 5** - recognises when and how to set up comparative and fair tests
- Step 6** - **recognises and controls variables where necessary** (e.g. explains which variables need to be controlled and why)

Curriculum Enhancements

Electrical diagrams for the children to investigate.



Suggested Activities

- Explain how a circuit operates to achieve particular operations, such as to control the light from a torch with different brightnesses or make a motor go faster or slower.
- Make circuits to solve particular problems, such as a quiet and a loud burglar alarm.
- Carry out fair tests exploring changes in circuits.
- Make circuits that can be controlled as part of a DT project

Curriculum links

DT

Possible Misconceptions

Some children may think:

- larger-sized batteries make bulbs brighter
- a complete circuit uses up electricity
- components in a circuit that are closer to the battery get more electricity.

This will lead to . . . (KS3)

- Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. (KS3)
- Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. (KS3)
- Differences in resistance between conducting and insulating components (quantitative). (KS3)
- Static electricity. (KS3)