Medium term Plan for Science

Y4 - Electricity — Autumn 1

Class Text: The Matilda Effect	**Hook:** Children will make their own torch
Topic Outcome: Children will understand what makes circuit work and what conductors and insulators are.	**Topic Reflection:** Children will explain what materials they have used to make their torch and explain why
Scientific Enquiry: Which circuits work and why? What makes a good switch? Which materials insulate or conduct electricity?	

Scientific Strands:

EYFS + KS1

Plants
Living things & their habitats
Animals including humans
Everyday materials
Light
Sound
Seasonal changes

KS2

Electricity
Earth and Space
Forces and Magnets
Sound
Light
States of matter
Properties & changes of materials
Rocks
Evolution and inheritance
Living things & their habitats
Animals including humans
Plants

vocabulary

Tier 1: power, battery, bulb, buzzer, switch, wires

Tier 2: electricity, energy, motor, source, fuel, natural, mains, appliance, device

Tier 3: generated, charge, static, insulator, conductor, component, circuit, cell, current, renewable, wind turbine, solar panel

Scientific Concepts

Previous Skills	Previous Knowledge	Previous Understanding
Children can identify and group familiar objects made from the same material Children can identify some metals	Children know that some sources of light need electricity to function	Children understand that familiar objects are made of a variety of materials including wood, metal, plastic, glass, brick, rock, paper and cardboard

	Concepts	**Learning Objective**	**Lesson Outcome**	**ARE Success Criteria**	**GD Success Criteria**	**SEND Success Criteria**
Lesson 1		LO: To identify common appliances that run on electricity	Children will sort everyday objects based on whether they run on electricity or not. They will also differentiate between those that need to be plugged in to work and those that run on batteries. They will then discover electrical dangers around the home and highlight the dangers to others.	I can identify electrical and non-electrical appliances I can sort appliances based on whether they use mains or battery power I can identify electrical dangers	I can clearly explain why I have sorted appliances in a certain way	See IEP/EHCP or Birmingham Toolkit for individual targets.
Lesson 2		LO: To identify the parts of a simple series circuit	Children will learn about Lewis Latimer and his work in creating lightbulbs. They will then construct a simple series circuit, naming the basic parts. Children will draw and label their circuit (Pupils should draw the circuit as a pictorial representation, not using conventional	I can label the individual parts of a circuit I can create a functioning circuit I can describe the achievement of a significant scientist	I can explain why a circuit doesn't work using scientific language	See IEP/EHCP or Birmingham Toolkit for individual targets.

			circuit symbols at this stage; these will be introduced in year 6)			
Lesson 3		LO: To identify if a lamp will light	Children will look at an image of a 'circuit' and decide if the lamp will light or not based on whether or not the lamp is part of a complete loop joined to a battery. They will make predictions, construct the 'circuit' as per the diagram and test to see if the lamp lights	I can predict whether or not a lamp will light and explain why I can construct each circuit as it appears in a picture I can test the circuit	I can accurately explain my findings using scientific vocabulary	See IEP/EHCP or Birmingham Toolkit for individual targets.
Lesson 4		LO: To plan and make a switch to include in a simple circuit	Children will learn that a switch creates a break in a circuit. They will look at images / videos / real examples of a variety of switches. Children will plan and then make a switch that must be included in a simple circuit. They will have a range of resources e.g. paper clips, pieces of card/paper, silver	I can explain the function of a switch I can identify different types of switches I can make a working switch	I can explain why the switch in the picture will / will not work	See IEP/EHCP or Birmingham Toolkit for individual targets.

			foil, split pins, small boxes, etc. to construct their own switch which they test by including it in a simple series circuit with a component.			
Lesson 5		LO: To recognise some common conductors and insulators	Children will learn about conductors and insulators. They will predict and test a range of materials within a simple series circuit and record their findings	I can make a prediction and explain why I can construct a functioning series circuit I can test different materials and identify if they are a conductor or an insulator	I can accurately explain my findings using scientific vocabulary	See IEP/EHCP or Birmingham Toolkit for individual targets.
Lesson 6		LO: To construct a simple series circuit including a switch to make a torch	Children will plan and make a functioning torch including a switch. They can explain what materials they have used for different parts and explain why	I can select the components needed I can assemble my torch including a switch I can test my torch	I can accurately explain the materials used for the different parts of my torch and say why I chose certain materials using scientific language	See IEP/EHCP or Birmingham Toolkit for individual targets.
Endpoints:	**Knowledge:** • Some appliances run on electricity. • Electricity is generated using energy from natural sources such as the Sun, oil, water and wind. These can also be called fuel sources. • Some appliances use batteries and some use mains electricity. • Batteries come in different sizes depending on how much and for how long the appliance is used for. • A complete circuit is a loop that allows electrical current to flow through wires.					

	• A circuit contains a battery (cell), wires, and an appliance that requires electricity to work (such as a bulb, motor or buzzer). • The electrical current flows through the wires from the battery (cell) to the bulb, motor or buzzer. • A switch can break or reconnect a circuit. • A switch controls the flow of the electrical current around the circuit. When switch is off, the current cannot flow. This not the same as an incomplete circuit. • Objects that are made from materials that allow electricity to pass through to create a complete circuit are called electrical conductors. Objects that do not allow the electricity to pass through are called electrical insulators. • Materials used in electrical appliances and components are chosen because of their insulating or conducting properties. E.g. metal wires allow electricity to flow but plastic insulating covers stop people from receiving electric shocks. **Skills:** Construct and test a simple series electrical circuit Investigate factors which would affect whether a circuit works including: opening and closing a switch and using insulators and conductors within the circuit, Identify and name the basic parts of the circuit, including cells, wires, bulbs, switches and buzzers.
	Understanding: Understand where electricity comes from How to be safe around electricity What is needed to create an electrical circuit