Subject	Term	Unit
Science- Year 4	Spring	Electricity

Intent

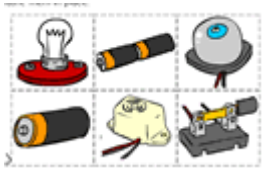
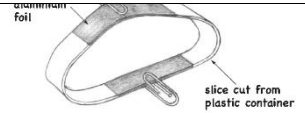
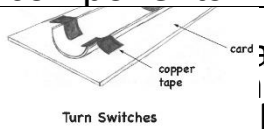
At Hurst Hill, we nurture young scientists by fostering curiosity and developing strong scientific knowledge and enquiry skills. Children learn to investigate, observe and evaluate confidently, understanding how science shapes the past, present and future while building firm foundations for lifelong scientific learning.

Prior knowledge	National Curriculum
New learning- May link to materials from KS1 • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• 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 or not a lamp will light in a simple series circuit, based on whether or not 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 or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors

What?	To understand which appliances work using electricity. To explain that a full circuit is needed to make components work and to build a simple circuit. To understand that switches need to be closed. To understand which materials, allow electricity to flow through them.
Why?	This unit will the starting point for the children's work on electricity. It is important that they understand how a circuit works.
How?	Through observation and enquiry, making circuits and finding out how they work.

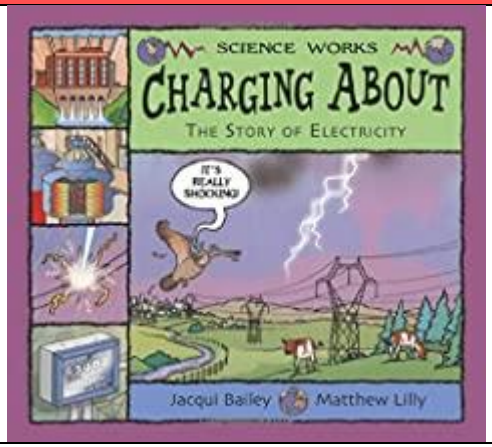
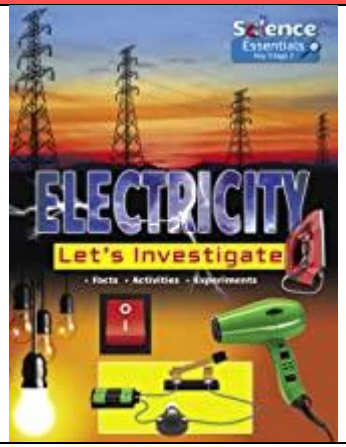
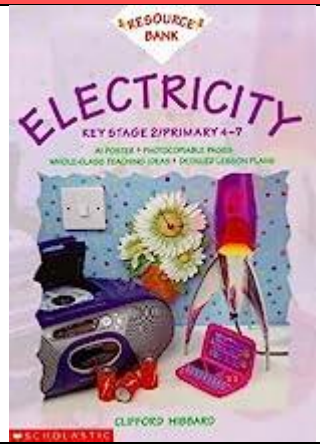
Vocabulary	
Circuit	A complete route which an electrical current can flow around
Current	A flow of electricity through a wire
Physics	The study of forces including electricity and the way it affects objects
Battery	A small device that provides power for electrical items
Cell	A device used to generate electricity. A battery is an example of a cell
Conductor	Any material that electricity can pass through or along
Insulator	Any material that electricity cannot pass through or along
Wire	A long thin piece of metal that carries an electrical current often covered in plastic for safety
Socket	A device on a wall that you can plug electrical equipment into
Switch	Button or lever
Bulb	A lamp or light
Appliance	An electrical device that is used for a specific purpose in the home
Series circuit	One continuous electrical circuit.

SOME OBJECTIVES MAY BE BROKEN DOWN OVER TWO LESSONS	
Objective	**Learning**
Can I identify common appliance that work using electricity?	**Pattern Seeking** Categorise the different appliances as to whether they are battery or mains and notice the patterns surrounding their use. Ask the children to identify appliances around school and ones from home. Sort into the correct category. Identify which ones are safe to carry experiments out with.

Can I identify the purpose of different components in a circuit?	**Identifying and classifying**  ren a simple circuit. Ask them to recreate and look at the different lentify and name main components of a circuit. What is their function? used for? CHIDLREN DO NOT NEED TO KNOW THE CIRCUIT SYMBOLS! ictures of the components with the purpose for each one.
Can I build simple series circuits?	**Identifying and classifying** Give the children the electrical equipment. Ask them to build a simple circuit with a cell, two wire and a bulb. What happens? Can they draw the circuit without using the circuit symbols. Give them different components to try- 2 bulbs, 3 wires and a cell/ a cell, two wires and a buzzer. Can they draw the circuit and make it? Do they all work? Why? Why not?
Can I explain what is needed to light a lamp?	**Pattern Seeking** Explore ways in which simple circuits are constructed and explain the patterns and observations found. Ask the children to make a simple series circuit. E.g. 1 lamp, 2 cells and wires. Remove a wire. What happens? Why? Give the children other scenarios on cards on different tables in a carousel- e.g. remove the battery, unscrew the lamp. Ask the children to record in a chart what happens in each case. Complete the sentence: For a lamp to light the circuit must be <u>complete</u> from the battery to the lamp. Other statements could be sued for other components.
Can switches impact on complete circuits?	   a circuit. Make their own or a slide switch (easier). Design and test a circuit using switches. What happens when the switch is open? What happens when it is closed? When the switch is open, the lamp is off. Why are switches useful?
Can I investigate which objects are conductors and which are insulators?	**Identifying and classifying** Organise materials as to whether they are conductors or insulators (rubber, paperclips, pencil, teaspoon, coin, paper, teabag, pen etc) Explain the meanings of both of the words. Use a simple circuit to test the materials. Sort the materials into conductors and insulators.
Can I show that metals are the best conductors?	**Comparative Testing** Metals are the best conductors.

	Set up an experiment to show that metals are the best conductors. Retest the different materials. Are any of the other materials conductors or is it just metals?
Can I explain why are conductors and insulators used in different ways?	**Pattern Seeking** Notice why conductors and insulators are used in different ways inside and outside electrical appliances. Look at a cross section of a wire. What is it made from? Why? How does the plastic keep us safe? What should we do if we notice a frayed cable or wire? Ask children to label a cross section of a wire. What would they say to people to warn them about exposed wires? Can they think of any other places insulators are used on electrical appliances?

Websites
https://www.stem.org.uk/resources/community/collection/12388/year-4-electricity https://www.bbc.co.uk/bitesize/topics/zj44jxs **(some year 6 content)**

Recommended Reads		
		

Golden Thread
Electricity