Subject	Term	Unit
Science- Year 6	Spring	Electricity and light

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

Light

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows change

Electricity

- 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

National Curriculum

Light

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Electricity

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram

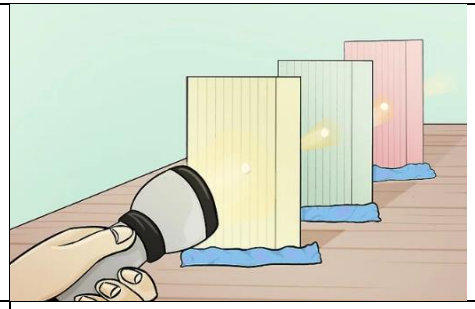
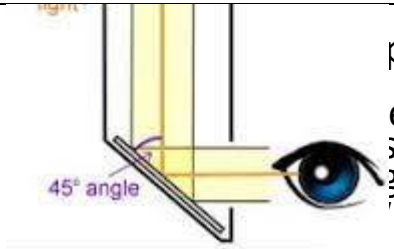
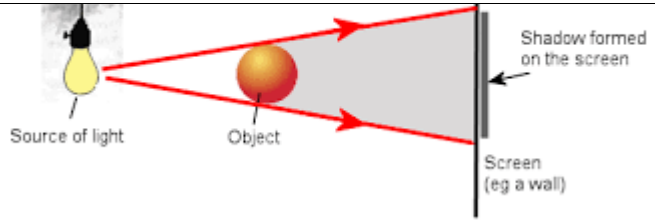
• recognise some common conductors and insulators, and associate metals with being good conductors	

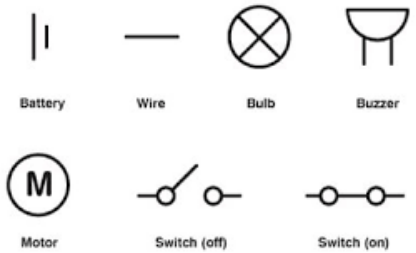
What?	This unit builds on what the children have learnt in Years 3 and 4 and develops their understanding of light and electricity. The children will learn more about how we can change electrical circuits and more about the way light travels.
Why?	These units will help the children get ready for the Key Stage 3 curriculum.
How?	Through observation and enquiry, testing different circuits. From using light sources to investigate how light travels.

Vocabulary	
Transparent	If an object is transparent, you can see through it
Translucent	A material that allows light to pass through it
Opaque	An object that you cannot see through
Shadow	A dark shape on a surface that is made when something stands between a light and surface
Reflect	When light bounces off a surface, changing the direction of a ray of light
Circuit	A complete route which an electrical current can flow around
Wire	A long, thin piece of metal that carries electrical current
Motor	A device that makes movement
Bulb	A light source

Current	The flow of electricity though a wire
Electrons	Carry energy around the circuit
Voltage	An electrical force that makes electricity move through a wire, measured in volts (V)

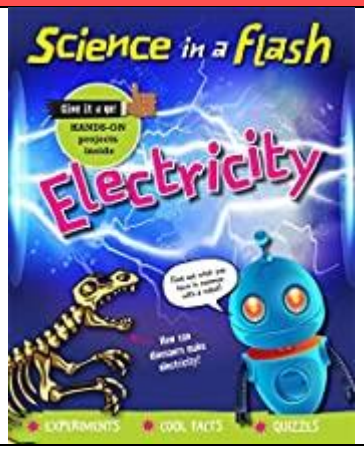
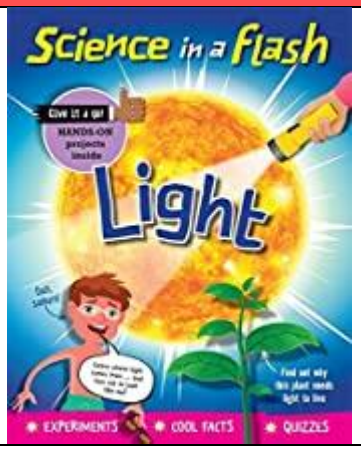
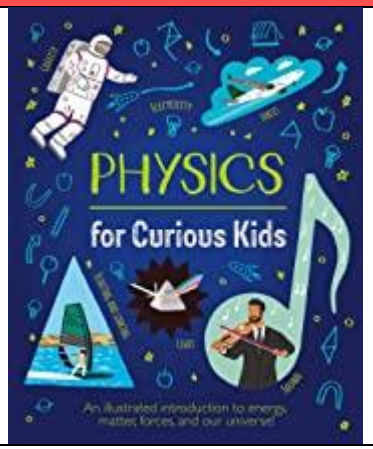
Objective	**Learning**
Can I recognise that light appears to travel in straight lines?	**Identifying and classifying** Hold a torch around the corner of a wall. Ask the children to walk around the corner. Can they still see the beams from the torch? Why not? Light travels in straight lines. Use pin hole cards to show how light travels through the slit in a straight line. Draw light travelling in straight lines from different light sources. https://www.wikihow.com/Prove-That-Light-Travels-in-a-Straight-Path

	
Can I explain the difference between a light source and a reflective surface?	**Identifying and classifying** Turn all the lights off and make it as dark as possible. Why can't we see anything? Explain that we see objects because they either give off light (they are a light source) or they reflect light (light bounces off the surface). The light must enter our eye for us to see the object. It must travel in straight lines to reach our eye. Have a range of objects or pictures for the children to classify into light sources and reflective surfaces.
Can I explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes?	 **Research** pes work. How can we see things around corners or above the es from a light source and then reflects off an object. This then s and into the eyes. g mirrors. the periscope works and how we see the objects.
Can I explain why shadows are the same shape as the object which cast them?	 **ern seeking** ising different objects- cars, action figures, shape of the shadow compared to the shape ake the shape of what made them. Because blocked, creating a shadow.

How are shadows formed and how can we change them?	**Pattern Seeking** Revisit knowledge about how shadows are formed and the objects which create them. Focus on the shapes of the shadows and why shadows are the shape of the object which creates them. Conduct an investigation into how we can change and manipulate shadows shape, length, intensity and size. Conduct and experiment identifying the key variables and observe the results. Draw conclusions from the results. Different to year 3 as they need to look at all 3 criteria- using distance, different objects for intensity of shadows etc. Plan independently.
Can I use recognised symbols when representing a simple circuit in a diagram?	 **Identifying and classifying** Teach the children the circuit symbols alongside the components and their uses which they learnt in year 4. Ask them to match the symbol to its name. Build simple circuits which they would have made in Year 4- use the symbols to draw the circuits they have made into their books.
Can I explain what happens to a component when more cells are added?	**Comparative Testing** Children can use motors/buzzer/lamps- mixture and the children can present their findings at the end. Add cells to the circuit and observe what happens. (Be careful not to pop the bulb) Why does this happen? Why would we need to do this? Record results and present findings so the children have an understanding of each component.
In what ways does the brightness of a bulb or speed of a motor change?	**Pattern Seeking/ Comparative Testing** Children to suggest ways in which changing circuits could affect the brightness of a bulb or the speed of a motor. They may then either give reasons for differences between drawings of circuits or investigate their ideas by making circuits. They need to look at increasing/decreasing the number of cells/ Adding or taking away components/ using switches/ changing the number of wires. This may take two lessons for them to test what happens with each variable and to write up their findings.

Websites

https://www.wikihow.com/Prove-That-Light-Travels-in-a-Straight-Path
https://www.bbc.co.uk/bitesize/topics/z3nnb9q
https://www.bbc.co.uk/bitesize/topics/zj44jxs/year/zncsscw

Recommended Reads		
		

Golden Thread
Electricity and light