Topic Title: Light and Electricity Year 6 Term Autumn 2

Skills Taught:

- 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.
- 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
- Using test results to make predictions to set up further comparative and fair tests.
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
- Identifying scientific evidence that has been used to support or refute ideas or arguments.

Immersion Activity/Provocation: Design and prepare a 'Festival of Light' for the classroom during the last week of term.

Key question?

How do we see things?

Big Questions:

What is an electrical circuit?

How does light travel?

What are the key symbols in a circuit diagram?

What are good electrical conductors?

How is light refracted/reflected?

Why do objects look different in water?

Do some materials absorb/reflect light better than others?

Topic Title: Light and Electricity Enquiry Question: How do we see things?

Focus Texts:

Challenge for All:

	Skills and Knowledge
Some children will:	• Ask relevant questions. • Set up simple, practical enquiries and comparative and fair tests.• Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. • Identify differences, similarities or changes related to simple, scientific ideas and processes. • Use straightforward, scientific evidence to answer questions or to support their findings. • 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 a solid object. • Find patterns in the way that the size of shadows change.
Most children will:	• Plan enquiries, including recognising and controlling variables where necessary. • Use appropriate techniques, apparatus, and materials. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. • Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further comparative and fair tests. • 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. • Understand 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 eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eye
Some children will progress further and will:	As above and- Ask questions and develop lines of enquiry based on observations. • Make predictions using scientific knowledge and understanding. • Plan and design investigations and experiments to make observations and test predictions. • Identify

	independent, dependent and control variables and other factors to be taken into account when collecting evidence and data. • Select appropriate techniques, apparatus, and materials during fieldwork and laboratory work, working safely. • Make and record observations and measurements using a range of methods for different investigations.

Enrichment/Outdoor Learning:

Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.

Links to Previous Learning:

Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.

Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions.

Key Vocabulary:

opaque translucent transparent shadow pupil iris lens eyelid reflection refraction convex concave kaleidoscope periscope rainbow prism source
cell battery switch bulb motor buzzer series parallel circuit symbol diagram

Cross-curricular links:

RE- What religions have festivals that feature light?

Celebration of knowledge and skills gained (opportunities for assessment):

Develop a 'Festival of Light' installation for the classroom using artificial light, reflection, refraction, electrical circuits/