Northfield Road Primary School
Science

Year 6 **Autumn Term**	At Northfield Road Primary School, Science is based around the 3 main areas: Biology, Chemistry and Physics. Building blocks of knowledge are an important aspect of our Science provision, as we ensure topics are planned to build upon previously taught knowledge. This gives our pupils the opportunity to make links to other topics they have been taught and also to reinforce their understanding.

Electricity – Physics
What happens to a circuit when you change components?

This unit is structured around sequential enquiries:

Enquiry 1: How does a simple circuit work?

Enquiry 2: How are electrical components represented by symbols in circuit diagrams?

Enquiry 3: What happens to a simple circuit when a component is changed?

National Curriculum Knowledge and Understanding

- 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

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	Learning Objective:	Key content and suggested lesson ideas	Suggested resources	Focus question
Enquiry 1: What are the properties of materials?				
Unit 1	LO: To understand how to construct a simple circuit	**Retrieval Practice** – What components make a up a circuit? Discuss answers. Add to the working wall as the vocabulary is introduced throughout the lesson: Circuit, cell, battery, wires, bulbs, switches, buzzers, conductors, components **Activity** – Children work in small groups, to explore making circuits using the components available (do not model this first – use as an AfL opportunity). Allow children to collect their own equipment. For additional discussion and challenge, include some components that are not traditionally part of the circuit, eg. Paper clips, scissors, pencils (sharpened at both ends), string, pipe cleaners etc. Pause the activity and ask children to share their circuits. Ask them to explain the components they have used and whether it has or has not worked. Show a circuit that has not worked and facilitate children in discussing why it has not worked and how it can be changed. Throughout the discussion, add the vocabulary that is being used to the working wall. Children should know that electricity flows through the circuit and if the circuit is not complete then the electricity cannot pass through. After the discussion, allow children to go back to their circuits and make any changes they need to.	**Learning resources:** Equipment to make electrical circuits: wires, bulbs, cells, battery holders, buzzers, motors. Equipment to add further discussion: pencil, paper clips, rubbers, etc.	Do the children understand what makes a complete circuit?

		Challenge: True or false – The minimum number of components you need you need to make a series circuit is 3. Children explore whether this is true or false and then explain their findings. Children to record their circuit in their book with a small explanation of how it works using the scientific vocabulary they have learned. **Plenary** – Show children pictures of simple circuits that do not work (photos and not diagrams with symbols) and have a class discussion as to why they don't work and how they can be fixed. This is to be put into books.		
Enquiry 2: How are electrical components represented by symbols in circuit diagrams?				
Unit 2	LO: To recognise and use the symbols for components in a circuit	**Retrieval Practice** – Have photos (not the symbols) of each component needed in a complete circuit and children name them. Ask children what electricity is used for. Discuss that it is not just the appliances in our homes, but lots of things in our world run on or use electricity – cars, traffic lights, Christmas lights, street lamps, house alarms, fire alarms, trams etc (provide photos if needed). **Activity** – Show children examples of circuit diagrams - explain that these are used all around the world to build anything that needs electricity. Tell children that a lot of these diagrams will use symbols to show the components being used, and it is a lot easier and clearer to use symbols to draw these circuits than to try and draw a picture of the components. Explain that the symbols are used throughout the industry and are recognised nationally and internationally. Have printed on card, photos of each component, its symbol and the name of each component. In pairs or groups, children compete a matching activity.	**Learning resources:** Electrical circuit component symbols matching activity cards https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zqryn9q	Can children recognise and use scientific symbols for electrical components?

		Discuss which symbols and components were easy to match up and why, which were harder and why? Allow children to edit and correct their answers if necessary. Show children the names, symbols and photos matched up correctly (add to the working wall). https://www.bbc.co.uk/bitesize/topics/zj44jxs/articles/zqryn9q In books, give children photos of circuits and children complete a diagram using symbols. This can be differentiated by using more/ less components or by having the diagram partially drawn and children drawing in the missing symbol. **Plenary** – Display a completed matching activity where the incorrect photo of a circuit is matched with the incorrect diagram. Children to correct them and explain the mistake.		