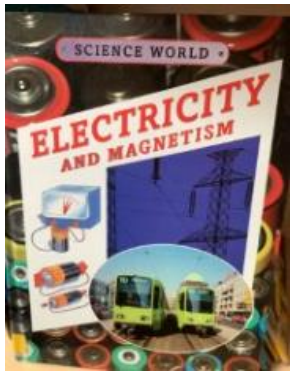
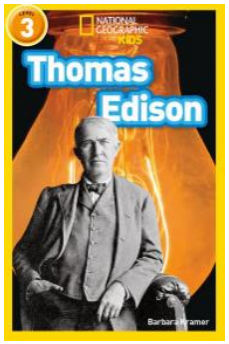
BILSTON CHURCH OF ENGLAND PRIMARY

MEDIUM TERM PLANNING

Subject	Topic/Key Question	Year Group	Term	Time Allocation
Science	Switched On (Electricity)	4	Autumn 1	7 weeks
 Library	 Library	 Library	 Library	 Reading scheme
End of lower Key stage 2 Outcomes	Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Reporting on findings from enquiries, including oral and written explanations, displays			

	or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.
End of Unit Outcomes	I can identify common appliances that run on electricity. I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. I can 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. I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I can recognise some common conductors and insulators, and associate metals with being good conductors.
Vocabulary	air resistance water resistance friction surface force effect move accelerate decelerate stop change direction brake mechanism pulley gear spring theory of gravitation Galileo Galilei Isaac Newton

Lesson Sequence	Time Allocation	Key Question/WALT	Teaching Activities E- learning links	Resources

Lesson 1 What makes it work?	2 hours	**WALT:** sort electrical products according to their power source. WILF: I can recognise items that are powered by electricity. I can identify the power source for an electrical device. I can organise and present fi ndings from sorting activity. I can recognise actions that are caused by electricity.	**Working Scientifically** Identifying differences, similarities or changes related to scientific ideas and processes. Identify common appliances that run on electricity • Create a thought shower about what they know about electricity. • Give the children cards (from twinkl) of different electrical items. • Can they sort the items into different groups – coming up with their own criteria. • Then suggest that they sort by mains power, battery power, solar power, kinetic energy. • Look at sustainable sources of electricity. • Children have a go at making a simple circuit.	Collins connect Twinkl 2 wires, cell, bulb and bulb holder.
Lesson 2	2 hours	**WALT:** make and record electric circuits.	**Working Scientifically**	Collins connect 2 wires, cell, bulb and bulb holder.

Can you light the bulb?		WILF: I can find different ways to light a bulb. I can record circuits using labelled drawings. I can apply what I have learned to connecting other components.	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables To make and record electrical circuits • Re-create the simple circuit from the previous lesson. • Discuss how the bulb lights up. • Model using the ping pong balls that model electrical flow how a complete circuit is the only way to make electricity flow. • Children to draw diagrams and explanations how to make a bulb light up. • Children then to experiment to see if they can make the light bulb work in a different way using electrical equipment.	Ping pong ball for electrical flow.
Lesson 3 How does a circuit work?	2 hours	**WALT:** explain, using a model, how an electrical circuit works. WILF: I can describe what is happening in the circuit. I can use annotated	**Working Scientifically** Reporting on findings from enquiries, including oral written explanations, displays or presentations of results and conclusions. Investigating complete and incomplete circuits. • Review some topic vocabulary with the class. • Look at pictorial examples of complete and incomplete circuits, discuss why some will work and others won't. Refer to the need for a circuit to be complete from prior learning in lesson 2.	Collins Connect Twinkl Image cards of complete and incomplete circuits. Wires, cells, bulbs and bulb holders.

		drawings to explain how a circuit works	• Using images, make and test circuits to see if they are complete or incomplete (**NB ensure that all equipment works as you can develop misconceptions if it doesn't**) • Discuss with the children the electrical safety involved with working with electricity. • Design a poster about electrical safety including how a circuit works.	
Lesson 4 Why doesn't it work?	2 hours	WALT: identify and correct problems with circuits. WILF: I can recognise circuits which are not complete. I can identify what is causing a circuit not to work. I can describe, using labelled drawings, what to do to make a circuit work	**Working Scientifically** Setting up simple practical enquiries and recording, classifying and presenting data in a variety of ways to help answer questions. Investigate which materials are electrical conductors and insulators • Review what makes a circuit complete and incomplete and discuss how a circuit can be broken. • Give the children a range of both conductors and insulators materials and ask the children to identify what they are. E.g. wood, plastic, metal etc. • Discuss the difference between a conductor and insulator – relate this to in/complete circuits. • Give the children resources to make a simple circuit and model how to test whether a material is a conductor/insulator. • Children test the materials. • Record in tables	Range of conductors/insulators. Collins Connect Twinkl Wires, cells, bulbs and bulb holders.

			• Discuss findings/patterns and draw conclusions.	
Lesson 5 What does a switch do?	2 hours	WALT: describe what a switch does and how it works. WILF: I can make circuits which include switches. I can record my circuits using labelled drawings. I can explore and explain how simple switches work. I can make a simple switch.	**Working Scientifically** Using results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further questions. Investigating switches. • Illicit from the children their understanding of the role of a switch. • Link the purpose of a switch to insulators/conductors and in/complete circuits. • Identify the different types of switches and give them a name – discuss the purpose and application of different types of switches. • Model how to make a variety of the switches using paper clips, split pins, bulldog clips and card. • Children to test these switches in a simple circuit and explore which is the most effective. • Evaluate the different switches that are made.	Collins Connect Twinkl Wires, cells, bulbs and bulb holders. Lots of paper clips, split pins, bulldog clips, small squares of card.
Lesson 6 How can we connect up the	2 hours	**WALT**: make an electric quiz board by applying their knowledge of electrical circuits. WILF:	**Working Scientifically** Using straightforward scientific evidence to answer questions or to support their findings. To make an electric quiz board by applying their knowledge of electrical circuits.	Laptops

quiz board?		I can identify how an electric quiz board works. I can write suitable questions and answers. I can connect the quiz board so that the questions are matched to the correct answers.	• Share with the children a model of a working quiz board. • Model to the children how to set up the quiz using the principal of a circuit being made complete/incomplete by matching the question to the correct answer. • Model the children how to design the game in a desktop publishing programme – Publisher. • Children to use a template frame. • Ask the children to come up with 5 questions and answers (could be linked to scientific knowledge or topic based) • Show the children how to not line the Q and As up. • Children to configure the design and import images from a folder to develop the aesthetics of the game.	
Lesson 7 How can we connect up the quiz board?	2 hours	WALT: make an electric quiz board by applying their knowledge of electrical circuits. WILF: I can identify how an electric quiz board works.	**Working Scientifically** Using straightforward scientific evidence to answer questions or to support their findings To make an electric quiz board by applying their knowledge of electrical circuits. • Model the children how to wire the quiz board together on the back of the game. • Children to wire the game so that they are creating the circuits. • Play and test their game with another group.	Wire, cells, card, bulbs, printed out quiz sheets. Wire tape.

		I can write suitable questions and answers. I can connect the quiz board so that the questions are matched to the correct answers		