Question: Could you design the next Fortnight?

National Curriculum Link

International Baccalaureate Learner Profile Link

Inquirers – Nurture skills for research and curiosity

Knowledgeable – Develop conceptual understanding and engage with issues and ideas

Communicators – Express yourself confidently and work cooperatively to solve problems

Thinkers – Use critical and creative thinking skills

Reflective – Consider the wider world and our own ideas and experience

Risk-takers – Work independently and cooperatively to explore ideas and innovative strategies

Critical Learning

- Identify and name the basic part in a series circuit, 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
- Investigate materials to identify that metals with being good conductors

Key Vocabulary

Circuit
Cells / bulbs / wires
Power / voltage
Brightness / loudness
Flow
Safety
Conductor / insulator

Prior Skills – Y3 (Light)

- Understand that electricity can produce light
- Recognise that they need light in order to see things
- Recognise that dark is the absence of light
- Make and record a prediction before testing
- Measure using different equipment and units of measure
- Record their observations in different ways (labelled diagrams, charts etc.)
- Describe what they have found using scientific words
- Make accurate measurements using standard units
- Explain what they have found out and use their measurements to say whether it helps to answer their question

Prior Skills – Y4

- Identify common appliances that run on electricity
- Construct a simple series electric circuit
- Identify and name the basic part in a series circuit, 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
- Associate a switch opening with whether or not a lamp lights in a simple series circuit
- Recognise some common conductors and insulators
- Investigate materials to identify that metals with being good conductors
- Ask a variety of scientific questions
- Make systematic and careful observations
- Set up a simple fair test to make comparisons
- Plan a fair test and isolate variables and explain why it was fair and explain which variables have been isolated
- Suggest improvements and predictions
- Decide which information needs to be collected and

New Skills – Y6

- Identify, name and use the basic parts of a simple electric series circuit (cells, wires, bulbs, switches, buzzers, motors)
- Use recognised symbols when representing a simple circuit in a diagram.
- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells (batteries) 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
- Ask a variety of types of scientific questions
- Choose the most appropriate scientific enquiry method to answer a question and outline the method
- Plan and carry out an investigation by controlling variables fairly and accurately
- Make predictions based on scientific knowledge

	decide which is the best way for collecting it • Use findings to draw a simple conclusion • Report on findings from enquires in a range of different ways, including oral and written explanations.	• Draw conclusions from observations and findings based on scientific knowledge • Report and present findings from enquiries, including conclusions in oral and written forms such as displays and other presentations

Knowledge, Skills and Understanding

- Identify, name and use the basic parts of a simple electric series circuit (cells, wires, bulbs, switches, buzzers, motors)
- Use recognised symbols when representing a simple circuit in a diagram.
- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells (batteries) 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

Knowledge, Skills and Understanding for Working Scientifically

- Ask a variety of types of scientific questions
- Choose the most appropriate scientific enquiry method to answer a question and outline the method
- Plan and carry out an investigation by controlling variables fairly and accurately
- Make predictions based on scientific knowledge
- Draw conclusions from observations and findings based on scientific knowledge
- Report and present findings from enquiries, including conclusions in oral and written forms such as displays and other presentations

Challenge for children working at great depth

- Can they make their own game or something similar?
- Can they explain the danger of short circuits?
- Can they explain what a fuse is?

Resources

- batteries of different voltages, wires, bulbs and/or buzzers for circuit construction
- electric motor
- games powered by batteries
- metal wire buzzer game
- circuit diagrams of 'real' systems *eg household appliances*
- diagrams of simple circuits
- fuse wires of different thickness and made from different materials

Website/Apps

http://www.andythelwell.com/blobz/guide.html
Good website to use at home (blocked in school)
http://www.learningkids.com/experiments.asp
Ideas for a game - Steady hand tester.
http://www.channel4learning.net/sites/essentials//science/worksheets/4F.doc
http://powerup.ukpowernetworks.co.uk/powerup/en/teachers-parents/interactives/
Seneca
Oak Academy
SIL Low Stakes Quizzes

Suggested Quality Texts

Kingfisher Light and Energy
Day and Night by Jay Richardson

Assessment ideas

Construct a working circuit, photograph and label then draw with symbols.

Writing Opportunities

Instructions for working circuit / game / clock / etc.

Cross Curricular Links

Literacy/DT: Look at a range of board games that require batteries and evaluate them. Use ideas and knowledge of circuits to create a game which requires and light to come on, a buzzer to sound or a motor to move something. Link to ticking clocks DT topic and add flashing lights or a light by use of a switch. The children will need to use their expertise for designing and making to create this product.