CYCLE A Spring	Years 3 and 4	Lead Subject (s)	Science	Topic	Can you hear a spark?	Local Context	Scott Jenner Pederson Tyndale Isambard Kingdom Brunel Berkeley Castle River Severn The Sharpness Canal Dursley & the Wool Trade St Martins Church Renishaws The Battle of Nibley Green

NATIONAL CURRICULUM

Science LKS2 –
Working Scientifically:

- 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
- 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.

Light –
Y3 Pupils should be taught to:

- 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.

Y6 Pupils should be taught to:

- 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.

Sound
Y4 - Pupils should be taught to:

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases.

Electricity –
Y4 Pupils should be taught to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches & 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
- recognise some common conductors and insulators, and associate metals with being good conductors.

Y6 Pupils should be taught to:

- 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.

LEARNING

SCIENCE

	Key Question	Activity	Learning
1	How do we see?	Sorting sources of light into artificial and natural Parts of an eye - labelling	What light sources are in every day life (artificial and natural) How the eye works to help us see
2	What is reflection?	Using prisms and mirrors to reflect light	What reflection means How to reflect a light How to use a mirror or prism to reflect or split light into colours
3	How do we protect our eyes?	Create a poster / leaflet to warn of dangers to the eye and how to prevent this	How the sun rays can cause damage to the eye
4	What is a shadow? How do they change throughout the day?	Shadows in playground throughout the day. Shadow puppets – explore.	Shadows are formed when light is partially How transparent, translucent and opaque materials affect this
5	How are sounds made?	Tuning forks to demonstrate vibrations Drum and rice experiment to demonstrate vibrations	Sound is made by vibrations / sound waves Vibrations travel through a medium to the ear
6	How does our ear hear?	Labelling picture of ear Fill in blanks to explain how the ear hears	Structure of the ear and how this helps us hear
7	What is pitch?	Use instruments to create high and low pitch sounds	You can have high and low pitches – we can change these e.g. using instruments
8	What is volume?	How much can you hear when you move away from a sound source? Create a line graph	How volume is affected when you are closer / further from a sound source
9	What is electricity?	Mains or battery operated	How electricity works using mains or batteries
10	How do we make a complete circuit?	Explore how to create a simple circuit – what does it need to work?	What components are needed to create a lit bulb in a circuit How other components affect a circuit How to draw this using key/symbols
11	How do we create a brighter bulb or louder buzz?	Explore how to alter a circuit given different criteria	How voltage affects bulb, buzzers and motors
12	What is a conductor and an insulator?	Which allow electricity to pass through investigation	Metals are good conductors of insulators

VOCABULARY

- words and phrases related to sound e.g. volume, pitch, high, low, vibrations, sound waves, labelling ears
- words and phrases related to light e.g. light, dark, reflect, prism, blocking, opaque, transparent, translucent, shadow, labelling eyes,
- words and phrases related to circuits e.g. battery, cell, wire, crocodile clip, bulb, light, switch, on, off, buzzer, motor, simple circuit, key, symbol, open, close, conductor, insulator

OPPORTUNITIES FOR EXTENDED WRITING

- To write a comic strip instruction set for how we hear sounds
- To create a poster encouraging electrical safety/warning against dangers
- To write an information leaflet about how the movement of the sun creates different shadows
- To write up a conclusion based on the D&T project

D&T KS2
Pupils should be taught to:
Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

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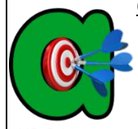
CROSS-CURRICULAR I.C.T. Opportunities, Key Stage 2
(COMPUTING TAUGHT DISCRETELY)
Pupils should be taught to:

- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.



<u>OUTCOMES</u>

SCIENCE
Y3.1 Set up simple fair tests
Y3.2 Collect and present data from scientific experiments
Y3.3 Use results from experiments to draw simple conclusions or suggest improvements
Y4.1 Take accurate measurements using a range of scientific apparatus
Y4.2 Present findings using tables, graphs and charts as appropriate
Y4.3 Use straightforward evidence in support of ideas
Y3.8 Notice that light is reflected from surfaces
Y3.9 Find patterns in the way that the sizes of shadows change
Y3.10 Group materials according to their magnetic properties
Y4.9 Recognise that vibrations from sounds travel through a medium to the ear
Y4.10 Construct a simple series electrical circuit, identifying and naming its basic parts
Y6.9 Explain that we see things which either give out or reflect light
Y6.9 Explain how the number of voltage of cells affects bulbs, buzzers or motors in a circuit
Y6.10 Use recognised symbols when representing a simple circuit in a diagram

D&T
Year 3
1. Can they show that their design meets a range of requirements? 2. Can they put together a step-by-step plan which shows the order and also what equipment and tools they need? 3. Can they describe their design using an accurately labelled sketch and words? 4. How realistic is their plan?
5. Can they use equipment and tools accurately?
6. What did they change which made their design even better?
Year 4
1. Can they come up with at least one idea about how to create their product? 2. Do they take account of the ideas of others when designing? 3. Can they produce a plan and explain it to others? 4. Can they suggest some improvements and say what was good and not so good about their original design?
5. Can they tell if their finished product is going to be good quality? 6. Are they conscience of the need to produce something that will be liked by others? 7. Can they show a good level of expertise when using a range of tools and equipment?
8. Have they thought of how they will check if their design is successful? 9. Can they begin to explain how they can improve their original design? 10. Can they evaluate their product, thinking of both appearance and the way it works?

Pupils' spiritual development is shown by their:

- Use of imagination and creativity in their learning
- Willingness to reflect on their experiences
- Beliefs, religious or otherwise, which inform spiritual development appertains to children's perspective on life and their interest in and respect for different people's feelings and values
- Sense of enjoyment and fascination in learning about themselves, others and the world around them, including the intangible

<u>School Values</u>
Responsibility & Social Justice
Friendship Perseverance Respect
Compassion Forgiveness Hope
Service Thankfulness & Generosity

<u>FAITH</u>
By demonstrating openness to the fact that some answers cannot be provided by Science.
By creating opportunities for pupils to ask questions.
By promoting a sense of awe and wonder in the created world.

<u>FUN</u>

- Using the iPads to play electrical safety games
- Watching video clips linked to sound work
- Creating a switchboard game for other children to play

<u>Partnerships & Community</u>

Homework help

<u>VISITS & VISITORS?</u>

<u>As independent learners we…</u>
Get Organised
Have a go
Concentrate
Push Ourselves
Support Others
Show excellent manners
Enjoy success!

"Live life to the full" The words of Jesus, John 10:10