ST BARTHOLOMEW'S C of E PRIMARY SCHOOL

'Roots to Grow and Wings to Fly'

Curriculum Progression Document

Science

Contents

Curriculum Intent

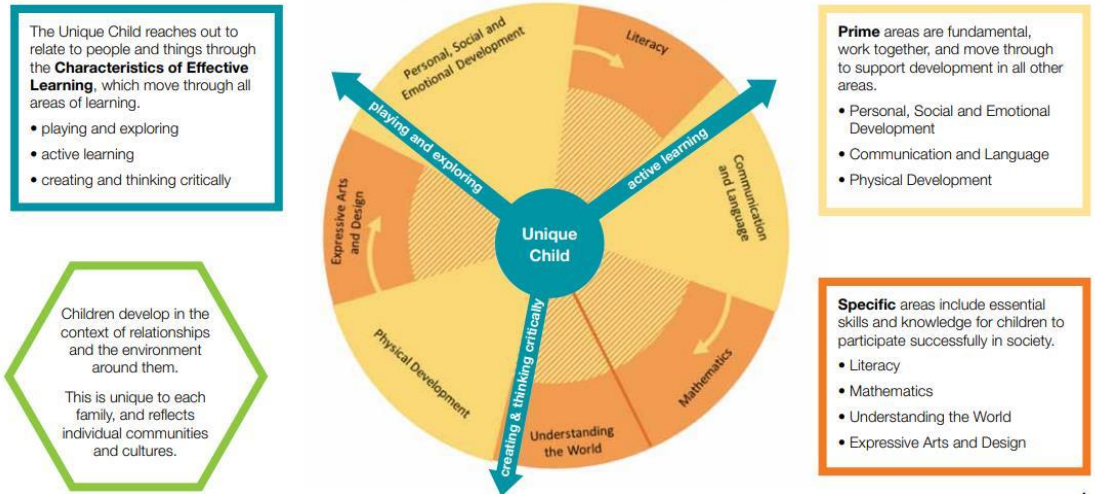
Intent - Our aim is to encourage our children to be inquisitive throughout their time at the school and beyond. We intend to prepare our children for life in an increasingly scientific and technological world. Through investigative science, our children will deepen their respect for the natural world and all its phenomena, and increase their care and appreciation of it.

This vision is achieved by:

- A curriculum that is built upon a healthy curiosity about our universe and promotes respect for the living and non-living
- A curriculum that develops scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- A curriculum that develops understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them

Science in The Early Years Foundation Stage

Each area of the EYFS curriculum has an **Early Learning Goal**, which is the standard that a child is expected to achieve by the end of their reception year. The ELG (Early Learning Goals) covers all of the 7 areas of learning as specified in the Early Years Foundation Stage Curriculum.



The following link to the teaching and learning of Science in our EYFS:

ELG: Understanding of the World: People and Communities
Children at the expected level of development will: • Children know about similarities and differences in relation to places, objects, materials and living things. • They talk about the features of their own immediate environment and how environments might vary from one to another. • They make observations of animals and plants and explain why some things occur and talk about changes.

KS1 YEAR C (2022-23)	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2	Early Learning Goal
THEME	**Over the hills and far away**	**Lest we forget**	**From Crewkerne to the rainforest**	**Sweet like Chocolate**	**Reduce, Reuse, Recycle**	**Pyramids, Mummies and Tombs**	
The Natural World	To ask questions about the natural environment. To respect and care for the natural environments To know about features of the world and Earth	To know about and recognise the signs of Autumn	To know about and recognise the signs of Winter To know some important processes and changes in the natural world including states of matter (freezing) To know about features of my own immediate environment and how they might vary from another. (Crewkerne) To know the different between herbivores and carnivores	To know about and recognise the signs of Spring To plant seeds (to harvest in the summer term) To know some important processes and changes in the natural world including states of matter (Melting)	To observe the growth of seeds and talk about changes To know how to care for growing plants To learn about lifecycles of plants and animals To know that some animals are nocturnal To know about different habitats	To know about and recognise the signs of Summer To know that some things in the world are man-made and some things are natural To harvest grown fruit and vegetables To know some important processes and changes in the natural world including states of matter (floating and sinking)	Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them including the season and changing states of matter.

Science and the National Curriculum: Key Stage One

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly- constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Pupils should be taught about:

- Working scientifically by asking simple questions and recognising that they can be answered in different ways, observing closely, using simple equipment, performing simple tests, identifying and classifying, using their observations and ideas to suggest answers to questions, gathering and recording data to help in answering questions.

Year 1

- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
- Identify and describe the basic structure of a variety of common flowering plants, including trees.
- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
- Identify and name a variety of common animals that are carnivores, herbivores and omnivores.
- Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets.)

- Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
- Distinguish between an object and the material from which it is made.
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Describe the simple physical properties of a variety of everyday materials.
- Compare and group together a variety of everyday materials on the basis of their simple physical properties.

Pupils should be taught to:

- Observe changes across the four seasons.
- Observe and describe weather associated with the seasons and how day length varies.

Year 2

- Explore and compare the differences between things that are living, dead, and things that have never been alive.
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.
- Identify and name a variety of plants and animals in their habitats, including micro- habitats.
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.
- Observe and describe how seeds and bulbs grow into mature plants.
- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
- Notice that animals, including humans, have offspring which grow into adults.
- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
- Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
- Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
- Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Science and the National Curriculum: Lower Key Stage Two

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Pupils should be taught about:

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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.

Pupils should be taught to: Year 3

- Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.
- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
- Investigate the way in which water is transported within plants.
- Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
- Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.
- Identify that humans and some other animals have skeletons and muscles for support, protection and movement.
- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
- Recognise that soils are made from rocks and organic matter.
- 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.
- Compare how things move on different surfaces.
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance.
- Observe how magnets attract or repel each other and attract some materials and not others.
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials.
- Describe magnets as having two poles.
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Year 4

- Recognise that living things can be grouped in a variety of ways.
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
- Recognise that environments can change and that this can sometimes pose dangers to living things.
- Describe the simple functions of the basic parts of the digestive system in humans.
- Identify the different types of teeth in humans and their simple functions.
- Construct and interpret a variety of food chains, identifying producers, predators and prey.
- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

- 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.
- Identify common appliances that run on electricity.
- Construct a simple series electrical circuit, identifying and naming its basic parts, 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 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.

Science and the National Curriculum: Lower Key Stage Two

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

'Working and thinking scientifically' is described separately at the beginning of the programme of study but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell and pronounce scientific vocabulary correctly.

Pupils should be taught about:

- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
- 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.

Pupils should be taught to: Year 5

- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
- Describe the life process of reproduction in some plants and animals.
- Describe the changes as humans develop to old age.
- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
- Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.

- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
- Describe the movement of the Moon relative to the Earth.
- Describe the Sun, Earth and Moon as approximately spherical bodies.
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Year 6

- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro- organisms, plants and animals.
- Give reasons for classifying plants and animals based on specific characteristics.
- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
- Describe the ways in which nutrients and water are transported within animals, including humans.
- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
- 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.
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Whole School Programme of Study

Year C = 2022 - 2023

	Autumn 1	***Autumn 2***	***Spring 1***	***Spring 2***	***Summer 1***	***Summer 2***
KS1	Seasonal Changes Part 1	Every day Materials	Living things and their habitats	Seasonal Changes Part 2	Plants	Animals including humans
KS2	Electricity	States of Matter	Living things and their habitats	Light	Plants	Sound

Year D = 2023 – 2024

	Autumn 1	***Autumn 2***	***Spring 1***	***Spring 2***	***Summer 1***	***Summer 2***
KS1	Every day Materials	Seasonal Changes Part 1	Living things and their habitats	Plants	Seasonal Changes Part 2	Animals including humans
KS2	Earth and Space	Rocks and fossils	Forces and Magnets	Evolution and inheritance	Living things and their habitats	Animals including humans

Year A = 2024 – 2025

	Autumn 1	***Autumn 2***	***Spring 1***	***Spring 2***	***Summer 1***	***Summer 2***
KS1	Seasonal Changes Part 1	Every day Materials	Living things and their habitats	Seasonal Changes Part 2	Plants	Animals including humans
KS2	Electricity	States of Matter	Living things and their habitats	Light	Plants	Sound

Year B = 2025 – 2026

	Autumn 1	***Autumn 2***	***Spring 1***	***Spring 2***	***Summer 1***	***Summer 2***
KS1	Every day Materials	Seasonal Changes Part 1	Living things and their habitats	Plants	Seasonal Changes Part 2	Animals including humans
KS2	Earth and Space	Rocks and fossils	Forces and Magnets	Evolution and inheritance	Living things and their habitats	Animals including humans

Reasoning Behind our Science Curriculum

STAGE	TOPIC	WE TEACH THIS SO …	LINKS TO ST BARTS SCHOOL LIFE …
KS1	Animals including humans	• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	**Christian Values:** Respect / Compassion / Hope / Trust
KS1	Everyday Materials	• distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching •	**Christian Values:** Respect / Compassion / Trust
KS1	***Plants***	• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees • observe and describe how seeds and bulbs grow into mature plants	**Christian Values:** Respect / Compassion / Hope / Trust

		• find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	
KS1	***Seasonal Change***	• observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies	**Christian Values:** Respect / Compassion / Trust
KS1	***Living things / Habitats***	• explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including micro-habitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	**Christian Values:** Respect / Compassion / Trust
KS1	***Working Scientifically*** ***RUNS THROUGH ALL TOPICS***	• Asking simple questions and recognising that they can be answered in different ways • Observing closely, using simple equipment • Performing simple tests • Identifying and classifying • Using their observations and ideas to suggest answers to questions • Gathering and recording data to help in answering questions	**Christian Values:** Respect / Compassion / Trust / Forgiveness / Hope / Courage

STAGE	TOPIC	WE TEACH THIS SO …	LINKS TO ST BARTS SCHOOL LIFE …
LKS2	***Living Things / Habitats***	• Recognise that living things can be grouped in a variety of ways • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • Recognise that environments can change and that this can sometimes pose dangers to living things.	**Christian Values:** Respect / Compassion / Hope / Trust
UKS2	***Living things / habitats***	• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • Describe the life process of reproduction in some plants and animals. • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics.	**Christian Values:** Respect / Compassion / Hope / Trust
LKS2	***Animals including humans***	• Identify that humans and some other animals have skeletons and muscles for support, protection and movement. • Identify the different types of teeth in humans and their simple functions • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • Describe the simple functions of the basic parts of the digestive system in humans • Construct and interpret a variety of food chains, identifying producers, predators and prey.	**Christian Values:** Respect / Compassion / Hope / Trust
UKS2	***Animals including humans***	• Describe the changes as humans develop to old age. • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Describe the ways in which nutrients and water are transported within animals, including humans.	**Christian Values:** Respect / Compassion / Hope / Trust
UKS2	***Evolution***	• Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	**Christian Values:**

		• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Respect / Compassion / Hope / Trust
LKS2	***Plants***	• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • Investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	**Christian Values:** Respect / Compassion / Hope / Trust
LKS2	***Rocks***	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • Describe in simple terms how fossils are formed when things that have lived are trapped within rocks • Recognise that soils are made from rocks and organic matter.	**Christian Values:** Respect / Trust
LKS2	***Forces and Magnets***	• Compare how things move on different surfaces • Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • Describe magnets as having 2 poles • Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	**Christian Values:** Respect / Trust / Compassion
UKS2	***Forces***	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	**Christian Values:** Respect / Trust / Compassion

		• Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	
LKS2	***Electricity***	• Identify common appliances that run on electricity • Construct a simple series electrical circuit, identifying and naming its basic parts, 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 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.	**Christian Values:** Respect / Trust / Courage
UKS2	***Electricity***	• 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 switche • Use recognised symbols when representing a simple circuit in a diagram.	**Christian Values:** Respect / Trust / Courage
LKS2	***Sound***	• 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	**Christian Values:** Respect / Trust / Compassion
LKS2	***Light***	• 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.	**Christian Values:** Respect / Trust / Compassion

UKS2	***Light***	• 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	**Christian Values:** Respect / Trust / Compassion
LKS2	***States of Matter***	• Compare and group materials together, according to whether they are solids, liquids or gases • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**Christian Values:** Respect / Trust
UKS2	***Properties and Changes of Materials***	• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • Demonstrate that dissolving, mixing and changes of state are reversible change • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	**Christian Values:** Respect / Trust
UKS2	***Earth and Space***	• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system • Describe the movement of the Moon relative to the Earth • Describe the Sun, Earth and Moon as approximately spherical bodies	**Christian Values:** Respect / Compassion / Hope / Trust / Courage

		• Use the idea of the Earth's rotation to explain day and night, and the apparent movement of the sun across the sky.	
KS2	***Working Scientifically*** ***RUNS THROUGH ALL TOPICS***	• 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.	**Christian Values:** Respect / Compassion / Trust / Forgiveness / Hope / Courage

Science Vocabulary

KS1 Science Vocabulary

Plants	Materials	Animals and Humans	Seasons	Living things and habitats
Year 1 Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Year 2 light, shade, sun, warm, cool, water, grow, healthy, germinate	Year 1 Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through Year 2 Properties of materials - as for year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/puling, twist/twisting, squash/squashing. Bend/bending, stretch/stretching	Year 1 – Animals Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Year 1 – Senses Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue Year 2 Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length, monsoon, khareef, thunder storm	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.

LKS2 Science Vocabulary

Electricity	States of Matter	Sound	Sources of light	Plants	Living things / habitats
Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate
Rocks	**Forces and Magnets**	**Skeletons / Teeth**	**Nutrition and digestion**		
Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain		

UKS2 Science Vocabulary

Earth and Space	Properties and Changes of Materials	Living things / habitats	Evolution
Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material	Year 5 Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings Year 6 Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils

Animals, including humans	Light	Electricity	Forces
Year 5 Vocab to be decided alongside PSHE puberty topic **Year 6** Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle	As for year 3 plus straight lines, light rays.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage - NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears

Progression in Science

Plants

	Year 1	Year 2
Biology - Plants	To identify and describe the basic structure of a variety of common plants and trees (leaves, flower, stem etc.)	
	To identify and name a variety of common wild and garden plants including deciduous and evergreen trees	
	To observe the growth of flowers and vegetables I have planted	To observe and describe how seeds and bulbs grow into mature plants.
		To describe how plants need water, light and a suitable temperature to grow and stay healthy
	To explore and study plants growing in our environment throughout the year	
	To carefully observe and group plants	To compare, contrast and sort plants based on observations

	Year 3	Year 4	Year 5	Year 6
Biology - Plants	To identify and describe the functions of different parts of flowering plants (flowers, leaf, stem, root)		To identify and describe the functions of a number of parts of flowering plants	
	To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	To investigate different methods of seed dispersal in a plant	To name the male and female parts of the flower (stamen, stigma, carpel, anther, filament, ovule, ovaries and stile) and know their role	To describe the life processes of reproduction in some plants
			To find out about different types of reproduction in plants (including sexual and asexual)	
	To explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room)		To investigate how changing the living conditions of a plant will affect it	To know that plants have different needs to be healthy at different stages in their life cycles
	To know how the requirements of plants to live and grow vary from plant to plant		To observe and compare the life cycles of plants in my local environment and others around the world	
	To group plants into categories based upon characteristics		To classify and sort plants based upon complex characteristics giving reasons for decisions	To reason where unfamiliar plants belong in a classification system
	To investigate the way in which water is transported within plants		To be able to describe how water is transported in plants	

Animals and Humans

Biology - Animals including humans	Year 1	Year 2
	To understand how to take care of familiar animals, including those from their local environment	To investigate and describe the basic needs of animals, including humans, for survival (food, water, air)
	To be aware of why exercise is important for good health	To describe the importance for humans of exercise and eating the right amounts of different food
	To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals)	To know the names of some of the major bones in humans
	To identify, name, draw and label the basic parts of the human body	To know that humans and other animals have muscles
	To say which part of the body is associated with each sense	
	To know how and why to brush my teeth	To know the importance of visiting the dentist; how to brush teeth correctly; food and drink that support dental health
	To know how and why to keep myself clean	To know and practice simple hygiene routines that can stop germs from spreading
	To say how they are similar and different to their friends	To recognise the ways in which we are all unique
	To name the main parts of the body including external genitalia (vagina, penis, testicles, nipples, anus)	To name the main parts of the body including external genitalia (vagina, penis, testicles, nipples, anus)
	To understand growing and changing from young to old	To understand growing and changing from young to old and how people's needs change

Biology – Animals Including humans	Year 3	Year 4	Year 5	Year 6
	To know that animals, including humans, need the right types and amount of nutrition	To know about the need for food for activity and growth and about the importance of an adequate and varied diet for health	To research different food groups and how they keep us healthy	To recognise the impact of diet, exercise, drugs and lifestyle on the way my body functions (RSHE)
	To know that animals, including humans, cannot make their own food; they get nutrition from what they eat.		To compare and contrast the diets of different animals	
	To identify that humans, and some other animals, have skeletons for support and protection		To identify and group vertebrates and invertebrates and compare their movement	
	To identify that humans, and some other animals, have muscles for support and movement		To name some of the major bones and muscles in the human body	
	To know the main body parts associated with the skeleton and muscles.		To know the skeleton and muscular system work together for movement	
	To know that different parts of the body have special functions	To recognise and name the major organs in the human body	To recognise, name and give the importance of the major organs in the human body	To understand the roles of the major organs, bones and muscles in the human body
	To know some of the organs involved in the digestive system	To describe the simple functions of the basic parts if the digestive system in humans		To describe the ways in which nutrients and water are transported within animals, including humans
	To know the importance of visiting the dentist; how to brush teeth correctly; food and drink that support dental health	To investigate what can damage teeth and how to look after them	To know about dental health and the benefits of good oral hygiene and dental flossing, including regular check-ups at the dentist.	
	To identify the different types of teeth in humans and their simple functions	To compare the teeth of carnivores and herbivores	To suggest reasons for the differences in the teeth of carnivores and herbivores	To make predictions about what an animal eats based upon its teeth
			To identify and name the main parts of the human circulatory system	To describe the functions of the heart, blood vessels and blood

	To recognise the ways in which we are all unique	To recognise their individuality and personal qualities	To know that our personal identity is made of many factors (e.g. ethnicity, family, gender, faith, culture, hobbies, likes/dislikes)
	To name the main parts of the body including external genitalia (vagina, labia, penis, foreskin, testicles, nipples, anus)	To identify and name the external genitalia and internal reproductive organs in males and females (vagina, major and minor labia, clitoris, ovary, oviduct, uterus, cervix: penis, testis, foreskin, scrotum: breast, nipple, anus)	
	To draw timelines to indicate stages of growth and developments of humans (including menstruation during puberty)	To know the physical and emotional changes that happen when approaching and during puberty (including menstruation, key facts about the menstrual cycle and menstrual wellbeing, erections and wet dreams)	
		To know how hygiene routines change during the time of puberty, the importance of keeping clean and how to maintain personal hygiene ★	
		Y6 To understand the processes of reproduction and birth as part of the human life cycle; how babies are conceived and born (and that there are ways to prevent a baby being made); how babies need to be cared for	
		Y6 To understand the role of breastfeeding as a natural and normal part of child care and that it may not be possible for every family ★	

Evolution and inheritance

	Year 3	Year 4	Year 5	Year 6*
Biology - Evolution and inheritance			To recognise that living things have changed over time	To understand how and why living things have changed over time
			To understand that some characteristics can be passed from one generation to the other.	To recognise that living things produce offspring of the same kind, but that offspring vary and are not identical to their parents
				To recognise that adaptations may make offspring more likely to survive.
			To identify some ways in which animals from different environments are adapted for the places in which they live	To recognise that adaptations may lead to evolution
				To identify how animals and plants are adapted to suit their environments in different ways

Living Things

Biology – Living things and their habitats	Year 1	Year 2
	To have explored come local habitats and looked at the living creatures found there	To identify and name a variety of plants and animals in their habitats including micro-habitats
	To identify and name a variety of common animals including fish, amphibians, reptiles birds and mammals	
	To sort things in to living or not living	To explore and compare the differences between things that are living, dead and things that have never been alive.
	To know some animals that can be found in familiar habitats	To know how different animals and plants depend on each other
	To know that a habitat is a home for a variety of plants and animals	To identify that most living things live in habitats to which they are suited
	To know that some animals eat plants and some animals eat other animals	To describe how different habitats provide for the basic needs of different kinds of animals and plants
	To identify and name a variety of common animals that are carnivores, herbivores and omnivores	To describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify different sources of food
	To know that some familiar animals change throughout their lives	To notice that animals, including humans have offspring which grow into adults
		To investigate the life cycles of a variety of familiar animals and insects

Biology – Living things and their habitats	Year 3	Year 4	Year 5	Year 6
	To understand that plants and animals are alive and that they feed, grow and reproduce		To reason whether something is or is not alive using the full range of characteristics (Mrs Gren)	
	To recognise that living things can be grouped in a variety of ways	To group animals using the categories: vertebrate: amphibian, reptile, mammal, fish and bird, invertebrate: Slugs, worms insects spiders	To describe how living things are classified into broad groups according to common observable characteristics including microorganisms, plants and animals	
			To give reasons for classifying plants and animals based on specific characteristics	
	To use classification keys to assign living things to groups	To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	To understand that broad classifications can be subdivided	
			To apply classification keys to animals from their local environment and those which are unfamiliar	
	To recognize how animals in an environment can be hurt by damage to that environment	To recognise that environments can change and that this can sometimes pose dangers to living things		
		To look at the positive and negative impact of humans on environments		
	To recognise how animals and plants are adapted to the environments in which they live and how they depend upon one another			
	To explore how local habitats can change throughout the year.		To study and raise questions about their local environment throughout the year.	
	To describe reproduction in some animals		To describe the differences in the life cycles of mammals, amphibians, insects and birds	To explain differences in life cycles from animals and plants in different areas or contexts
	To construct simple food chains for familiar habitats	To construct and variety of food chains, identifying producers, predators and prey.	To use terms such as primary, secondary or tertiary consumer and top carnivore when describing animals	
			To find out about the work of some naturalists and animal behaviourists	

Materials

	Year 1	Year 2	Year 3
Chemistry- Everyday materials	To distinguish between an object and the material from which it is made	To identify and compare the suitability of a variety of different everyday materials for particular uses	To understand that everyday objects can be made by combining the properties of different materials (e.g. spoon with a metal head and plastic handle)
	To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock		
	To describe the simple physical properties of a variety of everyday materials (hard, stretchy, shiny, rough, bendy, waterproof, absorbent, opaque)	To know that the same material can have many different uses based upon its properties	
	To compare and group together a variety of everyday materials on the basis of their simple physical properties		
	To solve problems using a knowledge of the properties of different materials		To carry out tests and explore differences between materials
	I know that the shape of objects can be changed by squashing, bending, twisting and stretching	To find out how the shapes of solid objects mage from some materials can be changed by squashing, bending, twisting and stretching	To explore how some materials change when they are heated or cooled
			To be able group solids, liquids and gases

Rocks

	Year 2
Rocks – fossils	To closely observe rocks for grains, crystals and fossils with a hand lens
	To closely observe and make accurate sketches of soil make up
	To closely observe fossils

	Year 3	Year 4	Year 5	Year 6*
Rocks - fossils	To compare and group together different kinds of rock based on their appearance and simple physical properties	To understand that the properties of different types of rock are related to the way in which they were formed	To classify igneous, sedimentary and metamorphic rock based upon their characteristics	
	To recognise that soils are made from rocks and organic matter	To explore similarities and differences between different types of soil	To describe rocks and spoils based on their own characteristics including physical appearance, texture, permeability	
	To describe in simple terms how fossils are formed when things that have lived are trapped in rock	To discuss the different kinds of living things whose fossils have been found in sedimentary rock e.g. plants, dinosaurs, sea creatures – ammonites, belemnites and trilobites	To explain how fossils are formed	To recognise that fossils provide information about living things that inhabited the Earth millions of years ago
			To look at the work of palaeontologists such as Mary Anning.	

States of Matter

States of matter and properties and changes of materials	Year 3	Year 4	Year 5	Year 6
	To be able group solids, liquids and gases	To compare and group materials together, according to whether they are solids, liquids or gases	To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	To suggest ways to separate unfamiliar mixtures using scientific knowledge and available equipment
		To know some features of solids, liquids and gases		
	To explore how some materials change when they are heated or cooled	To observe that some materials change state when they are heated or cooled and measure or research the temperature at which this happens	To demonstrate that dissolving, mixing and changes of state are reversible changes (physical changes)	To be able to classify a range of unfamiliar changes as reversible or irreversible (physical or chemical)
		To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature		
	To understand that everyday objects can be made by combining the properties of different materials (e.g. spoon with a metal head and plastic handle)	To make observations about what happens when simple substances are mixed with water	To compare and group together everyday materials on the basis of their properties (hardness, solubility, transparency, conductivity, magnetism)	To make predictions and carry out comparative tests on unfamiliar materials in terms of a variety of features
		To understand the difference between mixing and dissolving	To know that some materials will dissolve in liquid to form a solution	To use knowledge of dissolving to make predictions about whether a substance is soluble or not
			To describe how to recover a substance from a solution	
		To know that some processes such as burning cannot be reversed	To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible (chemical change)	I can explain that chemical changes result in the formation of new materials and can give some examples of this
	To carry out tests and explore differences between materials		To give reasons based on evidence from comparative and fair tests, for the particular uses of everyday materials	To evaluate the appropriateness of a material for a task based upon a range of evidence, including investigative and research

Seasonal changes

Seasonal changes	Year 1	Year 2
	To observe changes across the four seasons	To know how the four seasons affect the behaviour of plants and animals
		To identify seasonal and daily weather patterns in the United Kingdom
	To observe and describe whether associated with the seasons and how day length varies	To know that seasons might be different in different countries
	To talk about how the weather conditions in a place are similar or different	To compare weather in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles

Light

	Year 2	Year 3
Physics - Light	To compare sources of light (dark, dull, bright, darkest, brighter etc.)	To know that we need light to see things and that darkness is the absence of light
	To explore transparent, translucent and reflective objects	To notice that light is reflected from surfaces
		To know that light travels in straight lines
	To recognise that light from the sun can be dangerous and there are ways to protect the eyes	
	To explore making shadows	To recognise that shadows are formed when the light from a light source is blocked by an opaque object
		To find patterns in the way that the size of shadows change

	Year 3	Year 4	Year 5	Year 6
Physics - Light	To know that we need light to see things and that darkness is the absence of light	To investigate materials that are transparent, translucent, opaque and reflective	To explore phenomena involving light including prisms, refraction, filters etc.	
	To notice that light is reflected from surfaces	To explain that light travels in a straight line from a source and when reflected	To explain that we see things because light travels from light sources to our eyes or from light sources to objects and the to our eyes	
	To know that light travels in straight lines		To use the idea that light travels in straight lines to explain how objects are seen because they give out light or reflect light into our eyes	
	To recognise that light from the sun can be dangerous and there are ways to protect the eyes			
	To recognise that shadows are formed when the light from a light source is blocked by an opaque object		To use the idea that light travels in straight lines to explain why shadows has the same shape as the object that cast them	
	To find patterns in the way that the size of shadows change		To investigate how shadows can be altered by changing different variables	

Sound

	Year 3	Year 4	Year 5	Year 6
Physics - Sound	To observe and name a variety of sources of sound	To identify how sounds are made, associating some of them to something vibrating	To identify what is vibrating to make a sound even when that component is not visible	
	To understand that for us to hear something the sound must reach our ears	To recognise that vibrations from sounds travel through a medium to the ear	To explain the journey of sound through different mediums to reach the ear	
	To compare and describe the pitch of sounds from a variety of different sources	To find patterns between the pitch of a sound and features of the object that produced it	To explain why a sound may be changing in pitch by talking about vibrations	
	To compare and describe the volume of sounds from a variety of different sources	To find patterns between the volume of a sound and the strength of the vibrations that produced it	To explain why a sound may be changing in volume by talking about vibrations	
	To know that sound travels from a source	To recognise that sounds get fainter as the distance from the source increases	To experiment with materials that insulate sound	
	To experiment with altering the pitch and volume of a sound	To systematically create sounds varying pitch and volume	To explain how to alter the playing of an instrument in order to change the pitch or volume in a required way	

Earth and Space

	Year 3	Year 4	Year 5	Year 6
Physics – Earth and space		To explain that the Earth moves around the Sun taking one year to do so	To describe the movement of the Earth, and other planets, relative to the Sun in the solar system	To understand how understanding of the structure of the solar system has changed over time, the geocentric model of the solar system giving way to the heliocentric model
		To know a moon is a celestial body that orbits a planet	To describe the movement of the moon relative to the Earth	To investigate how the moon effects the earth geographically
		To know that the Sun is a star at the centre of our solar system	To describe the Sun, Earth and Moon as approximately spherical bodies	To know the names of some of the constellations as observed by Earth
		To measure shadows and find out what causes them to change	To use the idea of the Earth's rotation to explain day and night in the apparent movement of the Sun across the sky.	To understand how seasons are formed by the angle of the Earth
		To know that the Sun is a star and that it has eight planets	To know that the Sun is a star and to know the planets that orbit it	To explain that there are other planets around distant stars

Electricity

	Year 3	Year 4	Year 5	Year 6
Physics – Electricity	To identify common appliances that run on electricity			
	To construct a simple series circuit	To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs switches and buzzers		To 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
		To 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		
		To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	To know the effect of placing a switch anywhere in a circuit	
	To understand that some materials put in a circuit will prevent the circuit from working	To recognise some common conductors and insulators, and associate metals with being good conductors	To know a range of conductors and insulators of electricity	To understand that some metals are better conductors than others
	To create circuits from simple drawings	To create understandable pictorial representations of circuits	To begin to recognise standard electrical symbols	To use recognised symbols when representing simple circuits in a diagram
	To know how to work safely with electricity			
	To know the names for some common components	To observe what variables will affect the brightness of a bulb		To associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in a circuit

Forces and Magnets

	Year 2
Forces and magnets	To describe how things move on a surface using simple language (fast, slow, very fast, very slow)
	To talk about forces in terms of pushes and pulls
	To investigate how magnets act against different materials and other magnets

	Year 3	Year 4	Year 5	Year 6
Physics – forces and magnets	To compare how things move on different surfaces	To understand that forces can make things begin to move, get faster or slow down	To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	To compare and give reasons based on testing for how gravity affects the movement of a variety of objects
	To notice that some forces need contact between two objects, but magnetic forces can act at a distance	To know that friction is a force between surfaces	To identify the effects of air resistance, water resistance and friction, that act between moving surfaces	To explain how drag forces tend to slow things down including air resistant, water resistant and surface friction
	To observe how magnets attract and repel each other	To explore how free moving magnets will point to the Earth's poles		
	To observe that magnets attract some materials and not others	To make predictions about whether an object will be attracted to a magnet		
	To compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet			
	To be able to identify some magnetic materials			
	To identify magnets as having two poles	To use the term magnetic field		
	To predict whether two magnets will attract or repel each other, depending on which poles are facing			
		To have investigated pulleys and leavers	To recognise that some mechanisms, including pulleys and gears, allow for a smaller force to have a greater effect	To explain the impact of leavers, pulleys and gears on the force required for a task

Progression in working scientifically

EYFS	**Expected EYFS children**				
KS 1	Emerging (KS1 children …)	**Expected (KS1 children can…)**	Exceeded (KS1 Children can…)		
LKS 2		Emerging (LKS2 children can…)	**Expected (LKS2 children can…)**	Exceeding (LKS2 children can…)	KS3+
UKS 2			Emerging (UKS2 children can…)	Expected (UKS2 children can…)	Exceeding (UKS2 children can…)
Plan Observe Record Conclude & Evaluate	□ To explore the natural world around them and ask questions. □ Know about similarities and differences in relation to places, objects, materials and living things. □ They make observations of animals and plants □ To identify what is the same and what is different. □ To describe or show what they did and what happened. □ Describe what they see, hear and feel whilst outside. □ To experience different ways of finding out □ To make a suggestion about what to do. □ To experiment with given apparatus. Carry out a given task. □ To make a simple statement referring	□ ask simple questions and recognise that they can be answered in different ways □ observe closely, using simple equipment □ perform simple tests □ identify and classify □ gather and record data to help in answering questions □ use their observations and ideas to suggest answers to questions	□ ask relevant questions and using different types of scientific enquiries to answer them □ set up simple practical enquiries, comparative and fair tests □ make systematic and careful observations and , where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers □ 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, keys, bar charts, and tables □ report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions □ use results to draw simple conclusions, make predictions for new values, suggest	□ plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary □ use test results to make predictions to set up further comparative and fair tests □ take measurements, using a range of scientific equipment, with □ increasing accuracy and precision, taking repeat readings when appropriate □ record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, □ report and present 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	□ ask questions and develop a line of enquiry based on observations of the real world alongside prior knowledge and experience □ make predictions using scientific knowledge and understanding □ select, plan and carry out the most appropriate types of scientific enquiries to test predictions… □ make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements □ present observations and data using appropriate methods, including tables and graphs □ interpret observations and data, including identifying patterns and using observations,

	to something they have already encountered. □ To observe changes in something. □ To know that information can be gathered from books. □ To observe teacher putting results in a table. □ With help, explore the use of charts prepared by the teacher. E.g. cut and stick objects, tick or draw □ They talk about the features of their own immediate environment and how environments might vary from one another. □ Explain why some things occur, and talk about changes. □ To talk about what happened. □ To listen to the teacher using scientific vocabulary.		improvements and raise further questions □ identify differences, similarities or changes related to simple scientific ideas and processes □ use straightforward scientific evidence to answer questions or to support their findings.	□ identify scientific evidence that has been used to support or refute ideas or arguments.	measurements and data to draw conclusions □ present reasoned explanations, including data in relation to predictions and hypotheses □ evaluate data, showing awareness of potential sources of error □ identify further questions arising from results

Science Capital

'The concept of **science capital** can be imagined like a 'holdall', or bag, containing all the **science**-related knowledge, attitudes, experiences and resources that you acquire through life. ... That is, the more a young person has, the more likely they are to plan to continue with **science** in the future.'

'Enterprisingscience.com'

As a school it is our duty to challenge Scientific stereotypes and create Science in context that is relevant to our children lives and local area, enriching their 'Science Capital' exposure.

What will Science look like in the classroom?

- Science will be taught to enthuse and inspire leaners to question the world around them.
- Lesson starter activity and low stakes quizzing – reviewing previous learning and consolidation of knowledge and skills through starter activities.
- Specify key vocabulary to be used and its meaning. Vocab mats to be available
- Conduct investigations that are engaging and create awe and wonder, inspiring young minds to investigate independently or with appropriate scaffolding
- Research, investigation and interpretation of findings.
- Children will communicate their Scientific knowledge and understanding appropriately and will be able to apply this to their knowledge outside of school.
- Children will be able to evaluate their learning
- Display materials, vocabulary and resources to support and enhance learning.
- Appropriately challenging texts will be available to develop wider understanding.

Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.

Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and links to local areas and employers.

Reading in Science

Reading is at the heart of the curriculum. It is our intent to ensure that every child not only develops the skills of reading but also a love of reading that will last them a lifetime. Our children read at home and school for pleasure, for information and to expand and enhance their knowledge and understanding across all subjects. Our children not only learn to read, they read to learn. Appropriate opportunities are taken to enhance children's learning in science through reading with the use of high-quality texts across a wide range of genres.

These are systematically matched to each topic in each year group, in order to impact on learning in the following ways:

- Knowledge of an extensive and rich vocabulary.
- Fluency and accuracy in reading across a wide range of contexts throughout the curriculum.
- The motivation to read for both study and for pleasure.
- Extensive knowledge through having read a rich and varied range of texts.
- Excellent phonic knowledge and skills.
- An excellent comprehension of texts.
- A desire to embrace challenging activities, including opportunities to undertake high-quality research across a range of scientific topics.
- The ability to think, reflect, debate, discuss and evaluate scientific thinking and discoveries.
- The ability to consistently support, evaluate and challenge their own and others' views using detailed, appropriate and accurate scientific evidence and facts.

Assessment

We assess pupils as we observe them during lessons and mark their work following this, annotating with appropriate comments if necessary.

Science skills and learning can be enhanced through effective verbal and written questions.

Staff use the rising stars progression framework to support assessment judgements.

At the end of the unit, all children complete a scaled progress test. This also supports the teacher judgment and used to identify gaps. The tests are standardised and demonstrate children who have above age related expectation for scientific knowledge.

SEN

It is important for teachers to plan work in science which facilitates high expectations, matches children's needs and helps them to make progress.

Teachers implement and develop strategies to support SEN pupils whilst supporting inclusion in science. Teachers plan for appropriate pace and use a range of kinaesthetic /multi-sensory tools to promote enjoyment and progress.

Knowledge and skills can be developed in small steps through analogies, drama and practical activities. Paired and group work in science is widely used and can foster interpersonal and communication skills. Carefully matched work suited to the child's own needs and range of learning can promote confidence and stimulate an interest in future learning, leading to a better understanding of the world around them.

The Science subject leader monitors samples of children's work across the school and conducts regular work scrutinies (book looks). Furthermore, in KS2 their pupil voice is taken into consideration to help teachers to plan an effective and inspiring curriculum.

Monitoring and review

Monitoring of the standards of work and the quality of teaching in Science is the responsibility of the subject leader.

The work of the subject leader also includes supporting colleagues in the teaching of Science, updating staff on current developments in the subject and providing lead and direction for the subject in the school.

Observations of teaching, planning and work scrutiny take place over the course of the year in order to maintain and continue to raise standards.