



St Francis Xavier Catholic Primary School

Science Curriculum 2026-2027

What do we want for our pupils?

Intent

At St Francis Xavier, it is our intention that every child develops a secure and meaningful body of scientific knowledge and an understanding of how science helps us to explain the world around us. Our fully resourced, knowledge-rich curriculum provides children with the foundational knowledge, vocabulary and scientific understanding needed to support future learning. Science is taught through the disciplines of biology, chemistry and physics, developing children's curiosity, interest and enquiry about the natural and humanly constructed world. Children are encouraged to ask questions, make observations, seek patterns, classify and compare, carry out fair tests and other appropriate investigations, and use secondary sources to research scientific questions. Alongside substantive scientific knowledge, children develop their ability to work scientifically. They learn to observe carefully, measure, record and interpret data, identify patterns, draw conclusions and use evidence to explain their ideas. Working scientifically is embedded within the teaching of scientific content rather than taught as a separate strand. As children progress through the school, new learning builds systematically on prior knowledge. Teachers identify and address misconceptions and deliberately revisit important knowledge and vocabulary so that children's understanding becomes increasingly secure and can be retrieved and applied in new contexts. We aim for every child to leave St Francis Xavier with a strong scientific foundation, confidence in using scientific language, an understanding of how scientific knowledge is developed and a sense of curiosity, awe and respect for the world around them.

Implementation

Below, are statements for how Science is delivered in St Francis Xavier.

- Science is taught throughout the year in half-termly or termly topics which are designed to ignite curiosity about the world we live in and its processes.
- Science is taught through a vocabulary rich curriculum allowing children opportunities to learn new terminology and imbed this within their long term memory which will be evident within their work and classroom discussion.
- As children progress through school they are provided with opportunities to develop their knowledge and working scientifically skills which enable them to ask questions and investigate the world around them.
- Each classroom will have a Science display which clearly shows the learning journey of the topic. The display must include vocabulary (with pictures) and the knowledge end point organiser to support learning. Children's work is to be displayed through out the topic.
- It is important that children develop the skills of a Scientist by fully immersing them in all areas of the subject. The local area is fully utilised to achieve desired outcomes, with opportunities for learning outside the classroom embedded in practise. School trips and fieldwork are provided to give first hand experiences, which enhance children's understanding of the world beyond their locality.

What is our goal?

Impact

By the time children leave St Francis Xavier they should:

- Achieve age related expectations in science for the end of their cohort year.
- Gain and use a wide variety of skills linked to both scientific understanding and scientific enquiry/investigation.
- Have a general knowledge of biology, chemistry and physics which will allow them to make sense of the world around them. Hence enabling them to take on further learning and acquire new skills.
- Use a richer vocabulary and be able to convey meaning of taught concepts.
- Become 'scientists' with a love, curiosity and understanding of the subject.

Disciplinary Concepts

DC1: Ask relevant questions and use different types of scientific enquiries to answer them.

DC2: Plan simple scientific enquiries

DC3: Use a range of equipment.

DC4: Make careful observations.

DC5: Record findings using simple scientific language, drawings, and labelled diagrams.

DC6: Present data

DC7: Report on findings from enquiries, including oral and written explanations.

DC7: Use results to draw simple conclusions and make predictions.

DC8: Use models to represent a scientific concept or process.

Assessment in Science

Assessment in Science is used to identify what pupils know, understand and can apply, as well as how effectively they can work scientifically. Teachers use a range of assessment approaches, including:

- questioning and discussion;
- retrieval of previously taught knowledge;
- observation of pupils during practical and enquiry activities;
- assessment of scientific vocabulary;
- pupil explanations and reasoning;
- written and recorded work;
- practical outcomes;
- pre- and post-assessment activities where appropriate.

Assessment is used formatively to identify misconceptions, gaps in knowledge and areas requiring further teaching or retrieval. Teachers use assessment information to adapt subsequent teaching and to ensure that pupils build securely on prior learning. Teachers record attainment in accordance with the school's assessment procedures, including the use of O'Track where required. Assessment information is used to support professional judgement and does not replace teachers' knowledge of individual pupils. Assessment does not rely solely on written work. Practical enquiry, discussion, observation and pupil explanations provide important evidence of scientific understanding and the ability to work scientifically

Year Groups	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Everyday Materials	Autumn and Winter	Amazing Animals		The Seasons: Spring and Summer	Common Plants
Year 2	Uses of Materials	Animals and Survival	Living Things and their Habitats		Protecting the Environment	Plants and Growth
Year 3	Skeletons and Muscles	Rocks and Fossils	Light and Shadows		Plants: Need for Survival	Forces and Magnets
Year 4	Teeth and Digestion	States of Matter	Classification and Environments		Sound	Electricity
Year 5	Earth and Space	Forces	Properties and Changes of Materials		Life Cycles	Growing Older
Year 6	Light and Perception	Classification	Evolution and Inheritance		Electricity and Circuits	Circulation and Lifestyle

Biology

Chemistry

Physics

Year 1	Autumn 1— Everyday Materials	Autumn 2—Autumn and Winter	Spring—Amazing Animals	Summer 1—The Seasons: Spring and Summer	Summer 2—Common Plants
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National Curriculum Guidance

KS1 pupils should:

- experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.
- be encouraged to be curious and ask questions about what they notice.
- 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.
- 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.

Working Scientifically

- Ask simple questions and recognising that they can be answered in different ways
- Observe closely, using simple equipment
- Perform simple tests
- Identify and classify
- Use their observations and ideas to suggest answers to questions
- Gather and record data to help in answering questions.

Autumn 1— Everyday Materials

Pupils should be taught to:

- distinguish between an object and the material from which it is made
- learn to identify and name a variety of everyday materials.
- learn to describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials based on simple physical properties of the materials.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what materials are and the names of different materials
- what different materials look like
- which materials different objects are made from
- what some the properties of different materials are and if materials can have other properties
- some properties are easy to see but others need to be investigated
- how the properties of materials mean they are used to make certain objects
- how to group, sort, and compare objects and materials

Autumn 1 — Everyday Materials

Year 1

Pupils should be taught to:

- distinguish between an object and the material from which it is made
- learn to identify and name a variety of everyday materials.
- learn to describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials based on simple physical properties of the materials.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what materials are and the names of different materials
- what different materials look like
- which materials different objects are made from
- what some the properties of different materials are and if materials can have other properties
- some properties are easy to see but others need to be investigated
- how the properties of materials mean they are used to make certain objects
- how to group, sort, and compare objects and materials

In this unit children will work scientifically by:

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Make careful observations.
- Record findings using simple scientific language, drawings, and labelled diagrams.
- Report on findings from enquiries, including oral and written explanations.

Vocabulary

Fabric, glass, material, metal, paper, plastic, rock/stone, wood, object, bendy, dull, hard, properties, rough, shiny, smooth, soft, stiff, stretchy, absorbent, investigate, transparent, waterproof, test, umbrella, compare, group, sort

Main Strand: **Chemistry**

Disciplinary concepts:

DC1, DC4, DC5, DC7

Autumn 2 — Autumn and Winter

Year 1

Pupils should be taught to:

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

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- names of the four seasons
- which months are in each of the four seasons what we mean by the word 'weather'
- weather patterns, weather symbols and what the weather is like in both autumn and winter
- how we, as humans, might dress differently according to the weather outside
- how daylight hours change across autumn and winter
- the impact of changing weather and seasons on different plants and animals

In this unit children will work scientifically by:

- Present data in a variety of ways.
- Ask relevant questions and use different types of scientific enquiries to answer them.
- Record findings using simple scientific language, drawings, and labelled diagrams.
- Use results to draw simple conclusions and make predictions.
- Make careful observations.
- Report on findings from enquiries, including oral and written explanations.

Vocabulary

Autumn, month, season, spring, summer, winter, year, colder, forecast, weather, berries, fruit, fungi, migration, nuts, colder, daylight, shorter, temperature, sleet, snow, warm, active, hibernate

Main Strand: **Physics**

Disciplinary concepts:

DC1, DC4, DC5, DC6, DC7

Pupils should be taught to:

- identify and name a variety of common animals.
- identify and name carnivores, herbivores and omnivores
- describe and compare the structure of a variety of animals.
- identify, name, draw and label the basic parts of the human body and say which part is associated with each sense.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- recognise and name a variety of common animals including fish, amphibians, reptiles, birds, and mammals
- recognise and name a variety of common animals that are carnivores, herbivores, and omnivores
- know similarities and differences across a variety of common animals (fish, amphibians, reptiles, birds, and mammals, including pets)
- recognise and name the basic parts of the human body and say which part of the body is associated with each sense

In this unit children will work scientifically by:

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Make careful observations.
- Record findings using simple scientific language, drawings, and labelled diagrams.

Vocabulary

Animal, react, reproduce, amphibian, bird, fish, mammal, reptile, categories, characteristic, cold-blooded, gills, lungs, backbone, warm-blooded, beak, claws, feathers, wings, fin, freshwater, scales, compare, carnivore, omnivore, herbivore, teeth, company, exercise, medicine, pet, shelter, wild animal, ears, eyes, nose, senses, skeleton, skin, tongue

Main Strand: Biology**Disciplinary concepts:**

DC1, DC4, DC5

Summer 1 — Spring and Summer

Year 1

Pupils should be taught to:

- observe changes across the 4 seasons.
- observe and describe weather associated with the seasons and how the length of a day varies.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- how the weather changes from winter to spring
- what happens to plants and animals in spring and summer
- what changes can be seen in the weather from spring to summer
- understand how the changing seasons can affect humans

In this unit children will work scientifically by:

- Present data in a variety of ways.
- Ask relevant questions and use different types of scientific enquiries to answer them.
- Record findings using simple scientific language, drawings, and labelled diagrams.
- Use results to draw simple conclusions and make predictions.
- Make careful observations.
- Report on findings from enquiries, including oral and written explanations.

Vocabulary

Autumn, month, season, spring, summer, winter, year, colder, forecast, weather, berries, fruit, fungi, migration, nuts, colder, daylight, shorter, temperature, sleet, snow, warm, active, hibernate

Main Strand: **Physics**

Disciplinary concepts:

DC3, DC4, DC5, DC6, DC7

Summer 2 — Plants

Year 1

Pupils should be taught to:

- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what a plant is and the basic parts of a plant
- recognise and name common garden plants
- recognise and name common wild plants
- recognise and name different types of trees
- know why plants are important

In this unit children will work scientifically by:

- Present data in a variety of ways.
- Ask relevant questions and use different types of scientific enquiries to answer them.
- Record findings using simple scientific language, drawings, and labelled diagrams.
- Use results to draw simple conclusions and make predictions.
- Make careful observations.
- Use a range of equipment

Vocabulary

Flower, fruit, grow, living thing, plant, soil, bulbs, leaves, seeds, roots, stem, garden plant, insects, lavender, rose, sweet pea, sunflower, buttercup, daisy, dandelion, poppy, wild plant, bark, blossom, deciduous, evergreen, identify, tree, trunk, clothing, cotton, farmer, food, medicine, use

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC3, DC4, DC5, DC6, DC7

Year 2	Autumn 1— Uses of Materials	Autumn 2— Animals and Survival	Spring— Habitats	Summer 1— Protecting the Environment	Summer 2— Plants and Growth
<i>National Curriculum Guidance</i> KS1 pupils should: • experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. • be encouraged to be curious and ask questions about what they notice. • 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. • 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. <u>Working Scientifically</u> • Ask simple questions and recognising that they can be answered in different ways • Observe closely, using simple equipment • Perform simple tests • Identify and classify • Use their observations and ideas to suggest answers to questions • Gather and record data to help in answering questions.					

Pupils should be taught to:

- identify and compare the suitability of a variety of everyday materials.
- find out how the shapes of solid objects, made from some materials, can be changed.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the materials different objects are made from
- how materials are used in their local area
- gather and use data to compare the suitability of different materials
- perform simple tests to explore how the shapes of objects made from some materials can be changed
- suggest ways to stop plastic pollution
- understand how new materials have been/are discovered

In this unit children will work scientifically by:

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Record findings using simple scientific language, drawings, and labelled diagrams.
- Report on finding from research, including oral and written explanations
- Make careful observations.

Vocabulary

Materials, objects, properties, absorbent, suitability, suitable, unsuitable, bend, flexible, rigid, shape, squash, stretch, twist, pledge, pollution, recycle, rubbish, discover, invention, inventor, scientist

Main Strand: **Chemistry**

Disciplinary concepts:

DC1, DC4, DC5, DC7

Pupils should be taught to:

- find out about and describe the basic needs of animals, including humans, for survival (water, food, air).
- recognise that animals, including humans, have offspring and to describe the importance of exercise, eating the right amounts of types of foods and of hygiene for humans.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the things that animals need to survive.
- know how animals change as they grow
- know why exercise is important to health
- what a balanced diet is and apply this knowledge to understanding their own diet
- understand what hygiene is and why it is important

In this unit children will work scientifically by:

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Record findings using simple scientific language, drawings, and labelled diagrams.
- Report on finding from research, including oral and written explanations
- Make careful observations.
- Use results to draw simple conclusions and make predictions

Vocabulary

Essential, non-essential, oxygen, shelter, survive, adult, baby, life cycle, offspring, teenager, toddler, blood vessels, bones, exercise, heart, heart rate, muscles, pulse, balanced diet, carbohydrate, fats, sugars, fruits, vegetables, nutrients, protein, vitamins and minerals, germs (microbes), hygiene, spread

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC4, DC5, DC7

Pupils should be taught:

- the difference between things that are living, dead and things that have never been alive.
- most organisms live within habitats, that the organisms within an environment are suited to life there and that they depend on each other.
- Construct simple food chains in addition to identifying and classifying organisms within habitats.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- recognise and classify objects and organisms as: alive, dead, or never alive
- explore how we know if an object or organism is alive – using the life processes
- know some of the different habitats plants are found in
- investigate and name the minibeasts found in a range of different microhabitats
- which animals are found in different world habitats with a focus on the Arctic and the Sahara
- understand simple food chains using the vocabulary carnivore, herbivore, omnivore, predator and prey
- understand that habitats can change over time

In this unit children will work scientifically by:

- Ask relevant questions and use different types of scientific enquiries to answer them.
- Record findings using simple scientific language, drawings, and labelled diagrams.
- Report on finding from research, including oral and written explanations
- Make careful observations.
- Use models to represent a scientific concept or process

Vocabulary

Attached, dead, living, never lived, growth, life processes, movement, nutrition, reproduction, sensitivity, coast, farmland, habitat, needs, urban, woodland, microhabitat, minibeasts, compost, decaying, earthworm, soil, wormery, arctic, desert, needs, polar, Sahara, carnivore, depend, food chain, herbivore, omnivore, predator, prey, deciduous, season, United Kingdom, food chains

Main Strand: Biology**Disciplinary concepts:**

DC1, DC4, DC5, DC7

Summer 1 — Protecting the Environment

Year 2

The National Curriculum does not require pupils to explore the human impact on the environment until Year 4 but pupils will first be introduced to this concept here in Year 2. This unit is designed to expand pupils' subject knowledge of habitats through the lens of how and why habitats should be protected. The content is designed to support pupils in understanding why the environment is important and what they can do to make a difference on a local scale

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- why we need to protect our planet
- what we mean by the word 'environment'
- why trees are so important for the environment
- how habitats can be negatively impacted
- how their local environment is being impacted
- the different ways in which we can save or conserve water and electricity
- how their actions at home could support the protection of the environment

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams.
- Report on finding from research, including oral and written explanations
- Make careful observations.
- Present data in a variety of ways
- Use results to draw simple conclusions and make predictions

Vocabulary

Environment, habitats, pests, rural, urban, wildlife, extinction, incineration, landfill, recycling, waste, dams, efficient, energy, sewage, wastewater, water, eco-home, electricity, energy, fossil fuels, non-renewable, renewable, resource, carbon dioxide, extinct, fuel, oxygen, timber, effect, environmentally friendly, pledge

Main Strand: **Biology**

Disciplinary concepts:

DC4, DC5, DC6, DC7

Summer 2 — Plants and Growth

Year 2

Pupils should be taught to:

- observe and describe how seeds and bulbs mature into plants.
- find out and describe how plants need water, light and a suitable temperature to stay healthy.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what seeds are and the different types of seeds
- that plants can grow from seeds but can also grow from bulbs
- what is meant by 'seed dispersal'
- what is meant by 'germination' and that seeds need certain conditions to germinate
- the needs of a plant for survival after the initial germination stage

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams.
- Report on finding from research, including oral and written explanations
- Make careful observations.
- Plan simple scientific enquiries
- Use a range of equipment

Vocabulary

Bulb, leaves, roots, seeds, seedling, stem, anchor, dissect, embryo, root, seed coat, shoot, sprout, conditions, dormant, germinate, germination, grow, prediction, survive, dispersal, growth, life cycle, reproduction, expedition, instructions, packet

Main Strand: **Biology**

Disciplinary concepts:

DC2, DC3, DC4, DC5, DC6, DC7

Year 3	Autumn 1— Skeletons, Muscle and Nutrition	Autumn 2— Rocks and Fossils	Spring— Light and Shadow	Summer 1— Plants: Need for Survival	Summer 2— Forces and Magnets
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National Curriculum Guidance

LKS2 pupils should:

- Broaden their scientific view of the world around them.
- Explore, talk about, test and develop ideas about everyday phenomena and the relationships between living things and familiar environments
- Begin to develop their ideas about functions, relationships and interactions.
- 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.
- Draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Working Scientifically

- Ask relevant questions and use 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, take 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, including oral and written explanations, displays or presentations of results and conclusions
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identify differences, similarities or changes related to simple scientific ideas and processes ? using straightforward scientific evidence to answer questions or to support their findings

Autumn 1 — Skeletons, Muscle and Nutrition

Year 3

Pupils should be taught to:

- identify that animals, including humans, need the right types and amounts of nutrition and that they cannot make their own food.
- Identify that humans and some animals have skeletons and muscles for support, protection and movement

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what a human skeleton looks like
- what the function of the human skeleton is in terms of movement, support and protection
- how bones and muscles work together
- the different types of muscle found within our bodies
- how skeletons vary between different animals – endoskeletons, exoskeletons and hydrostatic skeletons
- what nutrition is and how it is obtained through eating different food groups
- how different animals get the nutrition they need

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams.
- Report on finding from research, including oral and written explanations
- Make careful observations.
- Plan simple scientific enquiries
- Use a range of equipment

Vocabulary

Bone, cartilage, skeleton, *names of common bones*, ball-and-socket joint, hinge joint, joint, movement, protection, support, ligament, muscle, tendon, endoskeleton, exoskeleton, invertebrate, vertebrate, balanced diet, carbohydrate, fat, fibre, minerals, nutrition, protein, vitamins, carnivore, food chain, herbivore, nutrition, omnivore,

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC3, DC4, DC5, DC6, DC7

Autumn 2 — Rocks and Fossils

Year 3

Pupils should be taught to:

- compare, and group together different kinds of rocks based on their appearance and simple physical properties.
- describe how fossils form and that soils are made from rocks and organic matter.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what rocks are and how they can be classified as either sedimentary, igneous or metamorphic
- the properties of different types of rocks – in particular, durability and permeability
- how different rocks can be used and how those uses are based upon their properties
- what fossils are and what they can tell us about the past
- who Mary Anning was
- the process of fossilisation and the different types of fossil
- what soil is, what soil is made from and whether all soils are the same

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams.
- Use results to draw conclusions
- Make careful observations.
- Plan simple scientific enquiries
- Use a range of equipment

Vocabulary

Crystal, grain, mineral, molten, rock, durable, erosion, igneous rock, metamorphic rock, sediment, sedimentary rock, weathering, impermeable, permeable, properties, fossil, fossilisation, palaeontologist, remains, absorb, soil

Main Strand: **Chemistry**

Disciplinary concepts:

DC1, DC3, DC4, DC5, DC6, DC7

Pupils should be taught to:

- recognise that they need light to see things and that dark is the absence of light.
- notice that light is reflected from surfaces, to recognise that light from the sun can be dangerous
- that there are ways we can protect our eyes from the sun.
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that shadows change.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- there are different sources of light and those sources can be natural or man-made
- who Thomas Edison was and why he is considered significant
- darkness is the absence of light and light allows us to see things
- light is reflected from surfaces
- some objects are opaque, some are transparent, and some are translucent
- shadows are formed when light is blocked by an opaque object
- position, shape and size of a shadow can be varied
- light is dangerous and we can take steps to protecting our ourselves from the Sun
- the different uses of mirrors

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams.
- Use results to draw conclusions and make predictions
- Make careful observations.
- Use a range of equipment
- Use models to represent a scientific concept or process

Vocabulary

Artificial light source, brightness, darkness, natural light source, ray, ultraviolet (UV) light, iris, pupil, reflect, opaque, transparent, translucent, shadow, sundial, absorb, matt, non-reflective, reflect, reflective, shiny, image, mirror, reflection, periscope

Main Strand: **Physics**

Disciplinary concepts:

DC3, DC4, DC5, DC6, DC7, DC8

Summer 1 — Plants: Needs for Survival

Year 3

Pupils should be taught to:

- identify and describe the functions of the different parts of flowering plants
- explore the requirements of plants for life and growth and investigate the way in which water is transported in plants.
- pupils should explore the part that flowers play in the life cycle of flowering plants.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what a plant needs to grow
- the impact of fertiliser on a growing plant
- plants have roots to absorb water and nutrients but also to anchor the plant in the ground
- plants have a stem as it is needed to support the plant and transport water from the roots
- plants have leaves because they play an important part in how a plant produces its own food
- that flowering plants produce flowers as an important part of their lifecycle
- the stages in the lifecycle of a flowering plant

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams.
- Make careful observations.
- Report on findings from enquiries, including oral and written explanations.
- Ask relevant questions and use different types of scientific enquiries to answer them

Vocabulary

Flower, leaves, nutrients, roots, stem, water transport, photosynthesis, producer, anther, fertilisation, ovary, ovule, pollen, pollination, stigma, style, germination, life cycle, seed dispersal,

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC4, DC5, DC7

Summer 2 — Forces and Magnets

Year 3

Pupils should be taught to:

- compare how things move on different surfaces
- notice that some forces need contact between two objects whilst magnetic forces can act at a distance.
- observe how magnets attract or repel each other and attract some materials but not others
- describe magnets as having two poles predicting whether two magnets will attract or repel each other depending on which way the poles are facing.
- compare and group together a variety of everyday materials based on whether they are attracted to a magnet
- identify some magnetic materials.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what forces are in terms of pushes and pulls
- that gravity and friction are forces
- how objects move on different surfaces
- what a magnet is and what different magnets look like
- that a magnet has two poles
- how magnets react to each other
- materials can be magnetic or non-magnetic
- how to investigate whether a material is magnetic
- how magnets are used in real-life scenarios to make some tasks much easier

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams.
- Make careful observations.
- Ask relevant questions and use different types of scientific enquiries to answer them
- Use models to represent scientific concepts or processes
- Use a range of equipment
- Use results to draw simple conclusions and make predictions

Vocabulary

Force, pull, push, twist, friction, gravity, attract, like poles, magnet, opposite poles, pole, repel, magnetic, magnetic material, magnetic field, compass

Main Strand: **Physics**

Disciplinary concepts:

DC3, DC4, DC5, DC7, DC8

Year 4	Autumn 1— Teeth and Digestion	Autumn 2— States of Matter	Spring— Classification and Environments	Summer 1— Sound	Summer 2— Electricity
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National Curriculum Guidance

LKS2 pupils should:

- Broaden their scientific view of the world around them.
- Explore, talk about, test and develop ideas about everyday phenomena and the relationships between living things and familiar environments
- Begin to develop their ideas about functions, relationships and interactions.
- 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.
- Draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Working Scientifically

- Ask relevant questions and use 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, take 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, including oral and written explanations, displays or presentations of results and conclusions
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identify differences, similarities or changes related to simple scientific ideas and processes □ using straightforward scientific evidence to answer questions or to support their findings

Autumn 1 — Teeth and Digestion

Year 4

Pupils should be taught to:

- 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

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the names of the different types of human teeth and the function of each type
- the importance of looking after teeth and what can happen if we do not look after our teeth
- how eating and drinking can damage teeth over time
- that not all animals have the same teeth
- the teeth that animals have greatly depend on whether that animal is a carnivore, an omnivore or an herbivore
- the different organs that make up the digestive system
- how the digestive system functions as a whole system

In this unit children will work scientifically by:

- Make careful observations.
- Use models to represent scientific concepts or processes
- Use a range of equipment
- Plan simple scientific enquiries

Vocabulary

Adult teeth, canines, incisors, milk teeth, molars, premolars, wisdom teeth, crown, dentine, enamel, plaque, pulp, root, acid, sugar, carnivore, omnivore, herbivore, digestive system, large intestine, small intestine, nutrients, oesophagus, rectum, stomach,

Main Strand: **Biology**

Disciplinary concepts:

DC2, DC3, DC4, DC5, DC7, DC8

Autumn 2 — States of Matter

Year 4

Pupils should be taught to:

- 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
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what the three states of matter are and the properties of each one.
- the processes of melting and freezing and how these processes affect the properties and state of a substance
- some of the conditions that can affect melting and freezing for example temperature
- what the processes of evaporation and condensation are
- what the water cycle is
- where the processes of evaporation and condensation fit into the water cycle
- the importance of the water cycle for plants and animals

In this unit children will work scientifically by:

- Make careful observations.
- Ask relevant questions and use different types of scientific enquiries to answer them
- Record findings using simple scientific language, drawings, and labelled diagrams
- Use results to draw simple conclusions and make predictions
- Use a range of equipment
- Use models to represent a scientific concept or process

Vocabulary

Gas, liquid, states of matter, solid, degrees Celsius, freezing, temperature, viscosity, material, melting, melting point, rate, evaporation, condensation, precipitation, water cycle, water vapour

Main Strand: **Chemistry**

Disciplinary concepts:

DC1, DC3, DC4, DC5, DC7, DC8

Pupils should be taught to:

- recognise that living things can be grouped in a variety of ways and to explore and use classification keys to help group
- identify and name a variety of living things within their local and wider environment.
- recognise that environments can change and that this can sometimes pose dangers to living things.
- construct and interpret a variety of food chains, identifying producers, predators and prey.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- a habitat is the natural home of an organism and all living organisms display the seven characteristics of life
- organisms within a habitat or ecosystem are interdependent
- the relationships between organisms can be represented by food chains and food webs
- the difference between a vertebrate and an invertebrate
- vertebrates can be classified into five different groups
- invertebrates can be classified into seven different groups
- characteristics of animals supports us with classification and we can use a key to identify and classify animals
- plants can be classified as flowering or non-flowering
- non-flowering plants can be classified into three groups
- who Libbie Hyman was and why she is considered significant
- that environments can change due to natural causes and through the actions of humans and that these changes can be both positive and negative
- the organisms and habitats found within their own local environment and how these are changing

In this unit children will work scientifically by:

- Make careful observations.
- Report on findings from enquiries, including oral and written explanations
- Record findings using simple scientific language, drawings and labelled diagrams
- Use a range of equipment
- Identifying differences, similarities, or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions.
- Ask relevant questions and use different types of scientific enquiry to answer them
- Present data in a variety of ways
- Use results to draw simple conclusions and make predictions

Vocabulary

Characteristic, organism, MRS GREN, ecosystem, habitat, microhabitat, carnivore, consumer, food chain, food web, herbivore, omnivore, predator, prey, producer, amphibian, bird, fish, mammal, reptile, vertebrate, annelid, arachnid, insect, invertebrate, mollusk, classification, identify, species, flowering, non-flowering, deforestation, environment, natural, human, pollution, positive, negative, atmosphere, carbon dioxide, global warming, impact, protect

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC3, DC4, DC5, DC6, DC7, DC8

Summer 1 — Sound

Year 4

Pupils should be taught to:

- identify how sounds are made, associating some of them with something vibrating and to 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 made it in addition to finding 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- sound is a form of energy which is produced when something vibrates
- different instruments make sound in different ways
- sound travels in waves
- how sound travels through solids, liquids and gases
- what makes up the inside of our ears
- how we hear and how we can protect our hearing
- volume is the intensity of sound and is determined by the strength of vibrations
- pitch is how high or low a sound is and is controlled by the speed of vibrations
- the distance we are from a sound impacts the volume at which we hear the sound

In this unit children will work scientifically by:

- Make careful observations.
- Record findings using simple scientific language, drawings and labelled diagrams
- Use results to draw simple conclusions and make predictions
- Report on findings from enquiries, including oral and written explanations
- Plan simple scientific enquiries
- Use a range of equipment

Vocabulary

Musical instruments, tuning fork, sound, strings, vibrations, vocal cords, gas, liquid, solid, sound waves, vibrate, cochlea, ear canal, eardrum, inner ear, middle ear, outer ear, nerve, decibel, distance, vibration, volume. pitch, instrument

Main Strand: **Physics**

Disciplinary concepts:

DC2, DC3, DC4, DC5, DC7

Summer 2 — Electricity

Year 4

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 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 whilst associating this with whether or not a lamp lights in a simple series circuit.
- recognise some common conductors and insulators and to associate metals with being good conductors.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- electricity is a form of energy which powers many things we use everyday
- an electric current is a flowing charge of electricity
- are renewable and non-renewable methods of producing electricity
- some appliances use electricity and others do not
- it is important to be safe and sensible around electricity
- what a circuit is and which components are needed to construct a circuit
- the difference between a complete and incomplete circuit
- how the brightness of a bulb can change within a circuit
- the function of a simple switch within a circuit
- which materials are conductors and insulators of electricity and how to investigate this property

In this unit children will work scientifically by:

- Make careful observations.
- Record findings using simple scientific language, drawings and labelled diagrams
- Use results to draw simple conclusions and make predictions
- Report on findings from enquiries, including oral and written explanations
- Use a range of equipment

Vocabulary

Appliance, battery electricity, electrical appliance, electricity, mains electricity, wires, battery, buzzer, circuit, component, mains, motor, complete circuit, incomplete circuit, predict, switch, brighter, dimmer, light bulb, conductor, conducts, electricity, insulates, insulator, material,

Main Strand: **Physics**

Disciplinary concepts:

DC3, DC4, DC5, DC7

Year 5	Autumn 1— Earth and Space	Autumn 2— Forces	Spring— Properties and Changes of Materials	Summer 1— Life Cycles	Summer 2— Growing Older
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National Curriculum Guidance

UKS2 pupils should:

- Develop a deeper understanding of a wide range of scientific ideas.
- Explore and talk about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
- Encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.
- Begin to recognise that scientific ideas change and develop over time.
- 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.
- 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 Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- 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
- Use test results to make predictions to set up further comparative and fair tests
- 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
- Identify scientific evidence that has been used to support or refute ideas or arguments.

Autumn 1 — Earth and Space

Year 5

Pupils should be taught to:

- 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 and describe the sun, Earth and moon as approximately spherical bodies.
- use the idea of the Earth's rotation to explain why we experience day and night and why the sun appears to move across the sky during the day.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- what a sun is, what a solar system is, what a galaxy is and how our own solar system fits in to the wider universe
- which planets make up our own solar system knowledge of the inner and outer planets of the solar system including order, size, what the planet consists of, atmosphere, temperature, rotation and orbit
- what the relationship is between the Earth and the sun in relation to night and day
- what a time zone is and how the different time zones are arranged across the world
- what the relationship is between the Earth and the sun in relation to seasons
- how daylight hours change across the year in different places across the world
- what a moon is and what the phases of our own moon are
- the heliocentric and geocentric theories of the solar system
- the flat and spherical Earth theories
- the views of various astronomers over time: Aristotle, Ptolemy, Alhazen, Tusi, Copernicus and Galileo

In this unit children will work scientifically by:

- Use models to represent a scientific concept or process
- Record findings using simple scientific language, drawings, and labelled diagrams
- Present data in a variety of ways
- Use results to draw simple conclusions and make predictions
- Make careful observations

Vocabulary

Earth, orbit, planet, star, Sun, gas, inner, outer, Solar System, moon, axis, day, crescent, gibbous, lunar month, satellite, waning, waxing, galaxy, geocentric model, heliocentric model, universe

Main Strand: **Physics**

Disciplinary concepts:

DC4, DC5, DC6, DC7, DC8

Pupils should be taught to:

- 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 and recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the names of a range of different forces – gravity, friction, water resistance, air resistance, upthrust and magnetism
- which forces are pushes and which are pulls
- the difference between contact and non-contact forces
- the difference between balanced and unbalanced forces
- who Isaac Newton was and the role he played in helping us to understand forces
- what ‘matter’ is, the difference between mass and weight and how we measure both
- how friction works in the world around us
- how air resistance works in the world around us
- who Galileo Galilei was and the role he played in helping us to understand air resistance
- how upthrust (or buoyancy) and water resistance act in water
- what ‘density’ is and the relationship between density and whether an object is able to float
- what levers, pulleys and gears are and what they can do to the strength and size of a force

In this unit children will work scientifically by:

- Use models to represent a scientific concept or process
- Record findings using simple scientific language, drawings, and labelled diagrams
- Report on findings from enquiries, including oral and written explanations
- Use a range of equipment
- Present data in a variety of ways
- Use results to draw simple conclusions and make predictions
- Make careful observations
- Plan simple scientific enquiries

Vocabulary

Force, pull, push, twist, gravity, mass, newton meter, newtons, weight, friction, air resistance, streamlined, water resistance, cogs, effort, fulcrum, gear, lever, load, pulley

Main Strand: Physics**Disciplinary concepts:**

DC1, DC2, DC3, DC4, DC5, DC7, DC8

Pupils should be taught to:

- compare and group together everyday materials on the basis of their properties.
- know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from that solution.
- use knowledge of solids, liquids and gases to decide how mixtures might be separated
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials.
- 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 usually irreversible.
- understand the changes associated with burning and the action of acid on bicarbonate of soda.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- materials can be grouped based on their properties including hardness, solubility, transparency and conductivity
- what we mean by 'dissolving' and whether certain substances dissolve in water to form a solution
- whether the rate at which a substance dissolves can be altered by heat or stirring
- mixtures can be sometimes be separated by sieving, filtering and/or evaporation
- the difference between a reversible and an irreversible change
- examples of reversible and irreversible changes
- the impact of heating and cooling on a range of different materials
- what happens when something burns
- how new materials are usually formed after an irreversible change
- the chemists and scientists who have created new materials that we use in our everyday lives

In this unit children will work scientifically by:

- Use models to represent a scientific concept or process
- Record findings using simple scientific language, drawings, and labelled diagrams
- Report on findings from enquiries, including oral and written explanations
- Use a range of equipment
- Present data in a variety of ways
- Use results to draw simple conclusions and make predictions
- Make careful observations
- Plan simple scientific enquiries

Vocabulary

Material, property, synthetic, conductor, insulator, metal, magnetic, magnetic field, dissolve, evaporation, insoluble, soluble, solute, solution, solvent, filtration, mixture, separate, sieving, irreversible, reversible

Main Strand: Physics**Disciplinary concepts:**

DC2, DC3, DC4, DC5, DC7, DC8

Summer 1 — Life Cycles

Year 5

Pupils should be taught to:

- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the difference between sexual and asexual reproduction
- the process of pollination and the role it plays in the lifecycle of a flowering plant
- how plants reproduce both sexually and asexually
- how different animals produce offspring
- how lifecycles differ between animals
- how and why gestation periods differ between animals
- what a naturalist is and why both Jane Goodall and David Attenborough are considered significant

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams
- Make careful observations

Vocabulary

Asexual reproduction, embryo, life cycle, mammal, offspring, sexual reproduction, species, amphibian, fertilisation, larva, metamorphosis, pupa, pistil, pollination, spores, stamen, dispersal, germination, environmentalist, naturalist

Main Strand: **Biology**

Disciplinary concepts:

DC4, DC5

Pupils should be taught to:

- describe the changes as humans develop as they grow old.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- humans grow and change throughout the human lifecycle
- how to place the stages of the human lifecycle on a timeline
- the stages of development in babies and children
- an introduction to what puberty is
- how humans change from adulthood to old age
- the changes experienced in old age

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams
- Use results to draw simple conclusions and make predictions
- Ask relevant questions and use different types of scientific enquiries to answer them

Vocabulary

Adolescence, adulthood, foetus, puberty, umbilical cord, uterus, gestation period, ovum, sperm, litter, pregnant, breasts, menstration, penis, puberty, pubic hair, testicles, vulva hormones, ability, bone mass, fertility

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC5, DC7

Year 6	Autumn 1— Light and Perception	Autumn 2— Classification	Spring— Evolution and Inheritance	Summer 1— Electricity and Circuits	Summer 2— Circulation and Lifestyle
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National Curriculum Guidance

UKS2 pupils should:

- Develop a deeper understanding of a wide range of scientific ideas.
- Explore and talk about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
- Encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.
- Begin to recognise that scientific ideas change and develop over time.
- 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.
- 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 Scientifically

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- 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
- Use test results to make predictions to set up further comparative and fair tests
- 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
- Identify scientific evidence that has been used to support or refute ideas or arguments.

Autumn 1 — Light

Year 6

Pupils should be taught to:

- recognise that light appears to travel in straight lines and to use this idea 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

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- that we see when light is reflected from an object into our eyes
- light travels (or appears to travel) in straight lines
- the parts of the human eye and how the eye works
- reflection is when light bounces off a surface and changes the direction of the ray of light
- the angle of incidence is always equal to the angle of reflection
- how light behaves in water (refraction)
- clear white light is made of 7 colours
- the colours we see are known as the visible spectrum
- light waves can be absorbed, transmitted or reflected to create colour, white or black
- how shadows are formed and that they are the same shape as the object that cast them
- what light pollution is and its impact on both humans and animals

In this unit children will work scientifically by:

- Record findings using simple scientific language, drawings, and labelled diagrams
- Make careful observations
- Ask relevant questions and use different types of scientific enquiries to answer them
- Use a range of equipment
- Identify differences, similarities, or changes related to simple scientific ideas and processes
- Plan simple scientific enquiries
- Report on finding from enquiries, including oral and written explanations

Vocabulary

Eye, light source, luminous, non-luminous, opaque, shadow, translucent, transparent, incident ray, reflection, reflected ray, illusion, refraction, absorb, colour, prism, reflect, artificial light, environment, light pollution,

Main Strand: **Physics**

Disciplinary concepts:

DC1, DC2, DC3, DC4, DC5, DC7

Pupils should be taught to:

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences. It states that this classification should include microorganisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- who Carl Linnaeus was and how his work influenced the classification of living things
- how to use the Linnaean System of classification
- the six kingdoms used in classification are: kingdom archaea, Kingdom Bacteria, Kingdom Protista, Kingdom Fungi, Kingdom Plantae and Kingdom Animalia
- how to classify vertebrates and invertebrates
- how to classify plants – beginning with vascular and non-vascular
- what microorganisms are and how they can be classified
- the positive and negative impacts of microorganisms
- how habitats are important for the conservation of species

In this unit children will work scientifically by:

- Present data in a variety of ways
- Make careful observations
- Ask relevant questions and use different types of scientific enquiries to answer them
- Identify differences, similarities, or changes related to simple scientific ideas and processes
- Report on finding from enquiries, including oral and written explanations

Vocabulary

Characteristic, classification, microorganism, organism, species, cold-blooded, invertebrate, vertebrate, warm-blooded, annelid, arachnid, arthropod, crustacean, insect, mollusc, flowering, non-flowering, pollinate, reproduce, bacteria, virus

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC4, DC6, DC7

Pupils should be taught to:

- recognise that living things have changed over time
- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- why the information fossils give us is so important
- who Mary Anning was and why her findings are significant
- living things have adapted or changed over time to be able to survive in their environments
- why animals need to adapt to their environments
- natural selection is when living things are better adapted to their environments and have a greater chance of survival
- evolution takes a very long time and animals do not simply chose to evolve
- who Charles Darwin and Alfred Wallace were and why they are considered significant
- why living things produce offspring of the same kind
- why offspring vary and are not identical to their parents

In this unit children will work scientifically by:

- Present data in a variety of ways
- Make careful observations
- Ask relevant questions and use different types of scientific enquiries to answer them
- Identify differences, similarities, or changes related to simple scientific ideas and processes
- Report on finding from enquiries, including oral and written explanations
- Plan simple scientific enquiries
- Record findings from enquiries, including oral and written explanations
- Use results to draw simple conclusions and make predictions

Vocabulary

Extinct, fossil, palaeontologist, palaeontology, characteristic, trait, variation, inheritance, offspring, adaptation, environment, habitat, survive, camouflage, natural selection, organism, evolution, predator, theory, species, endangered

Main Strand: **Biology**

Disciplinary concepts:

DC1, DC2, DC3, DC4, DC5, DC6, DC7

Summer 1 — Electricity

Year 6

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 change.
- to use recognised symbols when representing a simple circuit in a diagram.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- electricity is a type of energy produced when electrons move around very quickly and create a current
- electricity can be produced by generators which can be powered by renewable and non-renewable sources
- electrical components in a circuit can be represented by symbols
- the symbols for a bulb, cell, battery, buzzer, motor and switch (on and off)
- what happens to the components in a circuit if a component is added to the circuit or a component is changed
- the difference between a parallel and a series circuit
- we measure electricity in volts (V)

In this unit children will work scientifically by:

- Make careful observations
- Ask relevant questions and use different types of scientific enquiries to answer them
- Identify differences, similarities, or changes related to simple scientific ideas and processes
- Report on finding from enquiries, including oral and written explanations
- Plan simple scientific enquiries
- Use a range of equipment
- Record findings from enquiries, including oral and written explanations
- Use results to draw simple conclusions and make predictions

Vocabulary

Electrical appliance, electricity, energy, generate, electrical current, fossil fuel, non-renewable, renewable, resource, solar power, tidal power, wind power, circuit, complete circuit, component, series circuit, simple circuit, buzzer, cell, light bulb, motor, switch, symbol, wire,

Main Strand: **Physics**

Disciplinary concepts:

DC1, DC2, DC3, DC4, DC5, DC7

Summer 2 — Circulatory System and Lifestyle

Year 6

Pupils should be taught to:

- identify and name the main parts of the human circulatory system
- 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.

Pupils will acquire the following **scientific knowledge** throughout this unit of work:

- the circulatory system consists of the heart, the lungs and the systemic system
- the role the heart play in the circulatory system
- the names of the different parts of the human heart
- human blood consists of plasma, white blood cells and platelets and red blood cells
- the role the lungs play in the circulatory system
- how heart rate differs before and after exercise
- how nutrients are moved around the body by the circulatory system after they are broken down by the digestive system
- how diet, exercise and lifestyle impact the heart and the body
- what drugs are (legal and illegal) and the impact of different drugs on the human body

In this unit children will work scientifically by:

- Use models to represent a scientific concept or process
- Plan simple scientific enquiries
- Use a range of equipment
- Make careful observations
- Record findings using simple scientific language, drawings, and labelled diagrams
- Present data in a variety of ways
- Report on findings from enquiries, including oral and written explanations

Vocabulary

Blood, blood vessel, circulates, circulation, circulatory system, heart, oxygen, valve, platelet, plasma, red blood cell, white blood cell, artery, capillary, vein, heartbeat, heart rate, pulse, addiction, drug, illegal, legal, medical, painkiller, recreational

Main Strand: **Biology**

Disciplinary concepts:

DC2, DC3, DC4, DC5, DC6, DC7