# Long Term Curriculum Overview 2023-24

**Subject:** Science

*Dream big. Love God. Live well*

*'I can do all things through Him who strengthens me'* Philippians 4:13

<table>
<tr><th></th><th>Autumn 1</th><th>Autumn 2</th><th>Spring 1</th><th>Spring 2</th><th>Summer 1</th><th>Summer 2</th></tr>
<tr><td>EYFS</td><td colspan="3">Nursery<ul><li>Explore different materials freely, in order to develop their ideas about how to use them and what to make.</li><li>Develop their own ideas and then decide which materials to use to express them.</li><li>Join different materials and explore different textures.</li><li>Plant seeds and care for growing plants.</li><li>Understand the key features of the life cycle of a plant and an animal.</li><li>Begin to understand the need to respect and care for the natural environment and all living things.</li><li>Explore and talk about different forces they can feel.</li><li>Talk about the differences between materials and changes they notice.</li></ul></td><td colspan="3">Reception<ul><li>Explore the natural world around them.</li><li>Describe what they see, hear and feel whilst outside.</li><li>Recognise some environments that are different to the one in which they live.</li><li>Understand the effect of changing seasons on the natural world around them.</li><li>Explore different materials freely, in order to develop their ideas about how to use them and what to make.</li><li>Develop their own ideas and then decide which materials to use to express them.</li></ul></td></tr>
<tr><td></td><td colspan="6">Early Learning Goals<br><u>Creating with Materials</u><ul><li>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</li></ul><u>The Natural World</u><ul><li>Explore the natural world around them, making observations and drawing pictures of animals and plants.</li><li>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.</li><li>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</li></ul></td></tr>
<tr><td>Year 1</td><td>Animals including humans<br><br>Identify and name a variety of common animals.<br><br>To describe common animals and compare them<br><br>To name and sort carnivore, herbivore and omnivore animals</td><td>Seasonal Change<br><br>Observe changes across the four seasons<br><br>To observe and identify common plants<br><br>To observe and record daily weather patterns</td><td>Everyday Materials<br><br>To identify and describe a variety of everyday materials<br><br>To identify everyday materials<br><br>To distinguish between an object and the material from which it is made<br><br>To describe the physical properties of some everyday</td><td colspan="3">Plants (Summer plants)<br>To identify and name a variety of common wild plants.<br><br>To identify and name a variety of garden plants.<br><br>To identify and describe the structure of a variety of common plants.<br><br>To describe the basic function of a plant’s parts.<br><br>To understand how to plant a seed.</td></tr>
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| | To know and label my body parts<br><br>To understand and identify what I use to see, hear, taste, smell and feel.<br><br>**Working scientifically:** Using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and classify them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells. | To gather, record and discuss simple data.<br><br>To understand the seasonal changes in daylight hours.<br><br>**Working scientifically:** Making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change, observing changes closely using simple equipment, gather and record data to help in answering questions, using observations and ideas to suggest answers to questions. | materials<br><br>To describe the suitability of materials for objects<br><br>To carry out a simple test for waterproof materials<br><br>To design and make a house to with stand the Big Bad Wolf's blow dryer<br><br>To draw conclusions from an experiment<br><br>To use my knowledge to answer questions about everyday materials<br><br>**Working scientifically:** Identifying and classifying materials and objects, using observations and ideas to suggest answers to questions, performing simple tests on materials – waterproof or not, and using observations to suggest answers to questions | To understand the differences between deciduous and evergreen trees.<br><br>To be able to identify parts of a tree and describe their basic structure.<br><br>To observe seed growth and describe the process.<br><br>To study and observe garden and wild plants.<br><br>**Working scientifically:** Observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and classify them, classifying evergreen and deciduous trees and their parts, drawing diagrams showing the parts of different plants including trees, independently performing simple tests on seed growth, gathering and recording simple data and compare and contrast what they have found out about different plants. |
| Year 2 | **Animals including humans**<br>Explore the basic needs of animals and humans.<br><br>Sort food types and understand eating healthily.<br><br>Evaluate a food diary and understand healthy choices.<br><br>Compare an adult to its offspring.<br><br>Sequence human growth. Understand the human need for hygiene.<br><br>**Working scientifically:** Observing, through video or first-hand observation and measurement, how different animals, including humans, | **Plants (Winter plants)**<br>Make observations of and classify seeds and bulbs.<br><br>Investigate suitable growing conditions for seeds.<br><br>Discuss seasonal germination.<br><br>Make close observations to create a model.<br><br>Draw conclusions from a fair test.<br><br>Explain the life cycle of a plant.<br><br>**Working scientifically:** Observing and recording, with some accuracy, the growth of a variety of plants as they change | **Everyday Materials**<br>Investigate and sort everyday materials.<br><br>Identify objects made from different materials.<br><br>Identify waterproof and absorbent materials.<br><br>Complete a fair test to identify waterproof and absorbent materials.<br><br>Identify and describe the properties of materials.<br><br>**Working scientifically:** Comparing the uses of everyday materials in and around the school with materials found in other places; observing closely, identifying and classifying the uses of different materials, and recording their observations: gathering and recording data to help in answering questions; setting up simple practical enquiries and fair tests; making systematic and careful observations | **Living things and their habitats**<br><br>Identify things that are alive, dead and never been alive.<br><br>Understand that living things need to be in suitable habitats.<br><br>Explore micro-habitats and record my observations.<br><br>Investigate plants and animals in an unfamiliar habitat.<br><br>Investigate food chains within habitats.<br><br>**Working scientifically:** Sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions |

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| | grow; Children use their observations and testing to compare objects, materials and living things; Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g., observations they have made and information they have gained; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions. | over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy. | using measuring equipment; making simple conclusions and making predictions | | affect the number and type(s) of plants and animals that live there.<br><br>**Plants (Summer plants)**<br>Observe and describe how seeds and bulbs grow into mature plants<br><br>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.<br><br>**Working scientifically:** Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy. | |
| Year 3 | **Animals, including humans**<br><br>Understand that animals and humans need the right type of nutrition from what they eat.<br><br>Identify that humans have bones for support, protection and movement.<br><br>To plan and carry out an investigation into the human skeleton<br><br>Identify that humans have muscles for support and movement.<br><br>To understand that animals may have different types of | **Plants**<br>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers<br><br>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<br><br>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.<br><br>**Working scientifically:** Comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the | **Forces**<br>Know and understand how forces act on an object<br><br>Know and understand how magnetic forces work<br><br>Know and understand how to compare, group and identify magnetic materials<br><br>Know and understand how to identify the strength of different magnets<br><br>Know and understand how things move on different surfaces<br><br>**Working scientifically:** Comparing how different things move and grouping | **Rocks**<br>Describe and compare the properties of rocks<br><br>Understand that rocks can be permeable or impermeable and identify which have this property.<br><br>Learn and explain the difference between sedimentary and igneous rocks.<br><br>Understand and be able to explain how fossils are formed | **Light**<br><br>To recognise that we need light in order to see and understand that dark is the absence of light<br><br>To learn through investigation which surfaces reflect light<br><br>To recognise that light from the sun can be dangerous and there are ways to protect our eyes and skin<br><br>To recognise that shadows are formed when the light source is blocked by an opaque object<br><br>To find patterns in the way that the size of shadows change | **Plants**<br><br>To explore how different soil types affect a plant's growth<br><br>To explore the part that flowers play in the life cycle of flowering plants, including pollination.<br><br>To understand the importance of bees to the world<br><br>To investigate the way in which water is transported in plants<br><br>To identify how different soil types affect a plant's growth<br><br>To explain my knowledge about plant<br><br>**Working scientifically:** Comparing the effect of |

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| | bones or muscles for support and protection.<br><br>**Working scientifically:** Identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out. | different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. | them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another. | Recognise that soils are made from rock and organic matter.<br><br>**Working scientifically:**<br><br>using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what changes occur when they are in water. | **Working scientifically:**<br><br>Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. | different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time;. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers. |
| Year 4 | **Animals including humans**<br><br>Describe the simple functions of the basic parts of the digestive system in humans<br><br>Identify the different types of teeth in humans and their simple functions | **Sound**<br>**I**dentify how sounds are made, associating some of them with something vibrating<br><br>Recognise that vibrations from sounds travel through a medium to the ear<br><br>Find patterns between the pitch of a sound and features of the object that produced it | **States of matter**<br>Compare and group materials together, according to whether they are solids, liquids or gases and explain their properties.<br><br>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)<br><br>To explain how water changes state. | | **Electricity**<br>Identify common appliances that run on electricity<br><br>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers<br><br>Identify whether or not a lamp will light in a simple | **Living things and their habitats** Recognise that living things can be grouped in a variety of ways<br><br>To recognise a variety of ways that vertebrates can be classified<br><br>Explore and use classification keys to help group, identify |

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| | Construct a model of the digestive system to replicate how it works<br><br>Construct and interpret a variety of food chains, identifying producers, predators and prey.<br><br>**Working scientifically:** Comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images. | Find patterns between the volume of a sound and the strength of the vibrations that produced it<br><br>Recognise that sounds get fainter as the distance from the sound source increases.<br><br>**Working scientifically:** Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume. | Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.<br><br>**Working scientifically:** Grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting. | | series circuit, based on whether or not the lamp is part of a complete loop with a battery<br><br>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit<br><br>Recognise some common conductors and insulators, and associate metals with being good conductors.<br><br>**Working scientifically:** Observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit. | and name a variety of living things in their local and wider environment<br><br>To understand how classification keys can be used to name living things in the wider environment<br><br>**Working scientifically:** Using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched. |
| Year 5 | **Properties and changes of materials**<br><br>To identify independent, dependent and control variables in a scientific investigation<br><br>To know how to compare and group everyday materials on the basis of their properties<br><br>To know how to compare and group materials based on the insulating properties<br><br>To understand the best materials for the electrical insulation<br><br>To understand how materials can be classified<br><br>To learn which materials will dissolve in a liquid<br><br>To understand what affects the rate at which solids dissolve | **Forces**<br>To understand the concept of gravity<br><br>To understand what friction is and how is can be useful<br><br>To understand the effect of air resistance<br><br>To understand the effects of water resistance<br><br>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. | **Animals including humans**<br>Understand the term gestation and compare gestation periods of different animals<br><br>Explain how foetus' develop in the womb<br><br>Explain how children grow and develop<br><br>Learn and be able to explain how children develop into adolescence<br><br>Understand and describe the changes as humans develop to old age | **Living things and their habitats**<br><br>To describe the life process of reproduction in flowering plants<br><br>To describe the life process of asexual reproduction in plants<br><br>To recognise the differences in the life cycles of a mammal, an amphibian, an insect and a bird<br><br>To recall the life of a famous naturalist and retell their achievements and contributions to science | **Earth and Space**<br><br>To understand scientific concepts about space and create scientific enquiry questions<br><br>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system<br><br>Describe the movement of the Moon relative to the Earth |

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| | To understand the process of filtering<br><br>To learn how to separate materials by evaporation<br><br>To understand how to separate a mixture<br><br>To learn how to create new materials<br><br>**Working scientifically:** Carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials. | | **Working scientifically**: Exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects. | **Working scientifically**: researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows. | **Working scientifically:** Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. | Describe the Sun, Earth and Moon as approximately spherical bodies<br><br>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.<br><br>**Working scientifically:** Comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks. |
| Year 6 | **Light**<br>To recognise how light travels in a straight line and explain how light is seen<br><br>To recognise angles of incidence and reflection by creating a periscope and explaining how it works<br><br>To recognise that light travels in straight lines by investigating refraction and investigate how refraction changes the direction in which light travels | **Electricity**<br>To understand and explain the importance of the major discoveries in electricity<br><br>To recognise and draw scientific circuit symbols<br><br>To learn and explain the effects of differing voltages in a circuit<br><br>To understand variations in how components function<br><br>To learn how to effectively conduct an investigation and | **Evolution and inheritance**<br>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago<br><br>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents<br><br>Identify how animals and plants are adapted to suit | Animals including humans<br><br>To understand how fossils can teach us about the past<br><br>To learn about the life of Charles Darwin<br><br>To understand why and how animals have evolved over time to ensure their survival<br><br>To understand the impact of humans on evolution | **Living things and their habitats**<br><br>To recognise that leaves and flowers can be classified in a variety of ways<br><br>To identify similarities and differences between the groups in the plant kingdom<br><br>To learn and recall the main characteristics of vertebrate groups | **Second look at science**<br><br>A chance to recap the scientific topics covered throughout the year. |

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| | To recognise that light appears to travel in straight lines by exploring prisms and creating colour wheels<br><br>To understand how colours are seen<br><br>To explain how the ray model of light explains the size of shadows<br><br>**Working scientifically**: Deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur). | record my data and report my findings<br><br>**Working scientifically:** Systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit. | their environment in different ways and that adaptation may lead to evolution.<br><br>**Working scientifically:** Observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers. | To understand and explain the process of evolution and describe the evidence for this<br><br>**Working scientifically**: Exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. | To learn and recall the main characteristics of a non-vertebrate group<br><br>To learn what a microorganism is and understand their roles in the wider world<br><br>**Working scientifically**: Using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. | |