



Knowledge and Skills Progression

Subject area: Science

Curriculum leader: Miss Lewis

Intent

Implementation

Impact

Our curriculum drivers
To be evidenced throughout the science curriculum

An understanding of how to develop into global citizens in the modern world
Develop effective learning relationships by working collaboratively with others and presenting ideas clearly
Strong communication within and beyond our school community towards a common goal
Demonstrate creativity within our work
Making connections with prior learning develop new knowledge in the long term memory
Thinking critically to question information, seek answers to questions and to ask 'why' in our learning

Year 1

My body
Everyday Materials
Seasonal Changes
Identifying Plants
Identifying Animals

Year 2

Super Scientists
Exploring everyday materials
Growth and Survival
Growing plants
The Secret World of Plants

Year 3

Health and Movement
Rocks, Fossils and Soils
How Do Plants Grow?
Forces and magnets
What Do Scientists Do?
Light and Shadow

Year 4

Living in Environments
Eating and Digestion
States of Matter
Changing Sound
Circuits and Conductors
Desert Life

Year 5

Great British Scientists
Life Cycles
Properties and Changes of Material
Earth and Space
Forces In Action
Changes and Reproduction

Year 6

Seeing Light
Evolution and Inheritance
Changing Circuits
Classifying Organisms
Healthy Bodies
Great British Scientists

Scientific enquiry

asking simple questions and recognising that they can be answered in different ways

observing closely, using simple equipment

performing simple tests

identifying and classifying

using their observations and ideas to suggest answers to questions

gathering and recording data to help in answering questions

asking simple questions and recognising that they can be answered in different ways

observing closely, using simple equipment

performing simple tests

identifying and classifying

using their observations and ideas to suggest answers to questions

gathering and recording data to help in answering questions

asking relevant questions and using different types of scientific enquiries to answer them

setting up simple practical enquiries, comparative and fair tests

making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

asking relevant questions and using different types of scientific enquiries to answer them

setting up simple practical enquiries, comparative and fair tests

making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Planning different types of scientific enquiries to answer questions, including recognizing and controlling variables where necessary

taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

using test results to make predictions to set up further comparative and fair tests

reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and

Planning different types of scientific enquiries to answer questions, including recognizing and controlling variables where necessary

taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

using test results to make predictions to set up further comparative and fair tests

reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and

			<p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>using straightforward scientific evidence to answer questions or to support their findings</p>	<p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>using straightforward scientific evidence to answer questions or to support their findings</p>	<p>degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>identifying scientific evidence that has been used to support or refute ideas or arguments</p>	<p>degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>identifying scientific evidence that has been used to support or refute ideas or arguments</p>
Animals including humans	<p>identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p>notice that animals, including humans, have offspring which grow into adults</p> <p>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</p>	<p>identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food;</p> <p>Nutrition comes from what is eaten</p> <p>identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>	<p>describe the simple functions of the basic parts of the digestive system in humans</p> <p>identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>	<p>describe the changes as humans develop to old age</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p>
Working Scientifically examples	<p>Use observations to compare and contrast animals at first hand or through videos and photographs</p> <p>Describe how they identify and group animals</p> <p>Group animals according to what they eat</p> <p>Use their senses to compare different textures, sounds and smells</p>	<p>Observe, through video or first-hand observation and measurement, how different animals, including humans, grow</p> <p>Ask questions about what things animals need for survival and what humans need to stay healthy</p> <p>Suggest ways to find answers to questions</p>	<p>Identify and grouping animals with and without skeletons and observing and comparing their movement</p> <p>Explore ideas about what would happen if humans did not have skeletons</p> <p>Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat</p> <p>Research different food groups and how they keep us healthy and design meals based on what they find out</p>	<p>Comparing the teeth of carnivores and herbivores and suggesting reasons for differences</p> <p>Finding out what damages teeth and how to look after them</p> <p>Draw and discuss ideas about the digestive system and compare them with models or images</p>	<p>Research the gestation periods of other animals and compare them with humans</p> <p>Find out and record the length and mass of a baby as it grows</p> <p>Draw a timeline to indicate stages in growth and development of humans</p>	<p>Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health</p>

Vocabulary	Reptiles Mammals Amphibians (+ examples of each) Herbivore Omnivore Carnivore Surviva Offspring Calf Exercise Hygiene		Muscles Contract Relax Joints Nutrition Nutrients Carbohydrates Protein Fats Fibre Vitamins Minerals Invertebrates Vertebrates Digestive System Small Intestine Large Intestine Colon Saliva Canine Incisor Molar Producers			Foetus Embryo Womb Gestation Development Puberty Life Cycle Fertilisation Reproduce Life Expectancy Skeletal Muscle Digest Circulatory System Blood Vessels Lifestyle Nutrients Substances
Plants	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees	observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants		
Working Scientifically	Observe closely, perhaps using the magnifying glasses, and compare and contrast familiar plants. Observe to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them Grouping animals according to what they eat Use senses to compare different textures, sounds and smells Describe how they were able to identify and group them, and draw diagrams showing the parts of	Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb Observe similar plants at different stages of growth Set up comparative test to show that plants need light and water to stay healthy Keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; compare and contrast what they have found out about different plants	Comparing the effect of different factors on plant growth, for example the amount of light Discover how seeds are formed by observing the different stages of plant life cycles over a period of time Look for patterns in the structure of fruits that relate to how the seeds are dispersed 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			

	different plants including trees					
Vocabulary	<p>Bulb Stem Temperature Growth Deciduous Evergreen Blossom Petals Roots</p>		<p>Nutrients Reproduction Transportation Transpiration Dispersal Pollination</p>			
Living things and their habitats		<p>explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <p>identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>The adaptations these plants and animals make to survive these habitats</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</p> <p>Understand interdependency and food chains, explained through diagrams written and spoken presentations</p>		<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>describe the life process of reproduction in some plants and animals</p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>
Working Scientifically		<p>Sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts</p> <p>Describe how they decided where to place things by exploring questions like: 'Is a flame alive? Is a deciduous tree dead in winter?'</p> <p>Construct a simple food chain that also includes humans</p> <p>Describe the conditions in different habitats and</p>		<p>Use and make simple guides or keys to explore and identify local plants and animals</p> <p>Make a guide to local living things</p> <p>Raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched</p> <p>Group a wide selection of living things that include animals, flowering plants and non flowering plants</p>	<p>Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world</p> <p>Raise questions about their environment throughout the year</p> <p>Observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border</p> <p>Ask pertinent questions and suggest reasons for similarities and differences</p> <p>Try to grow new plants from different parts of the parent plant, for example,</p>	<p>Use classification systems and keys to identify some animals and plants in the immediate environment</p> <p>Research animals and plants from a broad range of other habitats and decide where they belong in the classification system</p>

		microhabitats – and find out the conditions affect the number and type of plants and animals that live there			seeds, stem and root cuttings, tubers, bulbs. Observe changes in an animal over a period of time (e.g. hatching and rearing chicks), comparing how different animals reproduce and grow.	
Vocabulary		Living Habitat Energy Food chain Predator Prey Woodland Desert Source Adapt		Vertebrates Invertebrates Environment Human Impact		Life Cycle Mammal Reproduction Amphibian Offspring Classify Classification domain Kingdom phylum Family genes Species characteristics Micro-organisms Organism Flowering Non-flowering
Evolution and inheritance						Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
Working scientifically						Observe and raise questions about local animals and how they are adapted to their environment Compare how some living things are adapted to survive in extreme conditions – for example cactuses, penguins and camels Find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution Analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.
Vocabulary						Evolution Adaptation Inherited traits Adaptive traits Natural selection Inheritance Charles Darwin Alfred Wallace

						DNA Variation Offspring Fossil
Materials	<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p>Rocks – compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>recognise that soils are made from rocks and organic matter</p>	<p>States of matter – compare and group materials together, according to whether they are solids, liquids or gases</p> <p>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)</p> <p>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<p>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <p>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda</p>	
Working scientifically	<p>Performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ... for lining a dog basket?... for curtains?... for a bookshelf?... for a gymnast's leotard?'</p> <p>Experiment with a wide variety of materials, for example: brick, paper, fabrics, elastic, foil</p>	<p>Compare the use of everyday materials in and around school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs);</p> <p>Observe closely, identifying and classifying the uses of different materials, and recording their observations.</p>	<p>Observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; 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.</p> <p>Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed.</p> <p>Explore different soils and identify similarities and differences between them and investigate what happens when rocks and rubbed together or what changes occur when they are in water.</p> <p>Raise and answer questions about the way soils are formed.</p>	<p>Grouping and classifying a variety of different materials.</p> <p>Explore 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)</p> <p>Research the temperature at which materials change state, for example when iron melts or when Oxygen condenses into a liquid</p> <p>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.</p>	<p>Carry 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?'</p> <p>Compare materials in order to make a switch in a circuit</p> <p>Observe and compare the changes that take place, for example, when burning different materials or baking bread and cakes.</p> <p>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 resources</p>	
Vocabulary		<p>Rough Smooth Stretchy Stiff Bending Twisting Stretching</p>		<p>Fossils Sndastone Granite Marble Rock Pumice Crystals</p>		<p>Properties Solubility Transparency Electrical conductor Thermal conductor Magnets Dissolve</p>

	Elastic Foil Dull Waterproof Absorbent Fabrics		Absorbent Sedimentary Organic Matter Grains Solid Liquid Gas Evaporation Condensation Particles Freezing Solidify Changing state Degrees Celsius Water cycle Water vapour		Solution Separate Separating Reversible changes Dissolving Evaporation Filtering Sieving Melting Irreversible New material Quantitative Measurements Conductivity Insulation Chemical
Forces			<p>Forces and magnets Compare how things move on different surfaces.</p> <p>Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract or repel each other and attract some materials and not others.</p> <p>Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.</p> <p>Describe magnets as having 2 poles.</p> <p>Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>		<p>Forces and magnets explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>
Working scientifically			<p>Compare how different things move and group them</p> <p>Raise questions and carry out tests to find out how far things move on different surfaces and gathering and recording data to find answers to their questions</p> <p>Explore the strengths of different magnets and find a fair way to compare them</p> <p>Sort materials into those that are magnetic and those that are not</p> <p>Look 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</p> <p>Identify how these properties make magnets useful in everyday items and suggesting creative uses for different magnets</p>		<p>Explore falling paper cones or cup cake cases, and design and make a variety of parachutes and carry out fair tests to determine which designs are the most effective</p> <p>Explore resistance in water by making and testing boats of different shapes</p> <p>Design and make products that use levers, pulleys, gears and/or springs and explore their effects</p>
Vocabulary			Magnetic Force Attract		Gravity Air resistance Water Resistance

			<p>Repel Friction Poles Magnetic Poles</p>		<p>Friction Surface Force Accelerate Decelerate Mechanism Pulley Gear Spring Theory of gravitation Galileo Galilei Isaac Newton</p>	
Light	<p><u>Seasonal changes</u> Observe changes across the 4 seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>		<p><u>Light</u> Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect the eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows change</p>			<p><u>Light</u> Recognise that light appears to travel in straight lines</p> <p>Use the idea that light travels in straight lines to explain that objects are seen because they give our or reflect light into the eye</p> <p>Explain that we see things because light travels from light sources to our eyes from light sources to objects and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p>
Working scientifically	<p>Make tables and charts about the weather</p> <p>Make displays of what happens in the world around them, including day length, as the seasons change</p>		<p>Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes</p>			<p>Deciding where to place rear view mirrors on cars</p> <p>Designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works</p> <p>Investigate the relationship between light sources, objects and shadows by using shadow puppets</p> <p>Extend their experience of light by looking at 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).</p>
	<p>Seasons Weather Summer Spring Autumn winter</p>		<p>Reflective Reflection Natural Artificial</p>			<p>Refraction Reflection Spectrum Rainbow Travels Straight Reflects Light source Object Shadows Mirrors Periscope Filters</p>
Electricity				<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells in the circuit</p>

				<p>basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p>		<p>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</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>
Working Scientifically				<p>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</p>		<p>Systematically identify 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</p>
Vocabulary				<p>Cells Switches Buzzers Motor Circuit Series Conductors Insulators Complete circuit</p>		<p>Amps Volts Voltage Cell Circuit Diagram Symbols</p>
Sound				<p>Identify how sounds are made, associating them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases</p>		
Working scientifically				<p>Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thickness</p> <p>Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound</p> <p>Make and play their own instruments by using what they have found out about pitch and volume</p>		

Vocabulary				Vibration Wave Pitch Tone Percussion Wood wind Brass Insulate		
Earth and Space					Describe the movement of the Earth, and other planets, relative to the sun in the solar system Describe the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	
Working Scientifically					Compare the time of the day at different places on the Earth through the internet links and direct communication Create simple models of the Solar System Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day Find out why some people think that structures such as Stonehenge might have been used as astronomical clocks	
Vocabulary					Earth Sun Moon Orbit Axis Rotation Spherical Day Night Hemisphere Season Tilt Phases of the Moon Star Constellation Solar System Mercury Venus Mars Jupiter Saturn Uranus Neptune Pluto	