Progression of Knowledge and Skills in Science

Our Science curriculum follows the English National Curriculum and is delivered through a spiral approach, revisiting and deepening key concepts and skills over time. Knowledge and disciplinary skills, including working scientifically, enquiry, observation, investigation, and evaluation, are carefully sequenced so learning is recalled, applied, and built upon to secure understanding and support end-of-key-stage attainment. Each unit is explicitly mapped to the content and aims of the National Curriculum, ensuring every lesson contributes to coherent, cumulative progression of scientific knowledge and skills. In EYFS, the curriculum aligns with the Early Learning Goals and Development Matters, particularly Understanding the World, providing guidance for rich scientific learning through play and exploration, and supporting smooth progression into Key Stage 1.

		Progression of Knowledge		Plants	
Scientific Knowledge and Understanding		**EYFS** **Our Beautiful Planet**	**Y1** **Introduction to Plants**	**Y2** **Plant Growth**	**Y3** **Plant Reproduction**
	Plant Structure and Function	To know the name for the basic plant parts (leaves, flowers, stem and roots). To know the names of some familiar flowering plants (e.g. daisy, rose, sunflower, daffodil).*	To know a variety of common plants and how they differ. To know that deciduous trees lose their leaves seasonally, but evergreen trees do not. To know the basic structure (including leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches, stem) of a variety of common plants, including flowering plants and trees.		To understand the functions of the basic parts of a plant and the relationship between structure and function. To know that water is transported within a plant from the root, through the stem, to the leaves.
	Plant Growth and Needs	To know plants are alive. To know that seeds need water to grow.	To begin to understand how plants grow and change over time.	To know that seeds and bulbs grow into seedlings by producing roots and shoots. To know that seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers. To know that seeds need water and warmth to germinate. To know that plants need water, light and a suitable temperature for growth and health.	To know that plants need water, light, air, nutrients and a suitable temperature for growth and health. To understand that the needs for growth and health vary from plant to plant.

	Plant Lifecycle	To know that seeds grow into plants if taken care of.			To know the life cycle of a plant from seed to mature plant. To know that flowers are the reproductive organ of a plant. To know that the process of pollination is the transfer of pollen to the female (part of the) flower. To know that the process of seed formation is the growth of a seed after pollination. To know some different methods of seed dispersal and the benefits of each.

		Progression of Knowledge		Animals, Including Humans	
Scientific Knowledge and Understanding		**EYFS** **Animal Adventures**	**Y1** **Sensitive Bodies** **Comparing Animals**	**Y2** **Life Cycles and Health**	**Y3** **Movement and Nutrition**
	Animal Growth	To know the names of familiar animals (e.g. farm animals, pets and animals seen in storybooks).	To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals).	To understand how living things change and that animals have offspring that grow into adults. To know which offspring comes from which parent animal. To know the stages in some animal life cycles.	
	Animal Structure and Function	To know the main body parts of common animals (number of legs, wings, fur, tail). To know that animals, including humans use their senses to explore the world.	To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell). To know key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth). To know the five main senses: sight, smell, hearing, taste and touch. To know that the skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing.		To know that animals can be grouped based on the presence of a skeleton. To know that the skeleton in humans and some animals is used for movement, protection and support. To know that the muscular system in humans and some animals works with the skeleton for movement. To know the main bones in the body.

tanding	Health and Nutrition	To know that animals need food.	To know that a carnivore is an animal that eats other animals and give some examples. To know that a herbivore is an animal that eats only plants and give some examples. To know that an omnivore is an animal that eats both animals and plants, and to give some examples.	To know that animals, including humans, need water, food and air to survive. To understand the importance of exercise, a balanced diet and hygiene for humans.	To know that animals, including humans, need the right types and amount of nutrition. To understand that humans cannot make their own food and therefore eat to get the nutrition needed. To know the main nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions. To know that a balanced diet should include all nutrient groups. To describe the diets of different animals.

		Progression of Knowledge		Animals, Including Humans
Scientific Knowledge and Understanding		**Y4** **Digestion and Food**	**Y5** **Human Timeline**	**Y6** **Circulation and Health**
	Animal Growth		To describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly). To describe changes that occur during puberty (in boys and girls). To know that gestation periods vary across mammals.	
	Animal Structure and Function	To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions. To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions.		To know the main parts of the human circulatory system (heart, blood vessels and blood). To know that the heart pumps blood around the body. To know that the blood vessels transport blood around the body. To know that the blood transports vital substances around the body, including oxygen and nutrients. To understand the relationships between different organ systems.
	Health and Nutrition	To know that teeth can be damaged, including the effect of sugary and acidic food. To know that it is important to brush teeth twice a day, make good food choices and visit the dentist regularly. To describe the teeth of carnivores and herbivores, and understand why they are different. To know that predators hunt for their food and prey are the animals being hunted. To know that producers make their own food.		To understand the impact of diet, exercise, drugs and lifestyle on the way a body functions. To know that the heart rate is the number of beats per minute. To know that exercise increases heart rate.

standing		To know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on.		

		Progression of Knowledge			Living Things and Their Habitats	
Scientific Knowledge and Understand		**EYFS** **Animal Adventures**	**Y2** **Habitats** **Microhabitats**	**Y4** **Classification and Changing Habitats**	**Y5** **Life Cycles and Reproduction**	**Y6** **Classifying Big and Small** **Evolution and Inheritance**
	Characteristics of Living Things	To know that animals and plants move, grow and feed. To know the difference between things that are living and things that are non-living. To know that some animals hibernate or store food in winter.*	To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes.	To know that living things can be grouped in different ways. To know that a classification key can be used to group and identify plants and animals. To know that vertebrates are animals which have a backbone and invertebrates are animals which do not have a backbone. To know that plants can be grouped into flowering or non-flowering varieties. To know that flowering plants include grasses and non-flowering plants includes ferns and mosses. To know that there are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. To know that invertebrate groups include snails, slugs, worms, spiders and insects.		To know that 'organism' is a term used to refer to an individual living thing. To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. To know the characteristics of the different groups of vertebrates and commonly found invertebrates.
	Variation and Inheritance	To know the names of familiar animals (e.g. farm animals, pets and animals seen in storybooks.)* To know the names of some familiar flowering plants (e.g. daisy, rose, sunflower, daffodil).*	To know a variety of plants and animals and describe some differences.		To know that a life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again. To know that all living things must reproduce for the species to survive.	To know that living things have changed over time. To know that fossils provide us with information about living things that inhabited the Earth millions of years ago. To know that characteristics are passed from parents to their

ing					To know that sexual reproduction requires two parents, whereas asexual reproduction only requires one parent. To know that there are different processes plants and animals use to reproduce (asexual and sexual reproduction).	offspring, but that all offspring vary from their parents. To know that over time, variation in offspring can affect animals' chances of survival in particular environments.
	Habitats and Interdependence	To know that plants and animals live in a range of different places. To name some different places where animals live on the school site.	To name a variety of habitats, including woodland, ocean, rainforest and seashore. To know that a habitat is the environment where an animal or plant lives/grows, because it provides what they need to survive. To know that a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter). To know that living things depend upon each other (e.g. for food, shelter.) To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals.	To know that habitats can change throughout the year and this can be dangerous for living things. To know that humans can have both a positive and negative impact on the environment.		To know that animals and plants have adapted to suit their environment over many millions of years and that this process can be called evolution.

		Progression of Knowledge		Materials	
Scientific Knowledge		EYFS I Am a Scientist	Y1 Everyday Materials	Y2 Use of Everyday Materials	Y3 Rocks and Soil
	Identifying and Naming		To know that objects are items or things. To know that a material is what an object is made from. To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.		To know that rocks can be grouped based on their appearance or properties (e.g. colour, texture, hardness, permeability). To know that rocks may contain grains, crystals or fossils. To know that grains and crystals appear differently and can be used to classify rocks. To know that soils are made from rocks and dead matter.
	Properties and	To know objects float or sink.	To know that property refers to how a material can be described. To describe the physical properties of a variety of everyday materials. To understand that materials can be grouped based on their physical properties.	To know why objects are made from particular materials and to give examples of their suitability. To know that one material can be used for a range of purposes (give examples).	To understand the relationship between the properties of rocks and their uses.

dgeandUnderstandingg	Uses			To know that different materials can be used for the same purpose (give examples). To know why certain materials are unsuitable for particular objects.	
	Change	To know some objects move when pushed or pulled. To know some objects freeze or melt.		To know that a push or pull must be applied to change the shape of a solid object. To know that solid objects can be squashed, bent, twisted or stretched. To know that different solid objects may take a different amount of force to change shape.	To know that fossils can form from the remains of living things. To know that rocks can change over time (e.g. erosion, weathering).

		Progression of Knowledge	Materials
Scientific Knowledgea		**Y4** **States of Matter**	**Y5** **Mixtures and Separation** **Properties and Changes**
	Identifyingand Naming	To know that all substances around us can exist as solids, liquids and gases.	
	Properties and Uses	To know that a property of a solid is that it keeps its shape unless a force is applied to it. To know that a property of a liquid is that it can flow freely and take on the shape of a container. To know that a property of a gas is it does not have a fixed shape and can escape from an unsealed container.	To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets.

Understanding	**Change**	To know that heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). To know that cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). To know that water can exist as a solid, a liquid or a gas. To know that the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. To know that water flows around the world in a continuous process called the water cycle. To know that in the water cycle, evaporation is when bodies of water are heated and turn into water vapour. To know that in the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation. To know that the rate of evaporation increases as temperature rises.	To know that some substances will dissolve in a liquid to form a solution. To know the factors that affect the time taken to dissolve, including temperature and stirring. To understand that dissolving, mixing and changes of state are reversible changes. To know that some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes. To understand that some changes result in the formation of new materials and that these are usually irreversible. (e.g. burning, rusting, the action of acid on bicarbonate of soda.)

		Progression of Knowledge	Energy Light	
Scientific Knowledge and Understanding		**EYFS** **I Am a Scientist**	**Y3** **Light and Shadows**	**Y6** **Light and Reflection**
	Sources	To know day is light because the sun is in the sky. To know night is dark because the sun is not in the sky.	To know that light travels from a source (e.g. the Sun, light bulbs and torches). To know that light is needed to see things and that dark is the absence of light. To know that light from the Sun can be dangerous and how to protect their eyes.	To know that light travels in a straight line from a light source. To understand that luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye.
	Transfer	To know that shadows are created when something blocks the light.	To know that all materials reflect light. To know that shadows are formed when the light from a light source is blocked by an opaque object.	To know that shiny surfaces reflect light uniformly. To know that when light is reflected off a surface, its direction changes. To know that mirrors and periscopes work using reflection of light on smooth surfaces. To understand why shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. To understand relationships between light sources, objects and shadows.
	Factors Affecting Energy		To know that shadows change as a result of different factors: Changing the position of the light source or changing the distances between the light source, object and surface. To know that shadows change position and length throughout the day as the Sun changes position in the sky.	To understand how and why the distance between the object and the screen affects the size of the shadow. To understand how the angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface.

		Progression of Knowledge	Energy Sound
Scientific Knowledge and Understanding		**EYFS** **I Am a Scientist**	**Y4** **Sound and Vibrations**
	Sources		To understand that sound is a result of vibrations.
	Transfer		To know that vibrations from sounds travel through mediums to the ear. To know that an insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds. To know that different materials provide different amounts of insulation against sound.
	Factors Affecting Energy	To know about differences in sounds.	To know a variety of ways to change the pitch or volume of a sound. To know that quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds. To know that stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds. To know that sounds get fainter as the distance from the sound source increases.

	Progression of Knowledge	Energy Electricity

Scientific Knowledge and Understanding		Y4 **Electricity and circuits**	Y6 **Circuits, batteries and switches**
	Sources	To know that all electrical appliances need a power source, including batteries or mains electricity. To know that an electrical circuit needs a complete path for the electrical charge to flow through. To know the main components in a simple series circuit. To know the precautions for working safely with electricity	To know a wider variety of components in a series circuit (including buzzer and motor). To know the conventions used to draw circuit diagrams, including the recognised symbols for common components and using straight lines.
	Transfer	To know that some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals). To know that some materials do not allow electrical charge to pass through them easily and these are known as electrical insulators (e.g wood and plastic). To know that metals are used for cables and wires because they are good conductors of electricity. To know that plastic is used to cover cables and wires because it is a good insulator.	
	Factors Affecting Energy	To understand that an open switch breaks a series circuit so the components will be off. To understand that a closed switch completes a series circuit so the components will be on. To understand the relationship between bulb brightness and the number of bulbs in a circuit.	To know that the voltage of a circuit can be changed and how this affects bulb brightness (or buzzer volume).

		Progression of Knowledge		Forces, Earth and Space
Scie		EYFS **Changing Seasons**	Y1 **Seasonal Changes**	Y5 **Earth and Space**

Scientific Knowledge and Understanding	**Key Facts**	To know that some trees change in the four seasons. To know some signs of each season (leaves on the ground, cold weather, daffodils growing and sunny weather). To know that some animals hibernate or store food in winter.*	To know the name and order of the four seasons; spring, summer, autumn and winter. To know that it is unsafe to look directly at the Sun.	To know that the Sun is a star at the centre of our solar system. To know that the Sun, Earth and Moon are approximately spherical bodies. To know the names, order and relative positions of the planets and other main celestial bodies. To know that a moon is a celestial body that orbits a planet and give examples of moons that orbit other planets.
	Forces in Motion	To know that the weather changes throughout the year. To know and compare weather types (rain, sun, snow, wind).	To know weather associated with the four seasons and how it changes (in the UK). To understand that day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.	To know that the Earth and other planets orbit around the Sun. To know that the tilt of the Earth and its orbit around the Sun causes the seasons. To know that the Moon orbits around the Earth. To understand how the Earth's rotation causes day and night and the apparent movement of the Sun across the sky.
	Factors Affecting Forces			

		Progression of Knowledge	Forces, Earth and Space
Scientific Knowledge and Understanding		**Y3** **Forces and magnets**	**Y5** **Unbalanced forces**
	Key Facts	To know some examples of contact and non-contact forces. To know that some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism). To know the North and South poles of a magnet. To know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. To know some different examples of magnets, including bar, horseshoe, button and ring. To know some uses of magnets.	To know that gravity is a non-contact force that pulls objects together. To know that air resistance and water resistance are both types of friction.
	Forces in Motion	To know that friction is a contact force that acts between two surfaces to slow an object down. To know that magnetism is a non-contact force that affects objects containing magnetic metal. To understand that the opposite poles of a magnet attract one another and like poles repel one another.	To know that unsupported objects fall towards the Earth because of gravity. To know that friction, air resistance and water resistance act in the opposite direction to a moving object. To know that when forces are imbalanced, the speed, shape or direction of an object changes. To know that when forces are balanced the speed, shape or direction of an object stays the same. To know that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.
	Factors Affecting Forces	To know that rougher surfaces have more friction between them than smoother surfaces. To understand that the strength of different magnets may vary.	To know that rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. To know that the larger the surface area of an object the greater the air or water resistance it creates.

	Progression of Skills			Working Scientifically			
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Posing Questions	To ask questions about the natural world with support.	To explore the world around them and raising their own simple questions. To recognise there are different types of enquiry (ways to answer a question). To respond to suggestions on how to answer questions.		To begin to raise further questions during the enquiry process. To consider what makes a testable question. To begin to recognise that there are different types of enquiry and that they are suitable for different questions. To begin to make suggestions about how different questions could be answered.		To raise questions throughout the enquiry process. To identify testable questions. To select the most appropriate enquiry method to answer questions and give justification.	
Planning	To begin to share ideas and suggestions, when working practically	To begin to recognise whether a test is fair. To decide if suggested observations are suitable, with support. To order a simple method.		To begin to select from options which variables will be changed, measured and controlled. To begin to suggest what observations to make and how long to make them for. To plan a simple method, verbally and in writing. To begin to write a simple method in numbered steps. To select and begin to decide what simple equipment might be used to aid observations and measurements.		To suggest which variables will be changed, measured and controlled. To make and explain decisions about what observations to make and how long to make them for. To write a method including detail about how to ensure control variables are kept the same. To write a method that considers reliability by planning repeated readings. To suggest the most appropriate equipment to make observations and measurements and justifying their choices.	
Predicting	To begin to make guesses about what might happen.	To suggest what might happen, often justifying with personal experience.		To make predictions about what they think will happen by: ● Using scientific knowledge and/or personal experience to explain their prediction (because…) . ● Beginning to consider cause and effect when making predictions, where appropriate. ● Predicting a trend by considering how the changing variable will affect the measured variable. E.g. (The smoother the surface, the longer the distance the car will travel).		To make increasingly scientific predictions by: ● Using previous scientific knowledge and evidence to inform their predictions. ● Using scientific language to describe a potential outcome or explain why they think something will happen. ● Making links between topics to evidence a prediction.	

	Progression of Skills					Working Scientifically	
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Observing (Qualitative Data)	To comment on what they see and hear in the natural world.	To use their senses to describe, in simple terms, what they notice or what has changed.		To use their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.		To use their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed.	
Measuring (Quantitative Data)		To use non-standard units to measure and compare. To begin to use standard units and read simple scales to measure and compare. To begin to use simple measuring equipment to make approximate measurements		To use standard units to measure and compare. To use measuring equipment with increasing accuracy. To read scales with unmarked intervals between numbers.		To use standard units to measure and compare with increasing precision (decimals). To reading a wider variety of scales with unmarked intervals between numbers.	
Researching	To recognise that information can be found online and in books.	To gather specific information from one simplified, specified source		To gather specific information from a variety of sources.		To gather answers to open-ended questions from a variety of sources	
Recording (Diagrams)	To draw and label pictures of plants and animals.	To draw and label simple diagrams.		To begin to draw more scientific diagrams by: ● Using some standard symbols. ● Drawing in 2D to produce simple line diagrams. ● Labelling with more scientific vocabulary		To draw scientific diagrams by: ● Using a wider range of standard symbols. ● Drawing with increasing accuracy. ● Labelling with a broader range of scientific vocabulary. ● Annotating diagrams to explain concepts and convey opinions.	
Recording (Tables)	To recognise that tables can be used to record information	To use a prepared table to record results including: ● Numbers. ● Simple observations. ● Tally frequency.		To use a prepared table to record results including more detailed observations. To use tables with more than two columns. To identify and add headings to tables. To begin to design simple results tables.		To use tables with columns that allow for repeat readings. To suggest headings to tables, including units. To design results tables with increasing independence with consideration of variables where applicable. To calculate the mean average.	
Grouping and Classifying	To group objects, plants and animals with support.	To group based on visible characteristics. To organise questions to create a simple classification key.		To group based on visible characteristics and measurable properties. To populate a pre-prepared branching and number key. To choose appropriate questions for classification keys.		To group in a broader range of contexts. To organise the layout of number and branching keys. To formulate appropriate questions for classification keys.	

	Progression of Skills			Working Scientifically			
	EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Graphing		To represent data using pictograms and block graphs.		To represent data using bar charts. To draw bars with greater accuracy. To read the value of bars with greater accuracy.		To represent data by using line graphs and scatter graphs. To plot points with greater accuracy. To read the value of plotted points with greater accuracy.	
Analysing and Drawing Conclusions	To describe their discoveries when working practically.	To use their results to answer simple questions. To begin to recognise when results or observations do not match their predictions.		To write a conclusion to summarise findings using simple scientific vocabulary. To begin to suggest how one variable may have affected another. To begin to quote results as evidence of relationships. Identifying data that does not fit a pattern (anomalous data). To recognise when results or observations do not match their predictions. To begin to use identified patterns to predict new values or trends.		To write a conclusion to summarise findings using increasingly complex scientific vocabulary. To suggest with increasing independence how one variable may have affected another. To quote relevant data as evidence of relationships. To identify anomalies in repeat data and excluding results where appropriate. To compare individual, class and/or model data to the prediction and recognising when they do not match. To use identified patterns to predict new values or trends.	
Evaluating				To begin to identify steps in the method that need changing and suggest improvements. To begin to identify which variables were difficult to control and suggesting how to better control them. To comment on the degree of trust by reflecting on: ● Results that do not fit a pattern (anomalies). ● The quality of results (accurate measurements and maintaining control variables). To begin to identify new questions that would further the enquiry.		To identify steps in the method that need changing and suggesting improvements. To identify which variables were difficult to control and suggesting how to control them better. To comment on the degree of trust by also reflecting on: ● Accuracy (human error with equipment). ● Reliability (repeating results). ● Sources of information (e.g. websites, books). To pose new questions in response to the data that would extend the enquiry. To decide what data to collect to further test direct relationships.	

Progression of Knowledge			Science in Action			
EYFS	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
To know some different job roles.	To know about famous scientists throughout history. To know about a range of jobs and careers that use scientific knowledge and methods. To know about the work of modern-day scientists. To know about science in the news and recent discoveries. To know there are spiritual, moral, social and cultural links with Science.					
			To know about the methods and equipment used by scientists throughout history and how these have led to modern methods. To know how scientific knowledge has changed over time, leading to the current understanding of Science. To know about current scientific research and what it aims to achieve in the future. To know that collaboration and peer reviewing is essential for effective scientific progress.			
					To know how scientific evidence is used to support or refute ideas or arguments. To know that mistakes can lead to new discoveries.	