

# SCIENCE PROGRESSION AND COVERAGE

THE CAREY FEDERATION



<b>EYFS 3-4</b>	Explore the natural world around them, making observations, beginning to notice similarities and differences.			
<b>EYFS Reception</b>	Draw information from a simple map. Understand that some places are special to members of their community. Recognise some similarities and differences between life in this country and life in other countries. Recognise some environments that are different from the one in which they live.			
<b>ELG</b>	<p>ELG: (Understanding the World, Nov. 2024) - <u>People, Culture and Communities</u>: Children at the expected level of development will: • Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. • Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class. • Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps.</p> <p>ELG: (Understanding the World, Nov. 2024) <u>The Natural World</u>: Children at the expected level of development will: • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>			
<b>Academic Year</b> Halwill Year A Ashwater A4 2022/2023 Halwill Year B /Ashwater B4 2023/2024 Halwill Year A Ashwater Year A3 2024/2025 Halwill Year B Ashwater Year B3 2025/2026	<b>Key Stage 1</b>	<b>Lower Key Stage 2</b>	<b>Upper Key Stage 2</b>	
<b>Coverage and context</b>	<b>Science knowledge</b>			

	<p><b>Plants</b></p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>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.</p> <p>Investigate the way in which water is transported within plants.</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>			
	<p><b>Stem sentences and Definitions</b></p>	<p>Plants are living things that grow in soil and need water, sunlight and air to survive.</p> <p>Deciduous trees – Deciduous trees are a type of tree that goes through changes with the seasons. Most deciduous trees lose their leaves in the autumn and grown new leaves in spring.</p> <p>Evergreen trees – Evergreen trees are a special type of tree that keeps their leaves or needles all year round, and throughout every season.</p> <p>There are plants almost <b>everywhere on our planet</b>.</p> <p>They may grow from a seed or a bulb but all have <b>four</b> important parts.</p> <p><b>Flowers</b></p> <p>Flowers are often brightly coloured and have petals. Flowers are where the seeds of the plant develop.</p> <p>Leaves take in the sunshine and turn it into food for the plant.</p> <p>The stem holds up the plant and carries water and nutrients to the leaves.</p> <p>Roots keep the plant in the ground and hold it up, they also take in water and nutrients from the soil for the plant to grow.</p> <p><b>Other important plant parts</b></p> <p>Branches allow plants to spread their leaves so they can reach more sunlight.</p> <p>Some plants produce fruit that an animal will eat and transport their seeds to reproduce.</p> <p>A tree's trunk is made of wood and is covered in bark. The trunk of a tree is like the stem of a small plant, only a lot stronger. It too carries water around the tree.</p> <p>The roots of a tree can go very deep under the ground and spread out a long way. The roots help a tree to stay upright in strong winds.</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>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</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>
	<b>Stem sentences and Definitions</b>	<p>Mammals are one of the main five groups of vertebrates – animals that have a backbone inside their body. Mammal – A mammal is a warm-blooded vertebrate, and most have fur or hair on their skin.</p> <p>Amphibians are one of the main five groups of vertebrates – animals that have a backbone inside their body. Amphibians are cold blooded animals, they lay eggs in water and breathe with gills. Amphibians go through a process known as metamorphosis, changing from an aquatic larval form with gills to an air-breathing adult form with lungs.</p> <p>Birds are one of the main five groups of vertebrates – animals that have a backbone inside their body. Birds lay hard-shelled eggs. Birds have feathers instead of scales or hair. Birds have tough pointed beaks and wings. Birds have a strong but lightweight skeleton. Many birds have the ability to fly.</p> <p>Reptiles are one of the five main groups of vertebrates – animals that have a backbone inside their body. Most reptiles are covered in dry, scaly skin. They can be found living in both water and on the land.</p> <p>Fish are one of the main five groups of vertebrates – animals that have a backbone inside their body. Fish are a type of animal that live in water. They breathe oxygen underwater through their gills. Fish can be found in freshwater, like ponds and streams, and also in salty seawater.</p>					
	<b>Everyday materials</b>	<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>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,</p>	

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	<p><b>Stem sentences and Definitions</b></p>	<p><b>Solid:</b> A solid has a fixed shape and volume, and its particles are tightly packed together.</p> <p><b>Liquid:</b> A liquid can flow and has a fixed volume but no fixed shape.</p> <p><b>Gas:</b> A gas can flow freely and has no fixed shape or volume.</p> <p><b>Condensation</b> is the process where water vapor cools down and turns into liquid water. This occurs when the gas (water vapor) loses heat energy, causing the water molecules to slow down and form tiny droplets. Condensation is a crucial part of the water cycle, as it helps create clouds and precipitation, returning water to the Earth's surface.</p> <p><b>Evaporation</b> is the process where a liquid turns into a gas because of increased energy in its particles. This can occur at any temperature. It happens at the surface of the liquid. It becomes vapour and rises into the air. Evaporation is a natural process that is essential for the movement of water on the earth.</p> <p><b>Dissolving</b> is the process where a solute (a soluble substance) is added to a solvent (a liquid that does the dissolving) to form a solution. During this process, the solute breaks down into smaller particles that are too small to be seen, but they are still present in the solution. This is a reversible process, meaning the original substances can be recovered by evaporating the solvent.</p> <p><b>Solute:</b> The substance that dissolves.</p> <p><b>Solvent:</b> The liquid that dissolves the solute.</p> <p><b>Solution:</b> The mixture formed when a solute is dissolved in a solvent</p> <p><b>Temperature scale - Celsius</b> is a temperature scale where 0 degrees Celsius is the freezing point of water and 100 degrees Celsius is the boiling point of water at standard atmospheric pressure. It was named after the Swedish astronomer Anders Celsius (1701–1744), who originally proposed a different scale where 0 was the boiling point and 100 was the freezing point. The Celsius scale is widely used in most countries around the world, while the Fahrenheit scale is still used in the United States and some other places.</p>					
	<p><b>Seasonal Changes</b></p> <p><b>Earth and Space</b></p>	<p>Observe changes across the 4 seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>				<p>Describe the movement of the Earth and other planets relative to the sun in the solar system.</p> <p>Describe the movement of the moon relative to the Earth.</p> <p>Describe the sun, Earth and moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent</p>	

							movement of the sun across the sky	
	<b>Stem sentences and Definitions</b>	<p><b>Seasons</b> - Each season lasts about three months and has different weather. The weather is also different in different parts of the UK as well.</p> <p><b>Spring</b> - the days start to get longer. The days start to get warmer, it can be sunny or rainy. Plants start to grow and flower, and lots of animals give birth.</p> <p><b>Summer</b> - usually has the hottest, sunniest days although there still may be some cooler or cloudier days. The days are longer.</p> <p><b>Autumn</b> - the days get shorter and cooler and there is usually more wind and rain.</p> <p><b>Winter</b> - is the coldest season with the shortest days, it can be stormy with lots of rain, wind, ice and snow.</p> <p><b>Solar system</b> - the Sun and the collection of objects in orbit around it.</p> <p><b>Planet</b> - a very large, spherical object in orbit around a star that has cleared the path of its orbit of other objects.</p> <p><b>Moon</b> - a natural object in orbit around a planet.</p> <p><b>Earth rotates (spins) on its axis</b> : This axis is an imaginary line that runs through the Earth. The axis is off by about 23.5 degrees, so the Earth is tilted. The Earth completes one full rotation (spin), every 24 hours. We call each complete rotation of the Earth a day.</p>						
	<b>Living Things and their habitats</b>	Explore and compare the differences between things that are living, dead, and things that have never been alive.	Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.	Identify and name a variety of plants and animals in their habitats, including microhabitats.	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.	Recognise that living things can be grouped in a variety of ways.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	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.
	<b>Stem sentences and Definitions</b>	<p><b>Alive</b> - <b>Living things</b> are <b>alive</b>. They move, respire, sense, grow, reproduce, excrete waste material and need nutrients.</p> <p><b>Dead</b> - Something that is <b>dead</b> was once <b>living</b> and now is no longer <b>alive</b>.</p> <p><b>Never alive</b> - Something that <b>has never been alive</b> cannot be called <b>alive</b> or <b>dead</b>.</p> <p><b>Habitat</b> - is a place where animals and plants live, providing them with food, water, air, and shelter.</p> <p><b>Animals</b> obtain their food from plants and other animals through a simple food chain, which is a sequence of organisms that show the flow of energy from one organism to another. In a food chain, each organism plays a specific role in the cycle, from producers (like plants) to consumers (like animals). Here's a brief overview of how animals obtain their food:</p> <p><b>Producers</b>: These are the base of the food chain, providing energy through photosynthesis. They include plants and some algae.</p> <p><b>Consumers</b>: Animals that eat plants are producers, while animals that eat other animals are consumers. Consumers can be herbivores (plant eaters), carnivores (animal eaters), and omnivores (both plant and animal eaters).</p> <p><b>Energy Transfer</b>: Energy is transferred from producers to consumers through the process of photosynthesis in plants and digestion in animals. This transfer is essential for the survival of all living organisms.</p>						

		<p><b>Interdependence:</b> Animals depend on each other and their environment for survival. The food chain illustrates this interdependence, showing how different organisms interact and rely on one another.</p> <p><b>Classification:</b> living things can be grouped by looking at the similarities and differences between their observable features.</p> <p><b>Taxonomy:</b></p> <p><b>Sexual reproduction in plants:</b> Pollination: In flowering plants, sexual reproduction typically involves pollination, where pollen from the male anther fertilizes the ovule in the female ovary. This can occur through wind, insects, or other animals.</p> <p><b>Fertilization:</b> After pollination, fertilization occurs, leading to the formation of seeds. The seeds develop into new plants, completing the life cycle.<b>Examples:</b> Many flowering plants, such as roses and sunflowers, reproduce sexually through this process.</p> <p><b>Asexual Reproduction:</b> Plants can also reproduce asexually through methods like runners, tubers, and cuttings. In this process, new plants grow from parts of the parent plant without the need for seeds.</p> <p><b>Examples:</b> Strawberries reproduce through runners, while potatoes reproduce through tubers.</p> <p><b>Sexual Reproduction in animals:</b> involves the formation of sperm and eggs from two parents. The fusion of the sperm and egg during fertilization creates a genetically diverse offspring.</p> <p><b>Examples:</b> Most mammals, including humans, reproduce sexually, where the female gives birth to live young after a gestation period. Birds also reproduce sexually, laying eggs that hatch into chicks.</p>					
	<p>Rocks</p> <p>Evolution and Inheritance</p>			<p>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>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
	<p><b>Stem sentences and Definitions</b></p>	<p><b>Soils:</b> a mixture of different things found in nature, including rocks, organic matter, and air. They are essential for supporting all living things and are made up of smaller pieces of rock and minerals as well as organic matter. Microscopic organisms, fungi, and larger organisms like earthworms play a part in breaking down organic matter, which then appears in soil. This process is vital for soil health and the wider ecosystem, as it promotes plant growth and biodiversity.</p> <p><b>Rock:</b> a solid material that occurs naturally in Earth.</p> <p>Sedimentary rocks: Formed from the accumulation of sediments over time, often at the bottom of oceans and lakes.</p> <p>Metamorphic rocks: Formed when rocks are subjected to heat and pressure, changing their structure.</p> <p>Igneous rocks: Formed when lava cools and solidifies.</p> <p>Rocks are used for various purposes, such as construction, landscaping, and as building materials. Understanding rocks is essential in KS2 science as it helps students learn about the Earth's materials and the processes that shape them.</p> <p>Fossils: when living things decompose, the minerals in the water replace the bone, leaving a <b>rock</b> replica of the original bone called a <b>fossil</b>. The <b>fossils</b> remain <b>within</b> the <b>rock</b> until uncovered through erosion or excavation.</p> <p><b>Evolution:</b> the process by which living things change over time to adapt to their environment. This change can occur gradually over many generations, allowing species to become better suited for survival in their habitats.</p>					

	Light			<p>Recognise that we 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 their 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>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 out or reflect light into the eye.</p> <p>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.</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>
	Stem sentences and Definitions	<p><b>Light:</b> a type of <b>energy</b> which comes from a light source (something which produces light energy). We need light for our eyes in order to see, if they are able</p> <p><b>Darkness:</b> the absence of light. Unlike light, which is created by light sources, you can't create darkness. To make somewhere dark, you have to stop the light from coming in.</p> <p><b>Shadows:</b> are formed when light from a light source is blocked by an opaque object. This means that the opaque object does not allow light to pass through, creating a dark area behind it where the light is obstructed. The shadow will be the same shape as the objects that cast them. Shadows are always formed on the opposite side of the light source and depend on the size of the object and the distance between the light source and the object.</p> <p><b>Light is reflected from surfaces:</b> It occurs when light travels towards a surface and bounces off it, creating an image. This phenomenon is observed in various materials, such as mirrors and water surfaces, where the light rays travel in the same direction as the reflected rays.</p> <p><b>Light is reflected from surfaces: Y5/6:</b> The angle of incidence and the angle of reflection are equal, demonstrating the law of reflection. This principle is crucial for understanding how we perceive objects and the nature of light.</p>					
	Forces and Magnets			<p>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. - I can predict whether 2 magnets will attract or repel each other, depending on which poles are facing.</p>		<p>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>	

	<p><b>Stem sentences and Definitions</b></p>	<p><b>Forces:</b> are just pushes and pulls in a particular direction.</p> <p><b>Contact forces:</b> when objects touch each other such as friction.</p> <p><b>Non-contact forces:</b> just pushes and pulls in a particular direction. No contact such as gravitational force.</p> <p><b>Balanced forces:</b> If two forces are balanced, it means the forces are the same size but are acting in opposite directions.</p> <p>If two balanced forces are acting on an object, that object will not change its motion. If it is still, the object will stay still or if it is moving, it will continue moving in the same direction and at the same speed.</p> <p><b>Unbalanced forces:</b> When two forces acting on an object are not equal in size, we say that they are unbalanced forces. Unbalanced forces do change the way something is moving.</p> <p>They can make objects start to move, speed up, slow down or change direction.</p> <p><b>Mass :</b>a measure of how much matter is in an object. It is commonly measured in units such as grams (g) and kilograms (kg).</p> <p><b>Newtons: (N)</b> is a unit of measurement for force.</p> <p><b>Mass :</b>a measure of how much matter is in an object. It is commonly measured in units such as grams (g) and kilograms (kg).</p> <p><b>Weight:</b> Weight is defined as the force acting on an object due to gravity. It is typically measured in newtons.</p> <p>Object that can attract magnetic materials</p> <p><b>A magnet:</b> is an object that can attract magnetic materials, such as iron and steel. Magnets have two poles: a north-seeking pole and a south-seeking pole. When a magnet is allowed to move freely, the north-seeking pole points north, while the south-seeking pole points south. All magnets look the same, with the poles located at opposite ends.</p> <p>Oak National Academy</p> <p><b>Magnetic force</b> is a non-contact force.</p> <p><b>Magnetic field :</b> an invisible area around a magnet where a magnetic force is active. It is the space around a magnet where magnetic forces can act on other objects.</p> <p><b>Friction:</b> Friction is the force between two surfaces that are moving or trying to move against each other. It always acts in the opposite direction to the movement of an object.</p> <p><b>Resistance:</b> a force that slows the movement of one object over another. It can occur in liquids, such as water and in air.</p> <p><b>Air resistance</b> – a type of friction between air and an object moving through it.</p> <p><b>Water resistance:</b> - a type of friction between water and another object moving through it.</p> <p><b>Mechanisms:</b> levers, pulleys and gears, allow us to use a smaller force to have a greater effect and change motion.</p>					
	<p><b>Sound</b></p>				<p>Identify how sounds are made, associating some of 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>		

	<p><b>Stem sentences and Definitions</b></p>	<p><b>Sound</b> : is an energy caused by vibrations that creates waves. When an object vibrates, it creates sound waves that travel through a medium, such as air, water, or solids. These waves then travel to our ears, where they are perceived as sound.</p> <p><b>Decibels:</b> (dB) is a unit used to measure the volume of sound. It helps us compare how loud one sound is compared to another. For example, normal conversation is around 60 dB.</p>					
	<p><b>Electricity</b></p>				<p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its 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>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</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>
	<p><b>Stem sentences and Definitions</b></p>	<p><b>Series circuit:</b> a type of electrical circuit where all components are connected in a single loop, allowing the same current to flow through each component.</p> <p><b>Parallel circuit:</b> a type of electrical circuit where multiple branches run off a single circuit. It allows each device in the circuit to receive its own source of power, independent of the other devices. The total voltage in a parallel circuit is the same throughout, and the current in each branch can vary independently.</p> <p><b>Switch:</b> A switch is a device that controls the flow of electricity in a circuit. It can either open or close the circuit, allowing or stopping electricity from flowing through it. Switches are essential for turning devices like lights, motors, and other electrical components on and off. They are commonly used in everyday electrical appliances and circuits.</p>					