



Primary Academy and Pre-school

Science Long Term Planning Document

Implemented: September 2021

Updated: September 2024

Next Review: September 2026

Our Curriculum Intent

The intent of our curriculum is for pupils to have high aspirations, make progress from their starting points and to contribute positively to the school community and beyond.

Communication	Community	Application
<p>It is essential that children leave Heathlands Primary Academy able to communicate their thoughts, ideas and feelings successfully in a wide range of different forms. Through our work on vocabulary, we aim to develop children’s imaginations and to support them with building a rich vocabulary, which will enable them to understand the world in which we live.</p> <p>We will do this in science by:</p> <ul style="list-style-type: none"> • Giving children the scientific vocabulary to identify and describe their observations • Ensuring children have an awareness of scientific vocabulary in other subject areas • Enabling children to ask and answer scientific questions about the world around them 	<p>Children who attend Heathlands Primary Academy should feel that they are always part of a community, whether this means their class, school, local area or as global citizens. We are closely supported by the Cultural Hub and this enables us to deliver authentic experiences that the children can then use back in the classroom. Some of the ways in which we will achieve this in science will be:</p> <ul style="list-style-type: none"> • Giving children the opportunity to explore science beyond their immediate self • Equipping children with the scientific skill and understanding to care for the world around them • Encouraging children to think enquiringly about their local area 	<p>A key part of our curriculum is ensuring that new skills and knowledge are applied across the subjects, where appropriate. This will enable children to see new information in a variety of contexts, and to become more independent learners.</p> <p>We will ensure this is effective in science by:</p> <ul style="list-style-type: none"> • Allowing children to apply their maths skills when analysing data and results • Encouraging children to use vocabulary accurately when undertaking an investigation • Enabling children to apply scientific skills and knowledge across other curriculum areas

Long Term Planning Document

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6										
Units of work (linked to NC Pos)	Area of Learning	Seasonal Changes (Spread across each term according to time of year) I can observe changes across the four seasons I can observe and describe weather associated with the seasons and how day length varies.	Animals, Including Humans (Focus on Animals) I can notice that animals have offspring which grow into adults I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	All living things and their habitats I can explore and compare the differences between things that are living, dead, and things that have never been alive I can identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of animals and plants, and how they depend on each other I can identify and name a variety of plants and animals in their habitats, including micro-habitats I can 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	Plants I can observe and describe how seeds and bulbs grow into mature plants I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Rocks I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties I can describe in simple terms how fossils are formed when things that have lived are trapped within rock I can recognise that soils are made from rocks and organic matter.	Forces and magnets I can compare how things move on different surfaces I can notice that some forces need contact between two objects, but magnetic forces can act at a distance I can observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles I can predict whether two magnets will attract or repel each other, depending on which poles are facing. I can 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	Light I can recognise that they need light in order to see things and that dark is the absence of light I can notice that light is reflected from surfaces I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes I can recognise that shadows are formed when the light from a light source is blocked by a solid object I can find patterns in the way that the size of shadows change.	Living things and their habitats I can recognise that living things can be grouped in a variety of ways I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment can recognise that environments can change and that this can sometimes pose dangers to living things.	Sound I can identify how sounds are made, associating some of them with something vibrating I can recognise that vibrations from sounds travel through a medium to the ear I can find patterns between the pitch of a sound and features of the object that produced it I can find patterns between the volume of a sound and the strength of the vibrations that produced it I can recognise that sounds get fainter as the distance from the sound source increases.	Electricity I can identify common appliances that run on electricity I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers I can 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 I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit I can recognise some common conductors and insulators, and associate metals with being good conductors.	Properties and changes of materials I can 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 I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic I can demonstrate that dissolving, mixing and changes of state are reversible changes I can explain that some changes result in the formation of new materials, and that this kind of change is not usually	Earth and Space I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system I can describe the movement of the Moon relative to the Earth I can describe the Sun, Earth and Moon as approximately spherical bodies I can use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky	Living things and their habitats I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird I can describe the life process of reproduction in some plants and animals.	Light I can 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 I can 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 I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	Living things and their habitats I can 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 I can give reasons for classifying plants and animals based on specific characteristics.	Evolution and inheritance I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
		Everyday Materials I can distinguish between an object and the material from which it is made I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock I can describe the simple physical properties of a variety of everyday materials I can compare and group together a variety of everyday materials based on their simple physical properties.	Plants I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants, including trees.	Animals, Including Humans I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals I can identify and describe the structure of a variety of common animals that are carnivores, herbivores and omnivores I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Uses of everyday materials I can identify and compare the suitability of a variety of everyday	Animals, Including Humans (Focus on Humans) I can notice that humans have	Plants I can identify and describe the functions of different parts of flowering plants:	Animals, Including Humans I can identify that animals, including humans, need the right types and	States of matter I can compare and group materials together, according to whether they are	Animals, Including Humans I can describe the simple functions of the basic parts of	Forces I can explain that unsupported objects fall towards the Earth because of the force of	Animals, Including humans I can describe the changes as humans develop to old age.	Electricity I can associate the brightness of a lamp or the volume of a buzzer with the number	Animals, Including Humans I can identify and name the main parts of the human circulatory system,			

					materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	offspring which grow into adults I can find out about and describe the basic needs of humans, for survival (water, food and air) I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	roots, stem/trunk, leaves and flowers I can 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 I can investigate the way in which water is transported within plants I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.	solids, liquids or gases I can 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) I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. I can 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) I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature I can compare and group materials together, according to whether they are solids, liquids or gases	the digestive system in humans I can identify the different types of teeth in humans and their simple functions I can construct and interpret a variety of food chains, identifying producers, predators and prey	reversible, including changes associated with burning and the action of acid on bicarbonate of soda. I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	gravity acting between the Earth and the falling object I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	and voltage of cells used in the circuit I can 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 I can use recognised symbols when representing a simple circuit in a diagram.	and describe the functions of the heart, blood vessels and blood I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function I can describe the ways in which nutrients and water are transported within animals, including humans.
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	Communication and Language	Personal, Social and Emotional Development	Physical Development	Understanding the World	Science	History	Geography	Art	Music	Physical Education	Design	Computing	Foreign Languages	Other		
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14		
Prior knowledge needed	<p><u>Communication and Language</u></p> <p>Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"</p> <p><u>Physical Development</u></p> <p>Make healthy choices about food, drink, activity and tooth brushing.</p> <p><u>Understanding the World</u></p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore collections of materials with similar and/or</p>	<p><u>ELG:</u></p> <p><u>Communication and Language:</u></p> <p><u>Listening, Attention and Understanding</u></p> <ul style="list-style-type: none"> Make comments about what they have heard and ask questions to clarify their understanding. <p><u>Personal, Social and Emotional Development:</u></p> <p><u>Managing Self</u></p> <ul style="list-style-type: none"> Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. <p><u>Understanding the World:</u></p> <p><u>The Natural World</u></p> <ul style="list-style-type: none"> 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. 	<p><u>Animals Including Humans (Focus on Animal)</u></p> <p>Name at least one fish, reptile and amphibian (Y1)</p> <p>Identify cow, dog, cat, pig, blackbird, sparrow (Y1)</p> <p>Identify simple differences between animals (e.g. legs/no legs, wings, feathers, fur, scales, beak, what they eat) (Y1)</p> <p>Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are</p>	<p><u>All living things and their habitats</u></p> <p>Make observations of animals and explain why some things occur, and talk about changes (UtW ELG)</p>	<p><u>Plants</u></p> <p>Know the 4 key parts of a flowering plant as stem, leaf, root, flower (Y1)</p> <p>Know that evergreen trees maintain their leaves throughout the year and that deciduous trees shed leaves in autumn (Y1)</p> <p>Identify leaves, flowers, petals, fruit, roots, bulbs, seeds trunk, branches, stem (Y1)</p>	<p><u>Rocks</u></p> <p>Know that scientists call the stuff things are made from; materials</p> <p>Recognise at least 5 materials of which objects are made (wood, plastic, glass, metal, rock, water) (Y1)</p> <p>Know that the shape of some solid objects can be changed by squashing, bending, twisting and stretching (rubber band can be stretched, paper can be twisted, pipe cleaner bent) (Y2)</p>	<p><u>Forces and Magnets</u></p> <p>Know why at least 2 materials are suitable for a particular use (Bricks are used for houses as they cannot be squashed, glass is used for windows as it is transparent) (Y2)</p>	<p><u>Light</u></p> <p>Know the sun gives us warmth and light (Y1)</p> <p>Know that days are longer in the summer and shorter in winter (Y1)</p>	<p><u>Living things and their habitats</u></p> <p>Know that things can be categorised into the 3 groups of living, dead and never been alive (Y2)</p> <p>Know what a food chain is and understand that the arrows on a food chain show the direction that the energy travels (Y2)</p>	<p><u>Sound</u></p> <p>Know the basic parts of the human body and say the sense associated with it (ears – hearing, eyes – sight, mouth – taste, nose – smell and fingers – touch) (Y1)</p>	<p><u>Electricity</u></p> <p>Know that electricity makes certain appliances work in their home and at school.</p> <p>Pupils have not yet been taught about electricity, but in history this term they are learning about Michael Faraday. Suggest set up a challenge involving wire, battery and lightbulb to see whether children can generate their own knowledge prior to the unit.</p>	<p><u>Properties and changes of materials</u></p> <p>Know how particles are arranged in solids, liquids and gases and group materials based on this (Y4)</p> <p>Know that materials can change state when heated or cooled (Y4)</p> <p>Know that water can be observed as a solid (ice), a liquid (water) and a gas (vapour) (Y4)</p> <p>Know why at least 2 materials are suitable for a particular use (Bricks are used</p>	<p><u>Earth and Space</u></p> <p>Say what differences there are between the four seasons (Y1)</p> <p>Know that days are longer in the summer and shorter in winter (Y1)</p> <p>Know that a force can be thought of as a push or a pull (Y3)</p> <p>Know that magnets have 2 poles (north and south) and can attract or repel each other (Y3)</p> <p>Understand that plants and animals can be affected if the</p>	<p><u>Light</u></p> <p>Know that we need light in order to see things and that dark is the absence of light (Y3)</p> <p>Know that light from the sun can be dangerous and that we must never look directly at the sun even when wearing sunglasses/shading our eyes (Y3)</p> <p>Know that as objects move towards a light source, the size of the shadow increase (Y3)</p>	<p><u>Living things and their habitats</u></p> <p>To understand the 7 processes of living things- movement, reproduction, sensitivity, growth, respiration, excretion, nutrition (Y4)</p> <p>Classify animals based on their physical characteristics, as vertebrates and invertebrates (Y4)</p> <p>Classify them based on this behaviour as herbivores, carnivores and omnivores (Y4)</p> <p>Understand that plants and animals can be affected if the</p>	<p><u>Evolution and inheritance</u></p> <p>Know the 6 different stages of a human's life cycle (Y5)</p> <p>Know that an animal that is eaten by another is called prey and that an animal that eats other animals is called a predator (Y4)</p> <p>Know that fossils are formed when things that have lived are buried within rock or mud (Y3)</p> <p>Pupils have not yet been taught about evolution, but in history this term they are learning about Charles Darwin. They are also</p>

EYFS	Y1			Y2	Y3			Y4	Y5			Y6			
<p>From Development Matters:</p> <p>Communication and Language</p> <p>Learn new vocabulary.</p> <p>Ask questions to find out more and to check what has been said to them.</p> <p>Articulate their ideas and thoughts in well-formed sentences.</p> <p>Describe events in some detail.</p> <p>Use talk to work out problems and organise thinking and activities.</p> <p>Explain how things work and why they might happen.</p> <p>Use new vocabulary in different contexts.</p> <p>PSED – Self Care</p> <p>Know and talk about the different factors that support their overall health and wellbeing:</p> <ul style="list-style-type: none"> - regular physical activity - healthy eating - tooth brushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian <p>Understanding the World</p> <p>Explore the natural world around them.</p> <ul style="list-style-type: none"> • Describe what they see, hear and feel while they are outside. 	<p>Seasonal Changes</p> <p>Conduct: Observe and describe weather associated with the seasons and how day length varies</p> <p>Seasonal Changes</p> <p>Record & Conclude: Write down words and numbers into pre-drawn tables or draw pictures to record what they find</p> <p>Everyday Materials</p> <p>Plan & Predict: Plan a scientific investigation to answer questions about everyday materials and their properties such as 'is it hard or soft?' 'Is it waterproof?'</p> <p>Say what they think the outcome of the experiment may be</p>	<p>Plants</p> <p>Plan & Predict: Predict what happens to plants over time</p>	<p>Animals, Including Humans</p> <p>Plan & Predict: Ask questions about what animals need to survive and suggest ways to find answer to their questions</p>	<p>Plants</p> <p>Plan & Predict: Predict what happens to plants over time when grown in different conditions</p>	<p>Forces and magnets</p> <p>Plan & Predict: Predict which materials or objects are magnetic / non-magnetic (based on scientific understanding or real life experiences)</p> <p>Conduct enquiries, make observations and take measurements Set up their own simple practical enquiry by identifying a question they want the answer to and making sure the test is fair (e.g. which poles attract and which repel?)</p>	<p>Light</p> <p>Plan & Predict: Identify scientific questions that can be investigated, e.g. 'why do the shape and size of shadows change throughout the day?'</p> <p>Plan & Predict: Make predictions and plan fair tests based on their question</p>	<p>Electricity</p> <p>Plan & Predict: Predict what will happen when a circuit is built, explaining how variables are controlled (changing one variable at a time (independent variable) and one thing that may change that is measured (dependent variable))</p>	<p>Properties and Changes of Materials</p> <p>Plan & Predict: Independently plan different types of scientific enquiries recognising which variables need to be controlled to answer questions such as; What materials would be the most effective for blackout curtains / ice cream container?</p> <p>Conduct enquiries, make observations and take measurements. Plan in factors to ensure reliability of results (e.g. take multiple measurements)</p>	<p>Earth and Space</p> <p>Plan & Predict: Ask relevant questions to start a scientific enquiry about why we have day and night</p>	<p>Light</p> <p>Plan & Predict: Explain how a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry</p>	<p>Evolution and Inheritance</p> <p>Plan & Predict: Explore relevant information by using a wide range of secondary sources</p> <p>Identify evidence that has been used to support or refute ideas about how animals have changed over time (e.g. fossil records as evidence of natural selection)</p>				
<p>regular physical activity</p> <p>healthy eating</p> <p>tooth brushing</p> <p>- sensible amounts of 'screen time'</p> <p>- having a good sleep routine</p> <p>- being a safe pedestrian</p>	<p>Everyday Materials</p> <p>Conduct: Identify and classify familiar materials based on their observable properties (appearance)</p> <p>Perform a simple test to see which materials are waterproof</p>	<p>Plants</p> <p>Conduct: Identify and classify familiar plants</p> <p>Compare and contrast familiar plants</p>	<p>Animals, Including Humans</p> <p>Conduct: Identify and classify a variety of animals as carnivores, herbivores and omnivores</p> <p>Use observations and ideas to compare animals, grouping them as reptiles, fish, amphibian, birds or mammals</p>	<p>Animals, Including Humans</p> <p>Conduct: Observe and discuss how animals grow, looking at some animals hatching from an egg (chick, caterpillar)</p>	<p>All living things and their habitats</p> <p>Conduct: Research and select relevant information about animals and their habitats from a range of sources</p> <p>Identify and classify animals and compare their differences</p>	<p>Plants</p> <p>Conduct: Observe closely change over time for the growth of a plant (using equipment such as ruler for standard measurement)</p> <p>Set up and perform simple comparative tests – e.g. plants with water vs plants without water, in order to ask and answer questions</p> <p>Use systematic observation to gather results</p>	<p>Rocks</p> <p>Conduct: Make systematic and careful observations of rocks and their differences</p>	<p>Forces and Magnets</p> <p>Conduct: Investigate and sort materials according to the effect they have when near a magnet</p> <p>Test the magnetic poles to see which attract and which repel</p>	<p>Light</p> <p>Conduct: Make systematic and careful observations of shadows changing throughout the day</p>	<p>Sound</p> <p>Model and explore how sound is made by something vibrating.</p> <p>Conduct: Experiment: Which materials are the most effective sound insulators? (What material is best for reducing sound?) Plan a fair test by only changing one variable to find out which material is the most effective sound insulator.</p>	<p>Electricity</p> <p>Conduct: Investigate different conductors</p> <p>investigate how to affect the brightness of a bulb</p>	<p>Properties and Changes of Materials</p> <p>Conduct: Use a range of scientific equipment, with increasing accuracy and precision to investigate different types of irreversible change, identifying any new materials created</p>	<p>Earth and Space</p> <p>Conduct: Explore how scientific ideas have developed over time</p>	<p>Living Things and Their Habitats</p> <p>Conduct: Explore how scientific ideas have changed over time (about life cycles and processes)</p>	<p>Light</p> <p>Conduct: A fair test and explain why shadows have the same shape as the objects that caused them</p> <p>Explore relevant information by using a wide range of secondary sources</p>

Scientific skills to be explicitly taught during this unit (Working Scientifically)

<ul style="list-style-type: none"> Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them. 	<p>Everyday materials Record & Conclude :</p> <p>Write down words and numbers into pre-drawn tables or draw pictures to record what they find</p> <p>Suggest an answer based on real life experience</p>	<p>Plants Record & Conclude: Observe plants closely and record observations over time such as leaves falling off trees using pictures</p> <p>Label simple diagrams/p re-drawn pictures showing the parts of a plant</p>	<p>Animals, including Humans Record & Conclude: Label a simple diagram to show the main body parts (head, neck, arms, legs, knees, face, ears, shoulders, feet)</p>			<p>Plants Record & Conclude: Record observations of change over time using drawings, measurements and descriptions</p> <p>Use their observations and taught scientific knowledge to suggest plausible answers to questions</p>	<p>Rocks Record & Conclude: Sort and classify rocks according to their different properties choosing an appropriate method of recording (table or chart)</p> <p>Report on finding from enquiries using oral and written explanations</p>	<p>Forces and Magnets Record & Conclude: Draw a conclusion based on the relationship between the independent and the dependent variable (e.g. the closer the magnet, the bigger the force)</p>	<p>Light Record & Conclude: Use diagrams, charts or tables to record results of the changes</p>	<p>Living Things and Their Habitats Record & Conclude: Use straightforward scientific evidence to answer questions or support findings e.g. how changes in environments have led to danger for some animals</p> <p>Show the relationship between an independent variable in a two-way table; and label specific results in a two-way table (e.g. classification of animal, vertebrae/ not; carnivore / not)</p>	<p>Sound Record & Conclude: Model and explore how sound gets louder/ quieter and create labelled diagrams/ drawings/ models to illustrate</p> <p>Explain an observation or event distinguishing between what has been observed and why it happened</p> <p>Select information to support findings and use this to explain an observation</p>	<p>Electricity Record & Conclude: Model and explore how different circuits work/ don't work and create labelled diagrams/ drawings/ models with a coloured key to explain</p> <p>Suggest improvements and raise further questions</p> <p>Ask and plan further questions as a result of the enquiry</p>	<p>Properties and Changes of Materials Record & Conclude: Systematically record data and results using scientific diagrams, labels, classification keys and tables to compare and group together everyday materials based on their properties</p> <p>Report and present findings using increasingly complex scientific diagrams and labels to explain how filtering, sieving and evaporation can be used to separate mixtures</p>	<p>Earth and Space Record & Conclude: Justify their conclusions using scientific evidence including causal relationships and explanations of and degree of trust in results</p>		<p>Light Record & Conclude: Record findings and present results in a variety of ways. Choose the best recording method to present their data (e.g. how we see objects or how light travels from light sources to our eyes)</p> <p>Independently write a simple scientific enquiry including areas of improvement and further research questions to investigate</p>		
				<p>Uses of Everyday materials Plan & Predict: Plan a simple test to find answers to questions like; Why are bricks more suitable than paper to build a bridge?</p> <p>Make predictions as to which materials can be changed by squashing, bending, twisting or stretching them</p>		<p>Animals, Including Humans Plan & Predict: Ask questions about what humans need to survive and keep healthy suggesting ways to find answers to their questions</p>	<p>Plants Plan & Predict: Plan a fair test, making predictions and deciding on which variables need to change in order for the seed to grow well</p>			<p>States of Matter Plan & Predict: Plan their own simple practical enquiry by asking a question and make predictions based on their increasing scientific knowledge (e.g. how temperatures may affect the water cycle)</p>		<p>Animals, Including Humans Plan & Predict: Discuss and decide on the criteria for grouping, sorting and classifying animals as producers, consumers, predators and prey</p>		<p>Forces Plan & Predict: Design a fair test to see the effects of air/ water resistance and friction have on moving objects recognising and controlling the variables where necessary</p> <p>Make predictions based on previous test results</p>		<p>Electricity Plan & Predict: Design a comparative and fair test to compare the number and voltage of cells used in a circuit to the brightness of a bulb/ loudness of a buzzer</p> <p>Know how to choose appropriate variables to test a hypothesis</p>		<p>Animals, Including Humans Plan & Predict: Plan a scientific enquiry, including recognising and controlling variables where necessary, to answer questions about the impact of diet, exercise, drugs and lifestyle on health (measuring their pulse before and after exercise)</p>

				<p>Uses of Everyday materials Conduct: Observe, identify and classify the use of different materials around them (metal is used for spoons, wood can be used for floors)</p> <p>Perform simple tests on solid objects to see if they can be changed by squashing, bending, twisting or stretching</p>		<p>Animals, Including Humans Conduct: Observe and measure how humans grow, from baby to toddler then child then teenager up to adult</p> <p>Identify and classify foods that are healthy and foods of which humans should eat less (high in sugar and fat)</p>		<p>Plants Conduct: Set up a simple practical demonstration showing the function of a stem taking water to the plant</p> <p>Experiment: What is needed for germination? What affects growth?</p>	<p>Animals, Including Humans Conduct: Research information from a range of sources about food groups and nutrition</p>	<p>States of Matter Conduct: Use scientific enquiry to answer relevant questions such as is this material a solid, liquid or gas? How can you tell?</p> <p>Make systematic and careful observations using thermometers and data loggers to research the temperature at which materials change state</p> <p>Experiment: creating own water cycle in a bowl</p>		<p>Animals, Including Humans Conduct: Research, observe and experiment to answer scientific questions about teeth, such as What is the difference between the teeth of a carnivore and herbivore?</p> <p>Experiment: re-enacting the digestive system using tights and "food" passing through</p>		<p>Forces Conduct: Recognise and control variables when testing</p> <p>Take accurate and precise measurements using standard units and a range of equipment taking repeat readings when appropriate</p>	<p>Animals, including Humans Conduct: Research the gestation period of other animals and compare to humans</p>	<p>Electricity Conduct: Know how and when to repeat measurements</p>	<p>Living Things and Their Habitats Conduct: Use a wide range of sources to explore information</p>	<p>Animals, Including Humans Conduct: Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health</p> <p>Accurately use further measuring devices recognising the relative accuracy of each device (heart rate monitor)</p>
				<p>Uses of Everyday Materials Record & Conclude: Record results to experiments in different ways table, labelled diagram</p>			<p>Plants Record & Conclude: Gather and record data from a fair test using scientific vocabulary (Y1), labelled diagrams (Y2) keys, bar charts and tables (Y2)</p>		<p>Animals, Including Humans Record & Conclude: Explain and describe the human digestive system using labelled diagrams, arrows, a coloured key and scientific language (mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, rectum, anus)</p>	<p>States of Matter Record & Conclude: Explain the water cycle using scientific language (evaporation, condensation, water vapour, precipitation)</p> <p>Use scientific evidence to show that water can be solid (ice), liquid (water) and gas (vapour)</p>		<p>Animals, Including Humans Record & Conclude: Explain and describe the human digestive system using labelled diagrams, arrows, a coloured key and scientific language (mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, rectum, anus)</p>		<p>Forces Record & Conclude: Draw conclusions based on the relationship between the independent and dependent variable (the bigger the... the smaller the... - the 'er' er rule)</p> <p>Independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion</p>	<p>Animals, Including Humans Record & Conclude: Use a timeline to demonstrate different stages for a human's life cycle</p> <p>Record data (gestation period) using graphs, tables and scientific diagrams</p> <p>Report and present findings from enquiries into puberty. Use diagrams and lists to explain the differences girls and boys experience during puberty, such as boys develop facial hair and a deeper voice, while girls start menstrual cycles and develop breasts</p>		<p>Living Things and Their Habitats Record & Conclude: Develop classification keys when classifying animals</p> <p>Identify evidence that has been used to support or refute ideas</p> <p>Identify evidence that supports/refutes causal relationship</p>	<p>Animals, Including Humans Record & Conclude: Use scientific diagrams, labels and classification keys, to show a technically accurate explanation of how the human circulatory system works</p> <p>Select a suitable method (tables, scatter graphs, bar/line graphs) to record data and results of experiments showing the impact of diet, exercise, drugs and lifestyle.</p>

	Y1	Y2	Y3	Y4	Y5	Y6									
<p>Content to be taught (Secured knowledge in bold)</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experience 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. (ELG The Natural World)</p> <p>Make comments about what they have heard and ask questions to clarify their thinking.</p>	<p><u>Seasonal Changes</u></p> <p>Say what differences there are between the four seasons</p> <p>Know that days are longer in the summer and shorter in winter</p> <p>Know that weather changes throughout the year, getting hotter in the summer and colder in the winter</p> <p>Know that the winter is likely to bring ice on the ground when water freezes due to the cold</p> <p>Know the sun gives us warmth and light</p>	<p><u>Animals, Including Humans (Focus on Animals)</u></p> <p>Know that animals have offspring that grow into adults, naming 3 different offspring and their parent (chick/ chicken, tadpole/ frog, lamb/ sheep)</p> <p>Know that animals need 3 things to survive: air, water and food</p>	<p><u>Animals, Including Humans (Focus on Humans)</u></p> <p>Know that things can be categorised into the 3 groups of living, dead and never been alive</p> <p>Know what a food chain is and understand that the arrows on a food chain show the direction that the energy travels</p> <p>Know that living things move, grow, consume nutrients and reproduce and that dead things used to do these things but no longer do and that never lived thing have never done these things</p> <p>Explain the difference between a habitat and a microhabitat (a habitat is an environment containing all an animal needs to survive; water, shelter, food and space. A microhabitat is a small area that differs somehow from the surrounding habitat)</p> <p>Know that animals and</p>	<p><u>Rocks</u></p> <p>Identify and classify rocks according to whether they have grains or crystals or have fossils in them</p> <p>Know that fossils are formed when things that have lived are buried within rock or mud</p> <p>Know that soil is a mixture of crumbled rock and organic matter broken down by the action of weather</p> <p>Know that there are three kinds of rocks: igneous (formed from molten rock below the Earth's crust), sedimentary (formed by small weathered rock fragments sticking together) and metamorphic (formed when rocks in the Earth's crust get squashed and heated)</p>	<p><u>Forces and Magnets</u></p> <p>Know that a force can be thought of as a push or a pull</p> <p>Know that magnets have 2 poles (north and south) and can attract or repel each other</p> <p>Know that N and N, and S and S, repel and N and S attract</p> <p>Know that some materials are magnetic (attracted to a magnet) and some are non-magnetic (not attracted to a magnet)</p> <p>Understand that the roughness of a surface affects how things move</p> <p>Know that magnetic forces can act at a distance</p> <p>Know friction is a force between two surfaces in contact</p>	<p><u>Light</u></p> <p>Know that we need light in order to see things and that dark is the absence of light</p> <p>Know that light from the sun can be dangerous and that we must never look directly at the sun even when wearing sunglasses/ shading our eyes</p> <p>Know that as objects move towards a light source, the size of the shadow increase</p> <p>Know that light is reflected from surfaces and travels in straight lines</p> <p>Know that shadows are formed when the light from a light source is blocked by a solid object (there is no shadow from transparent objects as light passes through them)</p> <p>Know that the Sun is a light source, but that the Moon is not (it just reflects light from the sun)</p>	<p><u>Living things and their habitats</u></p> <p>To understand the 7 processes of living things- movement, reproduction, sensitivity, growth, respiration, excretion, nutrition</p> <p>Classify animals based on their physical characteristics, as vertebrates and invertebrates</p> <p>Classify them based on this behaviour as herbivores, carnivores and omnivores</p> <p>Understand that plants and animals can be affected if the environment changes (know that human activity, such as climate change caused by pollution can change the environment for many living things, endangering their existence including extinction)</p> <p>Know that living things are divided into kingdoms: the animal kingdom, plants, fungi, bacteria and single celled organisms</p> <p>Know that a classification key uses questions to</p>	<p><u>Sound</u></p> <p>Know that a sound is made by something vibrating</p> <p>Know that sounds get fainter as the distance from the source increases</p> <p>Know that pitch is how high or low a sound is and that this is determined by how many vibrations per second are being made by the vibrating object</p> <p>Know the volume of a sound depends on the strength of the vibration producing it</p> <p>Know that vibrations from sound travel through a medium in to the ear (through particles in the air)</p>	<p><u>Electricity</u></p> <p>Know common appliances that run on electricity (fridge, hairdryer, washing machine, TV)</p> <p>Identify key components in a circuit (cell, wire, bulb, switch, buzzer, lamp)</p> <p>Know how to construct a simple circuit using components</p> <p>Know there must be a complete loop for electricity to flow</p> <p>Know that exposure to high levels of electrical current can be dangerous</p> <p>Know that electrical current flows well through some materials (electrical conductors) and poorly through other materials (electrical insulators)</p> <p>Know that when electrical current flows through a circuit's components within that circuit, they begin to work (a buzzer makes noise, a bulb emits light)</p>	<p><u>Properties and Changes of Materials</u></p> <p>Understand the meaning of hardness (the ability a material has to resist deformation), solubility (ability to dissolve in water), transparency (level of light able to pass through), electrical /thermal conductivity (the ability to conduct electricity/heat), magnetism (response to a magnet)</p> <p>Know that filtering is used to separate a mixture of an insoluble solid and a liquid, sieving is used to separate a mixture of different sized solids and evaporation is used to separate mixtures which a solid has dissolved in a liquid</p> <p>Name 2 materials that will dissolve in liquid to form a solution (sugar and salt) and understand how this can be reversed with the material from the solution recovered again through distillation (heating the solution to remove the water)</p>	<p><u>Earth and Space</u></p> <p>Know the Earth, Moon and Sun are roughly spherical</p> <p>Know that the Sun is a star at the centre of our solar system and that it has eight planets- Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune</p> <p>Know that planets orbit a star (Earth orbits the sun) Know that the Earth orbits the sun taking 365.25 days (1 year)</p> <p>Know that a moon orbits a planet and that our moon orbits Earth (every 28 days) because of the pull of the Earth's gravity</p> <p>Understand how the Earth rotates on its axis once every 24 hours (giving us day and night) the sun does not move, it just seems to because the Earth is rotating</p>	<p><u>Living things and their habitats</u></p> <p>Name mammals, amphibians, reptiles, insects and birds as types of living things</p> <p>Know that the life cycle of a living thing is a series of stages starting with a fertilized egg in animals or a seed in many plants</p> <p>Know in most mammals (e.g. dogs) a fertilized egg develops in the womb into an f and is born and fed on milk before it is weaned onto food that is adapted to eat; it then develops to maturity in a period called adolescence after which it can reproduce and the cycle can begin again</p> <p>Know that in amphibians (e.g. frogs) a fertilized egg develops into an embryo and then hatches, it then develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin again</p>	<p><u>Light</u></p> <p>Understand that we see light because it sends light to our eyes</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>Know that when light passes from one medium to another (from air to water) it changes direction; this is called refraction</p> <p>Know that white light comprises all the colours of light</p> <p>Know that white light refracted by two surfaces in a prism spread out so that all of its constituent colours can be seen (a spectrum) this happens as different colours of that constitute white light travel at different speeds</p> <p>Know how to draw a diagram to show why the shape of a shadow will</p>	<p><u>Living things and their habitats</u></p> <p>Know the 5 vertebrate groups as fish, bird, mammal, reptile and amphibian</p> <p>Know that there are 3 types of micro-organism; viruses, fungi and bacteria</p> <p>Know some commofn invertebrate groups, (insects, spiders, worms, snails)</p> <p>Know that an arthropod is an invertebrate with a hard external skeleton and jointed limbs</p> <p>Know that insects are a type of arthropod; their bodies have 6 legs, head, thorax and abdomen; most insects also have a pair of antennae and wings</p> <p>Know that an arachnid is a type of arthropod with 8 legs and no antennae or wings</p>	<p><u>Evolution and Inheritance</u></p> <p>Know that living things produce offspring of the same kind</p> <p>Know that offspring are similar, but not identical, to parents</p> <p>Know that fossils tell us about living things from millions of years ago</p> <p>Understand that variation has meant living things have changed over time (animals become more or less able to survive where they live because of variation)</p> <p>Know that living things change over time and that this gradual change is called evolution (the process of adaption leads to evolution)</p>

	<p><u>Everyday Materials</u></p> <p>Know that scientists call the stuff things are made from; materials</p> <p>Recognise at least 5 materials of which objects are made (wood, plastic, glass, metal, rock, water, brick, paper, fabric)</p> <p>Know there is a difference between an object and the material it is made from</p> <p>Name 2 materials that are waterproof (rubber and plastic)</p> <p>Know that materials can be hard/soft, strong, weak, absorbent, heavy, light, solid and runny, smooth and rough; these descriptions denote the properties of a material</p> <p>Say whether a material is hard/soft; stretchy/stiff; shiny/dull; rough/smooth;</p>	<p><u>Plants</u></p> <p>Know the 4 key parts of a flowering plant as stem, leaf, root, flower</p> <p>Know that evergreen trees maintain their leaves throughout the year and that deciduous trees shed leaves in autumn</p> <p>Identify leaves, flowers, petals, fruit, roots, bulbs, seeds trunk, branches, stem</p> <p>Name at least 3 common wild and garden plants (sunflower, daisy, runner beans)</p> <p>Name at least one evergreen (pine tree) and one deciduous plant/tree (oak tree)</p> <p>Know that a tree's stem is called a trunk</p>	<p><u>Animals Including Humans</u></p> <p>Name at least one fish, reptile and amphibian</p> <p>Identify cow, dog, cat, pig, blackbird, sparrow</p> <p>Identify simple differences between animals (e.g. legs/no legs, wings, feathers, fur, scales, beak, what they eat)</p> <p>Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone</p> <p>Know the basic parts of the human body and say the sense associated with it (ears – hearing, eyes – sight, mouth – taste, nose – smell and fingers – touch)</p> <p>Know that herbivorous animals eat plants; a carnivorous animal eats other animals; omnivorous animals eat both</p>	<p>plants live in a habitat to which they are suited (animals have suitable features that help them move and find food, plants have suitable features that help them grow well) and name some examples e.g. a polar bear has white fur to camouflage to their environment)</p>					<p><u>Animals, Including Humans</u></p> <p>Know that animals, including humans, get nutrition from food (they cannot make their own food)</p> <p>Know that some humans and animals have skeletons inside their body to protect their vital organs (heart, brain, lungs) and provide support to stand</p> <p>Know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods</p> <p>Know that human skeletons are made up of bones and cartilage</p>	<p>sort and identify different living things</p>		<p>Know that a circuit with everything in a single loop is a series circuit</p>	<p>Know a property and an associated use of everyday materials: Metal (thermal conductor used to keep drinks warm like a flask), Wood (hard and durable used for chairs) and Plastic (thermal insulator used for storing ice cream at cold temperature)</p> <p>Know that irreversible change can make a new material (burning wood makes ash, mixing vinegar and bicarbonate of soda makes carbonic acid and sodium acetate)</p>		<p>Know that in many insects (e.g. butterflies) a fertilized egg develops into wingless feeding form called a larva(caterpillar); the larva feeds then later becomes a pupa (chrysalis) with a protective cocoon; inside this cocoon, the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can begin again</p> <p>Know that in birds a fertilized egg hatches in a nest (hatchling) and is fed by its parents until it is ready to fly (fledgling); it then leaves the nest and grows into an adult after which it can reproduce and the cycle can begin again</p>	<p>match the shape of an object</p>	<p>Know that crustacean is a type of arthropod with two pairs of antennae (woodlouse)</p> <p>Know that a myriapod is a arthropod with a flat and long or cylindrical body and many legs (centipede)</p> <p>Know that germs are disease-causing bacteria</p>	
	<p><u>Uses of Everyday Materials</u></p> <p>Know why at least 2 materials are suitable for a particular use (Bricks are used for houses as they cannot be squashed, glass is used for windows as it is transparent)</p> <p>Know that the shape of some solid objects can be changed by squashing, bending, twisting and stretching (rubber band can be stretched, paper can be twisted, pipe cleaner bent)</p> <p>Know that many types of plastic are waterproof, that metal is usually strong, that rock is hard and rigid and</p>			<p><u>Plants</u></p> <p>Know that plants come from bulbs or seeds and can produce seeds (life cycle of a plant)</p> <p>Know that plants need water, light and a suitable temperature to grow and stay healthy</p> <p>Understand that germination is when a seed starts to grow</p> <p>Know that seeds and bulbs need to be buried underground in soil and that they will grow into adult plants under the right conditions (water, warmth)</p> <p>Know that plants produce seeds that grow into new plants that are the same</p>	<p><u>Plants</u></p> <p>Know the function of a plant's roots (to hold the plant firmly in the ground and take water and nutrients from the soil), stem/trunk (to carry water and nutrients to the plant), leaves (to absorb sunlight and use its energy to turn carbon dioxide and water into carbohydrates) and flowers (reproduction)</p> <p>Know that plants vary in their needs (air, water, nutrients from soil and room to grow)</p> <p>Know the life cycle of a flowering plant from pollination to seed dispersal</p>			<p><u>States of matter (and the Water Cycle)</u></p> <p>Know how particles are arranged in solids, liquids and gases and group materials based on this (solids: particles are tightly packed in a regular pattern. Liquids: particles are close together with no regular pattern. Gases; particles are well separated)</p> <p>Know that materials can change state when heated or cooled and that some of these changes are irreversible (changes that cannot be changed back again) and some are reversible (changes can be</p>		<p><u>Animals, Including Humans</u></p> <p>Identify teeth – incisors, canines, pre-molars and molars, wisdom teeth</p> <p>Know what the different teeth do; incisors slice food, canines tear food (especially meat) and molars grind food</p> <p>Know that food passes through the body with the nutrients being extracted and the waste products excreted, and that this process is called digestion</p> <p>Understand a food chain starts with the sun, then a plant, then an animal, usually herbivore then carnivores</p>	<p><u>Forces</u></p> <p>Know unsupported objects fall because of gravity between earth and the object</p> <p>Know that air resistance, water resistance and friction can change how things move</p> <p>Know that the amount of matter (stuff) in an object is its mass</p> <p>Know that gravity is a force that acts between all objects in the universe and can act more strongly between objects that have more mass and are close together</p> <p>Know that force is measured in a unit called Newtons (named</p>	<p><u>Electricity</u></p> <p>Use the correct symbols in circuit diagrams (bulb, switch, cell, wire, motor, buzzer)</p> <p>Know that as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase</p> <p>Understand that an open switch stops the electrical energy flowing to the bulb or buzzer</p> <p>Know that more cells provide greater voltage, so more energy</p> <p>Know that voltage is a measure of the power of a cell to produce</p>	<p><u>Animals, Including Humans</u></p> <p>Identify & name the main parts of the human circulatory system along with the function of products)</p> <p>Know that arteries carry blood away from the heart and veins carry blood towards the heart</p> <p>The use of oxygen to create energy is called respiration</p> <p>Know that when we exercise, our heart beats more frequently so that the oxygen used around the body can be replenished</p> <p>Describe at least 1 positive and 1 negative effects diet, exercise, drugs and</p>					

		<p>bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent</p>	<p>animals and plants</p> <p>Know that fish are different they have scaly skin and gills so that they can breathe underwater</p> <p>Know that amphibians are different as they begin their lives with gills but then develop lungs and breath on land</p> <p>Know that reptiles are different as they breath air and have scaly skin</p> <p>Know that birds are different to other animals as they have feathers and wings</p> <p>Know that mammals are different to other animals as they have fur/ hair and feed milk to their young</p>	<p>some plastics are flexible</p>	<p>Know that if plants are deprived of light, food or air they will not grow and will die</p>				<p>changed back again)</p> <p>Know that water can be observed as a solid (ice), a liquid (water) and a gas (vapour)</p> <p>Know that the first stage in the water cycle is evaporation (when the sun heats up the water on land/sea) and condensation happens when the water vapour cools down and turns back into water drops forming clouds</p> <p>Know that temperature impacts the water cycle by speeding up or slowing down the evaporation process</p>		<p>Know that an animal that is eaten by another is called prey and that an animal that eats other animals is called a predator</p> <p>Know that adult humans have 32 teeth</p> <p>Know that children develop an initial set of teeth which are gradually replaced between the ages of 6 and 12</p> <p>Know that the process of digestion involves breaking complex foodstuffs into simpler building blocks that can be absorbed by the body. It begins with food being chewed in the mouth by the teeth and saliva added</p> <p>Know that food is squeezed down the oesophagus towards the stomach in a wave-like action called peristalsis</p> <p>Know that the stomach releases acid and enzymes to continue breaking down the food; the stomach is an organ; an organ is a part of living thing that is self-contained and has a specific important job</p> <p>Know that further enzymes and bile break down the food further as it moves through the duodenum towards the small intestine</p> <p>Know that the small intestine adds more enzymes and then absorbs the nutrients</p>	<p>after British scientist Sir Isaac Newton) using a device called a force meter</p> <p>Know that levers, pulleys and gears can allow a smaller force to have a greater effect</p>	<p>electricity; it is a measure of the push, not size, of electrical current</p> <p>Know that current electricity is the flow of charged particles called electrons around a circuit</p> <p>Understand the difference between a parallel circuit and a series circuit (if a bulb blows in a series circuit the other will not shine, as the circuit has been broken. If a bulb blows in a parallel circuit, the other will shine as there will still be a complete circuit)</p>	<p>lifestyle have one the human body (positive; medicine can help you get better when ill, negative; smoking will damage your lungs)</p> <p>Know that the water we drink is absorbed by the intestines and circulated throughout the body in the form of body fluid (such as blood)</p>
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											<p>Know that the large intestine absorbs water from the undigested food</p> <p>Know that undigested food is stored in the rectum before being excreted through a muscle called the anus</p> <p>Know that the first consumer in a food chain is called a primary consumer, the second is a secondary consumer and above it is a tertiary consumer</p>						
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		Y1			Y2			Y3			Y4			Y5			Y6		
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<p>Scientific vocabulary to be explicitly taught during this unit</p> <p><u>The Sky at Night</u> Light, dark, space, stars, planets,</p> <p><u>Roots, shoots and muddy boots</u> f</p> <p><u>Homes and Habitats</u> Home, habitat, nest, den</p> <p><u>Superheroes</u> exercise, healthy, vitamins, fruit, vegetables</p>	<p><u>Seasonal Changes</u> winter summer spring autumn weather breeze showers year season short</p> <p>change observe measure table chart length</p>			<p><u>Animals, Including Humans (Focus on Animals)</u> diet food group feature structure claw hoof paw flipper antler horn tusk skin fur feathers scales wings beak gills tentacles</p> <p>criteria similarities differences explanation evidence</p>			<p><u>All Living Things and Their Habitats</u> diet baby toddler teenager adult carbohydrates protein fat sugars exercise healthy balanced diet vegetables dairy fruits rice bread potatoes potatoes</p> <p>criteria similarities differences explanation evidence</p>			<p><u>Animals, Including Humans (Focus on Human)</u> baby toddler teenager adult carbohydrates protein fat sugars exercise healthy balanced diet vegetables dairy fruits rice bread potatoes potatoes</p> <p>criteria similarities differences explanation evidence</p>			<p><u>Rocks</u> sedimentary metamorphic igneous texture heavy rigid fossil geologist layers buried palaeologist topsoil humus decomposing weathering taxonomy of soils plasticity structure percolation rates clay sandy soil silt permeable non-permeable</p>			<p><u>Forces and Magnets</u> magnetic non-magnetic poles attract repel force north pole south pole iron properties dependent variable independent variable enquiry</p>			<p><u>Light</u> reflection opaque translucent transparent shadow safety glasses natural source protection</p>			<p><u>Living Things and Their Habitats</u> invertebrates vertebrates amphibians reptiles mammals insects environment categories group</p>			<p><u>Sound</u> vibration source pitch volume sound wave decibels</p>			<p><u>Electricity</u> circuit switch battery plug mains appliance device wire crocodile clip bulb buzzer connection power current insulator conductor</p>			<p><u>Properties and Changes of Materials</u> hardness deformation durability solubility soluble insoluble dissolve transparency thermal conductor /conductivity thermal insulation electrical conductivity magnetism solution distillation filtering sieving</p>			<p><u>Earth and Space</u> planet orbit earth solar system rotate axis time zone revolution</p>			<p><u>Living things and their habitats</u> gestation asexual cell gene sperm egg fertilisation</p>			<p><u>Light</u> reflect angle beam</p>			<p><u>Living things and their habitats</u> species amphibian sorting diagram classification characteristic</p>			<p><u>Evolution and inheritance</u> DNA parent offspring inheritance genes genetic material cells evolution inherited theory</p>		
	<p><u>Everyday Materials</u> material/s waterproof rubber plastic wood glass metal rock paper properties hard/soft shiny/dull stretchy/stiff rough/smooth bendy absorbent transparent opaque</p> <p>compare classify group test</p>			<p><u>Plants</u> plant tree roots stem leaves flower seed petals branches trunk evergreen deciduous wild garden familiar</p> <p>identify observation record diagram data sketch magnifying</p>			<p><u>Animals Including Humans</u> animals humans fish reptiles birds mammals carnivores herbivores omnivores vertebrates body senses hearing sight touch taste smell</p> <p>label contrast</p>			<p><u>Uses of Everyday Materials</u> suitability uses properties glass brick cardboard solid alter squashing bending</p>			<p><u>Plants</u> bulb flowering fruit nutrients temperature germination survival life cycle disperse pollinate</p> <p>key</p>			<p><u>Plants</u> light source water source function fertilisation reproduction seed dispersal carbon dioxide</p> <p>variable practical demonstration</p>			<p><u>Animals, including humans</u> nutrition protein carbohydrates dairy vitamins minerals balanced skeleton exoskeleton invertebrate</p>			<p><u>State of Matter</u> Solids liquids gases particles state irreversible reversible substances chemical changing state condensation evaporation</p>			<p><u>Animals, Including Humans</u> oesophagus stomach acid bile large intestine small intestine anus rectum canine incisors milk teeth</p>			<p><u>Forces</u> balanced unbalanced gravity friction resistance mass weight levers pulleys fulcrum load effort</p>			<p><u>Animals, Including Humans</u> life cycle gestation foetus womb conception childhood adolescent juvenile adulthood reproduction</p>			<p><u>Electricity</u> battery cell voltage components symbols buzzer motor fuse wire filament</p>			<p><u>Animals, Including Humans</u> circulation circulatory system function vital organ vessels water products exercise negative positive</p>											

		object equipment			twisting stretching				requirement analyse / analysis	protective cage organs ribs heart lungs backbone vertebrae vertebrate skull muscle contract	water cycle precipitation water vapour steam clouds icecap infiltration run-off transpiration		premolars molars wisdom teeth food chain consumer producer predator prey primary secondary tertiary			puberty period menstruation			medicine drugs diet lifestyle muscles lungs veins arteries
		Y1			Y2			Y3			Y4			Y5			Y6		
Suggested high quality texts		<p><u>Seasonal Changes</u> (Fact Cat) Seasons by Izzi Howell</p> <p>Here comes Jack Frost by Kazuno Kohara</p> <p>Thinking about the Seasons series by Clare Collinson</p> <p>Year 1 weather- Skip through the seasons- Weather Detectives by Stella Blackstone and Maria Carluccio</p>			<p><u>Animals including Humans (Focus on Animals)</u></p> <p>Are you What You Eat? A Guide to What's on Your Plate and Why by Dorling Kindersley</p> <p>Materials (Fact Cat: Science) by Izzy Howell</p>	<p><u>All Living Things and Their Habitats</u></p> <p>The Hunter by Paul Geraghty</p> <p>Disappearing Acts by Isabella Bunnell</p>	<p><u>Animals Including Humans (Focus on Humans)</u></p> <p>Your Heart and Lungs by Sally Hewitt</p> <p>Your fantastic Elastic Brain by JoAnn Deak and Sarah Ackerley</p> <p>Professor Astro Cat's Human Body Odyssey by Dominic Walliman</p> <p>Ten Seeds by Ruth Brown</p>	<p><u>Rocks</u></p> <p>The Pebble in My Pocket by Meredith Hooper</p> <p>The Rock factory by Jacqui Bailey</p> <p>A Rock is Lively by Dianna Hutts Aston</p>	<p><u>Forces and Magnets</u></p> <p>Be a Scientist: Investigating Forces by Jacqui Bailey</p> <p>Science Action: Magnetism by Joanna Brundle</p>	<p><u>Light</u></p> <p>Light and Dark (Exploring Light) By Louise Spilsbury</p> <p>How Are Shadows and Reflections Made? (Let's Look at Light) by Mari C Schuh</p>	<p><u>Living Things and their Habitats</u></p> <p>The Variety of Life by Nicola Davies</p> <p>Saving Species by Jess French</p> <p>Lots : The Diversity of Life on Earth by Nicola Davies</p> <p>Animal Habitats by Ladybird Books</p>	<p><u>Sound</u></p> <p>Moving up with Science: Sound by Peter Riley</p> <p>Making Noise!: Making Sounds by Louise Spilsbury and Richard Spilsbury</p>	<p><u>Electricity</u></p> <p>Electricity- Next Steps STEM- Cool Circuits and Wicked Wires by Susan Martineau</p>	<p><u>Properties and Changes of Materials</u></p> <p>Foxton Primary Science: Properties and Changes of Materials (Upper KS2 Science) by Nichola Tyrrell</p> <p>Materials and Properties (Straight Forward with Science) by Peter Riley</p>	<p><u>Earth and Space</u></p> <p>Dr Maggie's Grand Tour of the Solar System by Dr Maggie Aderin-Pocock</p> <p>Earth and Space by Osborne Books</p>	<p><u>Living Things and their Habitats</u></p> <p>Living Habitats by Jon Richards</p> <p>The Animal Book: A visual Encyclopaedia of Life on Earth by Dorling Kindersley</p>	<p><u>Light</u></p> <p>Flowchart Science: Light by Mary Colson</p> <p>From Sunlight to Blockbuster Movies: An energy journey through the world of light (Energy Journeys) By Andrew Solway</p>	<p><u>Living Things and their Habitats</u></p> <p>Habitats (Science Skills Sorted!) by Anna Claybourne</p> <p>Creature Features by Natasha Durley</p>	<p><u>Evolution and Inheritance</u></p> <p>Robert Winston: All About Evolution by Dorling Kindersley</p> <p>Scientists Who Made History: Charles Darwin by Cath Senker</p> <p>Foxton Primary Science: Evolution and Inheritance (Upper KS2 Science) by Nichola Tyrrell</p>
		<p><u>Everyday Materials</u></p> <p>Go Facts Physical Science Materials</p> <p>Exploring Materials</p> <p>Materials by Anna Claybourne</p>	<p><u>Plants</u></p> <p>From Seed to Plant by Gail Gibbons</p> <p>Plants- Ways into Science: All About Plants by Peter Riley</p>	<p><u>Animals Including Humans</u></p> <p>Professor Astrocat's Human Body Odyssey</p> <p>Animals- Usbourne First Encyclopedia of Animals</p>															
Rationale for each unit		Children have the chance to observe changes in weather and seasons, building from observing differences in Yr R.			Children learn about the basic needs of animals, including humans. They will then learn more about food, exercise and hygiene in the summer term.	Children begin to understand about animals and the habitats that they have being suitable. The work here on the food chain is a precursor to the Year 4 unit, where they can construct and interpret a variety of food chains.	Building on Health and Self care in EY, children now begin to learn in more detail the things that humans need to stay healthy. The work on humans having offspring that grow in to adults is developed further in Year 5.	Children will have the vocabulary and skills to describe different rocks and think about how to group them. They can build on their recording skills by using oral and written explanations for their findings. This will give a good foundation for exploring states	Forces and Magnets gives the children the opportunity to explore and gives a foundation for the Yr 5 unit on materials.	Children begin to explore light and its properties, identifying scientific questions that they can answer. This will support work in Year 5 on Earth and Space and refraction in Year 6.	Children will build on their KS1 materials knowledge and start to develop investigations into the properties of materials.	Units on sound enable children to develop further their investigation and explanation skill as they learn about how sound works.	Units on electricity enable children to develop further their investigation and explanation skill as they learn about how electricity works.	Children can now plan a fair test, using the knowledge of materials and their various properties that they have amassed.	Children will build on their knowledge of forces from Y3 and use inquiry skills to look at scientific achievements in outer space.	Work on life cycles here will support the next unit, where children will describe the 6 stages of a human's life cycle. This will be followed in Year 6, where they can explore more about the offspring that humans and animals produce.	Light- builds on work on reflection and surfaces that reflect light in Year 3. They go on to investigate and explain/describe the properties of light.	Children now have a range of knowledge to draw on and can explore information in different ways. They have had experience of different methods of classification, and can choose the one that best fits their purpose.	In the unit on evolution and inheritance, children can draw on the knowledge that they have learnt about habitats, weather and seasons, animals and food chains to look at changes over a longer period of time.

Science through the books that we share in class	They can compare and describe materials and begin to use what they know to plan and test.	Children begin to learn that there are different types of plant, building on their knowledge in EY about similarities and differences.	Children build on their foundation from EY and begin to sort animals in to simple groups. They learn to label the parts of the human body, gaining an understanding of the body and its senses in preparation for their work in Year 2	Children use their knowledge of materials and their properties to explore how they can be changed and to predict the outcomes when comparing suitability of different materials for a purpose.		In testing plant growing variables, children develop their skills of observation of changes over time, building on ELG and preparing for the unit in year 3	of matter in Year 4.	Children will build on their KS1 knowledge of plants and start to understand the inner workings of plants and trees and how they function.	Building on their observations of a healthy diet, children now begin to learn the roles of different foods in keeping humans healthy. In preparation for Year 4, they begin to learn about the skeleton and it's function.	Children will now have the skills to plan an investigation in to what happens if you heat/ cool materials. They have already explored some of the changes in materials, eg when they are squashed or stretched.		As the children have learnt about the skeleton as being protection for the internal organs, children now begin to learn about those organs and their functions. This is a pre- cursor to the unit in Year 6 where they will describe the functions of the organs and systems of the body.		Children can now build on their working scientifically knowledge of predicting and testing variables in a new context.	Children are able to use the knowledge that they have of body parts to learn about and describe circulatory systems and life cycles.	Children will already have an understanding of a simple circuit and how it works, allowing them to explore variables such as voltage and different kinds of circuit.		Children are able to use the knowledge that they have of body parts to learn about and describe circulatory systems. They have learnt about the importance of a healthy lifestyle and can now explore the effect that this has on the body.
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Overall Rationale

The units of work have been arranged to ensure progression in subject knowledge as well as a progression in skills and vocabulary. Some units run across the year, for example Seasonal Changes in Year One, in order to learn about Seasons as they happen. Other units will repeat in Year groups, building the progression an Scientific skills that the children need. The knowledge and skills have been taken from the National Curriculum and are designed so that by the end of EYFS, the children will have achieved the Early Learning Goal in Understanding the World, and at the end of Key Stage One and Two will have met the 'pupil can' statements of the Teacher Assessment Frameworks.

Planning materials and resources are available from the science plans on the system from National Support School – this is all located on the server.