

Science Progression

EYFS (Acorns)	Key Stage 1 (Willow)	Lower Key Stage 2 (Beech)	Upper Key Stage 2 (Oak)
<p>Science at Foundation Stage is covered in the 'Understanding the World' area of the EYFS Curriculum. It is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.</p>	<p>The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. 'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science</p>	<p>The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how</p>	<p>The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. 'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly</p>

	<p>content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.</p>	<p>scientific methods and skills might be linked to specific elements of the content. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</p>	<p>related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly</p>
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Scientific Enquiry

	By the end of EYFS children will:	By the end of KS1 children will:	By the end of Year 4 children will:	By the end of KS2 children will:
Scientific Enquiry	<ul style="list-style-type: none"> ♣ ask simple questions ♣ explore ♣ problem solve ♣ observe ♣ predict ♣ make decisions ♣ talk about the world around them. 	<ul style="list-style-type: none"> ♣ ask simple questions and recognise that they can be answered in different ways ♣ observe closely, using simple equipment ♣ perform simple tests ♣ identifying and classifying ♣ using their observations and ideas to suggest answers to questions ♣ gather and recording data to help in answering questions 	<ul style="list-style-type: none"> ♣ ask relevant questions and use different types of scientific enquiries to answer them ♣ set up simple practical enquiries, comparative and fair tests ♣ make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ♣ gather, record, classify and present data in a variety of ways to help in answering questions ♣ record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables ♣ report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ♣ use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ♣ identify differences, similarities or changes related to simple scientific ideas and processes ♣ use straightforward scientific evidence to answer questions or to support their findings 	<p>plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> ♣ take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate ♣ record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ♣ use test results to make predictions to set up further comparative and fair tests ♣ report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ♣ identify scientific evidence that has been used to support or refute ideas or arguments

Scientific Disciplines

	By the end of KS1 children will:	By the end of Year 4 children will:	By the end of KS2 children will:
Everyday Materials/ States of Matter	<ul style="list-style-type: none"> distinguish between an object and the material from which it is made. e.g. The object is a table and it is made of wood. identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials. e.g. Hard, Soft, Shiny, Waterproof. compare and group together a variety of everyday materials which have simple physical properties. identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. E.g. Which would be best for a roof or a wall or a toy. find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled. Measure or research the temperature at which materials boil, melt or freeze in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle Identify what happens to the speed of evaporation as the temperature changes. 	<ul style="list-style-type: none"> 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 know that some materials will dissolve in liquid to form a solution. Describe how evaporation will recover a substance from a solution Be able to use a filter and sieve to separate mixtures. use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Choose the correct everyday materials (Wood, Metal, Plastic) to use giving reasons, based on evidence from comparative and fair tests. Understand what a reversible and an irreversible change are. Demonstrate that dissolving, mixing and changes of state are reversible changes Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible. Including changes associated with burning and the action of acid on bicarbonate of soda.

Animals Including Humans	<ul style="list-style-type: none"> • Know the 5 basic classifications of animals. Fish, Mammals, Birds, Reptiles and Amphibians. • Describe and compare the characteristics of the 5 basic classifications of animal. fish, amphibians, reptiles, birds and mammals • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • Understand what a carnivore, herbivore and omnivore are. • Identify and name a variety of common animals that are carnivores, herbivores and omnivores • Identify and name the basic parts of the human body. • Draw and label the basic parts of the human body. • Be able to identify which part of the body is associated with each sense. 	<ul style="list-style-type: none"> • Identify that animals, including humans need the right types and amount of nutrition. • Understand that animals cannot make their own food and they get nutrition from what they eat. • Understand what the terms skeleton means. • Identify that humans and some other animals have skeletons and muscles. • Identify that skeletons are used for support, protection and movement. • Know how muscles work. Understanding that they work in pairs to pull the bones allowing us to move. • Compare a human skeleton to that of another animal. • Identify the organs of the digestive system. • Describe the simple functions of each part of the digestive system in humans. • identify molar, canine and incisor teeth in humans and know their functions • To understand the terms: predator, prey and producer. • Construct a variety of food chains and webs. • Be able to interpret a food chain and web. 	<ul style="list-style-type: none"> • identify and name the main parts of the human circulatory system. • Be able to describe the functions of the heart. • Understand the role of blood vessels and blood • recognise the impact of diet on the way their bodies function • recognise the impact of exercise on the way their bodies function • recognise the impact of drugs on the way their bodies function • recognise the impact of lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans. • describe the changes as humans develop to old age. • Be able to identify the differences between a child and an adult human.
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Living Things and Their Habitats</p>	<ul style="list-style-type: none"> • To understand the terms: Living, dead and never lived. • Be able to 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. • Be able to describe how different habitats provide for the basic needs of different kinds of animals and plants. • Be able to identify a simple relationship where plants and animals 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, • Be able to create a simple food chain. • Be able to interpret a simple food chain. • Can identify and name different sources of food. 	<ul style="list-style-type: none"> • Recognise that living things can be grouped in a variety of ways. • Be able to group living things in a way they can explain. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change. • Understand how environmental change can affect animals and humans. 	<ul style="list-style-type: none"> • Be able to describe the characteristics of animals and micro-organisms. • Describe how living things are classified into broad groups according to common features. • Compare the similarities and differences of animals using observable characteristics. • Compare the similarities and differences of plants using observable characteristics. • Give reasons for classifying plants and animals based on specific characteristics. • Understand the life cycle of a mammal. • Understand the life cycle of an amphibian. • Understand the life cycle of an insect. • Understand the life cycle of a bird. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • Describe the life process of reproduction in plants. • Describe the life process of reproduction in some animals.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Plants</p>	<ul style="list-style-type: none"> • Identify and name a variety of common wild plants. • Identify and name a variety of common garden plants. • Identify and name common deciduous trees. • Identify and name common evergreen trees. • Understand the difference between deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants. • Identify and describe the structure of a tree. 	<ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the part that flowers play in the life cycle of flowering plants. • Understand the process of pollination and seed formation. • Explore the variety of ways that flowers carry out seed dispersal. 	

Seasonal Change	<ul style="list-style-type: none"> • Be able to name the four seasons. • Be able to order the four seasons. • Identify the characteristics of each season. • observe changes across the four seasons • observe and describe weather associated with the seasons. • Identify how the day length varies across the seasons. 		
Forces and Magnets		<ul style="list-style-type: none"> • Understand what a force is. • Compare how things move on different surfaces. • Notice that some forces need contact between two objects. • Understand that magnetic forces can act at a distance. • Know that magnets can attract or repel. • Observe how magnets attract or repel each other. • Understand that magnets attract some materials and not others. • Link this to understand the terms magnetic and non-magnetic. • Identify some magnetic materials. • Test a variety of everyday materials on the basis of whether they are magnetic or non-magnetic. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<ul style="list-style-type: none"> • Explain that unsupported objects fall towards the Earth because of the force of Gravity. • Understand that Gravity is a force acting between the Earth and the falling object. • Understand that Gravity is a pull not a push. • Identify and test the effects of air resistance. • Identify and test the effects of water resistance. • Understand that friction is a force that acts between two surfaces. • Identify the effect of friction on a moving object. • Test the amount of friction created by a range of surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Rocks and Soils		<ul style="list-style-type: none"> • Identify the characteristics of rocks. e.g Hard/Soft • Be able to identify rocks based on their appearance and characteristics. • Compare and group together different kinds of rocks on the basis of their appearance. • Group rocks based on their characteristics. • Understand the terms sedimentary, igneous and metamorphic. • Describe in simple terms how fossils are formed when things that have lived are trapped within rocks. • Recognise that soils are made from rocks and organic matter. • Be able to separate soils and rocks using a sieve. 	

Sound		<ul style="list-style-type: none"> • Identify that sound is a vibration. • Understand that for sound to be made there must be a vibration. • Recognise that vibrations from sounds travel through a medium e.g. air or water to the ear. • Understand the term pitch. • Be able to identify high and low pitches. • Find patterns between the pitch of a sound and features of the object that produced it. • Recognise that sounds get fainter as the distance from the sound source increases 	
Light		<ul style="list-style-type: none"> • Be able to identify sources of light. • Recognise that they need light in order to see things. • Understand that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Be able to create and identify a shadow. • Recognise that shadows are formed when light from a light source is blocked by a solid object. • Find patterns in the way that the size of shadows change. e.g. by moving closer to the source of light. 	<ul style="list-style-type: none"> • Recognise that light appears to travel in straight lines • 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 • 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 • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. • Be able to label the basic parts of the eye. e.g. Iris, retina, lens.
Electricity		<ul style="list-style-type: none"> • Identify common appliances that run on electricity. • Be able to identify and name the basic parts of circuit. e.g. cells, wires, bulbs, switches and buzzers. • Understand what a simple series electrical circuit. • Know that a circuit must be complete for it to work. • Construct a simple series electrical circuit. • 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. • Recognise that a switch opens and closes a circuit. • Understand that the position of a switch will affect whether or not a lamp lights in a simple series circuit. • Understand that an electrical conductor allows the passage of electricity. • Understand that an electrical insulator will not allow the passage of electricity. • Recognise some common conductors and insulators. • Discover that most metal are good conductors. 	<ul style="list-style-type: none"> • Understand the term brightness. • Understand the term volume. • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • 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 • Be able to identify the symbols for each component of a circuit. • Use recognised symbols when representing a simple circuit in a diagram.

Evolution and Inheritance			<ul style="list-style-type: none"> • Recognise that living things have changed over time. • Understand that fossils provide information about living things that inhabited the Earth millions of years ago • Recognise that living things produce offspring of the same kind. • Understand that normally offspring vary and are not identical to their parents. • Identify how animals and plants are adapted to suit their environment in different ways. • Understand that adaptation may lead to evolution.
Earth and Space			<ul style="list-style-type: none"> • Be able to name and order the planets of our solar system. • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Understand what the term orbit means. • Describe the movement of the Moon relative to the Earth • Describe the Sun, Earth and Moon as approximately spherical bodies • Use the idea of the Earth's rotation to explain day and night. • Use the Earth's rotation to explain the apparent movement of the sun across the sky.