

Level Expected at the End of EYFS

We have selected the Early Learning Goals that link most closely to the Science National Curriculum.

Understanding the World (The World)

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

Physical Development (Health and Self-Care)

Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

Key Stage 1 National Curriculum Working Scientifically

During Years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways;
- observing closely, using simple equipment;
- performing simple tests;
- identifying and classifying;
- using their observations and ideas to suggest answers to questions;
- gathering and recording data to help in answering questions.

Lower Key Stage 2 National Curriculum Working Scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them;
- setting up simple practical enquiries, comparative and fair tests;
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers;
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions;
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables;
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions;
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions;
- identifying differences, similarities or changes related to simple scientific ideas and processes;
- using straightforward scientific evidence to answer questions or to support their findings.

Intent

It is our intention at Piddle Valley to develop, in all young people, a lifelong curiosity and interest in the sciences. Our Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. In EYFS, our intention is for children to experience 'wow science' activities which make them gasp with wonder and curiosity. We also intend for our youngest learners to develop scientific enquiry skills, such as observing and questioning. At Piddle Valley we place emphasis on scientific language. Therefore, the quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. Our intent is to assist children in making their thinking clear, both to themselves and others, and teachers aim that children build secure foundations by using discussion to probe and remedy their misconceptions. When planning for the science curriculum, we intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. The overview ensures that children have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the EYFS and science national curriculum for KS1 and KS2. They develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Implementation

Teachers create a positive attitude to Science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. In EYFS, Science experiences are taught through the natural world, hands-on exploration and 'wow science' investigations where children are encouraged to observe and ask and answer 'why?' and 'how?' questions. The acquisition of key scientific knowledge is an integral part of our science lessons and taught through science topic blocks. Through our planning, we involve problem solving opportunities that allow children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Linked knowledge organisers enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. Each lesson has a clear focus. Scientific knowledge and enquiry skills are developed with increasing depth and challenge as children move through the year groups. They complete investigations and hands-on activities while gaining the scientific knowledge for each unit. The sequence of lessons helps to embed scientific knowledge and skills, with each lesson building on previous learning. Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. There is also the opportunity to regularly review and evaluate children's understanding. Activities are effectively differentiated so that all children have an appropriate level of support and challenge.

The whole school engages in British Science Week and celebrates science, technology, engineering and maths through a variety of assemblies and activities. The week sparks enthusiasm for, and celebrates STEM.

Impact

All children feel they are scientists and capable of achieving. Children at Piddle Valley overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding. In EYFS children talk excitedly about the 'wow science' activities they have taken part in. In Science, progress is measured through a child's ability to know more, remember more and explain more. Children will feel confident in their science knowledge and enquiry skills will be excited about science, show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations and also the importance of science in the real world.

Topic Blocks Statutory Programmes of Study Progression

	Year 1	Year 2	Year 3	Year 4
Plants	<p>Plants</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees. 	<p>Plants</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<p>Plants</p> <p>Pupils should be taught to:</p> <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, including pollination, seed formation and seed dispersal. 	
Key vocabulary	<p>Names of ...</p> <p>Wild flowers Garden plants Flowering plants tree, leaf, flower, blossom, petals, Fruit, root, seed, bulb, seed, trunk, branch, stem</p>	<p>seeds, bulbs, water, light, growth, healthy, shoot, seedling</p>	<p>leaf, flower, blossom, petal, fruit, trunk, branch, stem, water, light, air, nutrients, soil, fertilizer, grow, healthy, transported, life cycle, pollination, seed formation, seed dispersal</p>	

<p align="center">Animals Including Humans</p>	<p>Animals Including Humans Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare a variety of common animals including fish, amphibians, reptiles, birds and mammals including pets <ul style="list-style-type: none"> • Identify, name, draw and label the basic parts of the human body and say which part is associated with each sense 	<p>Animals Including Humans Pupils should be taught to:</p> <ul style="list-style-type: none"> • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. 	<p>Animals Including Humans Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement. 	<p>Animals Including Humans Pupils should be taught to:</p> <ul style="list-style-type: none"> • describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey
<p align="center">Key vocabulary</p>	<p>body, head, neck, arms, elbows, leg, knee, face, ears, eyes, nose, hair, mouth, teeth</p>	<p>Offspring, grow, change, life cycle, water, food, air egg, chick, chicken egg, caterpillar, pupa, butterfly spawn, tadpole, frog lamb, sheep baby, toddler, child, teenager, adult</p>	<p>Nutrition, skeleton, muscles, Carbohydrates, protein, minerals, Fat, balanced diet, Protection, movement, vertebrate, invertebrate</p> <p>Name simple bones: skull, ribs, spine, pelvis</p>	<p>digestive system, mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine carnivore, herbivore</p>

<p style="text-align: center;">Materials</p>	<p style="text-align: center;">Everyday Materials</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • distinguish between an object and the material from which it is made • 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 • compare and group together a variety of everyday materials on the basis of their simple physical properties. 	<p style="text-align: center;">Uses of Everyday Materials</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 		
<p style="text-align: center;">Key vocabulary</p>	<p>wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil</p> <p>hard/soft, stretchy/stiff, shiny/dull, bendy/not bendy, waterproof/not waterproof, absorbent/ not absorbent, opaque/transparent</p>	<p>property, suitable/unsuitable, purpose</p> <p>Wood, metal, plastic, glass, brick, rock, paper, cardboard</p> <p>Solid, change</p> <p>Squashing, bending, twisting, stretching</p> <p>John Dunlop, Charles Macintosh, John McAdam</p>		

<p>Living Things and their Habitats</p>		<p>Living Things and their Habitats Pupils should be taught to:</p> <ul style="list-style-type: none"> • explore and compare the differences between things that are living, dead, and things • that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including • microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 		<p>Living Things and their Habitats Pupils should be taught to:</p> <ul style="list-style-type: none"> • recognise that living things can be grouped in a variety of ways • 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 and that this can sometimes pose dangers to living things.
<p>Key vocabulary</p>		<p>Living, dead, habitat, micro-habitat Seashore, ocean, woodland, rainforest</p> <p>Sort, classify, food chain</p>		<p>amphibian, reptiles, bird, mammal</p> <p>flowering plant non flowering plant, fern, moss</p> <p>impact, environment, nature reserve, ecological, population, litter, deforestation</p>

<p>Rocks</p>			<p>Rocks Pupils should be taught to:</p> <ul style="list-style-type: none"> • compare and group together different kinds of rocks on the basis of their appearance and simple physical properties describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter. 	
<p>Key vocabulary</p>			<p>rock, stone, pebble, soil, fossil</p> <p>slate, granite, sandstone sedimentary rock</p>	
<p>Light</p>			<p>Light Pupils should be taught to:</p> <ul style="list-style-type: none"> • recognise that they need light in order to see things and 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 • recognise that shadows are formed when the light from a light source is blocked by an opaque object • find patterns in the way that the size of shadows change. 	

<p>Key vocabulary</p>			<p>light, dark, light source, darkness, reflect, reflective, mirror, shadow, block, direction, transparent, opaque, translucent</p>	
<p>Forces and Magnets</p>			<p>Forces and Magnets Pupils should be taught to:</p> <ul style="list-style-type: none"> • compare how things move on different surfaces • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • observe how magnets attract or repel each other and attract some materials and not others • 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 • describe magnets as having 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing 	
			<p>force, magnetic, magnet, attract, repel, metal, iron, steel, non-magnetic, south pole, north pole</p>	

<p>State of Matter</p>				<p>State of Matter</p> <p>Pupils should be taught to:</p> <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, and measure or research the temperature at which this happens in degrees Celsius (°C)• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
<p>Key vocabulary</p>				<p>solid, liquid, gas changes, heated, cooled, melt, freeze</p>

<p style="text-align: center;">Sound</p>				<p style="text-align: center;">Sound</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases
<p style="text-align: center;">Key vocabulary</p>				<p>Sound, noise, vibration, travel, pitch, high, low, volume, loud, quiet, fainter, muffle, insulation</p>

<p style="text-align: center;">Electricity</p>				<p style="text-align: center;">Electricity</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • 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 and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors
				<p>electric, electricity, appliance, device, circuit, symbol, cell, battery, negative, positive, battery, switch, dim/bright, conductor, insulator</p>
	<p style="text-align: center;">Seasonal Changes</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe changes across the four seasons • observe and describe weather associated with the 			

Seasonal Changes	seasons and how day length varies.			
Key vocabulary	Season, spring, summer, autumn, winter Hot, warm, cool, cold, sunny, cloudy, windy, rainy, snowing, hailing, sleet, frost, fog, mist, icy, rainbow, thunder, lightning, storm, light, dark, day, night, weather			

	KS1	LKS2
Asking Questions and Carrying Out Fair and Comparative Tests	<p>KS1 Science National Curriculum Asking simple questions and recognising that they can be answered in different ways.</p> <p>Performing simple tests. Children can:</p> <ul style="list-style-type: none"> a explore the world around them, leading them to ask some simple scientific questions about how and why things happen; b begin to recognise ways in which they might answer scientific questions; c ask people questions and use simple secondary sources to find answers; d carry out simple practical tests, using simple equipment; e experience different types of scientific enquiries, including practical activities; f talk about the aim of scientific tests they are working on; g with support, start to recognise a fair test. 	<p>Lower KS2 Science National Curriculum Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Setting up simple practical enquiries, comparative and fair tests.</p> <p>Children can:</p> <ul style="list-style-type: none"> a start to raise their own relevant questions about the world around them in response to a range of scientific experiences; b start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c recognise when a fair test is necessary; d help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; e set up and carry out simple comparative and fair tests.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Observing and Measuring Changes</p>	<p>KS1 Science National Curriculum Observing closely, using simple equipment.</p> <p>Children can:</p> <ul style="list-style-type: none"> a observe the natural and humanly constructed world around them; b observe changes over time; c use simple measurements and equipment; d make careful observations, sometimes using equipment to help them observe carefully. 	<p>Lower KS2 Science National Curriculum Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Children can:</p> <ul style="list-style-type: none"> a make systematic and careful observations; b observe changes over time; c use a range of equipment, including thermometers and data loggers; d ask their own questions about what they observe; e where appropriate, take accurate measurements using standard units using a range of equipment. 	<p>Upper KS2 Science National Curriculum Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Children can:</p> <ul style="list-style-type: none"> a choose the most appropriate equipment to make measurements and explain how to use it accurately; b take measurements using a range of scientific equipment with increasing accuracy and precision; c take repeat readings when appropriate; d understand why we take an average in repeat readings.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Identifying, Classifying, Recording and Presenting Data</p>	<p>KS1 Science National Curriculum Identifying and classifying.</p> <p>Gathering and recording data to help in answering questions.</p> <p>Children can:</p> <ul style="list-style-type: none"> a use simple features to compare objects, materials and living things; b decide how to sort and classify objects into simple groups with some help; c record and communicate findings in a range of ways with support; d sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables. 	<p>Lower KS2 Science National Curriculum Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Children can:</p> <ul style="list-style-type: none"> a talk about criteria for grouping, sorting and classifying; b group and classify things; c collect data from their own observations and measurements; d present data in a variety of ways to help in answering questions; e use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; f record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. 	<p>Upper KS2 Science National Curriculum Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Children can:</p> <ul style="list-style-type: none"> a independently group, classify and describe living things and materials; b use and develop keys and other information records to identify, classify and describe living things and materials; c decide how to record data from a choice of familiar approaches; d record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

Drawing Conclusions, Noticing Patterns and Presenting Findings	<p>KS1 Science National Curriculum Using their observations and ideas to suggest answers to questions.</p> <p>Children can:</p> <ul style="list-style-type: none"> a notice links between cause and effect with support; b begin to notice patterns and relationships with support; c begin to draw simple conclusions; d identify and discuss differences between their results; e use simple and scientific language; f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; g talk about their findings to a variety of audiences in a variety of ways. 	<p>Lower KS2 Science National Curriculum Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Children can:</p> <ul style="list-style-type: none"> a draw simple conclusions from their results; b make predictions; c suggest improvements to investigations; d raise further questions which could be investigated; e first talk about, and then go on to write about, what they have found out; f report and present their results and conclusions to others in written and oral forms with increasing confidence. 	<p>Upper KS2 Science National Curriculum Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Children can:</p> <ul style="list-style-type: none"> a notice patterns; b draw conclusions based in their data and observations; c use their scientific knowledge and understanding to explain their findings; d read, spell and pronounce scientific vocabulary correctly; e identify patterns that might be found in the natural environment; f look for different causal relationships in their data; g discuss the degree of trust they can have in a set of results; h independently report and present their conclusions to others in oral and written forms.
Using Scientific Evidence and Secondary Sources of Information		<p>Lower KS2 Science National Curriculum Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Children can:</p> <ul style="list-style-type: none"> a make links between their own science results and other scientific evidence; b use straightforward scientific evidence to answer questions or support their findings; c identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; d recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. 	<p>Upper KS2 Science National Curriculum Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Children can:</p> <ul style="list-style-type: none"> a use primary and secondary sources evidence to justify ideas; b identify evidence that refutes or supports their ideas; c recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; d use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; e talk about how scientific ideas have developed over time.

ALL YEARS Cycle 1 2021/22	Autumn Term 1.1	Autumn Term 1.2	Spring Term 2.1	Spring Term 2.2	Summer Term 3.1	Summer Term 3.2
R/Y1	Animals Including Humans	Seasonal Changes: Autumn Plants: Trees	Seasonal Changes: Winter	Seasonal Changes: Spring Plants: Flowers	Everyday Materials	Seasonal Changes: Summer Animals Including Humans
Y2	Use of Everyday Materials		Animals Including Humans		Plants	Living Things and their Habitats
Y 3/4	Sound	Light & Electricity	Animals Including Humans		Living Things and Their Habitats	State of Matter
ALL YEARS Cycle 2 2022/23	Autumn Term 1.1	Autumn Term 1.2	Spring Term 2.1	Spring Term 2.2	Summer Term 3.1	Summer Term 3.2
R/Y1	Animals Including Humans	Seasonal Changes: Autumn Plants: Trees	Seasonal Changes: Winter	Seasonal Changes: Spring Plants: Flowers	Everyday Materials	Seasonal Changes: Summer Animals Including Humans
Y2	Use of Everyday Materials		Animals Including Humans		Plants	Living Things and their Habitats
Y3/4	Sound	Forces and Magnets	Animals Including Humans		Plants	Rocks