

*Nurturing Knowledge:
Learning for Life*



Courtwood Primary School



Science Curriculum

Science Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception						
Year 1	Animals, including Humans 		Everyday Materials 	Plants 		Seasonal Changes (across the year) 
Year 2	Living Things and Habitats 	Everyday Materials 	Animals, including Humans 		Plants 	
Year 3	Rocks 		Light 	Forces and Magnets 	Plants 	Animals, including Humans 
Year 4		Animals, including Humans 	States of Matter 		Living things and Habitats 	Electricity  Sound 
Year 5	Properties and Changes of Materials 	Forces 		Earth and Space 	Living Things and Habitats 	Animals, including Humans 
Year 6	Animals, including Humans 	Electricity 	Living things and Habitats 	Evolution and Inheritance 		Light 

Enquiry Questions

	Autumn Term	Spring Term	Summer Term
Reception			
Year 1	Animals, including Humans	Everyday Materials	Plants
	<i>How are we different to animals?</i>	<i>What materials can we use to build a ?</i>	<i>What plants can we find around our school?</i>
Year 2	Living Things and Habitats	Animals, including Humans	Plants
	<i>How has climate change affected an animal's habitat?</i>	<i>What food do you need in a healthy diet and why?</i>	<i>How can I grow my own salad?</i>
	Everyday Materials		
	<i>Why did London burn?</i>		
Year 3	Plants	Rocks	Forces and Magnets
	<i>How did that blossom become an apple?</i>	<i>What do rocks tell us about the way the Earth was formed?</i>	<i>Does the size and shape of a magnet affect how strong it is?</i>
		Light	Animals, including Humans
		<i>How can I change the size of my shadow?</i>	<i>Do people with long arms throw further?</i>
Year 4		States of Matter	Living things and Habitats
		<i>How would we survive without water?</i>	<i>How many ways can we classify and identify our classmates?</i>
	Animals, including Humans		1) Electricity 2) Sound
	<i>How does a human digest their food?</i>		<i>1) How could we cope without electricity? 2) Does the shape of an ear affect how we hear sounds?</i>
Year 5	Properties and Changes of Materials		Living Things and Habitats
	<i>Whilst cooking, can we create a reversible change?</i>		<i>Do all animals and plants start life as an egg?</i>
	Forces	Earth and Space	Animals, including Humans
	<i>Why do objects fall from the sky?</i>	<i>Will we ever send another human to the moon?</i>	<i>How different will you be when you are as old as your grandparent?</i>
Year 6	Animals, including Humans	Evolution and Inheritance	
	<i>What would a journey through your body look like?</i>	<i>Have we always looked like this?</i>	
	Electricity	Living things and Habitats	Light
	<i>How can I make a lamp brighter or a buzzer louder?</i>	<i>Who is the 'odd one out'?</i>	<i>Can we create our own rainbow?</i>

Science Overview

Progression via Unit Coverage						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Scientific Discipline: Biology						
Animals including Humans	✓	✓	✓	✓	✓	✓
Plants	✓	✓	✓			
Evolution and Inheritance						✓
Living Things and Their Habitats		✓		✓	✓	✓
Scientific Discipline: Chemistry						
Rocks			✓			
Everyday Materials	✓	✓				
Properties and Changes of Materials					✓	
States of Matter				✓		
Scientific Discipline: Physics						
Electricity				✓		✓
Light			✓			✓
Forces and Magnets			✓		✓	
Sound				✓		
Earth and Space					✓	
Seasonal Changes	✓					
Working Scientifically	✓	✓	✓	✓	✓	✓

Working Scientifically Skills Progression

	Asking questions and recognising that they can be answered in different ways
Year 1 & 2	<p>Asking simple questions and recognising that they can be answered in different ways</p> <ul style="list-style-type: none"> • While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. • The children answer questions developed with the teacher often through a scenario. • The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.
Year 3 & 4	<p>Asking relevant questions and using different types of scientific enquiries to answer them</p> <ul style="list-style-type: none"> • The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. • The children answer questions posed by the teacher. • Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.
Year 5 & 6	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> • Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. • Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
	Making observations and taking measurements
Year 1 & 2	<p>Observing closely, using simple equipment</p> <ul style="list-style-type: none"> • Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. • They begin to take measurements, initially by comparisons, then using non-standard units.
Year 3 & 4	<p>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> <ul style="list-style-type: none"> • The children make systematic and careful observations. • They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.
Year 5 & 6	<p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <ul style="list-style-type: none"> • The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).

Engaging in practical enquiry to answer questions	
Year 1 & 2	<p>Performing simple tests</p> <ul style="list-style-type: none"> • The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. <p>Identifying and classifying</p> <ul style="list-style-type: none"> • Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. • They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.
Year 3 & 4	<p>Setting up simple practical enquiries, comparative and fair tests</p> <ul style="list-style-type: none"> • The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><u>Explanatory note</u></p> <p>A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.</p> </div>
Year 5 & 6	<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> • The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.

Recording and presenting evidence	
Year 1 & 2	<p>Gathering and recording data to help in answering questions</p> <ul style="list-style-type: none"> • The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. • They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. • They classify using simple prepared tables and sorting rings.
Year 3 & 4	<p>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</p> <ul style="list-style-type: none"> • The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. • Children are supported to present the same data in different ways in order to help with answering the question.
Year 5 & 6	<p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <ul style="list-style-type: none"> • The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. • Children present the same data in different ways in order to help with answering the question.

Answering questions and concluding	
Year 1 & 2	<p>Using their observations and ideas to suggest answers to questions</p> <ul style="list-style-type: none"> • Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.
	<p>Using their observations and ideas to suggest answers to questions</p> <ul style="list-style-type: none"> • The children recognise 'biggest and smallest', 'best and worst' etc. from their data.
Year 3 & 4	<p>Using straightforward scientific evidence to answer questions or to support their findings</p> <ul style="list-style-type: none"> • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.
	<p>Identifying differences, similarities or changes related to simple scientific ideas and processes</p> <ul style="list-style-type: none"> • Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.
	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> • They draw conclusions based on their evidence and current subject knowledge.
Year 5 & 6	<p>Identifying scientific evidence that has been used to support or refute ideas or arguments</p> <ul style="list-style-type: none"> • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. • They talk about how their scientific ideas change due to new evidence that they have gathered. • They talk about how new discoveries change scientific understanding.
	<p>Reporting and presenting 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</p> <ul style="list-style-type: none"> • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.

Evaluating and raising further questions and predictions	
Year 3 & 4	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> • They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.
	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> • Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. • Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.
Year 5 & 6	<p>Reporting and presenting 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</p> <ul style="list-style-type: none"> • They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data.
	<p>Using test results to make predictions to set up further comparative and fair tests</p> <ul style="list-style-type: none"> • Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.

Communicating their findings	
Year 3 & 4	<p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <ul style="list-style-type: none"> • They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.
Year 5 & 6	<p>Reporting and presenting 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</p> <ul style="list-style-type: none"> • They communicate their findings to an audience using relevant scientific language and illustrations.

Science and Outdoor Learning at Courtwood

Year & Unit	National Curriculum Requirement	How Outdoor Learning at Courtwood supports this
NC Year 1 Plants	Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted.	The class work with our Outdoor learning TAs to plant courgettes and corn in the Edible Playground in spring term and observe their growth weekly in outdoor sessions. The school grounds are used to locate different plants and explore their habitats and ask questions.
NC Year 1 Animals, including Humans	Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them safely after study.	Children use the school grounds and pond to collect/locate animals for identification and grouping based on features, including fish, birds and mammals. They can also say if these creatures are herbivores, omnivores or carnivores, using clues about the local habitats.
NC Year 2 Living Things and their Habitats	They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals.	Children gather and use natural resources i.e. twigs, fallen wood, leaves and loam soil in the Wise Owl Wood to build homes for invertebrates and small woodland creatures such as hedgehogs, voles and grass snakes.
NC Year 2 Plants	Pupils should use the local environment throughout the year to observe how plants grow.	The children use the Edible Playground to plant runner beans and sugar snaps and observe the growth.
NC Year 3 Rocks	Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.	Children collect different types of rocks and soil from the school grounds observing the differences. Forest School sessions help children learn about loam soil and how this differs compared to soil used in the Edible Playground.
NC Year 4 Living Things and their Habitats	Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year.	Children complete a survey about which trees are found in the school grounds/woods and investigate changes over the year. They also consider the same for animals and wildlife.
NC Year 5 Living Things and their Habitats	Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.	Children in Year 5 plant tomatoes and cucumber in the Edible Playground and observe the life-cycles of their produce from planting the seed to harvesting the plant. David Attenborough and Jane Goodall are featured naturalists on the knowledge organiser that children study.

For more information on Outdoor Learning at Courtwood, please see our 'Outdoor Learning' page in the curriculum area of our website.