



**The Harlington and Sundon Academy Trust**  
**Harlington Lower School - Science Curriculum Overview and Skills Progression**



Reception	Topics	ELG – KUW (40-60)	Skills – EY - Small groups, adult led tasks.	Impact by the end of the year
<b>Autumn 1</b>	Ourselves and family	To talk about the features of their own immediate environment and how environments might vary from one another.	Observe and compare their features, making observational drawings. Make comparisons by measuring themselves. Identify similarities and differences between each other in appearance and discuss. Identify the similarities between humans. Identify similarities between themselves and all living things.	Children will experience and observe the natural and human world around them.  Children will be curious and ask questions to help them understand the world around them.
	Autumn and Harvest	To make observations of animals and plants and explain why some things occur, and talk about changes.	Identify the signs of autumn and the changes these represent. Identify and describe a range of native leaves.	
<b>Autumn 2</b>	Light and dark / Space	<i>Look closely at similarities, differences, patterns and change</i> To talk about the features of their own immediate environment and how environments might vary from one another.	Explore ways to block out light. Discuss and compare the experiences of light and dark. Explore with shadows, experimenting how to change the size and shape, and how to make them vanish!	Develop scientific thinking and problem solving skills.  Use simple equipment e.g. magnifying glasses, petri dishes, tweezers, torches etc.  Begin to use simple scientific language.
	Traditional tales Christmas	<i>Looks closely at similarities, differences, patterns and change</i> To talk about the features of their own immediate environment and how environments might vary from one another.	Identify the signs of winter and the changes these represent.	
<b>Spring 1</b>	Food and cooking (healthy eating)	Looks closely at similarities, differences, patterns and change. To know about similarities and differences in relation to places, objects, materials and living things.	Describe the appearance, aroma and taste of a variety of different fruits and freshly made treats. Explore the properties of materials. Experiment with materials to solve problems e.g. building bridges.	Children will experience and observe the natural and human world around them.  Children will be curious and ask questions to help them understand the world around them.  Develop scientific thinking and problem solving skills.
	Snow and Ice	To know about similarities and differences in relation to places, objects, materials and living things.	Discuss how ice is formed. Apply knowledge of floating and sinking to predict what their picture will look like. Experiment with freezing water in differently shaped containers. Explore 'freezing' frozen toys through melting in different places and by sprinkling salt. Explore materials that reflect the light or glow in a dark tent using torches.	
<b>Spring 2</b>	Sticks	<i>Looks closely at similarities and differences, patterns and change.</i>	Investigate objects that float and sink and discuss patterns in their findings.	Use simple equipment e.g. magnifying glasses, petri dishes, tweezers, torches etc.  Begin to use simple scientific language.
	Dinosaurs	<i>Looks closely at similarities and differences, patterns and change between living and non-living things.</i>	Identify, group and sort dinosaurs. Compare prehistoric habitats with their local environment. Make comparisons based on observations and measurements.	



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	Spring	To make observations of animals and plants and explain why some things occur, and talk about changes. <i>Looks closely at similarities, differences, patterns and changes between living and non-living things.</i>	Identify the signs of spring and the changes these represent. Identify a range of native animals and know some animals are born alive while others lay eggs. Compare parent and child animals. Discover that plants take up water through their stem. Conduct an investigation.	
Summer 1	Fairy tales	<i>Children know about similarities and differences between themselves and others, and among families, communities and traditions. Children know about similarities and differences in relation to places, objects, materials and living things. They make observations of animals and plants and explain why some things occur, and talk about changes.</i>	Explore how they might help a baby sleep.  Explore materials using their senses. Observe and discuss germination. Find out about how wool is made.	Children will experience and observe the natural and human world around them.  Children will be curious and ask questions to help them understand the world around them.
	Plants	<i>Know about similarities and differences in relation to living things. Make observations of plants and explain why some things occur, and talk about changes.</i>	Compare and contrast seeds, plants, fruits and vegetables. Identify the different parts of a plant and appreciate their function. Explore plants by planting, harvesting and tasting food.	
Summer 2	Lifecycles	<i>Knows about similarities and differences in relation to living things. They make observations of animals and explain why some things occur, and talk about changes. Talks about the features of their own immediate environment and how environments might vary.</i>	Identify how living things are similar and different. Identify stages in the lifecycle of humans, butterflies and frogs. Identify how to care for living things and know what animals need to survive. Compare and describe a home, garden and pond environment. Identify how living things are suited to where they live and how each environment is unique.	Develop scientific thinking and problem solving skills.  Use simple equipment e.g. magnifying glasses, petri dishes, tweezers, torches etc.
	Transport	<i>Talks about the features of their own immediate environment and how environments might vary from one another.</i>	Describe places accurately and compare and contrast them successfully.	Begin to use simple scientific language.
<b>Year group</b>	<b>Topics</b>	<b>National Curriculum Objectives</b>	<b>Skills (practical activities supported by adults in small groups)</b>	<b>Impact by the end of the year</b>
Yr 1 Science	Autumn Ourselves	<ul style="list-style-type: none"> <li>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</li> </ul>	<ul style="list-style-type: none"> <li>-Asking simple questions and recognising that they can be answered in different ways</li> <li>-Identifying and classifying</li> <li>-Use their observations and ideas to suggest answers to questions</li> <li>-Gather and record data in a simple way to help answer questions.</li> </ul>	<p>Children will experience and observe the natural and human world around them.</p> <p>Children will be curious and ask questions to help them understand the world around them.</p>
	Spring Materials	<ul style="list-style-type: none"> <li>Distinguish between an object and the material from which it is made</li> <li>Identify and name a variety of materials including wood, plastic, glass, metal, water and rock</li> <li>Describe simple physical properties of a variety of everyday materials</li> </ul>	<ul style="list-style-type: none"> <li>-Asking simple questions and recognising that they can be answered in different ways</li> <li>-Observing closely, using simple equipment</li> <li>-Performing simple tests</li> </ul>	Develop scientific thinking and problem solving skills.



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		<ul style="list-style-type: none"> <li>Compare and group together a variety of everyday materials on the basis of their simple physical properties</li> <li></li> <li></li> </ul>	<ul style="list-style-type: none"> <li>-Identifying and classifying</li> <li>-Gather and record data to help answer questions</li> </ul>	Begin to develop an understanding of how we can answer questions.
	Spring Animals	<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>Identify and name a variety of common animals that are carnivores, herbivores, and omnivores</li> <li>Describe and compare the structure of a variety of common animals</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>-Asking simple questions and recognising that they can be answered in different ways</li> <li>-Observing closely, using simple equipment</li> <li>-Performing simple tests</li> <li>-Identifying and classifying</li> <li>-Gather and record data to help answer questions</li> </ul>	<p>Begin to use simple scientific language verbally and in written form.</p> <p>Begin to conduct simple scientific investigations.</p>
	Seasonal changes (Throughout the year)	<ul style="list-style-type: none"> <li>Observe changes across the 4 seasons</li> <li>Observe and describe weather associated with the seasons and how day lengths varies</li> </ul>	<ul style="list-style-type: none"> <li>-Observing closely, using simple equipment</li> <li>-Use their observations and ideas to suggest answers to questions</li> <li>-Make bar graphs and pictograms using the weather data.</li> </ul>	
	Summer Plants	<ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>Identify and describe the basic structure of a variety of common flowering plants including trees</li> </ul>	<ul style="list-style-type: none"> <li>-Asking simple questions and recognising that they can be answered in different ways</li> <li>-Observing closely, using simple equipment</li> <li>-Performing simple tests</li> <li>-Identifying and classifying</li> <li>-Use their observations and ideas to suggest answers to questions</li> </ul>	
<b>Yr 2</b>	<b>Topics</b>	<b>National Curriculum Objectives</b>	<b>Skills</b> <b>(developing increasing independence to perform investigations in table groups.)</b>	<b>Impact by the end of the year</b>
<b>Science</b>	Autumn 1 Animals including humans	<ul style="list-style-type: none"> <li>Understand that animals, including humans, have offspring which grow into adults</li> <li>Know the names of animals and their offspring and their life cycles</li> <li>Describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>Describe the importance for humans of exercise, eating the right amount of different types of food, and hygiene.</li> </ul>	<ul style="list-style-type: none"> <li>-Asking more complex questions and recognising that they can be answered in different ways</li> <li>-Observing closely, using simple equipment (magnifying glasses, rulers, timers) and increasing command of vocabulary to describe their observations precisely</li> <li>-Identify and classify using an increasing command of scientific vocabulary</li> <li>-Use their observations and ideas to suggest answers to increasingly complex questions</li> </ul>	<p>Children will experience and observe the natural and human world around them.</p> <p>Children will be curious and ask questions to help them understand the world around them.</p>



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			<p>-Gather and record data with growing accuracy and precisions to answer questions, using premade tables.</p>	<p>Develop scientific thinking and problem solving skills.</p>
Autumn 2 Living things and their habitats	<ul style="list-style-type: none"> <li>Explore and compare the differences between things that are living, dead and things that have never been alive</li> <li>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, plants and how they depend on each other</li> <li>Identify and name a variety of plants and animals in their habitats, including micro-habitats</li> <li>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.</li> </ul>		<p>-Asking more complex questions and recognising that they can be answered in different ways</p> <p>-Observing closely, using simple equipment (magnifying glasses, rulers, timers) and increasing command of vocabulary to describe their observations precisely</p> <p>-Identify and classify using an increasing command of scientific vocabulary</p> <p>-Use their observations and ideas to suggest answers to increasingly complex questions</p> <p>-Gather and record data with growing accuracy and precisions to answer questions, using premade tables.</p>	<p>Begin to develop an understanding of how we can answer questions.</p> <p>Increase the use of simple scientific language verbally and in written form.</p> <p>Begin to plan and conduct simple scientific investigations in groups.</p>
Spring Uses of everyday materials	<ul style="list-style-type: none"> <li>Identify and compare the properties of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</li> <li>Find out how the shapes of solid objects made from some materials can be change by squashing, bending, twisting and stretching.</li> </ul>		<p>-Asking more complex questions and recognising that they can be answered in different ways</p> <p>-Observing closely, using simple equipment (magnifying glasses, rulers, timers) and increasing command of vocabulary to describe their observations precisely</p> <p>-Identify and classify using an increasing command of scientific vocabulary</p> <p>-Use their observations and ideas to suggest answers to increasingly complex questions</p> <p>-Gather and record data with growing accuracy and precisions to answer questions,</p> <p>-Make tables and bar graphs to record their data.</p>	
Summer Plants	<ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants</li> <li>Know how light, water and temperature affect plants.</li> </ul>		<p>-Asking more complex questions and recognising that they can be answered in different ways</p> <p>-Observing closely, using simple equipment (magnifying glasses, rulers, timers) and increasing command of vocabulary to describe their observations precisely</p>	



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			<ul style="list-style-type: none"> <li>-Identify and classify using an increasing command of scientific vocabulary</li> <li>-Use their observations and ideas to suggest answers to increasingly complex questions</li> <li>-Gather and record data with growing accuracy and precisions to answer questions</li> <li>-Make tables and bar graphs to record their data.</li> </ul>	
Yr 3	Topics	National Curriculum Objectives	Skills (Investigations performed in table groups only assisted if necessary by an adult.)	Impact by the end of the year
<b>Science</b>	Autumn 1 Forces and Magnets	Compare how objects move on different surfaces <ul style="list-style-type: none"> <li>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>• Observe how magnets attract or repel each other and attract some materials and not others</li> <li>• Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> <li>• 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</li> <li>• Know some everyday uses of magnetic materials</li> </ul>	<p><i><b>The following skills progress gradually from Autumn term to the Summer term. Whilst all are targeted throughout the topics, detail and depth develop through the year. This progresses from being guided by the teacher through scaffolding approaches to becoming independent in showing these skills during investigations.</b></i></p> <ul style="list-style-type: none"> <li>-Asking relevant questions and using different types of scientific enquiries to answer them With help set up simple practical enquiries, comparative and fair tests</li> <li>-Making systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment including thermometers, rulers and data loggers</li> <li>-Gather, record, classify and present data in a variety of ways to help in answering questions</li> <li>-Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables</li> <li>-Reporting on findings from enquiries, including oral and written explanations begin to form simple conclusions</li> <li>-Using results to draw simple conclusions, make predictions</li> </ul>	Children will experience and observe the natural and human world around them.  Children will be curious and ask questions to help them understand the world around them.  Develop scientific thinking and problem solving skills.
	Autumn 2 Animals including humans	<ul style="list-style-type: none"> <li>• 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</li> <li>• Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> </ul>		Begin to develop an understanding of how we can answer questions.  With support plan investigations.
	Spring 1 Rocks	<ul style="list-style-type: none"> <li>-Know different rocks and their properties</li> <li>-Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</li> <li>-Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</li> <li>-Recognise that soils are made from rocks and organic matter.</li> </ul>		Begin to use simple scientific language.  Begin to make conclusions based on their scientific findings.
	Spring 2 Light	<ul style="list-style-type: none"> <li>• Identify different light sources</li> <li>• Understand we need light to see things and that dark is the absence of light</li> <li>• Know that light is reflected from surfaces</li> </ul>	<ul style="list-style-type: none"> <li>-Identifying differences, similarities or changes related to simple scientific ideas and processes</li> </ul>	



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		<ul style="list-style-type: none"> <li>Know that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>Describe that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>Find patterns in the way that the size of shadows change.</li> </ul>	-Using straightforward scientific evidence to answer questions or to support their findings	
	Summer 1 + 2 Plants	<ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>Explore the requirement of plants for life and growth</li> <li>Investigate the way in which water is transported within plants</li> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</li> </ul>		
<b>Yr 4</b>	<b>Topics</b>	<b>National Curriculum Objectives</b>	<b>Skills</b> <b>(Investigations performed independently in pairs or groups.)</b>	<b>Impact by the end of the year</b>
<b>Science</b>	Autumn 1 Animals including humans	<ul style="list-style-type: none"> <li>describe the simple functions of the basic parts of the digestive system in humans</li> <li>identify the different types of teeth in humans and their simple functions</li> <li>construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul>	<p>-asking relevant questions</p> <p>-independently and within small groups set up simple practical enquiries, comparative and fair tests</p>	<p>Children will experience and observe the natural and human world around them.</p>
	Autumn 2 Electricity	<ul style="list-style-type: none"> <li>Learn about electrical safety</li> <li>identify common appliances that run on electricity</li> <li>construct a simple electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>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</li> <li>recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>	<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> <p>-gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>-recording findings using confident command of scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p>	<p>Children will be curious and ask questions to help them understand the world around them.</p> <p>Develop scientific thinking and problem solving skills.</p> <p>Answer questions using their scientific findings.</p>
	Spring 1 Help our habitats (Living things and their habitats)	<ul style="list-style-type: none"> <li>recognise that living things can be grouped in a variety of ways (plants: trees, grasses, flowers, ferns and mosses, vertebrates: fish, amphibians, reptiles, birds, and mammals. Invertebrates: snails and slugs, worms, spiders, and insects)</li> <li>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul>	<p>-reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>-using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>-identifying differences, similarities or changes</p>	<p>With increasing independence plan investigations to answer questions.</p> <p>Confidently use scientific language.</p>
	Spring 2 States of matter (Materials)	<ul style="list-style-type: none"> <li>compare and group materials together, according to whether they are solids, liquids or gases</li> <li>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)</li> </ul>	<p>-use straightforward scientific evidence to answer questions or to support their findings</p>	<p>Present their findings in a range of ways.</p>



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		<ul style="list-style-type: none"><li>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li></ul>		
	Summer 1 Sound	<ul style="list-style-type: none"><li>• identify how sounds are made, associating some of them with something vibrating</li><li>• recognise that vibrations from sounds travel through a medium to the ear</li><li>• find patterns between the pitch of a sound and features of the object that produced it</li><li>• find patterns between the volume of a sound and the strength of the vibrations that produced it</li><li>• recognise that sounds get fainter as the distance from the sound source increases.</li></ul>		
	Summer 2 Living things and their habitats	<ul style="list-style-type: none"><li>• recognise that living things can be grouped in a variety of ways (plants: trees, grasses, flowers, ferns and mosses, vertebrates: fish, amphibians, reptiles, birds, and mammals. Invertebrates: snails and slugs, worms, spiders, and insects)</li><li>• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li><li>• recognise that environments can change and that this can sometimes pose dangers to living things.</li></ul>		



Knowledge progression by topic

Seasonal changes	
Reception	ELG - To know the similarities and differences in relation to places, objects, materials and living things. ELG - To talk about the features of their own immediate environment and how environments might vary from one another. ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.
Year 1	Observe changes across the four seasons Observe and describe the weather associated with the seasons and how day lengths varies
Year 2	
Year 3	Recognise that light from the sun can be dangerous and that there are ways to protect their eyes (Light)
Year 4	
Year 5	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky (Earth and space)
Year 6	
KS3	The season's and the earth's tilt, day length at different times of the year, in different hemispheres.
Animals including humans	
Reception	ELG - To know the similarities and differences in relation to places, objects, materials and living things. ELG - To talk about the features of their own immediate environment and how environments might vary from one another. ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.
Year 1	Identify, name, draw and label the basic parts of the human body Know which part of the body is associated with each sense 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 the structure of a variety of common animals
Year 2	Understand that animals, including humans, have offspring which grow into adults Know the names of animals and their offspring and their life cycles Describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amount of different types of food, and hygiene.



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Year 3	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
Year 4	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
Year 5	Describe the changes as humans develop to old age. <a href="#">Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (Living things and their habitats)</a> <a href="#">Describe the life process of reproduction in some plants and animals. (Living things and their habitats)</a>
Year 6	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. <a href="#">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. (Y6 - Living things and their habitats)</a> <a href="#">Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)</a>
KS 3	Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. The structure and functions of the gas exchange system in humans, including adaptations to function. The mechanism of breathing to move air in and out of the lungs. The impact of exercise, asthma and smoking on the human gas exchange system.
Living things and their habitats	
Reception	ELG - To know the similarities and differences in relation to places, objects, materials and living things. ELG - To talk about the features of their own immediate environment and how environments might vary from one another. ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.
Year 1	<a href="#">Plants</a> <a href="#">Identify, name, draw and label the basic parts of the human body (Animals including humans)</a> <a href="#">Know which part of the body is associated with each sense (Animals including humans)</a> <a href="#">Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (Animals including humans)</a> <a href="#">Identify and name a variety of common animals that are carnivores, herbivores, and omnivores (Animals including humans)</a> <a href="#">Describe and compare the structure of a variety of common animals (Animals including humans)</a> <a href="#">Observe changes across the four seasons (Seasonal changes)</a>
Year 2	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, plants and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats



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	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. <a href="#">Know the names of animals and their offspring and their life cycles (Animals including humans)</a>
Year 3	Plants <a href="#">Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</a> <a href="#">Explore the requirement of plants for life and growth</a> <a href="#">Investigate the way in which water is transported within plants</a> <a href="#">Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</a>
Year 4	Recognise that living things can be grouped in a variety of ways (plants: trees, grasses, flowers, ferns and mosses, vertebrates: fish, amphibians, reptiles, birds, and mammals. Invertebrates: snails and slugs, worms, spiders, and insects) 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. <a href="#">Construct and interpret a variety of food chains, identifying producers, predators and prey (Animals including humans)</a>
Year 5	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals.
Year 6	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.
KS 3	Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. Differences between species.
<b>Plants</b>	
Reception	ELG - To know the similarities and differences in relation to places, objects, materials and living things. ELG - To talk about the features of their own immediate environment and how environments might vary from one another. ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.
Year 1	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
Year 2	Observe and describe how seeds and bulbs grow into mature plants Know how light, water and temperature affect plants.
Year 3	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Explore the requirement of plants for life and growth 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



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Year 4	<p>(Living things and their habitats)</p> <p>Recognise that living things can be grouped in a variety of ways (plants: trees, grasses, flowers, ferns and mosses, vertebrates: fish, amphibians, reptiles, birds, and mammals. Invertebrates: snails and slugs, worms, spiders, and insects) (Living things and their habitats)</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (Living things and their habitats)</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things. (Living things and their habitats)</p>
Year 5	<p>(Living things and their habitats)</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals.</p>
Year 6	<p>(Living things their habitats)</p> <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p>
KS3	<p>Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.</p>
<b>Materials</b>	
Reception	<p>ELG - To know the similarities and differences in relation to places, objects, materials and living things.</p> <p>ELG - To talk about the features of their own immediate environment and how environments might vary from one another.</p> <p>ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.</p>
Year 1	<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of materials including wood, plastic, glass, metal, water and rock</p> <p>Describe simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p>
Year 2	<p>Identify and compare the properties of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Find out how the shapes of solid objects made from some materials can be change by squashing, bending, twisting and stretching.</p>
Year 3	<p><b>Rocks</b></p> <p>Know different rocks and their properties</p> <ul style="list-style-type: none"> <li>-Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</li> <li>-Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</li> </ul> <p><b>Forces and magnets</b></p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p>
Year 4	<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>



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Year 5	<p>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>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.</p>
Year 6	
KS3	<p>Chemical reactions as the rearrangement of atoms.</p> <ul style="list-style-type: none"> <li>• Representing chemical reactions using formulae and using equations.</li> <li>• Combustion, thermal decomposition, oxidation and displacement reactions.</li> <li>• Defining acids and alkalis in terms of neutralisation reactions.</li> <li>• The pH scale for measuring acidity/alkalinity; and indicators.</li> </ul>
<b>Rocks</b>	
Reception	<p>ELG - To know the similarities and differences in relation to places, objects, materials and living things.</p> <p>ELG - To talk about the features of their own immediate environment and how environments might vary from one another.</p> <p>ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.</p>
Year 1	<p><a href="#">Everyday materials</a></p> <p><a href="#">Distinguish between an object and the material from which it is made</a></p> <p><a href="#">Identify and name a variety of materials including wood, plastic, glass, metal, water and rock</a></p> <p><a href="#">Describe simple physical properties of a variety of everyday materials</a></p> <p><a href="#">Compare and group together a variety of everyday materials on the basis of their simple physical properties</a></p>
Year 2	<p><a href="#">Uses of everyday materials</a></p> <p><a href="#">Identify and compare the properties of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</a></p> <p><a href="#">Find out how the shapes of solid objects made from some materials can be change by squashing, bending, twisting and stretching.</a></p>
Year 3	<p>Know different rocks and their properties</p> <ul style="list-style-type: none"> <li>-Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</li> <li>-Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</li> <li>-Recognise that soils are made from rocks and organic matter.</li> </ul>
Year 4	
Year 5	
Year 6	<p><a href="#">Evolution and inheritance</a></p> <p><a href="#">Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</a></p> <ul style="list-style-type: none"> <li>• <a href="#">Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</a></li> <li>• <a href="#">Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</a></li> </ul>



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KS3	<p>The composition of the Earth.          The structure of the Earth.          The rock cycle and the formation of igneous, sedimentary and metamorphic rocks.</p>
<b>Light</b>	
Reception	<p>ELG - To know the similarities and differences in relation to places, objects, materials and living things.          ELG - To talk about the features of their own immediate environment and how environments might vary from one another.          ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.</p>
Year 1	<p><a href="#">Animals and humans</a>  <a href="#">Identify, name, draw and label the basic parts of the human body</a>  <a href="#">Know which part of the body is associated with each sense</a></p>
Year 2	
Year 3	<p>Identify different light sources          Understand we need light to see things and that dark is the absence of light          Know that light is reflected from surfaces          Know that light from the sun can be dangerous and that there are ways to protect their eyes          Describe 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>
Year 4	
Year 5	
Year 6	<p>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.</p>
KS3	<p>The similarities and differences between light waves and waves in matter.          Light waves travelling through a vacuum; speed of light.          The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface.          Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye.          Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras.          Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.</p>
<b>Sound</b>	
Reception	<p>ELG - To know the similarities and differences in relation to places, objects, materials and living things.          ELG - To talk about the features of their own immediate environment and how environments might vary from one another.          ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.</p>



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Year 1	<p><b>Animals and humans</b>  Identify, name, draw and label the basic parts of the human body  Know which part of the body is associated with each sense</p>
Year 2	
Year 3	
Year 4	<p>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>
Year 5	
Year 6	
KS3	<p>Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition.  Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound.  Sound needs a medium to travel, the speed of sound in air, in water, in solids.  Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal.  Auditory range of humans and animals.  Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound.  Waves transferring information for conversion to electrical signals by microphone.</p>
<b>Forces</b>	
Reception	<p>ELG - To know the similarities and differences in relation to places, objects, materials and living things.  ELG - To talk about the features of their own immediate environment and how environments might vary from one another.  ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.</p>
Year 1	
Year 2	<p><b>Uses of everyday materials</b>  Find out how the shapes of solid objects made from some materials can be change by squashing, bending, twisting and stretching.</p>
Year 3	<p>Compare how objects move on different surfaces  Notice that some forces need contact between two objects, but magnetic forces can act at a distance  Observe how magnets attract or repel each other and attract some materials and not others  Describe magnets as having two poles  Predict whether two magnets will attract or repel each other, depending on which poles are facing.  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  Know some everyday uses of magnetic materials</p>



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Year 4	
Year 5	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>
Year 6	
KS3	<p>Magnetic fields by plotting with compass, representation by field lines.</p> <p>Earth's magnetism, compass and navigation.</p> <p>Forces as pushes or pulls, arising from the interaction between two objects.</p> <p>Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces.</p> <p>Moment as the turning effect of a force.</p> <p>Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water.</p> <p>Forces measured in Newtons, measurements of stretch or compression as force is changed.</p>
<b>Electricity</b>	
Reception	<p>ELG - To know the similarities and differences in relation to places, objects, materials and living things.</p> <p>ELG - To talk about the features of their own immediate environment and how environments might vary from one another.</p> <p>ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.</p>
Year 1	
Year 2	
Year 3	
Year 4	<p>Learn about electrical safety</p> <p>Identify common appliances that run on electricity</p> <p>Construct a simple electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>
Year 5	
Year 6	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</p> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>



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KS3	Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. Differences in resistance between conducting and insulating components (quantitative). Static electricity.
<b>Earth and Space</b>	
Reception	ELG - To know the similarities and differences in relation to places, objects, materials and living things. ELG - To talk about the features of their own immediate environment and how environments might vary from one another. ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.
Year 1	<a href="#">Seasonal changes</a> <a href="#">Observe changes across the four seasons</a> <a href="#">Observe and describe the weather associated with the seasons and how day lengths varies</a>
Year 2	
Year 3	
Year 4	
Year 5	Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. 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 and the apparent movement of the sun across the sky.
Year 6	
KS3	Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$ , different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). Our Sun as a star, other stars in our galaxy, other galaxies. The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. The light year as a unit of astronomical distance.
<b>Evolution and Inheritance</b>	
Reception	ELG - To know the similarities and differences in relation to places, objects, materials and living things. ELG - To talk about the features of their own immediate environment and how environments might vary from one another. ELG - To make observations of animals and plants and explain why some things occur, and talk about changes.
Year 1	



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Year 2	<p>Living things and their habitats</p> <p>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, plants and how they depend on each other</p>
Year 3	<p>Rocks</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p>
Year 4	<p>Living things and their habitats</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p>
Year 5	
Year 6	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
KS3	<p>Heredity as the process by which genetic information is transmitted from one generation to the next.</p> <p>A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model.</p> <p>The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection.</p> <p>Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.</p>



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Skills	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Planning and Communication and Sources	<ul style="list-style-type: none"> <li>draw simple pictures talk about what they see and do use simple charts to communicate findings identify key features ask questions</li> </ul>	<ul style="list-style-type: none"> <li>describe their observations using some scientific vocabulary</li> <li>use a range of simple texts to find information</li> <li>suggest how to find things out</li> <li>identify key features</li> <li>ask questions</li> </ul>	<ul style="list-style-type: none"> <li>Use pictures, writing, diagrams and tables as directed by their teacher</li> <li>use simple texts, directed by the teacher, to find information</li> <li>record their observations in written, pictorial and diagrammatic forms</li> <li>select the appropriate format to record their observations</li> </ul>	<ul style="list-style-type: none"> <li>record observations, comparisons and measurements using tables and bar charts</li> <li>begin to plot points to form a simple graph</li> <li>use graphs to point out and interpret patterns in their data</li> <li>select information from a range of sources provided for them</li> </ul>	<ul style="list-style-type: none"> <li>record observations systematically</li> <li>use appropriate scientific language and conventions to communicate quantitative and qualitative data</li> <li>select a range of appropriate sources of information including books, internet and CD Rom</li> </ul>	<ul style="list-style-type: none"> <li>choose scales for graphs which show data and features effectively</li> <li>identify measurements and observations which do not fit into the main pattern</li> <li>begin to explain anomalous data</li> <li>use appropriate ways to communicate quantitative data using scientific language</li> </ul>
Enquiring and Testing and Obtaining and Presenting Evidence	<ul style="list-style-type: none"> <li>test ideas suggested to them</li> <li>say what they think will happen</li> <li>use first hand experiences to answer questions</li> <li>begin to compare some living things</li> </ul>	<ul style="list-style-type: none"> <li>use simple equipment provided to aid observation</li> <li>compare objects, living things or events</li> <li>make observations relevant to their task</li> <li>begin to recognise when a test or comparison is unfair</li> <li>use first hand experiences to answer questions</li> </ul>	<ul style="list-style-type: none"> <li>put forward own ideas about how to find the answers to questions</li> <li>recognise the need to collect data to answer questions</li> <li>carry out a fair test with support</li> <li>recognise and explain why it is a fair test</li> <li>with help, pupils begin to realise that scientific ideas are based on evidence</li> </ul>	<ul style="list-style-type: none"> <li>with help, pupils begin to realise that scientific ideas are based on evidence</li> <li>show in the way they perform their tasks how to vary one factor while keeping others the same</li> <li>decide on an appropriate approach in their own investigations to answer questions</li> <li>describe which factors they are varying and which will remain the same and say why</li> </ul>	<ul style="list-style-type: none"> <li>use previous knowledge and experience combined with experimental evidence to provide scientific explanations</li> <li>recognise the key factors to be considered in carrying out a fair test</li> </ul>	<ul style="list-style-type: none"> <li>describe evidence for a scientific idea</li> <li>use scientific knowledge to identify an approach for an investigation</li> <li>explain how the interpretation leads to new ideas</li> </ul>



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Observing and Recording	<ul style="list-style-type: none"> <li>• make observations using appropriate senses</li> <li>• record observations</li> <li>• communicate observations orally, in drawing, labelling, simple writing and using ICT</li> </ul>	<ul style="list-style-type: none"> <li>• respond to questions asked by the teacher</li> <li>• ask questions</li> <li>• collect and record data (supported by the teacher)</li> <li>• suggest how they could collect data to answer questions</li> <li>• begin to select equipment from a limited range</li> </ul>	<ul style="list-style-type: none"> <li>• make relevant observations</li> <li>• measure using given equipment</li> <li>• select equipment from a limited range</li> </ul>	<ul style="list-style-type: none"> <li>• carry out measurement accurately</li> <li>• make a series of observations, comparisons and measurements</li> <li>• select and use suitable equipment</li> <li>• make a series of observations and measurements adequate for the task</li> </ul>	<ul style="list-style-type: none"> <li>• make a series of observations, comparisons and measurements with increasing precision</li> <li>• select apparatus for a range of tasks</li> <li>• plan to use apparatus effectively</li> <li>• begin to make repeat observations and measurements systematically</li> </ul>	<ul style="list-style-type: none"> <li>• measure quantities with precision using fine – scale divisions</li> <li>• select and use information effectively</li> <li>• make enough measurements or observations for the required task</li> </ul>
Considering Evidence and Evaluating	<ul style="list-style-type: none"> <li>• make simple comparisons and groupings</li> <li>• say what has happened</li> <li>• say whether what has happened was what they expected</li> </ul>	<ul style="list-style-type: none"> <li>• say what has happened</li> <li>• say what their observations show and whether it was what they expected</li> <li>• begin to draw simple conclusions and explain what they did</li> <li>• begin to suggest improvements in their work</li> </ul>	<ul style="list-style-type: none"> <li>• begin to offer explanations for what they see and communicate in a scientific way what they have found out</li> <li>• begin to identify patterns in recorded measurements</li> <li>• suggest improvements in their work</li> <li>• evaluate their findings</li> </ul>	<ul style="list-style-type: none"> <li>• predict outcomes using previous experience and knowledge and compare with actual results</li> <li>• begin to relate their conclusions to scientific knowledge and understanding</li> <li>• suggest improvements in their work, giving reasons</li> </ul>	<ul style="list-style-type: none"> <li>• make predictions based on their scientific knowledge and understanding</li> <li>• draw conclusions that are consistent with the evidence</li> <li>• relate evidence to scientific knowledge and understanding</li> <li>• offer simple explanations for any differences in their results</li> <li>• make practical suggestions about how their working methods could be improved</li> </ul>	<ul style="list-style-type: none"> <li>• make reasoned suggestions on how to improve working methods</li> <li>• show how interpretation of evidence leads to new ideas</li> <li>• explain conclusions, showing understanding of scientific ideas</li> </ul>
Context	<ul style="list-style-type: none"> <li>• Life processes</li> <li>• Materials</li> </ul>	<ul style="list-style-type: none"> <li>• Physical processes</li> <li>• BOS 1b,c, d</li> <li>• Health and Safety</li> </ul>	<ul style="list-style-type: none"> <li>• Forces</li> <li>• Rocks and Soils</li> <li>• Life processes - Healthy Eating</li> </ul>			