

The Science Curriculum at Kings Heath Primary School

Subject intent

We believe a high-quality science education provides the foundation for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity as such all pupils should be taught the essential aspects of the knowledge, methods, processes and uses of science. We believe that through building up a body of key foundational knowledge and concepts, children should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Science Overview

The science themes are well sequenced to provide a coherent subject scheme that develops children's skills and knowledge of scientific concepts.

Themes are placed alongside other subject projects where there are opportunities for making meaningful connections.

'Working scientifically' specifies the understanding of the nature, process and methods of science. Working scientifically is embedded in the science curriculum content, so that children learn to use a variety of approaches to answer relevant scientific questions. This scientific enquiry includes: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Children seek answers to questions through collecting, analysing and presenting data.

Key Stage 1 (Years 1 and 2)

The principle focus of science teaching in KS1 is to enable children to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They are encouraged to be curious and ask questions about what they notice. They are helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out by using secondary sources of information. They begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science will be done through the use of first hand practical experiences, but there will also be use of appropriate secondary sources, such as, books, photographs and videos. 'Working scientifically' will always be taught through and clearly related to the substantive science content.

Lower Key Stage 2 (Years 3 and 4)

In Lower Key Stage 2, the principal focus of teaching is to enable children to broaden their scientific view of the world around them. They will do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They are encouraged to ask their own questions about what they observe and make some decisions about which type of scientific enquiry are likely to be the best ways of answering them, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple and fair tests and finding things out using secondary sources of information. They will draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working scientifically' will always be taught through and clearly related to the substantive science content.

Upper Key Stage 2 (Years 5 and 6)

In Upper Key Stage 2, the principal focus of teaching is to enable children to develop a deeper understanding of a wide range of scientific ideas. They will do this through exploring and talking about the ideas: asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. They will encounter more abstract ideas and begin to recognize how these ideas help them to understand and predict how the world operates. They will also begin to recognize that scientific ideas change and develop over time. They will select the most appropriate ways to answer scientific questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources of information. Pupils will draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. 'Working scientifically' will always be taught through and clearly related to the substantive science content.

Curriculum Map Science: Whole School

	Our Changing World Revisited throughout the year in all YGs	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2	
	Working Scientifically is incorporated in all topics across all year groups							
Y1	Plants: How do trees and other plants change over the year - What flowers found in different seasons Animals – which animals live around the school Seasons- weather changes – what can I see and hear that shows seasonal change	Our Changing World – Plants/Animal Antics/ Sensing Seasons 4 seasons	Plant Detectives: Identify and name basic structure – plants found around the school – similarities and differences between flowers – how is a tree different to a flower	Looking At Animals Identifying different animal groups – how they move – nocturnal animals	Using Our Senses: The 5 Senses – exploring the world around us using our senses	Everyday Materials: Naming materials – looking at different examples of the same material eg paper, fabric	Our Changing World – Plants/Animal Antics/ Sensing Seasons 4 seasons	
Y2	What lives in a habitat? – how the habitat changes over the year – how animals in a habitat depend on each other	Growing Up: What do babies need? – changes from birth to now and throughout lives	Take Care: Food groups balanced diet Keeping fit Keeping clean	Materials – Good Choices: Describing materials and what it is made of The uses of different materials	Materials – Shaping Up: How to alter the shape of materials – squashing, stretching, bending Matching properties to material use	Apprentice Gardener: Conditions for growth – water, nutrients, light Sequence of growth – planting, germination	What's In Your Habitat?: Differing habitats – animals that inhabit these and what they eat Suitability of habitat for different animals	
Y3	how the leaves on deciduous/ evergreen trees change through the year - observe seeds, berries and flowers are visible on different plants throughout the year according to their different life cycles	The Power of Forces: Magnets Friction	Amazing Bodies: Nutrition Movement – the skeleton and muscles	How Does Your Garden Grow?: Conditions for growth Functions of parts Life cycles	Famous Inventors	Rocks Detectives: Properties and how different rocks are used How soil is made Fossils – what are they and how are they formed?	Can You See Me?: Light sources Shadows Reflections	
Y4	Using leaves to classify trees – classifying and identifying deciduous trees in winter – classifying plants using their flowers	In A State: Properties of materials – solid-liquid-gas	In A State: Changes of state Melting – freezing Evaporation - condensation	Switched On: Simple circuits – complete circuits Making a simple switch Conductors & insulators	Where Does All That Food Go?: Digestion Teeth Food chains	Good Vibrations: How sounds are made and travel Measuring/ changing the volume of a sound Changing the pitch of sounds	Who am I? Classification Vertebrates/ invertebrate groupings Construct & use keys	Human Impact: Local impact World habitat destruction Breaking food chains
Y5	develop their understanding of the life cycles of plants and of reproduction as a specific stage of those life cycles	Feel the Force A: Measuring forces – newtons Gravity Water/ air resistance	Sorting Everyday Materials & Marvellous Mixtures: Differing properties of the same materials Separating solids Mixing & separating solids & liquids	Circle of Life: Compare & contrast life cycles of mammals/ amphibians/insects/ birds	Reproduction in Plants and Animals: flowering plants/non-flowering plants Amphibians/insects, mammals/birds	All Change: Reversible and irreversible changes	Forces B: Levers, gears and pulleys	Earth & Beyond: Earth rotation Time zones Seasons Moon shape
Y6	ways in which physical characteristics, patterns of behaviour and life cycles help to adapt organisms and improve their chances of survival.	The Nature Library: Vertebrate & invertebrate classification Micro-organisms	Danger Low Voltage: Changing circuits Switches and resistors Symbolic representation of components	Body Pump: Heart, blood & circulatory system	Body Health: Nutrition Exercise Effects of drugs	Everything Changes: Adaptation Natural selection and evolution Inherited characteristics	Light Up Your World: Shadows Reflections and how we see How light travels	

Science Progression of Knowledge and Skills

Big Idea		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
8/7	Plants	Identify and name basic structure	Conditions for growth Sequence of growth	Conditions for growth Functions of parts Life cycles			
6/7/8	Living things and habitats		Life processes Interdependence		Human influence Classification	Life cycles Reproduction	Classification
1	Animals inc. humans	Identify and name basic structure Senses	Life cycle and basic needs	Nutrition Movement	Digestion Food chains	Human life cycle	Circulation Health
10	Evolution and inheritance						Variation Adaptation Evolution
10	Rocks			Properties Fossils			
5	Materials and Properties	Name and simple properties	Materials and their uses			Properties separation	
5	States of matter				States of matter Changes of state	Changes	
2/10	Seasonal change	4 seasons					
2	Light			Light sources Shadows Reflections			Shadows Reflections and how we see How light travels
2	Electricity				Simple circuits Conductors and insulators		Symbolic representation of components Changing circuits
2	Sound				Sound		
2	Earth and space					Earth, Sun and Moon Day, night and year	
2	Forces and magnets			Magnets Fiction		Air and water resistance Gravity, Friction Mechanisms	

Science Progression of Knowledge and Skills: KPIs

Big Idea		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Working Scientifically	<p>Ask simple questions and recognising that they can be answered in different ways</p> <p>Observe closely, using simple equipment</p> <p>Perform simple tests</p> <p>Identify and classify</p> <p>Use their observations and ideas to suggest answers to questions</p> <p>Gather and record data to help in answering questions</p>		<p>Ask relevant questions and use different types of scientific enquiries to answer them</p> <p>Set up simple practical enquiries, comparative and fair tests</p> <p>Make systematic and careful observations and , where appropriate, take accurate measurements using standard units, using a range of equipment, inc. thermometers and data loggers</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions</p> <p>Record findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes</p> <p>Use straightforward scientific evidence to answer questions or to support their findings</p>			<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables when necessary</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeating readings when appropriate</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Use test results to make predictions to set up further comparative and fair tests</p> <p>Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p style="text-align: center;">Identify scientific evidence that has been used to support or refute ideas or arguments</p>
8/7	Plants	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>•Identify and describe the basic structure of a variety of common flowering plants, including trees</p>	<p>•observe and describe how seeds and bulbs grow into mature plants</p> <p>•find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>•identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>•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</p> <p>•investigate the way in which water is transported within plants</p> <p>• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>			
6/7/8	Living things and habitats		<p>•explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>•identify that most living things live in habitats to which they are suited and describe how different</p>		<p>•recognise that living things can be grouped in a variety of ways</p> <p>•explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</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>	<p>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</p>

			habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other <ul style="list-style-type: none"> •identify and name a variety of plants and animals in their habitats, including micro-habitats •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. 		<ul style="list-style-type: none"> •recognise that environments can change and that this can sometimes pose dangers to living things. 		<ul style="list-style-type: none"> • give reasons for classifying plants and animals based on specific characteristics.
1	<i>Animals inc. humans</i>	<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 the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) •<i>identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</i> 	<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. 	<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. 	<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. 	<ul style="list-style-type: none"> •describe the changes as humans develop from birth to old age. 	<ul style="list-style-type: none"> •Identify and name the main parts of the human circulatory system, and explain 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.
10	Evolution and inheritance						<ul style="list-style-type: none"> •recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago •recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents •identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
10	Rocks			<ul style="list-style-type: none"> •compare and group together different kinds of rocks on the basis of their 			

				appearance and simple physical properties <ul style="list-style-type: none"> •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. 			
5	Materials and Properties	<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. 	<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. 			<ul style="list-style-type: none"> •compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets •know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution •use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating •give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic 	
5	States of matter				<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. 	<ul style="list-style-type: none"> •demonstrate that dissolving, mixing and changes of state are reversible changes •explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 	
2/10	Seasonal change	<ul style="list-style-type: none"> •observe changes across the four seasons •observe and describe weather associated with the seasons and how day 					

		length varies.				
2	Light			<p>recognise that they need light in order to see things and that dark is the absence of light</p> <p>notice that light is reflected from surfaces</p> <p>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p>find patterns in the way that the size of shadows change.</p>		<ul style="list-style-type: none"> •recognise that light appears to travel in straight lines •use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye •explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes •use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
2	Electricity				<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. 	<ul style="list-style-type: none"> •associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit •compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches •use recognised symbols when representing a simple circuit in a diagram.
2	Sound				<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 	

					<p>volume of a sound and the strength of the vibrations that produced it</p> <ul style="list-style-type: none"> •recognise that sounds get fainter as the distance from the sound source increases. 	
2	Earth and space					<ul style="list-style-type: none"> •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.
2	Forces and magnets			<ul style="list-style-type: none"> •compare how things 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 •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 two poles •predict whether two magnets will attract or repel each other, depending on which poles are facing. 		<ul style="list-style-type: none"> •explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object •identify the effects of air resistance, water resistance and friction, that act between moving surfaces •recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Science Year Group Termly Overview

	Our Changing World Revisited throughout the year in all YGs	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Y1	Plants: How do trees and other plants change over the year - What flowers found in different seasons Animals – which animals live around the school Seasons- weather changes – what can I see and hear that shows seasonal change	Our Changing World – observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.	Plant Detectives: 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	Looking At Animals 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 (fish, amphibians, reptiles, birds and mammals, including pets)	Using Our Senses: identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Everyday Materials: 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.	Our Changing World – observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.
Y2	<ul style="list-style-type: none"> What lives in a habitat? – how the habitat changes over the year – how animals in a habitat depend on each other 	Growing Up: What do babies need? – changes from birth to now and throughout lives notice that animals, including humans, have offspring which grow into adults	Take Care: 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.	Materials – Good Choices: identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	Materials – Shaping Up: find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Apprentice Gardener: 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.	What's In Your Habitat?: 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 micro-habitats

							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.	
Y3	how the leaves on deciduous/ evergreen trees change through the year - observe seeds, berries and flowers are visible on different plants throughout the year according to their different life cycles	<p>The Power of Forces:</p> <p>compare how things move on different surfaces</p> <p>notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>describe magnets as having two poles</p> <p>predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Amazing Bodies:</p> <p>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</p> <p>identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>How Does Your Garden Grow?:</p> <p>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>investigate the way in which water is transported within plants</p> <p>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>	9 Famous Inventors	<p>Rocks Detectives:</p> <p>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>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>	<p>Can You See Me?:</p> <p>recognise that they need light in order to see things and that dark is the absence of light</p> <p>notice that light is reflected from surfaces</p> <p>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>recognise that shadows are formed when the light from a light source is blocked by a solid object find patterns in the way that the size of shadows change.</p>	
Y4	Using leaves to classify trees – classifying and identifying deciduous trees in winter – classifying plants using their flowers	<p>In A State:</p> <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>	<p>Switched On:</p> <p>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</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>Where Does All That Food Go?:</p> <p>describe the simple functions of the basic parts of the digestive system in humans</p> <p>identify the different types of teeth in humans and their simple functions</p> <p>construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	Good Vibrations:	<p>identify how sounds are made, associating some of them with something vibrating</p> <p>recognise that vibrations from sounds travel through a medium to the ear</p> <p>find patterns between the pitch of a sound and features of the object that produced it</p>	<p>Who am I?</p> <p>recognise that living things can be grouped in a variety of ways</p> <p>explore and use classification keys to help group, identify and name a variety of</p>	<p>Human Impact:</p> <p>recognise that environments can change and that this can sometimes pose dangers to living things.</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>		<p>find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>recognise that sounds get fainter as the distance from the sound source increases.</p>	<p>living things in their local and wider</p>		
Y5	<p>develop their understanding of the life cycles of plants and of reproduction as a specific stage of those life cycles</p>	<p>Feel the Force A:</p> <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>Sorting Everyday Materials & Marvellous Mixtures:</p> <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>Circle of Life:</p> <p>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p>	<p>Reproduction in Plants and Animals:</p> <p>describe the life process of reproduction in some plants and animals.</p> <p>describe the changes as humans develop from birth to old age.</p>	<p>All Change:</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>	<p>Forces B:</p> <p>recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>	<p>Earth & Beyond:</p> <p>describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>describe the movement of the Moon relative to the Earth</p> <p>describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>
Y6	<p>ways in which physical characteristics, patterns of behaviour and life cycles help to adapt organisms and improve their</p>	<p>The Nature Library:</p> <p>describe how living things are classified into broad</p>	<p>Danger Low Voltage:</p> <p>associate the</p>	<p>Body Pump:</p> <p>Identify and name the main parts of the human</p>	<p>Body Health:</p> <p>recognise the impact of diet, exercise, drugs and</p>	<p>Everything Changes:</p> <p>recognise that living</p>	<p>Light Up Your World:</p> <p>recognise that light appears to travel in straight lines</p>	

	<p>chances of survival.</p>	<p>groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</p> <p>give reasons for classifying plants and animals based on specific characteristics.</p>	<p>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>	<p>circulatory system, and explain the functions of the heart, blood vessels and blood</p>	<p>lifestyle on the way their bodies function</p> <p>describe the ways in which nutrients and water are transported within animals, including humans.</p>	<p>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>	<p>use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <p>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</p> <p>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>
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Science Progression of Vocabulary

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	plant (verb and noun), leaf, leaves, bud, twig, branch, tree, roots, stem, shoot, bud, flower, leaf, rough, smooth, shiny, glossy, wrinkled, crinkled, crunchy, crisp, soft, green, olive, brown, orange, red, yellow, rust, flower, blossom, petals, stem, stalk, small, little, big, large, single, lots, deciduous, evergreen, plug plant, soil, compost, manure, dig, prepare, water, watering, vegetable, fruit, names of vegetables and fruits, salad, wash, clean, peel, cut, chop, grate, mix, sprinkle, combine	seeds, plant (verb and noun), apprentice, gardener, bulb, grow, observe, observations, describe, identify, expert, question, predict, prediction, water, compare, answer, investigate, bean, soil, surface, test, bury, light, dark, water, germinate, fair, same, plan, suitable, radicle, root, shoot, leaves, change, evidence, height, tallest, shortest, bar chart, scale, pattern, question, connection, measure, seedling, mature plant, wilting, healthy, unhealthy, warmth, care, die, block, agree, disagree, alive, food store, first, next, later, after...days, order, conclusion, because	plant, roots, stem, trunk, leaf/leaves, flower, leaflet, stalk, veins, surface, edge, lobes, tip, food, root hair, nutrients, anchor, support, seed, germination, seedling, growth, mature plant, flowering, pollination, seed formation, bud, petal, sepal, carpel, stamen, pollen, reproduce, nectar, seed, fruit, dispersal, animal, wind, water, self-dispersal, explosion, sprinkling, competition, air, light, stigma, style, ovary, anther, filament, observe, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions			
Living things and habitats	butterfly, fly, wasp, bee, frog, spider, woodlice, worm, ant, ladybird, fly, squirrel, fox, dog, puppy, cat, kitten, hedgehog, bird, blackbird, house sparrow, starling, pigeon, seagull, robin, thrush, wagtail, blue tit, chaffinch, great tit, collared dove,	habitat, alive, living, once-lived, dead, never-lived, plants, animals, decay, rocks, soil, air, water, food chain, plants, animals, herbivores (eat plants and parts of plants), carnivores (eat other animals), omnivores (eat plants/parts of plants)		environment, impact, positive, negative, litter, pollution, waste, biodiversity, habitat, derelict, graffiti, traffic, destroy, create, location, food chain, producer, consumer, human impact, global issue, destruction,	reproduction, reproduce, flower, organ, carpel, stamen, pollen, seeds, seed head, berry, fruit, pollinator, pollination, fertilisation, reproduction, reproduce, propagate, stem, leaf	General terms: identify, identification, classify, classification, division, family, genus, species, reason, common characteristics, distinguishing characteristics, leaves, shape, size, colour, backbone,

	<p>magpie, wood pigeon, bird table, feeder, nuts, seed, types of seed, fat ball, snail, shell, foot, slime, slimy, striped, stripy, ridged, spiral, terrarium, dandelion, feed, food, leaves, lettuce, paws, claws, fur, whiskers, tail, furry, fluffy, silky, smooth, rough, thick, thin, long, short, big, small, brush, comb, lead, collar, toys, biscuits, chews</p>	<p>and other animals), direction, source of food, suited, habitat, features, names of habitats, living things and animal body parts</p>		<p>deforestation, rainforest, climate, climate change, zoo, endangered, breed, wild, natural, predator, prey, conservation, categories, tally chart, pictogram, bar chart, axes, scale, opinion, point of view, argument, viewpoint, debate</p> <p>features, sequence, key, distinguish, similarities, differences, vertebrate, fish, amphibian, reptile, bird, mammal, backbone, hair, scales, feathers, eggs, wings, beak, lungs, gills, cold blooded, warm blooded, suckle, head, thorax, abdomen, wing, segment, antennae, insects, arachnids (spiders), crustaceans, myriapods, molluscs, worms, observations, sort, group, classify, identify</p>	<p>and root cuttings, runners, tubers, bulbs, rhizomes, gender, male, female, sex, sexual, asexual, metamorphosis, mate, sperm, pregnant, give birth, young, pup, calf, foal, chick, hatch, fledge, fledgling</p>	<p>wings, jointed legs, cased, transparent, antennae, shell, segments, explain, group, small, harmful, beneficial (helpful), colony, colonies, mould, multiply, historically, grouping, Aristotle, Carl Linnaeus, kingdom, Phillip Miller, John Ray, botany, conventions</p> <p>Kingdoms of living things: Animalia, Plantae, Fungi, Protista, and Monera</p> <p>Plant kingdom: flowering plants, conifers, ferns, mosses and algae</p> <p>Animal kingdom: vertebrates, fish, amphibians, mammals, birds, reptiles, invertebrates, molluscs, annelids, arachnids, insects, arthropods</p> <p>Micro-organisms: (3 kingdoms: Fungi, Monera, Protista), micro-organisms (microbes) bacteria</p>
<p>Animals inc. humans</p>	<p>body, head, neck, arms, elbows, hands, fingers, legs, knees, feet, face, skin, ears, eyes, nose, nostrils, hair, mouth, teeth, tall, taller, short, shorter, big, bigger, small, smaller, louder, softer, loud, quiet, high, low, senses, taste, hearing, touch, smell, sight, bitter, sweet, sour, sharp,</p>	<p>food, sort, classify, Venn diagram, Carroll diagram, healthy diet, dairy, fruits, vegetables, meat, fish, beans, fat, sugar, bread, potatoes, cereals, exercise, physical activity, hot, sweaty, heart beating, pulse, tired, aching, muscles, clean, hygiene, hygienic, wash, bath,</p>	<p>stay alive, survive, food, balanced diet, nutrition, nutrients, fruit and vegetables, carbohydrates, protein, roughage, fibre, sugar, fat, dairy, skeleton, bones, protect, support, move, muscles, joints, ribs, heart, skull, brain, backbone, spine, spinal column, vertebrate, footprint,</p>	<p>mouth, oesophagus, stomach, small intestine, large intestine, rectum, anus, digestive system, digestion, carbohydrate, fat, sugar, protein, roughage, dairy, fruit, vegetables, vitamins, minerals, balanced diet, healthy, mechanical process, chemical process,</p>	<p>life cycle, birth, growth, reproduction, metamorphosis, aging, death, animal, mammal, amphibian, insect, bird, elephant, toad, bumblebee, blue tit, hedgehog, bat, polar bear, mountain gorilla, cubs, pups, hibernate, nocturnal, marsupial, toad, newt, salamander,</p>	<p>aorta, artery, atrium, blood, blood vessel, body temperature, capillaries, carbon dioxide, cells, chamber, chest cavity, circulation, circulatory system, deoxygenated blood, digestive system, digestive tract, health, heart, heart valves, humans, hydration, lubricant,</p>

	tingly, fizzy, milky, creamy, buzzer, doorbell, radio, tocker timer, bird song, wind blowing, car horn, traffic noise, loud/er, quiet/er, peaceful, silent, silence, noise, noisy, bang, crash, whistle, buzz, ring, squeak, creak, rattle, bang, knock, tick, chime, feel, touching, sensitive, sense, sensory, rub, pinch, prod, rough, smooth, bumpy, wrinkled, grooved, shiny, smooth, soft, hard, crunchy, slippery, slimy, fragrance, scent, pong, flowery, fruity, sour, bitter, sharp, strong, gentle, smelly, delicate, sensitive, fabric, material, layers, thick, thin, thicker, thinner, soft, hard, clock, window, door, floorboards, kettle, fire, chicken, sheep, cow, cluck, baa, moo	shower, brush, comb, toothbrush, toothpaste, soap, water, shampoo	trail, vitamins, minerals, question, classify, investigation, survey, measure, pattern, evidence, draw conclusions	absorb, nutrients, water, saliva, chemicals, enzyme, teeth, canine, incisor, premolar, molar, jaw, cutting, tearing, grinding, dental hygiene, decay, dentist, brushing, toothpaste, floss, mouthwash, food, plants, animals, food chain, food web, producer, consumer, predator, prey, herbivore, omnivore, carnivore	tree frog, metamorphosis, tadpole, larva, frog, toad, gills, cold blooded, ladybird, butterfly, dragonfly, head, thorax, abdomen, antennae, egg, pupa, cocoon, adult, thrush, peregrine falcon, ostrich, emperor penguin, breeding cycle, clutch, brood, hatch, fledge, prey, predator, reproduce, habitat, environment, humpback whale, blue whale, swift, osprey, wildebeest, caribou, monarch butterfly, migrate, migration, navigate, genetic, endangered, threatened, extinct, extinction, evolution, giant panda, black rhino, peregrine falcon, bumblebee, salamander, osprey, koala bear	lungs, muscular system, nutrients, nutrition, oxygen, oxygenated blood, plasma, platelets, pump, red blood cell, skeletal, system, transport, valve, vein, vena cava, ventricle, vessel, waste, waste gases, white blood cells alcohol, asthma, athlete, balanced diet, beats per minute (bpm), benefits, breathing, caffeine, calories, cancer, carbohydrates (including sugars), cheating, cigarettes, clinical trial, consequences, dairy, diet, doping, drugs, eat well plate, energy, exercise, fat, fibre, heart, heart rate, intensity, illegal, impact, James Lind, legal, lifestyle, long-term effect, lungs, medicine, mental benefits, mineral, motivation, norm, nutrition, oxygen, passive smoking, peer pressure, performance enhancing, persuade, physical benefits, protein, pulse rate, RDA (recommended daily allowance), recovery rate, resting rate, rickets, roughage, saturated fat, scurvy, short-term effect, smoking,
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						sodium, solvents, steroids, tobacco, training, unsaturated fat, vitamin
Evolution and inheritance						population, variation, environment, inheritance, adaptation, selective breeding, generation, survival, natural selection, evolution, fossils, genes, genetics, DNA, extinct, extinction, speciation, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions
Rocks			sandstone, granite, chalk, limestone, marble, pumice, rough, smooth, hard, soft, rock, stone, pebble, texture, particle, crystal, granule, properties, soil, clay, sandy, loam, peat, organic material, weather, weathering, frost, beach, cliff, trilobite, starfish, sea urchin, ammonite, fossil, fossilise, remains			
Materials and Properties	materials, wood, wooden, plastic, metal, glass, water, rock, brick, paper, writing, wrapping, shiny, drawing, display, greaseproof, kitchen towel, handkerchief, wallpaper, sand paper, fabric, wool, nylon, silk, fleece	material, wood, property, metal, plastic, glass, rock, brick, paper, cardboard, fabric, smooth, rough, soft, hard, bendy, squashy, stiff, rigid, shiny, dull, see through, cold, warm, breaks, fold, crease, waterproof, absorb, absorbent,			properties, material, solid, liquid, gas, compare, contrast, group, organise, criteria, hardness, soluble, insoluble, transparent, transparency, opaque, hardness, strength, rigidity, flexibility, elastic, elasticity, ductile,	

	<p>fibre, properties, hard, soft, fluffy, rough, smooth, shiny, dull, light, heavy, transparent (see-through), opaque (can't see-through), translucent (see something through), harder, lighter, rougher, stretch, stretchy, elastic, stiff, bend, bendy, not bendy, press, squash, twist, shape, waterproof, absorb, absorbent, soak up, mop up; frozen, freeze, melt, salt, tissue paper, button, glass bead, marble, pebble, pasta</p>	<p>wet, sunglasses, lenses, light, block, transparent, opaque, translucent, strength, strong, weak, tear, teabag, tea leaves, chair, legs, arms, seat, backrest, cushion, tent, stretchy, tent cover, frame, flexible, measure, record</p> <p>twist, squash, bend, stretch, squashing, bending, twisting, stretching, push, pull, pushing, pulling, roll, pinch, press, smooth, flexible, rigid, stretchy, squashy, elastic, stiff, properties, suitable, stretchiness, weight, catapult, frame, missile, strong, table, column, Venn diagram, set, sort, label, measure, record, bar chart</p>			<p>electrical conductor/insulator, thermal conductor/insulator, magnetic, non-magnetic, attract, repel, viscosity, viscous, thick, thicker, types of plastic – polyester, nylon, polythene, PVC, polystyrene acrylic – recycle, reuse, biodegradable, environmentally friendly</p> <p>material, compare, contrast, separate, mixture, sieve, filter, evaporate, solid, liquid, gas, powder, particle, dissolve, soluble, solution, contamination, contaminate, contaminated, impurity, pure, purity, suspension, saturated, saturation, reversible, non-reversible, microbes, bacteria, types of oil, liquid, solid, detergent, sticky, filter, mechanical, boom, residue, environment, biological, marine life, purify, drinkable, sterilise</p>	
States of matter				<p>solid, liquid, hard, soft, pour, flow, pile, pool, surface, horizontal, runny, viscous, sticky, grain, powder, ice, water, temperature, cool, cooling, warm,</p>	<p>material, change, compare, contrast, solid, liquid, gas, change of state, dissolve, melt, reversible, non-reversible, mixture, powder, particle,</p>	

				warming, hot, degree Celsius, melt, melting, freeze, freezing, solidify, solidifying, heating, states of matter, change of state, melting point, freezing point, process, gas, air, carbon dioxide, helium, oxygen, bubbles, empty, particle, weight, compress, squash, shape, volume, dry, evaporate, evaporation, water vapour, boil, boiling, boiling point, steam, thermometer, data logger, sensor, droplets, condense, condensation, water, droplets, cycle, model, snow, expand, scale, calibrate, heat sensitive, sensor, observe, measure, fair test, variable, collect, present, interpret, data, axis, scale, interval, control, keep the same, evidence, annotate, accuracy, describe, explain, evaluate, reliable, repeatable	tablet, bubbles, carbon dioxide, change, reaction, inflate, rust, oxidise, oxygen, corrode, tarnish; types of metal: iron, steel, chromium, tin, zinc; boil, vapour, fuel, heat, burn, burning, flammable, flame, melts, solidifies, candle, wick, wax material, compare, contrast, separate, mixture, sieve, filter, evaporate, solid, liquid, gas, powder, particle, dissolve, soluble, solution, contamination, contaminate, contaminated, impurity, pure, purity, suspension, saturated, saturation, reversible, non-reversible, microbes, bacteria, types of oil, liquid, solid, detergent, sticky, filter, mechanical, boom, residue, environment, biological, marine life, purify, drinkable, sterilise	
Seasonal change	seasons, autumn, winter, spring, summer, evidence, similar, different, group, compare, change, names of the months of the year, temperature, hot, warm, cold, cool, freezing, frosty, wet, dry, sunny, cloudy, showery, stormy,					

	windy, breeze, gale, rainy, sunny, snow, shower, drizzle, puddle, breeze, gale, thunder, lightning, sleet, fog, mist, hat, gloves, mittens, scarf, muffler, ear muffs, boots, coat, umbrella, wellies, kite, windmill, sunglasses, thick, thin, woolly, furry, warm, waterproof					
Light			light, dark, shadow, mirror, bright, dim, reflect, eye, opaque, transparent, translucent, ultraviolet, ray, beam, absorb, luminous, non-luminous, infrared, question, investigation, fair test, change, measure, predict, prediction, explain, explanation, observations, draw conclusions			light, dark, shadow, mirror, bright, dim, reflect, eye, opaque, transparent, translucent, ultra violet, ray, beam, refraction, periscope, spectrum, dispersion, inverted, medium, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions
Electricity				electricity, electrical, mains, plugged in, battery, power, rechargeable, solar, wind up, sound, light, heat, movement, cell, wire, bulb, bulb holder, buzzer, motor, component, circuit, complete circuit, short circuit, flow, break, make, metal, connect, disconnect, terminal, positive, negative, switch, press switch, toggle switch, tilt switch, pendulum switch, property, electrical conductor,		cell, battery, lamp, wire, buzzer, motor, circuit, current, filament, electrical insulator, electrical conductor, mains electricity, terminal, switch, toggle switch, push switch, slide switch, tilt switch, trembler switch, pressure switch, reed switch, series circuit, resistance, resistor, current, circuit diagram, recognised symbols, generate, generator, coal, gas, oil, fossil fuels, nuclear, biomassfired

				electrical insulator, electron, filament, sets, Venn diagram, Carroll diagram, table, conclusion, evidence, annotate		power stations, wind turbine, wave hub, tidal flow, hydro-electric, grid, pylon, transmission, transformer, solar panels
Sound				sound, loud, quiet, high, low, repeating, continuous, strike, blow, shake, pluck, vibration, vibrate, solid, gas, volume, strength of vibrations, sound source, fainter, distance, pitch, particles, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions		
Earth and space					Aldebaran, Arctic, Antarctic, British Summer Time, Earth, Greenwich Meridian, International Date Line, Jupiter, Mars, Mercury, Milky Way, Moon, North Pole, Saturn, South Pole, Sun, Neptune, Universe, Uranus, Venus, asteroid, autumn, axis, compass, crescent, dawn, degrees, dusk, equator, equinox, fixed stars, Full Moon, galaxy, gibbous, hemisphere, horizon, illuminate, leap year, longitude, lunar month, meridian, nebula, New Moon, northern, orbit, planet, reflect, rotate,	

					<p>rotation, solar system, solstice, southern, spin, spring, star, summer, sunrise, sunset, telescope, temperature, tilt, time zone, waning, waxing, winter, year, change, compare, draw conclusions, explain, explanation, investigation, line graph, measure, model, observations, plan, predict, prediction, presentation, question, record, review, scientific diagram, table</p>	
Forces and magnets			<p>push, pull, twist, force, air, turns, fast, slow, slows down, material, surface, magnet, attracts, magnetic material, magnetism, acts at a distance, non-magnetic material, metal, non-metal, strength, north pole, south pole, repel, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions</p>		<p>air resistance, Aristotle, balanced, balanced forces, bevel gears, clockwork, cogs, compress, extend, effort, force arm, forces, force, friction, force arrow, fulcrum, gravity, Galileo, gear ratio, gears, gear trains, lever, lift, machine, mechanisms, movement, Newton, Newton meter, pinion, pivot, pulley, pull, push, rack, resistance, rotary motion, simple machines, speed, time, unbalanced force, upthrust, water resistance, weight arm, wheel</p>	