

Christopher Rawlins CE Primary School
 Science Long-term Overview
 Units and key questions by term



Phase	Cycle	Autumn		Spring		Summer	
EYFS	A	All About Me and People Who Help Us Learning about ourselves - face features and body parts Keeping healthy and safe Oral health	Books, Books, Books! Science not explicitly taught but is embedded within continuous provision.	Houses and Homes Introduction to materials (language and types of materials- wood, brick, stone, ice, water) Introduction to basic properties e.g. hard soft. Exploring and feeling different materials. Village walk.	All Things Bright and Beautiful Observations of things changing over time. Exploring living things e.g. plants, flowers Investigate minibeasts and simple life cycles (butterfly/sunflower)	Explorers Observations of things changing over time. Exploring jungle animals and dinosaur bones and fossils Developing simple enquiry skills and scientific language Exploring scientific equipment e.g. microscope	Sea Adventures Exploring living things and habitats e.g. sea creatures and the ocean/sea
		Seasonal Changes Daily weather, names of seasons, basic changes during seasons					
	Forest School (Reception only) Explore, observe and interact with the natural world around them						
	B	All About Me and People Who Help Us Learning about ourselves - face features and body parts Keeping healthy and safe Oral health	Celebrations Science not explicitly taught but is embedded within continuous provision.	Where in the World? Introduce the concept of space in relation to where we live- the universe, solar system and planet Earth	Castles Explore materials and naming the (stone, wood, water etc) Explore basic properties e.g. hard soft. Explore growth and change and simple life	Animal Homes Observations of things changing over time. Exploring living things e.g. farm animals Developing simple enquiry skills and scientific language	On the Move Introduction to language around forces and how things work Introduction to space and related language

					cycle of a plant and (broad bean)	Exploring scientific equipment e.g. microscope Investigate minibeasts and simple life cycles (chicken))	
Seasonal Changes Daily weather, names of seasons, basic changes during seasons							
Forest School (Reception only) Explore, observe and interact with the natural world around them							
KS1	A	Seasonal Changes How does the weather change across the year? What happens to day length over a year? What are some of the key differences between the seasons?					
			Animals Including Humans Can you name variety of common animals and their basic body parts? Can you compare a range of common animals? Which body parts help with humans' five senses? What do animals and humans need to survive? Why do humans need to exercise, eat healthily and maintain good hygiene?			Plants Can you name and recognise a variety of common plants? What are the basic parts of a flowering plant? Can you describe how seeds and bulbs grow into plants? What do plants need to grow and stay healthy?	
	B	Seasonal changes How does the weather change across the year? What happens to day length over a year? What are some of the key differences between the seasons?					
		We will spend the autumn term mainly focusing on the seasonal changes objectives and working scientifically skills.	Materials What materials are these objects made from? What properties to these materials have? How can you sort these materials based on their properties? Which material is best suited to this job? How can we change the shape of solid objects?			Living things and their habitats What is the difference between things that are living, dead or have never been alive? Can you identify and name a variety of plants and animals in their habitats? Can you describe how animals find food from plants and other animals?	

LKS2 Yr 3/4	A	<p>Sound</p> <p>How are sounds made? How do we hear vibrations from sound? What happens to sound as you increase the distance from the sound? What is the pattern between the volume of a sound and the strength of the vibrations that produce it?</p>	<p>Living things and their habitats</p> <p>How can you group these plants and animals in different ways? Can you use the classification keys to sort these living things? How can changes in environments affect living things?</p>	<p>Animals Including Humans</p> <p>What types of nutrition do animals and humans need and how do they get it? What is the basic purpose of the skeleton and muscles? Can you describe the simple functions of basic parts of the digestive system? What are the different types of human teeth and can you explain their function? Can you draw a food chain and label it with the terms: producers, predators and prey?</p>		<p>Plants</p> <p>Can you describe the function of different parts of a flowering plant? What do plants need to grow and live and how does that differ between different plants? How is water transported in plants? How is the flower involved in the life cycle of a plant?</p>	
	B	<p>Rocks</p> <p>How can you classify these rocks based on their appearance and properties? Can you describe simply how fossils are formed? What is soil made from?</p>	<p>Light</p> <p>Why do we need light? How can we protect ourselves from light from the sun? How are shadows formed? What affects the size of a shadow?</p>	<p>Electricity</p> <p>Can you identify common appliances that run on electricity? Can you construct a simple series electrical circuit, identifying and naming its basic parts? Can you 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? Can you name some good insulators and conductors? What does a switch do?</p>	<p>Force and Magnets</p> <p>How do objects move differently on different surfaces? How do magnets behave with each other? Which materials attract and which repel magnets? Can you classify these materials based on their magnetic properties?</p>	<p>States of Matter</p> <p>Can you compare and group these materials together, according to whether they are solids, liquids or gases? At what temperature do different materials change state? Can you describe the water cycle? Can you explain evaporation and condensation? How does temperature affect evaporation?</p>	
UKS2 Yr 5/6	A	<p>Earth and Space</p> <p>How does the Earth and other planets move relative to the Sun? How does the Moon move relative to the Earth? What shape are the Earth, Sun and Moon? Why do we experience day and night?</p>		<p>Light</p> <p>How does light travel? How do we see objects? Why do shadows have the same shape as the object that cast them?</p>	<p>Animals Including Humans</p> <p>Can you name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood?</p>	<p>Animals Including Humans</p> <p>How do humans change as they develop to old age?</p>	<p>Evolution and Inheritance</p> <p>How have living things changed over time? How do fossils support the theory of evolution? Why are offspring not identical to their parents? How do animals and plants adapt to suit their environment?</p>

				<p>What is the impact of diet, exercise, drugs and lifestyle on the way our bodies function?</p> <p>How are nutrients and water transported in animals, including humans?</p>		<p>How can adaptation lead to evolution?</p>
	B	<p>Properties and changes of materials</p> <p>Can you compare and group together everyday materials on the basis of their properties?</p> <p>Can you name some materials that can dissolve to form a solution?</p> <p>How can you separate a substance from a solution?</p> <p>Can you describe how mixtures might be separated, including through filtering, sieving and evaporating?</p> <p>Can you give reasons from your results to suggest why certain materials would be best for certain uses?</p> <p>Can you give examples of reversible changes?</p> <p>Can you explain an irreversible change?</p>	<p>Electricity</p> <p>How is the brightness of a lamp or volume of a buzzer affected by the number of cells in the circuit?</p> <p>What affects the brightness of bulbs/loudness of buzzers in a circuit?</p> <p>What effect does the position of a switch have on the components in a circuit?</p> <p>Can you use symbols to draw a simple circuit diagram?</p>	<p>Forces</p> <p>Can you explain why unsupported objects fall towards the Earth?</p> <p>Can you give examples of air resistance, water resistance and friction?</p> <p>What affect do air resistance, water resistance and friction have on moving objects?</p> <p>What is the purpose of different mechanisms such as levers, pulleys and gears?</p>	<p>Living things and their habitats</p> <p>Can you describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird?</p> <p>Can you describe the life process of reproduction in some plants and animals?</p> <p>Can you classify these living things based on their observable characteristics?</p> <p>Can you explain how you have classified these living things?</p>	

Christopher Rawlins CE Primary School
 Science Long-term Overview
 National Curriculum Objectives/Early Learning Goals



Phase	Cycle	Autumn		Spring		Summer	
Nursery	A	<p>All About Me and People Who Help Us Talk about what they see using wide vocabulary</p> <p>Understand simple why questions</p> <p>Be increasingly independent in meeting their own care needs e.g.brushing teeth</p> <p>Making healthy choices about food, drink, activity and tooth brushing</p>	<p>Books, Books, Books! Talk about what they see using wide vocabulary</p> <p>Use all their senses in hands on exploration of natural materials</p> <p>Understand simple why questions</p>	<p>Houses and Homes Explore natural materials indoors and outside.</p> <p>Explore collections of materials with similar or different properties.</p> <p>Talk about what they see using wide vocabulary.</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore how things work</p> <p>Understand simple why questions</p>	<p>All Things Bright and Beautiful Plant seeds and care for growing plants.</p> <p>Understand the key features of the life cycle of a plant and an animal.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Can talk about some things they have observed such as plants, animals, natural and found objects.</p> <p>Use all their senses in hands-on exploration of natural materials.</p>	<p>Explorers Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Can talk about some things they have observed such as plants, animals, natural and found objects.</p> <p>Use all their senses in hands on exploration of natural materials</p> <p>Explore how things work</p> <p>Understand simple why questions</p>	<p>Sea Adventures Can talk about some things they have observed such as plants, animals, natural and found objects.</p> <p>Use all their senses in hands on exploration of natural materials</p> <p>Understand simple why questions</p>

					Understand simple why questions	
<p align="center">Seasonal Changes: Develop some understanding of growth and decay and changes over time. Begin to use language related to weather and seasons.</p>						
<p>Continuous Provision Opportunities for Science: investigation area, access to magnifying glasses, tweezers, magnets, toy insects, non-fiction books related to Science, water and sand play and other sensory play, opportunities outside to explore natural materials, construction area with different materials, dentist role play area, home corner (recipe books etc.) Ongoing talk and opportunities around physical development and health and self-care e.g. healthy eating, oral health, physical activity, cooking</p>						
B	<p>All About Me and People Who Help Us Talk about what they see using wide vocabulary</p> <p>Understand simple why questions</p> <p>Be increasingly independent in meeting their own care needs e.g. brushing teeth</p> <p>Making healthy choices about food, drink, activity and tooth brushing</p>	<p>Celebrations Talk about what they see using wide vocabulary.</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Understand simple why questions.</p>	<p>Where in the World? Talk about what they see using wide vocabulary</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Understand simple why questions.</p>	<p>Castles Explore natural materials indoors and outside.</p> <p>Explore collections of materials with similar or different properties.</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore how things work</p> <p>Plant seeds and care for growing plants.</p> <p>Understand simple why questions.</p>	<p>Animal Homes Can talk about some things they have observed such as plants, animals, natural and found objects.</p> <p>Use all their senses in hands on exploration of natural materials</p> <p>Understand simple why questions</p>	<p>On the Move Talk about what they see using wide vocabulary.</p> <p>Explore and talk about different forces they can feel</p> <p>Explore how things work</p> <p>Understand simple why questions</p>
<p align="center">Seasonal Changes: Develop some understanding of growth and decay and changes over time. Begin to use language related to weather and seasons.</p>						
<p>Opportunities for Science in Continuous Provision: Investigation area, access to magnifying glasses, tweezers, magnets, toy insects, non-fiction books related to Science, water, sand and other sensory play, opportunities outside to explore natural materials, construction area with different materials, dentist role play area, home corner (recipe books etc.) Ongoing talk and opportunities around physical development and health and self-care e.g. healthy eating, oral health, physical activity, cooking</p>						

<p>Reception</p>	<p>A</p>	<p>All About Me and People Who Help Us Talk about the different factors that support their health and overall wellbeing: regular physical activity, healthy eating, toothbrushing, sensible amounts of screen time, having a good sleep routine, being a good pedestrian.</p> <p>Observe and can describe in words or actions the effects of physical activity on their bodies.</p> <p>Can name and identify different parts of their body.</p> <p>Can wash and dry hands and understand why it is important.</p> <p>Understands the need for a variety of food when cooking and eats a healthy range of food.</p> <p>Describes physical changes on the body.</p> <p>Shows an understanding that good practices in regards to exercise, eating, drinking water, sleeping and hygiene and that these contribute to good health.</p>	<p>Books, Books, Books! Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.</p> <p>Knows about similarities and differences in relation to places, objects, materials and living things.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p> <p>Understand some important processes in the natural world around them including the seasons and changing states of matter (ELG)</p>	<p>Houses and Homes Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.</p> <p>Knows about similarities and differences in relation to places, objects, materials and living things.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen.</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p>	<p>All Things Bright and Beautiful Developing an understanding of growth, decay and changes over time.</p> <p>Show care and concern for living things and the environment.</p> <p>Make observations of animals and plants and explain why some things occur and talks about changes.</p> <p>Explore the natural world around them, describe what they see, hear and feel whilst outside.</p> <p>Understand the effect of changing seasons on the natural world around them.</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p>	<p>Explorers Show care and concern for living things and the environment.</p> <p>Make observations of animals and plants and explain why some things occur and talks about changes.</p> <p>Explore the natural world around them, describe what they see, hear and feel whilst outside.</p> <p>Ask questions to find out more.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Observing patterns in nature</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and</p>	<p>Sea Adventures Show care and concern for living things and the environment.</p> <p>Make observations of animals and plants and explain why some things occur and talks about changes.</p> <p>Ask questions to find out more.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Observing patterns in nature</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their</p>
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	<p>Manage their own basic hygiene and personal needs and understanding the importance of healthy food choices (ELG).</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p>			<p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p> <p>Understand some important processes in the natural world around them including the seasons and changing states of matter (ELG)</p>	<p>differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p>	<p>experiences and what they have read in class (ELG).</p>
<p>Seasonal Changes: Understand the effect of changing seasons on the natural world around them. Describe what they see, hear and feel whilst outside.</p> <p>Understand some important processes in the natural world around them including the seasons and changing states of matter (ELG)</p>						
<p>Forest School: explore the natural world around them, describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.</p> <p>Making observations of animals and plants (ELG). Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG). Understand some important processes in the natural world around them including the seasons and changing states of matter.(ELG)</p>						
<p>Opportunities for Science in Continuous Provision: Investigation area, access to magnifying glasses, tweezers, magnets, toy insects, non-fiction books related to Science, water, sand and other sensory play, opportunities outside to explore natural materials, construction area with different materials, dentist role play area, home corner (recipe books etc.) Ongoing talk and opportunities around physical development and health and self-care e.g. healthy eating, oral health, physical activity, cooking</p>						
B	<p>All About Me and People Who Help Us</p> <p>Talk about the different factors that support their health and overall wellbeing: regular physical</p>	<p>Celebrations</p> <p>Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.</p>	<p>Where in the World?</p> <p>Comments and asks questions about aspects of their familiar world</p>	<p>Castles</p> <p>Comments and asks questions about aspects of their familiar world such as the place where</p>	<p>Animal Homes</p> <p>Developing an understanding of growth, decay and changes over time.</p>	<p>On the Move</p> <p>Comments and asks questions about aspects of their familiar world such as</p>

	<p>activity, healthy eating, toothbrushing, sensible amounts of screen time, having a good sleep routine, being a good pedestrian.</p> <p>Observe and can describe in words or actions the effects of physical activity on their bodies.</p> <p>Can name and identify different parts of their body.</p> <p>Can wash and dry hands and understand why it is important.</p> <p>Understands the need for a variety of food when cooking and eats a healthy range of food.</p> <p>Describes physical changes on the body.</p> <p>Shows an understanding that good practices in regards to exercise, eating, drinking water, sleeping and hygiene and that these contribute to good health.</p> <p>Manage their own basic hygiene and personal needs and understanding the importance of healthy food choices (ELG).</p>	<p>Knows about similarities and differences in relation to places, objects, materials and living things.</p> <p>Ask questions to find out more.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p>	<p>such as the place where they live or the natural world.</p> <p>Knows about similarities and differences in relation to places, objects, materials and living things.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p> <p>Understand some important processes in the natural world around them including the seasons and changing states of matter (ELG)</p>	<p>they live or the natural world.</p> <p>Knows about similarities and differences in relation to places, objects, materials and living things.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen.</p> <p>Describe what they see, hear and feel whilst outside.</p> <p>Recognise some environments which are different to the one they live in.</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and differences between the natural world</p>	<p>Show care and concern for living things and the environment.</p> <p>Make observations of animals and plants and explain why some things occur and talks about changes.</p> <p>Explore the natural world around them, describe what they see, hear and feel whilst outside.</p> <p>Ask questions to find out more.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Observing patterns in nature</p> <p>Explore the natural world around them, making observations of animals and plants (ELG).</p> <p>Know some similarities and differences between the natural world</p>	<p>the place where they live or the natural world.</p> <p>Knows about similarities and differences in relation to places, objects, materials and living things.</p> <p>Ask questions to find out more.</p> <p>Use talk to help work out problems, organise thinking and explaining how things work and why they might happen</p> <p>Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG).</p>
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<p>Seasonal Changes: Understand the effect of changing seasons on the natural world around them. Describe what they see, hear and feel whilst outside. Understand some important processes in the natural world around them including the seasons and changing states of matter.(ELG)</p>							
<p>Forest School: explore the natural world around them, describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them. Making observations of animals and plants (ELG). Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG). Understand some important processes in the natural world around them including the seasons and changing states of matter.(ELG)</p>							
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KS1	A	<p>Seasonal changes</p> <ul style="list-style-type: none"> Observe changes across the four seasons Observe and describe weather associated with the four seasons and how day length varies 					
		See seasonal changes objectives above.	<p>Animals including humans</p> <ul style="list-style-type: none"> identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) 		<p>Plants</p> <ul style="list-style-type: none"> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees identify and describe the basic structure of a variety of 		

			<ul style="list-style-type: none"> • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. 	<p>common flowering plants, including trees</p> <ul style="list-style-type: none"> • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.
	B	<p style="text-align: center;">Seasonal changes</p> <ul style="list-style-type: none"> • Observe changes across the four seasons • Observe and describe weather associated with the four seasons and how day length varies 		
		<p>See seasonal changes objectives above.</p>	<p style="text-align: center;">Materials</p> <ul style="list-style-type: none"> • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 	<p style="text-align: center;">Living things and their habitats</p> <ul style="list-style-type: none"> • explore and compare the difference 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 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

LKS2 Yr 3/4	A	<p style="text-align: center;">Sound</p> <ul style="list-style-type: none"> ● identify how sounds are made, associating some of them with something vibrating ● recognise that vibrations from sounds travel through a medium to the ear ● find patterns between the pitch of a sound and features of the object that produced it ● find patterns between the volume of a sound and the strength of the vibrations that produced it. ● recognise that sounds get fainter as the distance from the sound source increases <p style="text-align: center;">Living things and their habitats</p> <ul style="list-style-type: none"> ● recognise that living things can be grouped in a variety of ways ● explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment ● recognise that environments can change and that this can sometimes pose dangers to living things. 	<p style="text-align: center;">Animals including humans</p> <ul style="list-style-type: none"> ● identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat ● identify that humans and some other animals have skeletons and muscles for support, protection and movement. ● describe the simple functions of the basic parts of the digestive system in humans ● identify the different types of teeth in humans and their simple functions ● construct and interpret a variety of food chains, identifying producers, predators and prey. 	<p style="text-align: center;">Plants</p> <ul style="list-style-type: none"> ● identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers ● explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant ● investigate the way in which water is transported within plants ● explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
	B	<p style="text-align: center;">Rocks</p> <ul style="list-style-type: none"> ● compare and group together different kinds of rocks on the basis of their appearance and simple physical properties ● describe in simple terms how fossils are formed when things that have lived are trapped within rock ● recognise that soils are made from rocks and organic matter <p style="text-align: center;">Light</p> <ul style="list-style-type: none"> ● recognise that they need light in order to see things and that the dark is the absence of light ● notice that light is reflected from surfaces ● recognise that light from the sun can be dangerous and that there are ways to protect their eyes ● recognise that shadows are formed when the light from a light source is blocked by a solid object ● find patterns in the way that the size of shadows change 	<p style="text-align: center;">Electricity</p> <ul style="list-style-type: none"> ● identify common appliances that run on electricity ● construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers ● identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery ● recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit ● recognise some common conductors and insulators, and associate metals with being a good conductor <p style="text-align: center;">Force and magnets</p> <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 on whether they are attracted to a magnet, and identify some magnetic materials 	<p style="text-align: center;">States of matter</p> <ul style="list-style-type: none"> ● compare and group materials together, according to whether they are solids, liquids or gases ● observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) ● identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

			<ul style="list-style-type: none"> describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing 	
UKS2 Yr 5/6	A	<p style="text-align: center;">Earth and space</p> <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. 	<p style="text-align: center;">Light</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 	<p style="text-align: center;">Animals including humans</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. 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. <p style="text-align: center;">Evolution and inheritance</p> <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.
	B	<p style="text-align: center;">Properties and changes of materials</p> <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 	<p style="text-align: center;">Electricity</p> <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. <p style="text-align: center;">Forces</p>	<p style="text-align: center;">Living things and their habitats</p> <ul style="list-style-type: none"> 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. Classify living things into broad groups according to observable characteristics and based on similarities and differences. Give reasons for classifying plants and animals based on specific characteristics.

		<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.	<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 and the impact of gravity on our lives.• Identify the effects of air resistance, water resistance and friction, which act between moving surfaces.• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect•• greater effect.	
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Christopher Rawlins CE Primary School

Science Progression of Skills

Sources: National Curriculum, Statutory Framework For EYFS, PSTT



	By the end of EYFS	By the end of KS1	By the end of LKS2	By the end of UKS2
PLAN	<ul style="list-style-type: none"> choose the resources they need for their chosen activities and say when they do or don't need help 	<ul style="list-style-type: none"> ask simple questions and recognising that they can be answered in different ways 	<ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests 	<ul style="list-style-type: none"> plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
DO	<ul style="list-style-type: none"> explore the natural world around them making observations of animals and plants explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. select and use technology for particular purposes 	<ul style="list-style-type: none"> observe closely, using simple equipment perform simple tests identify and classify 	<ul style="list-style-type: none"> make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers 	<ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
RECORD	<ul style="list-style-type: none"> represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories. 	<ul style="list-style-type: none"> gather and record data to help in answering questions. 	<ul style="list-style-type: none"> gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 	<ul style="list-style-type: none"> record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
REVIEW	<ul style="list-style-type: none"> talk about features of their immediate environment and know similarities and differences between the natural world and contrasting environments drawing on experiences and books read in class. Offer explanations of why things happen and understand some important processes and changes in the world around them. 	<ul style="list-style-type: none"> use their observations and ideas to suggest answers to questions 	<ul style="list-style-type: none"> report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes use straightforward scientific evidence to answer questions or to support their findings 	<ul style="list-style-type: none"> use test results to make predictions to set up further comparative and fair tests report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments

Christopher Rawlins CE Primary School

Science Progression of Knowledge

Sources: National Curriculum, PLAN knowledge matrices



Year 1- Animals including humans			
	Prior Learning (EYFS)	New Learning (Year1)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals (ELG). 	<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). Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 	<ul style="list-style-type: none"> 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. (Y2 - Living things and their habitats) 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. (Y6 – Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
Key Ideas	<ul style="list-style-type: none"> Animal names and groups e.g. jungle animals, sea animals, farm animals and their homes Simple life cycles of animals e.g. butterfly, chicken, farm animals, humans 	<ul style="list-style-type: none"> Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. Humans have key parts in common, but these vary from person to person. Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. 	<ul style="list-style-type: none"> Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses.
Key Questions	<ul style="list-style-type: none"> What can you see? Are we all the same? What makes us different? 	<ul style="list-style-type: none"> Can you name variety of common animals and their basic body parts? Can you compare a range of common animals? 	<ul style="list-style-type: none"> Can you draw and explain a food chain? (Y2) How can you classify these plants and animals based on their characteristics? (Y6)

	<ul style="list-style-type: none"> • Where do these animals live? • Why does a snail have a shell? • How has the animal changed? (life cycle) • What does the animal look like? 	<ul style="list-style-type: none"> • Which body parts help with humans' five senses? 	<ul style="list-style-type: none"> • What are the key characteristics of mammals, amphibians, reptiles, fish and birds? (Y6)
Vocabulary	Body (parts and face features), human, animal, healthy food/drink, exercise, grow, change, living, teeth	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)

Year 1- Plants

	Prior Learning (EYFS)	New Learning (Year1)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Explore the natural world around them, making observations of animals and plants (ELG). Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG). Understand some important processes in the natural world around them including the seasons and changing states of matter.(ELG) 	<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. 	<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants) Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats) Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants) Investigate the way in which water is transported within plants. (Y3 Plants)
Key Ideas	<ul style="list-style-type: none"> growing beans, sunflowers Simple life cycle (seed to sunflower or beanstalk) Planting seeds Trees 	<ul style="list-style-type: none"> Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. 	<ul style="list-style-type: none"> Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.
Key Questions	<ul style="list-style-type: none"> What can you see? What do you notice? How has the plant changed? How will it grow? 	<ul style="list-style-type: none"> Can you name and recognise a variety of common plants? What are the basic parts of a flowering plant? 	<ul style="list-style-type: none"> What do plants need to grow and survive? (Y2) What are the functions of the different parts of plants? (Y3) How is water transported in plants? (Y3)
Vocabulary	seed, grow, plant, flower, trees, leaves, roots, water, sun	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in the local area. Names of garden and wild flowering plants in the local area	As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy

Year 1- Everyday materials

	Prior Learning (EYFS)	New Learning (Year1)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG). Understand some important processes in the natural world around them including the seasons and changing states of matter.(ELG) 	<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. (Y2 - Uses of everyday materials) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Key Ideas	<ul style="list-style-type: none"> Names of materials What they look and feel like Introduction to basic properties e.g. hard and soft 	<ul style="list-style-type: none"> All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. 	<ul style="list-style-type: none"> All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.
Key Questions	<ul style="list-style-type: none"> What can you see? How does it feel? What can we use it for? 	<ul style="list-style-type: none"> What materials are these objects made from? What properties to these materials have? How can you sort these materials based on their properties? 	<ul style="list-style-type: none"> Which material is best suited to this job? How can we change the shape of solid objects?
Vocabulary	brick, stone, wood, sticks, hard, soft, water, sand, plastic	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	<p>Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard</p> <p>Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid</p> <p>Shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>

Year 1- Seasonal Changes

	Prior Learning (EYFS)	New Learning (Year1)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Explore the natural world around them, making observations of animals and plants (ELG). Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what they have read in class (ELG). Understand some important processes in the natural world around them including the seasons and changing states of matter.(ELG) 	<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. 	<ul style="list-style-type: none"> Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light) Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space) The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3)
Key Ideas	<ul style="list-style-type: none"> Describe daily weather Know the name of the seasons Observe changes over time between the seasons in relation to their environment and the world around them 	<ul style="list-style-type: none"> In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. 	<ul style="list-style-type: none"> Recognise that they need light in order to see things, and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.
Key Questions	<ul style="list-style-type: none"> What is the weather like today? How do you know? What is the season? 	<ul style="list-style-type: none"> How does the weather change across the year? What happens to day length over a year? What are some of the key differences between the seasons? 	<ul style="list-style-type: none"> Why do we need light? How can we protect ourselves from light from the sun? How are shadows formed? What affects the size of a shadow? Why do we experience day and night?
Vocabulary	Introduce some language related to weather and seasons; sun, rain, wind,) spring, summer, autumn, winter	Weather (sunny, rainy, windy, foggy, frosty, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous

Year 2- Living things and their habitat

	Prior Learning (Year 1)	New Learning (Year 2)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) Observe changes across the four seasons. (Y1 - Seasonal changes) 	<ul style="list-style-type: none"> Explore and compare the differences between things that are living, dead, and things that have never been alive Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including 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 living things can be grouped in a variety of ways. (Y4 -Living things and their habitats) Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 – Living things and their habitats) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats) Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)
Key Ideas	<ul style="list-style-type: none"> Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. 	<ul style="list-style-type: none"> All objects are either living, dead or have never been alive. Living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.) An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels). Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water. Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. 	<ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things.

	<ul style="list-style-type: none"> Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. 	<ul style="list-style-type: none"> The plants and animals in a habitat depend on each other for food and shelter etc. The way that animals obtain their food from plants and other animals can be shown in a food chain. 	
Key Questions	<ul style="list-style-type: none"> Can you name and recognise a variety of common plants? What are the basic parts of a flowering plant? Can you name variety of common animals and their basic body parts? Can you compare a range of common animals? Which body parts help with humans' five senses? 	<ul style="list-style-type: none"> What is the difference between things that are living, dead or have never been alive? Can you identify and name a variety of plants and animals in their habitats? Can you describe how animals find food from plants and other animals? 	<ul style="list-style-type: none"> How can you group these plants and animals in different ways? Can you use the classification keys to sort these living things? How can changes in environments affect living things?
Vocabulary	<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in the local area.</p> <p>Names of garden and wild flowering plants in the local area, head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</p>	<p>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed. Names of local habitats e.g. pond, woodland etc. Names of micro-habitats e.g. under logs, in bushes etc.</p>	<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p>

Year 2- Plants

	Prior Learning (Year 1)	New Learning (Year 2)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. 	<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. (Y3 - Plants) 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. (Y3 - Plants) Investigate the way in which water is transported within plants. (Y3 -Plants) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Key Ideas	<ul style="list-style-type: none"> Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. 	<ul style="list-style-type: none"> Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy. 	<p>Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.</p>
Key Questions	<ul style="list-style-type: none"> Can you name and recognise a variety of common plants? What are the basic parts of a flowering plant? 	<ul style="list-style-type: none"> Can you describe how seeds and bulbs grow into plants? What do plants need to grow and stay healthy? 	<ul style="list-style-type: none"> Can you describe the function of different parts of a flowering plant? What do plants need to grow and live and how does that differ between different plants? How is water transported in plants? How is the flower involved in the life cycle of a plant?
Vocabulary	<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees/flowers in the local area.</p>	<p>As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy</p>	<p>Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)</p>

Year 2- Animals, including humans

	Prior Learning (Year 1)	New Learning (Year 2)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) 	<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. (Y3 - Animals, including humans) Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)
Key Ideas	<ul style="list-style-type: none"> Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. 	<ul style="list-style-type: none"> Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. Good hygiene is also important in preventing infections and illnesses. 	<ul style="list-style-type: none"> Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. (Y3) Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. (Y3) Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support. (Y3)
Key Questions	<ul style="list-style-type: none"> Can you name variety of common animals and their basic body parts? Can you compare a range of common animals? Which body parts help with humans' five senses? 	<ul style="list-style-type: none"> What do animals and humans need to survive? Why do humans need to exercise, eat healthily and maintain good hygiene? 	<ul style="list-style-type: none"> What types of nutrition do animals and humans need and how do they get it? What is the basic purpose of the skeleton and muscles? Can you describe the simple functions of basic parts of the digestive system? What are the different types of human teeth and can you explain their function? Can you draw a food chain and label it with the terms: producers, predators and prey?
Vocabulary	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints

Year 2- Uses of everyday materials

	Prior Learning (Year 1)	New Learning (Year 2)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) 	<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 different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets) 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. (Y5 - Properties and changes of materials) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials)
Key Ideas	<ul style="list-style-type: none"> All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. 	<ul style="list-style-type: none"> All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. E.g., clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness. 	<ul style="list-style-type: none"> Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.
Key Questions	<ul style="list-style-type: none"> What materials are these objects made from? What properties to these materials have? How can you sort these materials based on their properties? 	<ul style="list-style-type: none"> Which material is best suited to this job? How can we change the shape of solid objects? 	<ul style="list-style-type: none"> How can you classify these rocks based on their appearance and properties? Can you compare and group together everyday materials on the basis of their properties? Can you name some materials that can dissolve to form a solution? Can you give reasons from your results to suggest why certain materials would be best for certain uses?
Vocabulary	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft,	Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil

	stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid. Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material
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Year 3- Plants

	Prior Learning (Year 2)	New Learning (Year 3)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. (Y2 - Plants) Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. (Y2 - Plants) 	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	<ul style="list-style-type: none"> Describe the life process of reproduction in some plants and animals. (Y5- Living things and their habitats) Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)
Key Ideas	<ul style="list-style-type: none"> Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy. 	<p>Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.</p>	<p>Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects.</p>
Key Questions	<ul style="list-style-type: none"> Can you describe how seeds and bulbs grow into plants? What do plants need to grow and stay healthy? 	<ul style="list-style-type: none"> Can you describe the function of different parts of a flowering plant? What do plants need to grow and live and how does that differ between different plants? How is water transported in plants? How is the flower involved in the life cycle of a plant? 	<ul style="list-style-type: none"> Can you describe the life process of reproduction in some plants and animals? Can you classify these living things based on their observable characteristics? Can you explain how you have classified these living things?
Vocabulary	As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)	Life cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, bulbs, cuttings

Year 3- Animals including humans

	Prior Learning (Year 1/2)	New Learning (Year 3)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans) Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) 	<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. (Y4 - Animals, including humans) Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans) Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans)
Key Ideas	<ul style="list-style-type: none"> Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. 	<ul style="list-style-type: none"> Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support. 	<ul style="list-style-type: none"> Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).
Key Questions	<ul style="list-style-type: none"> Can you name variety of common animals and their basic body parts? 	<ul style="list-style-type: none"> What types of nutrition do animals and humans need and how do they get it? What is the basic purpose of the skeleton and muscles? 	<ul style="list-style-type: none"> What types of nutrition do animals and humans need and how do they get it? What is the basic purpose of the skeleton and muscles?

	<ul style="list-style-type: none"> • Can you compare a range of common animals? • Which body parts help with humans' five senses? 		<ul style="list-style-type: none"> • Can you describe the simple functions of basic parts of the digestive system? • What are the different types of human teeth and can you explain their function? • Can you draw a food chain and label it with the terms: producers, predators and prey?
Vocabulary	Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain

Year 3- Rocks

	Prior Learning (Year 1/2)	New Learning (Year 3)	Future Learning
<p>National Curriculum Objectives</p>	<ul style="list-style-type: none"> Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) 	<ul style="list-style-type: none"> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. 	<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. (Y6 - Evolution and inheritance) The composition of the Earth. (KS3) The structure of the Earth. (KS3) The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. (KS3)
<p>Key Ideas</p>	<ul style="list-style-type: none"> All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons. Materials can be described by their properties e.g. shiny, stretchy, rough etc. Some materials e.g. plastic can be in different forms with very different properties. 	<ul style="list-style-type: none"> Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water. 	<ul style="list-style-type: none"> Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics. (Y6- evolution and inheritance) The crust is the Earth's outer layer and is made of rocks. Rocks are solids which are made of grains of minerals which fit together. (KS3) Minerals are chemical compounds which occur naturally in the Earth's crust. A compound is a substance which is made from two or more elements which are chemically bonded together in a fixed ratio of atoms. (KS3) Rocks can be classified into three types depending on what minerals they contain and how they are formed. The three types of rock are: igneous, metamorphic, sedimentary (KS3) Igneous rocks are formed from molten (liquid) rock that has cooled and solidified. (KS3)

			<ul style="list-style-type: none"> • The grains in sedimentary rocks are arranged in layers. The oldest layers are at the bottom and the youngest layers are at the top. Chalk, limestone, shale, and sandstone are all examples of sedimentary rocks. (KS3) • Metamorphic rocks are formed from other rocks which change due to heat or pressure. The original rocks are usually sedimentary rocks or igneous rocks. Sometimes one metamorphic rock can be turned into a different metamorphic rock. (KS3)
Key Questions	<ul style="list-style-type: none"> • What materials are these objects made from? • What properties to these materials have? • How can you sort these materials based on their properties? 	<ul style="list-style-type: none"> • How can you classify these rocks based on their appearance and properties? • Can you describe simply how fossils are formed? • What is soil made from? 	<ul style="list-style-type: none"> • How do fossils support the theory of evolution?
Vocabulary	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil	Igneous, sedimentary, metamorphic, rock cycle, composition

Year 3- Light

	Prior Learning (Year 1/2)	New Learning (Year 3)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) 	<ul style="list-style-type: none"> Recognise that they need light in order to see things, and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. 	<ul style="list-style-type: none"> Recognise that light appears to travel in straight lines. (Y6 - Light) 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. (Y6 - Light) 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. (Y6 - Light) Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. (Y6 - Light)
Key Ideas	<ul style="list-style-type: none"> Humans (and other animals) find out about the world using their senses. (Y1 animals) Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. (Y1 animals) 	<ul style="list-style-type: none"> We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface. 	<ul style="list-style-type: none"> Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.
Key Questions	<ul style="list-style-type: none"> Which body parts help with humans' five senses? 	<ul style="list-style-type: none"> Why do we need light? How can we protect ourselves from light from the sun? How are shadows formed? What affects the size of a shadow? 	<ul style="list-style-type: none"> How does light travel? How do we see objects? Why do shadows have the same shape as the object that cast them?
Vocabulary	Head, body, eyes, ears, mouth	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	As for Year 3 - Light, plus straight lines, light rays

Year 3- Forces and magnets

	Prior Learning (Year 1/2)	New Learning (Year 3)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) 	<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. (Y5 -Forces) Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. (Y5 - Forces) Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. (Y5 - Forces) Magnetic fields by plotting with compass, representation by field lines. (KS3) Earth's magnetism, compass and navigation. (KS3)
Key Ideas	<ul style="list-style-type: none"> Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. E.g., clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness. 	<ul style="list-style-type: none"> A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts. 	<ul style="list-style-type: none"> A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object. A mechanism is a device that allows a small force to be increased to a larger force. Pulleys, levers and gears are all mechanisms, also known as simple machines.
Key Questions	<ul style="list-style-type: none"> Which material is best suited to this job? How can we change the shape of solid objects? 	<ul style="list-style-type: none"> How do objects move differently on different surfaces? How do magnets behave with each other? Which materials attract and which repel magnets? Can you classify these materials based on their magnetic properties? 	<ul style="list-style-type: none"> Can you explain why unsupported objects fall towards the Earth? Can you give examples if air resistance, water resistance and friction? What affect do air resistance, water resistance and friction have on moving objects? What is the purpose of different mechanisms such as levers, pulleys and gears?
Vocabulary	flexible, rigid. Shape, push/pushing, pull/puling, twist/twisting, squash, bend/bending, stretch/stretching	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears

Year 4- Living things and their habitats

	Prior Learning (Year 1/2)	New Learning (Year 4)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats) 	<ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. 	<ul style="list-style-type: none"> Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) 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. (Y6 – Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
Key Ideas	<ul style="list-style-type: none"> Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals. Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring. 	<ul style="list-style-type: none"> Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year. 	<ul style="list-style-type: none"> As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. (Y5) Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot. Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms.

			Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. (Y6)
Key Questions	<ul style="list-style-type: none"> • Can you name and recognise a variety of common plants? • What are the basic parts of a flowering plant? • Can you name variety of common animals and their basic body parts? • Can you compare a range of common animals? 	<ul style="list-style-type: none"> • How can you group these plants and animals in different ways? • Can you use the classification keys to sort these living things? • How can changes in environments affect living things? 	<ul style="list-style-type: none"> • Can you describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird? • Can you describe the life process of reproduction in some plants and animals? • Can you classify these living things based on their observable characteristics? • Can you explain how you have classified these living things?
Vocabulary	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in the local area. Names of garden and wild flowering plants in the local area. Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings

Year 4- Animals, including humans

	Prior Learning (Year 1/2/3)	New Learning (Year 4)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) 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. (Y3 - Animals, including humans) 	<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"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. (Y6 - Animals, including humans) Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. (Y6 - Animals, including humans) Describe the ways in which nutrients and water are transported within animals, including humans. (Y6 - Animals, including humans)
Key Ideas	<ul style="list-style-type: none"> Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support. 	<ul style="list-style-type: none"> Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). Living things can be classified as producers, predators and prey according to their place in the food chain. 	<ul style="list-style-type: none"> The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins. This content is also included in PSHE.
Key Questions	<ul style="list-style-type: none"> What types of nutrition do animals and humans need and how do they get it? What is the basic purpose of the skeleton and muscles? 	<ul style="list-style-type: none"> Can you describe the simple functions of basic parts of the digestive system? What are the different types of human teeth and can you explain their function? 	<ul style="list-style-type: none"> Can you name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? What is the impact of diet, exercise, drugs and lifestyle on the way our bodies function?

		<ul style="list-style-type: none"> Can you draw a food chain and label it with the terms: producers, predators and prey? 	<ul style="list-style-type: none"> How are nutrients and water transported in animals, including humans?
Vocabulary	<ul style="list-style-type: none"> Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints 	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle

Year 4- States of matter

	Prior Learning (Year 1/2)	New Learning (Year 4)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) 	<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"> 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. (Y5 - Properties and changes of materials) Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. (Y5 - Properties and changes of materials) Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (Y5 - Properties and changes of materials) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y5 - Properties and changes of materials) Demonstrate that dissolving, mixing and changes of state are reversible changes. (Y5 - Properties and changes of materials) 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. (Y5- Properties and changes of materials)
Key Ideas	<ul style="list-style-type: none"> All objects are made of one or more materials that are chosen specifically because they have suitable properties for the task. For example, a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials. Objects made of some materials can be changed in shape by bending, stretching, squashing and twisting. E.g., clay can be shaped 	<ul style="list-style-type: none"> A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid. Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the 	<ul style="list-style-type: none"> Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.

	<p>by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness.</p>	<p>liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.</p> <ul style="list-style-type: none"> Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle. 	
Key Questions	<ul style="list-style-type: none"> What materials are these objects made from? What properties to these materials have? How can you sort these materials based on their properties? Which material is best suited to this job? How can we change the shape of solid objects? 	<ul style="list-style-type: none"> Can you compare and group these materials together, according to whether they are solids, liquids or gases? At what temperature do different materials change state? Can you describe the water cycle? Can you explain evaporation and condensation? How does temperature affect evaporation? 	<ul style="list-style-type: none"> Can you compare and group together everyday materials on the basis of their properties? Can you name some materials that can dissolve to form a solution? How can you separate a substance from a solution? Can you describe how mixtures might be separated, including through filtering, sieving and evaporating? Can you give reasons from your results to suggest why certain materials would be best for certain uses? Can you give examples of reversible changes? Can you explain an irreversible change?
Vocabulary	<p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through</p>	<p>Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p>	<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p>

Year 4- Sound

	Prior Learning (Year 1)	New Learning (Year 4)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans) 	<ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. 	<ul style="list-style-type: none"> Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. (KS3) Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3) Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3) Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3) Auditory range of humans and animals. (KS3) Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3) Waves transferring information for conversion to electrical signals by microphone. (KS3)
Key Ideas	<ul style="list-style-type: none"> Humans (and other animals) find out about the world using their senses. Humans have five senses – sight, touch, taste, hearing and smelling. These senses are linked to particular parts of the body. 	<ul style="list-style-type: none"> A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds. 	
Key Questions	<ul style="list-style-type: none"> Which body parts help with humans' five senses? 	<ul style="list-style-type: none"> How are sounds made? How do we hear vibrations from sound? What happens to sound as you increase the distance from the sound? What is the pattern between the volume of a sound and the strength of the vibrations that produce it? 	NA
Vocabulary	<ul style="list-style-type: none"> Head, body, eyes 	Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	Waves, frequencies, Hertz, echoes, longitudinal, auditory, electrical signal

Year 4- Electricity

	Prior Learning (EYFS)	New Learning (Year 4)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes. (Early Learning Goal) 	<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. (Y6 - Electricity) 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. (Y6 - Electricity) Use recognised symbols when representing a simple circuit in a diagram. (Y6 - Electricity)
Key Ideas		<ul style="list-style-type: none"> Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity. 	<ul style="list-style-type: none"> Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. You can use recognised circuit symbols to draw simple circuit diagrams.
Key Questions		<ul style="list-style-type: none"> Can you identify common appliances that run on electricity? Can you construct a simple series electrical circuit, identifying and naming its basic parts? Can you 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? Can you name some good insulators and conductors? What does a switch do? 	<ul style="list-style-type: none"> How is the brightness of a lamp or volume of a buzzer affected by the number of cells in the circuit? What affects the brightness of bulbs/loudness of buzzers in a circuit? What effect does the position of a switch have on the components in a circuit? Can you use symbols to draw a simple circuit diagram?
Vocabulary		Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol. N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage N.B. Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.

Year 5- Living things and their habitats

	Prior Learning (Year 2/3)	New Learning (Year 5)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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. (KS3) Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3)
Key Ideas	<ul style="list-style-type: none"> Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth. 	<ul style="list-style-type: none"> As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. 	<ul style="list-style-type: none"> Male and female reproductive systems allow human reproduction. Fertilisation occurs when a sperm and egg join to form an embryo. An embryo develops into an unborn baby in the uterus during pregnancy. When the nucleus of a sperm and egg fuse together, the egg is fertilised and it develops into a fetus. The fetus grows in the mother's uterus. The mother's body provides all the baby needs until birth. The menstrual cycle is an approximately 28 day cycle that prepares the female body for pregnancy. Hormone levels change during the cycle. Insect-pollination of flowering plants is responsible for the majority of the world's flowering diversity and is an essential part of plant reproduction.
Key Questions	How is the flower involved in the life cycle of a plant?	<ul style="list-style-type: none"> Can you describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird? Can you describe the life process of reproduction in some plants and animals? 	NA
Vocabulary	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly),	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	Reproduction, menstrual cycle, foetus, embryo, hormones

Year 5- Animals, including humans

	Prior Learning (Year 2)	New Learning (Year 5)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) 	<ul style="list-style-type: none"> Describe the changes as humans develop to old age. 	<ul style="list-style-type: none"> 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. (KS3)
Key Ideas	<ul style="list-style-type: none"> Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. 	<ul style="list-style-type: none"> When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. This needs to be taught alongside PSHE. See SCARF. 	<ul style="list-style-type: none"> Male and female reproductive systems allow human reproduction. Fertilisation occurs when a sperm and egg join to form an embryo. An embryo develops into an unborn baby in the uterus during pregnancy. When the nucleus of a sperm and egg fuse together, the egg is fertilised and it develops into a fetus. The fetus grows in the mother's uterus. The mother's body provides all the baby needs until birth. The menstrual cycle is an approximately 28 day cycle that prepares the female body for pregnancy.
Key Questions	NA	<ul style="list-style-type: none"> How do humans change as they develop to old age? 	NA
Vocabulary	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly),	Puberty – the vocabulary to describe sexual characteristics	Reproduction, menstrual cycle, foetus, embryo, hormones

Year 5- Properties and changes of materials

	Prior Learning (Year 2/3/4)	New Learning (Year 5)	Future Learning
National Curriculum Objectives	<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. (Y2 - Uses of everyday materials) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) 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. (Y3 - Forces and magnets) Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 - States of matter) 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). (Y4 - States of matter) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Y4 - States of matter) 	<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. 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. 	<ul style="list-style-type: none"> Chemical reactions as the rearrangement of atoms. (KS3) Representing chemical reactions using formulae and using equations. (KS3) Combustion, thermal decomposition, oxidation and displacement reactions. (KS3) Defining acids and alkalis in terms of neutralisation reactions. (KS3) The pH scale for measuring acidity/alkalinity; and indicators. (KS3)
Key Ideas	<ul style="list-style-type: none"> A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid. Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens 	<ul style="list-style-type: none"> Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation. Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible. 	<ul style="list-style-type: none"> Chemical reactions make new chemicals. Atoms are rearranged during a chemical reaction, but the number of atoms does not change. Evidence of chemical reactions includes a large temperature change, bubbles, or a colour change. Chemical reactions can be represented using equations.

	<p>more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.</p> <ul style="list-style-type: none"> •Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle. 		
Key Questions	<ul style="list-style-type: none"> • Can you compare and group these materials together, according to whether they are solids, liquids or gases? • At what temperature do different materials change state? • Can you describe the water cycle? • Can you explain evaporation and condensation? • How does temperature affect evaporation? • Which material is best suited to this job? • How can we change the shape of solid objects? 	<ul style="list-style-type: none"> • Can you compare and group together everyday materials on the basis of their properties? • Can you name some materials that can dissolve to form a solution? • How can you separate a substance from a solution? • Can you describe how mixtures might be separated, including through filtering, sieving and evaporating? • Can you give reasons from your results to suggest why certain materials would be best for certain uses? • Can you give examples of reversible changes? • Can you explain an irreversible change? 	NA
Vocabulary	<p>Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle,</p> <p>Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard. Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid. Shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>	<p>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material</p>	<p>Chemical reaction, formulae, atoms, pH scale, acid, alkali, combustion, thermal decomposition, oxidation and displacement reactions, neutralisation</p>

Year 5- Earth and Space

	Prior Learning (Year 1)	New Learning (Year 5)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Observe changes across the four seasons. (Y1 - Seasonal changes) Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes) 	<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. 	<ul style="list-style-type: none"> Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10$ N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). (KS3) Our Sun as a star, other stars in our galaxy, other galaxies. (KS3) The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3) The light year as a unit of astronomical distance. (KS3)
Key Ideas	<ul style="list-style-type: none"> In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people. 	<ul style="list-style-type: none"> The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365$\frac{1}{4}$ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical. 	<ul style="list-style-type: none"> The solar system is made up of the Sun (our nearest star) and the objects that orbit around it, including planets, asteroids and comets. Planets orbit the Sun in roughly circular paths, and moons orbit around planets. Asteroids and comets move in paths which are more oval in shape. The Sun's gravity holds all of these objects together, and the gravitational forces between objects can cause less massive objects to orbit more massive objects. The Sun is our nearest star. It is a yellow dwarf star and is found at the centre of our solar system. The Sun is composed mostly of hydrogen and helium and it releases energy because of nuclear fusion. The Sun will eventually run out of hydrogen and stop releasing energy. The changes that a star goes through during its 'lifetime' depend on the mass of the star. Days, years and months are periods of time which are determined by the movement of Earth around the Sun, and the movement of the Moon around Earth. The Earth's axis of rotation is tilted, which leads to changing seasons as Earth itself orbits around the Sun. The distances between objects in space are enormous. They are often so large that standard units of measurement, like metres or kilometres, are

			<p>replaced by alternatives that can cover the huge distances in space.</p> <ul style="list-style-type: none"> • Scientists and astronomers often use units of light years to talk about the distances to distant objects, such as stars and galaxies. • A light year is the distance travelled by light in one year and is approximately equal to 9.46 trillion kilometres or 9,460,000,000,000 km.
Key Questions	<ul style="list-style-type: none"> • How does the weather change across the year? • What happens to day length over a year? • What are some of the key differences between the seasons? 	<ul style="list-style-type: none"> • How does the Earth and other planets move relative to the Sun? • How does the Moon move relative to the Earth? • What shape are the Earth, Sun and Moon? • Why do we experience day and night? 	NA
Vocabulary	Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets	Gravitational field astronomical distance

Year 6- Living things and their habitats

	Prior Learning (Year 4/5)	New Learning (Year 6)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 – Living things and their habitats) Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats) 	<ul style="list-style-type: none"> 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. Give reasons for classifying plants and animals based on specific characteristics. 	<ul style="list-style-type: none"> Differences between species. (KS3)
Key Ideas	<ul style="list-style-type: none"> Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things. Living things live in a habitat which provides an environment to which they are suited (Year 2 learning). These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change with the seasons; different living things can be found in a habitat at different times of the year. As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. 	<ul style="list-style-type: none"> Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot. Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. 	<ul style="list-style-type: none"> Humans, dogs and goldfish are examples of species. Different species have different characteristics from each other. For example, dogs have tails and humans do not. Dogs have fur, but goldfish have scales. The individual members of a species also have differences in characteristics. For example, humans have different coloured eyes, and dogs have different length tails. This means that no two members of a species are identical. The differences between the individuals in a species is called variation. Variation helps a species to survive, by causing individuals of a species to be genetically and physically different.

	<ul style="list-style-type: none"> Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. 		
Key Questions	<ul style="list-style-type: none"> How can you group these plants and animals in different ways? Can you use the classification keys to sort these living things? How can changes in environments affect living things? Can you describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird? Can you describe the life process of reproduction in some plants and animals? 	<ul style="list-style-type: none"> Can you classify these living things based on their observable characteristics? Can you explain how you have classified these living things? 	NA
Vocabulary	<ul style="list-style-type: none"> Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings 	Vertebrates, fish, amphibians, reptiles, birds, mammals, insects, spiders, snails, worms, flowering, non-flowering	

Year 6- Animals, including humans

	Prior Learning (Year 2/3/4)	New Learning (Year 6)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) 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. (Y3 - Animals, including humans) Describe the simple functions of the basic parts of the digestive system in humans. (Y4 - Animals, including humans) Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans) 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. (KS3) The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. (KS3) The structure and functions of the gas exchange system in humans, including adaptations to function. (KS3) The mechanism of breathing to move air in and out of the lungs. (KS3) The impact of exercise, asthma and smoking on the human gas exchange system. (KS3)
Key Ideas	<ul style="list-style-type: none"> All animals, including humans, have the basic needs of feeding, drinking and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise. (Y2) Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. (Y3) Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. (Y3) Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. (Y4) The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in 	<ul style="list-style-type: none"> The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins. This content is also included in PSHE. 	<ul style="list-style-type: none"> A balanced diet contains the correct amount of all food groups. The food groups are: carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water. Each food group has its own role to play within a healthy diet. Malnutrition is a serious health problem. It happens when people do not eat the right amounts of nutrients. Too little food, or a lack of nutrients, can cause deficiency diseases or death. Too much food results in obesity. This may cause heart disease or type 2 diabetes The gas exchange system is responsible for getting oxygen into the blood and removing carbon dioxide as a person breathes. Breathing is also called 'ventilation' and is the movement of gases into and out from the lungs. Exercise, smoking and asthma are all factors that can affect the gas exchange system. Asthma is a condition that affects the airways carrying air into and out of the lungs. Smoking causes lung disease, heart disease and increased risks of several different types of cancer due to its effects on the gas exchange system.

	the rectum until it leaves the body through the anus when you go to the toilet. (Y4)		<ul style="list-style-type: none"> Exercise increases the demands of the gas exchange system as there is a greater need for oxygen in respiration, and a larger production of carbon dioxide that needs to be removed.
Key Questions	<ul style="list-style-type: none"> Why do humans need to exercise, eat healthily and maintain good hygiene? (Y2) What types of nutrition do animals and humans need and how do they get it? (Y3) 	<ul style="list-style-type: none"> Can you name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? What is the impact of diet, exercise, drugs and lifestyle on the way our bodies function? How are nutrients and water transported in animals, including humans? 	NA
Vocabulary	exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta), Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water,	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle	Obesity, starvation, deficiency, gas exchange, asthma, respiration

Year 6- Evolution and inheritance

	Prior Learning (Year 2/3/4/5)	New Learning (Year 6)	Future Learning
<p>National Curriculum Objectives</p>	<ul style="list-style-type: none"> 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. (Y2 - Living things and their habitats) Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals, including humans) Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants) Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats) Describe the life process of reproduction in some plants and animals. (Living things and their habitats - Y5) 	<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. 	<ul style="list-style-type: none"> Heredity as the process by which genetic information is transmitted from one generation to the next. (KS3) 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. (KS3) The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. (KS3) 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. (KS3)
<p>Key Ideas</p>	<ul style="list-style-type: none"> Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water. (Y3) As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. (Y5) 	<ul style="list-style-type: none"> All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution. Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics. 	<ul style="list-style-type: none"> The differences in characteristics between individuals of the same species is called variation. Some variation is passed on from parents to offspring, via genes during reproduction. This is inherited variation. Some variation is the result of differences in the surroundings, or what an individual does. This is called environmental variation. Variation is the differences between individuals of the same species, caused by genetic and environmental factors. Evolution explains how better adapted organisms have an advantage and are more likely to have offspring with this same adaptation. Over many years this leads to the formation of new species. Evolutionary trees show how different species have evolved over time from common ancestors. Characteristics like eye colour and genetic diseases are inherited.

	<ul style="list-style-type: none"> Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or insects. (Y5) 		<ul style="list-style-type: none"> A Punnett square can be used to work out the probability of offspring inheriting some characteristics. Heredity is the study of inheritance.
Key Questions	<ul style="list-style-type: none"> How can you classify these rocks based on their appearance and properties? Can you describe simply how fossils are formed? What is soil made from? Can you describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird? Can you describe the life process of reproduction in some plants and animals? 	<ul style="list-style-type: none"> How have living things changed over time? How do fossils support the theory of evolution? Why are offspring not identical to their parents? How do animals and plants adapt to suit their environment? How can adaptation lead to evolution? 	NA
Vocabulary	Fossil, life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils	Evolutionary trees, Punnett square, heredity, genetic variation, environmental variation

Year 6- Light

	Prior Learning (Year 3/5)	New Learning (Year 6)	Future Learning
National Curriculum Objectives	<ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light. (Y3 - Light) Notice that light is reflected from surfaces. (Y3 - Light) Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light) Recognise that shadows are formed when the light from a light source is blocked by an opaque object. (Y3 - Light) Find patterns in the way that the size of shadows change. (Y3 - Light) 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. (Y5 - Properties and changes of materials) 	<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. 	<ul style="list-style-type: none"> The similarities and differences between light waves and waves in matter. (KS3) Light waves travelling through a vacuum; speed of light. (KS3) The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. (KS3) 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. (KS3) Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. (KS3) Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. (KS3)
Key Ideas	<ul style="list-style-type: none"> We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface. 	<ul style="list-style-type: none"> Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object. 	<ul style="list-style-type: none"> Examples of waves include: light, sound, ocean waves, radio waves, ultraviolet radiation and more. All waves transfer energy from one place to another. There are two types of wave: transverse or longitudinal. Waves can be represented using diagrams, which allow their frequency, wavelength and amplitude to be compared. Light travels as a transverse wave and moves in straight lines. Light can pass through transparent and translucent materials, but not opaque materials. Ray diagrams use straight lines to represent rays of light, arrows show the direction the light travels in. Light travels as a transverse wave and can be reflected by surfaces and objects. Smooth, shiny surfaces produce specular reflections, and rough surfaces produce diffuse reflections. Ray diagrams are used to show the path of light rays which are reflected and how images are formed in a mirror. White light is made of a spectrum of different colours.

			<ul style="list-style-type: none"> • Light can be split up into these separate colours using a prism. • There are three primary colours of light, which can be combined to make secondary colours.
Key Questions	<ul style="list-style-type: none"> • Why do we need light? • How can we protect ourselves from light from the sun? • How are shadows formed? • What affects the size of a shadow? 	<ul style="list-style-type: none"> • How does light travel? • How do we see objects? • Why do shadows have the same shape as the object that cast them? 	NA
Vocabulary	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	As for Year 3 - Light, plus straight lines, light rays	Waves, transverse, longitudinal, spectrum, prism, ray diagram

Year 6- Electricity

	Prior Learning (Year 4)	New Learning (Year 6)	Future Learning
National Curriculum Objectives	<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. (Y6 - Electricity) 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. (Y6 - Electricity) Use recognised symbols when representing a simple circuit in a diagram. (Y6 - Electricity) 	<ul style="list-style-type: none"> Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. (KS3) Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. (KS3) Differences in resistance between conducting and insulating components (quantitative). (KS3) Static electricity. (KS3)
Key Ideas	<ul style="list-style-type: none"> Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity. 	<ul style="list-style-type: none"> Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. You can use recognised circuit symbols to draw simple circuit diagrams. 	<ul style="list-style-type: none"> Electricity is the presence or flow of charged particles. An electric current is the flow of electrons around a circuit. Static electricity is the build up of electrons on an insulator Objects can become positively charged or negatively charged, usually because of friction between insulators. This is called static electricity. Charged objects exert electrostatic forces on each other. These can be attractive forces or repulsive forces. Charged objects can attract neutral objects, due to the polarisation of charge. Conductors are materials which allow electrical current to flow through them easily. Metals are generally good electrical conductors. Insulators are materials which are poor conductors and do not allow electrical current to flow through them easily. How well a material conducts depends on the number of free electrons in the material. Resistance (R) is a measure of how difficult it is for current to flow. Resistance is measured in units called ohms (Ω). The amount of current flowing in a circuit is affected by the resistance of that circuit. Each component in a circuit has a resistance.

			<ul style="list-style-type: none"> Resistance can be calculated using the equation: Resistance = potential difference ÷ current
Key Questions	<ul style="list-style-type: none"> Can you identify common appliances that run on electricity? Can you construct a simple series electrical circuit, identifying and naming its basic parts? Can you 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? Can you name some good insulators and conductors? What does a switch do? 	<ul style="list-style-type: none"> How is the brightness of a lamp or volume of a buzzer affected by the number of cells in the circuit? What affects the brightness of bulbs/loudness of buzzers in a circuit? What effect does the position of a switch have on the components in a circuit? Can you use symbols to draw a simple circuit diagram? 	NA
Vocabulary	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol. N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage N.B. Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.	Electric charge, static, particles, electrons, polarisation, resistance