



Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	Animals Including Humans	Animals Including Humans	Animals Including Humans	Animals Including Humans	Animals Including Humans	Animals Including Humans
	Plants	Plants	Plants			
		Living Things and their Habitats		Living Things and their Habitats	Living Things and their Habitats	Living Things and their Habitats
						Evolution
Physics	Seasonal Changes					
			Forces & Magnets		Forces	
				Sound		
				Electricity		Electricity
			Light			Light
					Earth & Space	
Chemistry	Everyday Materials	Uses of Everyday Materials	Rocks	States of Matter	Properties & Changes of Materials	

Playing and Exploring, Active Learning and Creating and Thinking Critically support children's learning across all areas of EYFS Early Learning Goals. 'Understanding the World' is the foundation for all the National Curriculum science topics that will be studied in KS1 and KS2. However, the following ELGs are also required to help build upon this foundation for future learning and Working Scientifically: Understanding, Speaking, Health and Self-care, Moving and Handling, Shapes, Space and Measures, People and Communities, The World, Technology, Exploring and Using Media and Materials and Being Imaginative. Continuous and enhanced provision is set up daily to initiate child-led learning to achieve these ELGs. The listed topics above are examples only, aspects are taught throughout the year to help each child reach their ELGs. See end of document for more detail.

EYFS		ANIMALS INCLUDING HUMANS - KEY STAGE 1	
Biology	Reception	Year 1	Year 2
<p>ELGs:</p> <p>National Curriculum Objectives:</p>	<p>ELG13 – People and Communities:</p> <p>Children talk about past and present events in their own lives and in the lives of family members. They know that other children don't always enjoy the same things, and are sensitive to this. They know about similarities and differences between themselves and others, and among families, communities and traditions.</p> <p>ELG14 – The World:</p> <p>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.</p> <p>ELG02 – Understanding:</p> <p>Children follow instructions involving several ideas or actions. They answer 'how' and 'why' questions about their experiences and in response to stories or events.</p> <p>ELG03 - Speaking</p> <p>ELG05 – Health and Self-care:</p> <p>Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe. They manage their own basic hygiene and personal needs successfully, including dressing and going to the toilet independently.</p>	<p>*identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>*identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>*describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>*identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p>*notice that animals, including humans, have offspring which grow into adults</p> <p>*find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>*describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>

<p>Prior Knowledge:</p>	<p>30-50 months:</p> <ul style="list-style-type: none"> *Shows interest in the lives of people who are familiar to them. *Knows some of the things that make them unique, and can talk about some of the similarities and differences in relation to friends or family *Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. *Can talk about some of the things they have observed such as plants, animals, natural and found objects. *Talks about why things happen and how things work. *Developing an understanding of growth, decay and changes over time. *Shows care and concern for living things and the environment. *Beginning to understand 'why' and 'how' questions. *Questions why things happen and gives explanations. Asks e.g. who, what, when, how *Eats a healthy range of foodstuffs and understands need for variety in food. *Usually dry and clean during the day. *Shows some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health. 	<p>ELG13 – People and Communities:</p> <p>Children talk about past and present events in their own lives and in the lives of family members. They know that other children don't always enjoy the same things, and are sensitive to this. They know about similarities and differences between themselves and others, and among families, communities and traditions.</p> <p>ELG14 – The World:</p> <p>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.</p> <p>ELG02 - Understanding</p> <p>Children follow instructions involving several ideas or actions. They answer 'how' and 'why' questions about their experiences and in response to stories or events.</p> <p>ELG03 - Speaking</p> <p>ELG05 – Health and Self-care:</p> <p>Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe. They manage their own basic hygiene and personal needs successfully, including dressing and going to the toilet independently</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) *identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense
-------------------------	--	--	--

<p>Key Vocabulary:</p>	<p>Head, body, eyes, ears, mouth, nose, shoulders, knees, toes, fingers, teeth, leg, bottom, cheeks, chin, forehead, eyebrows, eyelashes, hair</p> <p>Names of animals experienced first-hand from each vertebrate group</p> <p>change, different, similar, taste, see,</p>	<p>elbows, ankles, hips, wrist, chest, sense, hear, smell, taste, see/ sight, touch, feel, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</p> <p>Names of animals experienced first-hand from each vertebrate group</p> <p>N.B. The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc.</p> <p>The children also do not need to use the words carnivore, herbivore and omnivore.</p>	<p>Offspring, Reproduction, Growth, Child, Young/Old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), Exercise, Heartbeat, Pulse, Breathing, Hygiene, Germs, Disease, Nutrition, Food types (examples – meat, fish, vegetables, bread, rice, pasta)</p>
<p>Key Ideas:</p>	<p>Forest School</p> <p>Observe animals over time: caterpillars/ frogspawn/ chicken eggs</p> <p>Look at similarities and differences and talk about changes</p> <p>Learn how to care for a pet</p> <p>Know basic parts of the body</p> <p>Know that materials can be changed in a variety of ways which may alter their look or feel</p> <p>How we can make change happen</p> <p>Where does food come from?</p> <p>Eats a healthy range of foodstuffs and understands need for variety in food.</p> <p>Shows some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health.</p> <p>Small world play (different animals, props, dolls' house)</p> <p>play doh (encourage talk about changing and growing)</p>	<p>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.</p> <p>Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals.</p>	<p>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.</p> <p>All animals including humans have basic needs of feeding, drinking and breathing that must be satisfied in order to survive, but 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.</p>

Working Scientifically Focus:	<p>Make observations of animals and observe changes over time</p> <p>Answer how and why questions about their experiences</p> <p>Use senses to explore the world around them</p> <p>Explain reasoning</p> <p>Describe changes</p> <p>Record and communicate observations</p>	<p>Make first hand close observations of animals from each of the groups</p> <p>Compare two animals from the same or different group</p> <p>Classify animals using a range of features</p> <p>Identify animals by matching them to named images</p> <p>Classify animals according to what they eat</p>	<p>Describe the life cycle of some animals, including humans, and their growth to adults.</p> <p>Describe basic needs of humans and other animals for survival.</p> <p>Explain how development and health might be affected by differing conditions and needs being met/not met.</p>
Working Scientifically Assessment:	<p>Evaluating: 'Taste Test'</p> <p>Predicting: 'Browning Apples' (Change over time)</p> <p>Changes in our world: 'Making Butter'</p>	<p>Identifying and Classifying: 'Animal Identification'</p> <p>Concluding: 'Body Parts'</p>	<p>Concluding: 'Comparing Hand Spans'</p>

ANIMALS INCLUDING HUMANS - KEY STAGE 2

Biology	Year 3	Year 4	Year 5	Year 6
National Curriculum Objectives:	<p>*identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</p> <p>*identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>	<p>*describe the simple functions of the basic parts of the digestive system in humans</p> <p>*identify the different types of teeth in humans and their simple functions</p> <p>*construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>*describe the changes as humans develop to old age.</p>	<p>*identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>*recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>*describe the ways in which nutrients and water are transported within animals, including humans.</p>
Prior Knowledge:	<p>* notice that animals, including humans, have offspring which grow into adults</p> <p>*find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p>	<p>*identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</p>	<p>*describe the simple functions of the basic parts of the digestive system in humans</p> <p>*identify the different types of teeth in humans and their simple functions</p>	<p>*describe the changes as humans develop to old age.</p>

	*describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	*identify that humans and some other animals have skeletons and muscles for support, protection and movement.	*construct and interpret a variety of food chains, identifying producers, predators and prey.	
Key Vocabulary:	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, 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	Puberty, the vocabulary to describe a range of sexual characteristics	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle
Key Ideas:	<p>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 that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars, water. A piece of food will often provide a range of nutrients.</p> <p>Humans and some other animals have skeletons and muscles which help them move and provide protection and support</p>	<p>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.</p> <p>Humans have four types of teeth - incisors for cutting, canines for tearing, molars and premolars for grinding (chewing).</p> <p>Living things can be classified as producers, predators and prey according to their place in the food chain.</p>	<p>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.</p> <p>This needs to be taught alongside PSHE</p>	<p>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.</p> <p>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.</p>
Working Scientifically Focus:	<p>Classify food in a range of ways</p> <p>Use food labels to explore the nutritional content of a range of food</p>	<p>Research the function of the parts of the digestive system</p> <p>Create a model of the digestive system</p>	<p>This unit is likely to be taught through direct instruction due to its sensitive nature</p>	<p>Create a role play model for the circulatory system</p> <p>Carry out a range of pulse rate</p>

	<p>items</p> <p>Use secondary sources to find out they types of food that contain the different nutrients</p> <p>Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks?</p> <p>Plan a daily diet contain a good balance of nutrients</p> <p>Explore the nutrients contained in fast food</p> <p>Use secondary sources to research the parts and functions of the skeleton</p> <p>Investigate pattern seeking questions such as</p> <p>*Can people with longer legs run faster?</p> <p>*Can people with bigger hands catch a ball better?</p> <p>Compare, contrast and classify skeletons of different animals</p>	<p>using household objects</p> <p>Explore eating different types of food, to identify which teeth are being used for cutting, tearing and grinding (chewing)</p> <p>Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls Use food chains to identify producers, predators and prey within a habitat</p> <p>Use secondary sources to identify animals in a habitat and find out what they eat</p>		<p>investigations</p> <ul style="list-style-type: none"> • Fair test – effect of different activities on my pulse rate • Pattern seeking – exploring which groups of people may have higher or lower resting pulse rates • Observation over time - how long does it take my pulse rate to return to my resting pulse rate (recovery rate) • Pattern seeking – exploring recovery rate for different groups of people <p>Learn about the impact of exercise, diet, drugs and lifestyle on the body. This is likely to be taught through direct instruction due to its sensitive nature</p>
Working Scientifically Assessment:	Ask relevant questions and using different types of scientific enquiries to answer them: ‘Investigating the human skeleton’	Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions: ‘Teeth in Liquid’	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate: ‘Growth Survey’	Use test results to make predictions to set up further comparative and fair tests ‘Heart Rate Headstands’

	EYFS	PLANTS - KEY STAGE 1		PLANTS - KEY STAGE 2
Biology	RECEPTION	YEAR 1	YEAR 2	YEAR 3
ELGs: National Curriculum	ELG14 – The World: Children know about similarities and differences in relation to places, objects,	*Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	*observe and describe how seeds and bulbs grow into mature plants *find out and describe how plants need	*identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

<p>Objectives:</p>	<p>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.</p> <p>ELG02 - Understanding</p> <p>Children follow instructions involving several ideas or actions. They answer 'how' and 'why' questions about their experiences and in response to stories or events.</p> <p>ELG03 - Speaking</p>	<p>*Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>water, light and a suitable temperature to grow and stay healthy.</p>	<p>*explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p> <p>*investigate the way in which water is transported within plants</p> <p>*explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>
<p>Prior Knowledge:</p>	<p>30-50 months:</p> <p>*Understands use of objects (e.g. "What do we use to cut things?")</p> <p>* Beginning to understand 'why' and 'how' questions.</p> <p>*Questions why things happen and gives explanations. Asks e.g. who, what, when, how</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>*Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>*Developing an understanding of growth, decay and changes over time.</p> <p>*Shows care and concern for living things and the environment.</p>	<p>ELG14 – The World:</p> <p>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.</p> <p>ELG02 - Understanding</p> <p>Children follow instructions involving several ideas or actions. They answer 'how' and 'why' questions about their experiences and in response to stories or events.</p> <p>ELG03 - Speaking</p>	<p>*Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>*Identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>*observe and describe how seeds and bulbs grow into mature plants</p> <p>*find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>
<p>Key Vocabulary:</p>	<p>grass, twigs, leaves, flowers, stones, litter, more, less, size, big, small, plant</p>	<p>leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark,</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</p>

		<p>stalk, bud</p> <p>Names of trees from local area</p> <p>Names of garden and wild flowering plants in the local area</p>		<p>dispersal – wind dispersal, animal dispersal, water dispersal</p>
<p>Key Ideas:</p>	<p>What is in my world?</p> <p>Forest School</p> <p>Look closely at similarities, differences, patterns and change.</p> <p>Growing area</p>	<p>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 whilst other trees drop their leaves during autumn and grow them again during spring.</p>	<p>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 the 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>	<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>Working Scientifically Focus:</p>	<p>Gather and sort objects.</p> <p>Explain criteria for sorting</p> <p>Make observations of how plants change over time</p>	<p>Make close observations of leaves, seeds, flowers etc.</p> <p>Compare two leaves, seeds, flowers etc.</p> <p>Classify leaves, seeds, flowers etc. using a range of characteristics.</p> <p>Identify plants by matching them to named images.</p> <p>Make observations of how plants change over a period of time.</p>	<p>Make close observations of seeds and bulbs</p> <p>Classify seeds and bulbs</p> <p>Research and plan when and how to plant a range of seeds and bulbs</p> <p>Look after the plants as they grow – weeding, thinning, watering etc.</p> <p>Make close observations and measurements of their plants growing from seeds and bulbs</p> <p>Make comparisons between plants as they grow</p>	<p>Observe what happens to plants over time when the leaves or roots are removed</p> <p>Observe the effect of putting cut white carnations or celery in coloured water</p> <p>Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space</p> <p>Spot flowers, seeds, berries and fruits outside throughout the year</p>

				<p>Observe flowers carefully to identify the pollen</p> <p>Observe flowers being visited by pollinators e.g. bees and butterflies in the summer</p> <p>Observe seeds being blown from the trees e.g. sycamore seeds</p> <p>Research different types of seed dispersal</p>
Working Scientifically Assessment:	Doing: 'Scavenger Sort'	Observe closely using simple equipment: 'Plant Structure' or 'Leaf Looking'	Observe closely using simple equipment: 'Comparing plant growth in different conditions'	<p>Making systematic and careful observations and measurements using standard units: 'How Much Water do Plants Need?'</p> <p>Use straightforward scientific evidence to answer questions or to support their findings: 'The Function of a Plant Stem'</p>

EYFS		LIVING THINGS AND THEIR HABITATS KEY STAGE 1	LIVING THINGS AND THEIR HABITATS - KEY STAGE 2		
Biology	Reception	Year 2	Year 4	Year 5	Year 6
National Curriculum Objectives:	<p>ELG14 – The World:</p> <p>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.</p> <p>ELG02 - Understanding</p>	<p>*explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>*identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <p>*identify and name a variety of plants and animals in their habitats, including microhabitats</p>	<p>*recognise that living things can be grouped in a variety of ways</p> <p>*explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>*recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>*describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>*describe the life process of reproduction in some plants and animals.</p>	<p>*describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</p> <p>*give reasons for classifying plants and animals based on specific characteristics.</p>

	<p>Children follow instructions involving several ideas or actions. They answer 'how' and 'why' questions about their experiences and in response to stories or events.</p> <p>ELG03 - Speaking</p> <p>ELG05 – Health and Self-care:</p> <p>Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.</p>	<p>*describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>			
<p>Prior Knowledge:</p>	<p>30-50 months:</p> <p>*Shows interest in the lives of people who are familiar to them.</p> <p>*Knows some of the things that make them unique, and can talk about some of the similarities and differences in relation to friends or family</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>*Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>*Talks about why things happen and how things work.</p> <p>*Developing an understanding of growth, decay and changes over time. *Shows care and concern for living things and the environment.</p>	<p>*Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>*Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>*identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>*identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>*describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>*identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each</p>	<p>*explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>*identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p> <p>*identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>*describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>	<p>*recognise that living things can be grouped in a variety of ways</p> <p>*explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>*recognise that environments can change and that this can sometimes pose dangers to living things.</p>	<p>*describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>*describe the life process of reproduction in some plants and animals.</p>

	<p>*Beginning to understand 'why' and 'how' questions.</p> <p>*Questions why things happen and gives explanations. Asks e.g. who, what, when, how</p> <p>*Eats a healthy range of foodstuffs and understands need for variety in food.</p> <p>*Usually dry and clean during the day.</p> <p>*Shows some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health.</p>	sense			
Key Vocabulary:	Same as plants + common animals and names of pets, insects, dead, alive	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.	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, invertebrates, insects, spiders, snails, worms, flowering and non-flowering
Key Ideas:	<p>What is in my world?</p> <p>Forest School</p> <p>Look closely at similarities, differences, patterns and change.</p> <p>small world play (different animals, props, dolls' house)</p> <p>play doh (encourage talk about changing and growing)</p>	<p>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</p>	<p>Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.</p> <p>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</p>	<p>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</p>	<p>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.</p> <p>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</p>

		<p>fuels).</p> <p>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 what plants and animals live there. 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.</p>	<p>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</p>	<p>change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.</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>	<p>– 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.</p> <p>Plants can be divided broadly into two main groups – flowering plants and non-flowering plants.</p> <p>Plants can be divided broadly into two main groups – flowering plants and non-flowering plants.</p>
<p>Working Scientifically Focus:</p>	<p>Gather and sort objects.</p> <p>Explain criteria for sorting</p> <p>Explore the outside environment</p>	<p>Explore the outside environment regularly to find objects that are living, dead and have never lived</p> <p>Classify objects found in the local environment</p> <p>Observe animals and plants carefully, drawing and labelling diagrams</p> <p>Create simple food chains for a familiar local habitat from first hand observation and research</p>	<p>Observe plants and animals in different habitats throughout the year</p> <p>Compare and contrast the living things observed</p> <p>Use classification keys to name unknown living things</p> <p>Classify living things found in different habitats based on their features</p> <p>Create a simple identification key based on observable</p>	<p>Use secondary sources and, where possible, first hand observations to find out about the life cycle of a range of animals</p> <p>Compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth</p> <p>Look for patterns between the size of an animal and its expected life span</p>	<p>Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important</p> <p>Use first hand observation to identify characteristics shared by the animals in a group</p> <p>Use secondary sources to research the characteristics of animals that belong to a group</p> <p>Use information about the characteristics of an unknown animal or plant to assign it to a</p>

			<p>features</p> <p>Use fieldwork to explore human impact on the local environment e.g. litter, tree planting</p> <p>Use secondary sources to find out about how environments may naturally change</p> <p>Use secondary sources to find out about human impact, both positive and negative, on environments</p>	<p>Grow and observe plants that reproduce asexually e.g. strawberries, spider plant, potatoes</p> <p>Take cuttings from a range of plants e.g. African violet, mint</p> <p>Plant bulbs and then harvest to see how they multiply</p> <p>Use secondary sources to find out about pollination</p>	<p>group</p> <p>Classify plants and animals presenting this in a range of ways – Venn diagrams, Carroll diagrams and keys</p> <p>Create an imaginary animal which has features from one or more groups</p>
Working Scientifically Assessment:	Sorting objects	<p>Identifying and classifying: 'Nature Spotters'</p> <p>'Gather and record data to help in answering questions: 'Woodlice Habitat'</p> <p>Use of appropriate scientific language to communicate their ideas: 'Sorting Living and Non-Living'</p>	Gather, record and classify data : 'Local Environment Study'	Report and present findings from enquiries, in oral and written forms such as displays and other presentations, using appropriate scientific language: 'Life Cycle Research'	<p>Record the results of a survey using a classification key : 'Outdoor Keys'</p> <p>Report and present findings from enquiries using appropriate scientific language: 'Invertebrate Research'</p>

EVOLUTION AND INHERITANCE - KEY STAGE 2

Biology	Year 6
National Curriculum Objectives:	<p>*recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>*recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>*identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
Prior Knowledge:	<p>Year 2: 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</p> <p>Year 3: describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Year 4: recognise that environments can change and that this can sometimes pose dangers to living thing</p>
Key Vocabulary:	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils

Key ideas:	<p>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.</p> <p>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.</p> <p>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.</p>
Working Scientifically Focus:	<p>Design a new plant or animal to live in a particular habitat</p> <p>Use models to demonstrate evolution e.g. Darwin's finches bird beak activity</p> <p>Use secondary sources to find out about how the population of peppered moths changed during the industrial revolution</p> <p>Make observations of fossils to identify living things that lived on Earth millions of years ago</p> <p>Identify features in animals and plants that are passed on to offspring</p> <p>Explore this process by considering the artificial breeding of animals or plants e.g. dogs</p> <p>Compare the ideas of Charles Darwin and Alfred Wallace on evolution</p> <p>Research the work of Mary Anning and how this provided evidence of evolution</p>
Working Scientifically Assessment:	<p>Explain degree of trust in results: 'Egg Strength'</p> <p>Identifying scientific evidence that has been used to support or refute ideas or arguments: 'Fossil Habitat'</p>

EYFS		SEASONAL CHANGES - KEY STAGE 1
Physics	RECEPTION	YEAR 1
ELGs: National Curriculum Objectives:	ELG14 – The World: Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. ELG02 - Understanding Children follow instructions involving several ideas or actions. They answer 'how' and 'why' questions about their	*observe changes across the four seasons *observe and describe weather associated with the seasons and how day length varies.

	experiences and in response to stories or events. ELG03 - Speaking	
Prior Knowledge:	30-50 months: * Beginning to understand 'why' and 'how' questions. *Questions why things happen and gives explanations. Asks e.g. who, what, when, how *Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. *Can talk about some of the things they have observed such as plants, animals, natural and found objects. *Developing an understanding of growth, decay and changes over time.	ELG14 – The World: Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes. ELG02 - Understanding Children follow instructions involving several ideas or actions. They answer 'how' and 'why' questions about their experiences and in response to stories or events. ELG03 - Speaking
Key Vocabulary:	weather (sunny, rainy, windy, snowy etc.) , seasons (winter, summer, spring, autumn), sun, sunrise, sunset, day, night	weather (sunny, rainy, windy, snowy etc.) , seasons (winter, summer, spring, autumn), sun, sunrise, sunset, day length
Key Ideas:	Use senses to explore the world, eg Explore puddles Explore changes over time Similarities and differences (day, night) Notice patterns(eg cold – shorter day)	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.
Working Scientifically Assessment:	Use drawings, photos and labels to present evidence	Describe the general types of weather and changes in day length over the seasons. Describe some other features of their surroundings, themselves, animals , plants that change over the seasons
Working Scientifically Focus:		Observe over time and record data to help in answering questions: ' Seasonal Change '

FORCES AND MAGNETS - KEY STAGE 2

Physics	Year 3	Forces – Year 5
National Curriculum Objectives:	<ul style="list-style-type: none"> *compare how things move on different surfaces *notice that some forces need contact between two objects, but magnetic forces can act at a distance *observe how magnets attract or repel each other and attract some materials and not others *compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials *describe magnets as having two poles *predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<ul style="list-style-type: none"> *explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object *identify the effects of air resistance, water resistance and friction, that act between moving surfaces *recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Prior knowledge:	<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 	<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.
Key Vocabulary:	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
Key Ideas:	<p>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.</p> <p>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.</p>	<p>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.</p> <p>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.</p> <p>A mechanism is a device that allows a small force to be increased to a larger force.</p>

	<p>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.</p> <p>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 attract</p>	<p>The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.</p>
Working Scientifically Focus:	<p>Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc.</p> <p>Explore what materials are attracted to a magnet</p> <p>Classify materials according to whether they are magnetic</p> <p>Explore the way that magnets behave in relation to each other</p> <p>Use a marked magnet to find the unmarked poles on other types of magnets</p> <p>Explore how magnets work at a distance e.g. through the table, in water, jumping paper clip up off the table</p> <p>Devise an investigation to test the strength of magnets</p>	<p>Investigate the effect of friction in a range of contexts e.g. trainers, bath mats, mats for a helter-skelter</p> <p>Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water, pulling shapes e.g. boats along the surface of water</p> <p>Investigate the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats</p> <p>Explore how levers, pulleys and gears work</p> <p>Make a product that involves a lever, pulley or gear</p> <p>Create a timer that uses gravity to move a ball</p> <p>Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation</p>
Working Scientifically Assessment:	<p>Set up simple practical enquiries, comparative and fair tests: ‘What is the strongest Magnet?’</p> <p>Set up simple practical enquiries: ‘Shoe Grip’</p> <p>Gather, record and present data (in a table or bar chart) to help in answering questions: ‘Cars down Ramps’</p>	<p>Evaluate and amend outcomes: ‘Marble Run’</p> <p>Measure, taking repeat readings: ‘Spinners’</p> <p>Plan enquiry, recognising and controlling variables: ‘Paper Planes’</p> <p>Explain the degree of trust in the results: ‘Aqua Dynamics’</p>

SOUND - KEY STAGE 2

Physics	Year 4
National Curriculum Objectives:	<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
Prior Knowledge:	Year 1: identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
Key Vocabulary:	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation
Key Ideas:	<p>A sound source vibrates to produce sound waves which travel through a medium from the source to our ears. Different mediums such as air or water or wood can carry sound but sound cannot travel through a vacuum (an area empty of matter). The sound waves cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.</p> <p>The loudness (volume) of the sound depends on the amount of energy of vibrations how well they travel through the medium. Therefore bigger vibrations cause louder sounds and sounds decrease in volume the further they have to travel.</p> <p>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 pitch sounds.</p>
Working Scientifically Focus:	<p>Make sounds with a range of objects such as musical instruments and other household objects.</p> <p>Use objects that change in feature to change pitch and volume such as length of guitar string, bottles of water or tuning forks.</p> <p>Measure sounds over different distances and through different insulation materials</p>
Working Scientifically Assessment:	<p>Ask relevant questions and use different types of scientific enquiries to answer them: ‘Investigating Pitch’</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes: ‘String Telephones’</p>

ELECTRICITY - KEY STAGE 2

Physics	Year 4	YEAR 6
National Curriculum Objective:	<ul style="list-style-type: none"> *identify common appliances that run on electricity *construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers *identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery *recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit *recognise some common conductors and insulators, and associate metals with being good conductors. 	<ul style="list-style-type: none"> *associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit *compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches *use recognised symbols when representing a simple circuit in a diagram.

<p>Prior Knowledge:</p>	<p>Year 2: identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p>	<ul style="list-style-type: none"> *identify common appliances that run on electricity *construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers *identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery *recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit *recognise some common conductors and insulators, and associate metals with being good conductors.
<p>Key Vocabulary:</p>	<p>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</p> <p>N.B. Children in year 4 do not need to use standard symbols as this is taught in year 6</p>	<p>Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage</p> <p>NB 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</p>
<p>Key Ideas:</p>	<p>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.</p> <p>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</p>	<p>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.</p> <p>You can use recognised circuit symbols to draw simple circuit diagrams.</p>
<p>Working Scientifically Focus:</p>	<ul style="list-style-type: none"> Construct a range of circuits Explore which materials can be used instead of wires to make a circuit Classify the materials that were suitable/not suitable for wires Explore how to connect a range of different switches and investigate how they function in different ways Choose switches to add to circuits to solve particular problems such as a pressure switch for a burglar alarm Apply their knowledge of conductors and insulators to design and make different types of switch 	<ul style="list-style-type: none"> Explain how a circuit operates to achieve particular operations, such as control the light for a torch with different brightnesses or make a motor go faster or slower Make circuits to solve particular problems such as a quiet and a loud burglar alarm Carry out fair tests exploring changes in circuits Make circuits that can be controlled as part of a D&T project

	Make circuits that can be controlled as part of a D&T project N.B. Children should be given one component at a time to add to circuits.	
Working Scientifically Assessment:	Report on findings from enquires, including oral and written explanations, displays or presentations of results and conclusions: 'Does it Conduct Electricity?' Use equipment safely and revise design where necessary: 'Circuit Products'	Plan a scientific enquiry to answer a question, recognising and controlling variables: 'Bulb Brightness' Use equipment and make systematic observations: 'Conductive Dough'

LIGHT - KEY STAGE 2

Physics	Year 3	YEAR 6
National Curriculum Objective:	<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 *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.
Prior Knowledge:	Year 1: 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"> *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.
Key Vocabulary:	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	Straight lines, Light rays. (Y3 vocabulary - Light, Light source, Dark, Absence of light, Transparent, Translucent, Opaque, Shiny, Matt, Surface, Shadow, Reflect, Mirror, Sunlight, Dangerous)
Key Ideas:	We see objects because our eyes can sense light. Some objects, for example the sun, light bulbs and candles are sources of light. We can see light sources shining	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

	<p>directly into our eyes but to see other objects, light from a source must first shine on the object and then be reflected into our eyes. Some objects are easier to see as they are more reflective or shiny than other objects. Objects are easier to see if there is more light. Dark is the absence of light. We cannot see anything in complete darkness.</p> <p>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. If the light source and object move closer to each other, the shadow will become larger.</p>	<p>objects some light must be reflected from the object into our eyes for the object to be seen.</p> <p>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 and the size of the shadow is larger when the light source and object move closer to each other as more of the light is blocked.</p>
Working Scientifically Focus:	<p>Explain why different objects are more or less visible in different lighting and for different object surfaces</p> <p>e.g. shiny vs matt.</p> <p>Explain how shadows vary as the distance between a light source and an object is changed.</p>	<p>Observe objects in different lighting conditions – using light from sources that can be moved, reflected and blocked in different ways.</p> <p>Observe shadows of different objects as the object and the light source are moved so that the distance between them and their distance from the surface where the light is falling changes.</p> <p>Predict or explain some uses or behaviours of light, reflection and shadows such as periscope design, shadow puppets, bending of light in water.</p>
Working Scientifically Assessment:	<p>Gather and record data to answer questions. ‘Can everything make a shadow?’</p>	<p>Take accurate measurements and record data on a graph: ‘Investigating Shadows’</p> <p>Identify different types of scientific enquiries to answer their own questions: ‘Raising and Sorting Light Questions’</p>

		EARTH AND SPACE - KEY STAGE 2
Physics	RECEPTION	YEAR 6
<p>EYFS:</p> <p>National Curriculum Objectives:</p>	<p>ELG14 – The World:</p> <p>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.</p> <p>ELG02 - Understanding</p> <p>Children follow instructions involving several ideas or actions. They answer ‘how’ and ‘why’ questions about their experiences and in response to stories or events.</p> <p>ELG03 - Speaking</p>	<p>*describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>*describe the movement of the Moon relative to the Earth</p> <p>*describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>*use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.</p>

<p>Prior Knowledge:</p>	<p>30-50 months:</p> <ul style="list-style-type: none"> * Beginning to understand ‘why’ and ‘how’ questions. *Questions why things happen and gives explanations. Asks e.g. who, what, when, how *Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. *Can talk about some of the things they have observed such as plants, animals, natural and found objects. *Developing an understanding of growth, decay and changes over time. 	<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. <p>Revisit knowledge learned in EYFS</p>
<p>Key Vocabulary:</p>	<p>Earth, Sun, Moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, stars, astronaut, rocket, Space</p>	<p>Earth, Sun, Moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune</p> <p>Spherical, Solar system, rotates, star, orbits, planets, axis</p>
<p>Key Ideas:</p>	<p>Explore planets, rockets and astronauts</p> <p>Link to materials/ forces – making rockets</p>	<p>The sun is a star. It is at the centre of our solar system. There are 8 planets (can name them). These travel around the sun in fixed orbits. Earth takes 365 ¼ days to complete its orbit around the sun. The earth rotates (spins) on its axis. As earth rotates, half faces the sun (here it is 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.</p>
<p>Working Scientifically Focus:</p>	<p>Use secondary resources (picture books)</p> <p>Perform simple tests</p> <p>Use drawings, photos and labels to present evidence</p>	<p>Use secondary sources to help create a model e.g. role play or using balls, to show the movement of the Earth around the Sun and the Moon around the Earth.</p> <p>Use secondary sources to help make a model to show why day and night occur</p> <p>Make first-hand observations of how shadows caused by the Sun change through the day</p> <p>Make a sundial</p> <p>Research time zones</p> <p>Consider the views of scientists in the past and evidence used to deduce shapes and movements of the Earth, Moon and planets before space travel</p>
<p>Working Scientifically Assessment:</p>	<p>Perform simple tests to answer questions: ‘Rocket Mice’</p>	<p>Gather and record data using tables and graphs: ‘Craters’</p> <p>Report and present findings from enquiries using appropriate scientific language: ‘Solar System Research’</p>

EYFS		MATERIALS - KEY STAGE 1	
Chemistry	RECEPTION	YEAR 1 – EVERYDAY MATERIALS	YEAR 2 – USE OF EVERYDAY MATERIALS
<p>ELGs:</p> <p>National Curriculum Objectives:</p>	<p>ELG14 – The World:</p> <p>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.</p> <p>ELG12 – Shape, Space and Measures:</p> <p>Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.</p> <p>ELG16 – Exploring and using media and materials</p> <p>Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>ELG02 - Understanding</p> <p>Children follow instructions involving several ideas or actions. They answer ‘how’ and ‘why’ questions about their experiences and in response to stories or events.</p> <p>ELG03 – Speaking</p> <p>ELG17- Being Imaginative:</p> <p>Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art,</p>	<p>*distinguish between an object and the material from which it is made</p> <p>*identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>*describe the simple physical properties of a variety of everyday materials</p> <p>*compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>*identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>*find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>

	<p>music, dance, role play and stories.</p> <p>ELG – Technology</p> <p>Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.</p>		
<p>Prior Knowledge:</p>	<p>30-50 months:</p> <ul style="list-style-type: none"> * Beginning to understand ‘why’ and ‘how’ questions. *Questions why things happen and gives explanations. Asks e.g. who, what, when, how *Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. *Can talk about some of the things they have observed such as plants, animals, natural and found objects. *Developing an understanding of growth, decay and changes over time. *Shows an interest in shape and space by playing with shapes or making arrangements with objects. *Shows awareness of similarities of shapes in the environment. *Shows interest in shape by sustained construction activity or by talking about shapes or arrangements. *Shows interest in shapes in the environment *Beginning to talk about the shapes of everyday objects, e.g. ‘round’ and ‘tall’. *Beginning to be interested in and describe the texture of things. *Uses various construction materials. *Beginning to construct, stacking blocks vertically and horizontally, making enclosures and creating spaces. *Joins construction pieces together to build and balance. 	<p>ELG14 – The World:</p> <p>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.</p> <p>ELG16 – Exploring and using media and materials:</p> <p>Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>ELG12 – Shape, Space and Measures:</p> <p>Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.</p> <p>ELG02 - Understanding</p> <p>Children follow instructions involving several ideas or actions. They answer ‘how’ and ‘why’ questions about their experiences and in response to stories or events.</p> <p>ELG03 - Speaking</p> <p>ELG17- Being Imaginative:</p> <p>Children use what they have learnt about media and</p>	<ul style="list-style-type: none"> *distinguish between an object and the material from which it is made *identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock *describe the simple physical properties of a variety of everyday materials *compare and group together a variety of everyday materials on the basis of their simple physical properties.

	<p>*Realises tools can be used for a purpose.</p> <p>*Uses available resources to create props to support role-play.</p> <p>*Captures experiences and responses with a range of media, such as music, dance and paint and other materials or words.</p> <p>*Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones.</p> <p>*Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.</p>	<p>materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.</p>	
<p>Key Vocabulary:</p>	<p>wet, cold, hard, lumpy, freeze, ice, water, melting, warm, dry, protect, waterproof, change, heat, cook, melt, mix</p>	<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>Materials – wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber</p> <p>Properties – rough/smooth, flexible/rigid, strong/weak reflective/non-reflective, transparent/translucent/opaque</p> <p>Changing Shape - squashing, bending, twisting and stretching, pushing and pulling</p>
<p>Key Ideas:</p>	<p>Melting , freezing and changes in materials:</p> <p>Can describe observations and begin to explain how materials change.</p> <p>Explore a range of fabrics and explore what happens when materials get wet.</p> <p>Make bread/ cakes</p> <p>Construction - Junk modelling</p> <p>Water tray/ sand pit</p> <p>playdoh</p>	<p>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.</p>	<p>The properties of materials (prior learning from Y1) make them suitable or unsuitable for particular purposes. 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. More than one material may be suitable. A material can be suitable for different purposes. Some objects can be bent, stretched, squashed and twisted. This can be a property of the material or depend on how the material has been processed e.g. thickness</p>

Working Scientifically Focus:	Describe observations and make simple comparisons Use drawings, photos and labels to present evidence	Classify objects made of one material in different ways e.g. a group of object made of metal Classify in different ways one type of object made from a range of materials e.g. a collection of spoons made of different materials Classify materials based on their properties Test the properties of objects e.g. absorbency of cloths, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters	Explain why a material is suitable or unsuitable for a particular purpose Carry out simple tests to determine the properties of materials Identify, with reasons, possible uses for a given material Recognise that a material may come in different forms which have different properties.
Working Scientifically Assessment:	Explore and Perform Simple Tests: 'Incy Spider Shelter Test' Changing Materials: 'Frozen Balloons'	Ask simple questions and recognising that they can be answered in different ways: 'Waterproof Materials' Collect data to compare bridges: 'Bridge Testers'	Perform simple tests to compare and group: 'Floating and Sinking' Describe what they have found out and use their results to make comparisons: 'Boat Materials' gather and record data to help in answering questions: 'Materials Hunt'

MATERIALS - KEY STAGE 2

Chemistry	YEAR 3	YEAR 4 – STATES OF MATTER	YEAR 5 – PROPERTIES AND CHANGES OF MATERIALS
National Curriculum Objectives:	<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"> *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 *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>*demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>*explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>
Prior Knowledge:	<p>*identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>*find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>*Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>*Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter</p>	<p>*compare and group materials together, according to whether they are solids, liquids or gases</p> <p>*observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p> <p>*identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>
Key Vocabulary:	<p>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, permeable, erosion, organic matter</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>
Key Ideas:	<p>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 piece and the amount of organic matter affect the property of the soil.</p> <p>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.</p>	<p>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.</p> <p>Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0°C. 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 100°C. 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.</p>	<p>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.</p> <p>Mixtures can be separated by filtering, sieving and evaporation.</p> <p>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>

		<p>Evaporation happens 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> <p>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.</p>	
<p>Working Scientifically Focus:</p>	<p>Observe rocks closely</p> <p>Classify rocks in a range of ways based on their appearance</p> <p>Devise a test to investigate the hardness of a range of rocks</p> <p>Devise a test to investigate how much water different rocks absorb</p> <p>Observe how rocks change over time e.g. gravestones or old building</p>	<p>Observe closely and classify a range of solids</p> <p>Observe closely and classify a range of liquids</p> <p>Explore making gases visible e.g. squeezing sponges under water to see bubbles, and showing their effect e.g. using straws to blow objects, trees moving in the wind</p> <p>Classify materials according to whether they are solids, liquids and gases</p> <p>Observe a range of materials melting e.g. ice, chocolate, butter</p> <p>Investigate how to melt ice more quickly</p> <p>Observe the changes when making rocky road cakes or ice-cream</p> <p>Investigating melting point of different materials e.g. ice, margarine, butter and chocolate</p> <p>Explore freezing different liquids e.g. tomato ketchup, oil, shampoo</p> <p>Use a thermometer to measure temperatures e.g. icy water (melting), tap water, hot water, boiling water (demonstration)</p> <p>Observe water evaporating and condensing e.g. on cups of icy water and hot water</p> <p>Set up investigations to explore changing the rate of evaporation e.g. washing, puddles, handprints on</p>	<p>Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat</p> <p>Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate</p> <p>Investigate rates of dissolving by carrying out comparative and fair test</p> <p>Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture</p> <p>Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning</p> <p>Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?</p> <p>Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton)</p>

		<p>paper towels, liquids in containers</p> <p>Use secondary sources to find out about the water cycle</p>	
Working Scientifically Assessment:	Reporting on findings from enquiries: 'Reporting on Rocks'	<p>Set up a fair test: 'Drying Materials'</p> <p>Take accurate measurements using standard units, using a range of equipment including thermometers and data loggers: 'Measuring Temperature'</p> <p>Evaluate method and suggest how it could have been improved: 'Dunking Biscuits'</p> <p>Questioning: 'Cornflour Slime'</p>	<p>Plan different types of scientific enquiry, including recognising and controlling variables: 'Testing Nappy Absorbency'</p> <p>Plan scientific enquiry to answer question and recognise and control variables:</p> <p>'Dissolving'</p> <p>Report and present findings from enquiries, including conclusions and explanations of degree of trust in results: 'Champion Tape'</p> <p>Gather and record data of increasing complexity using tables: 'Sugar cube stacks'</p> <p>Use test results to make predictions to set up further comparative and fair tests: 'Insulation Layers'</p>

Science Progression for EYFS draw upon guidance from Development Matters. EYFS does not follow the National Curriculum topics for science. However, through 'Continuous Provision' and 'Enhanced Provision' each scientific strand is introduced to the children, giving them a strong foundation to progress to the National Curriculum topics as they enter KS1. Teacher led inputs may include investigations to see changes over time and the key to this provision and developing this provision is the adults' responses and questioning, encouraging children to give explanations about what is happening. Through this child-led approach, spontaneous opportunities will often arise eg, snow or a spider crawls on them. Consequently, children's talk and adults' interactions are vital in encouraging curiosity of the world around them and developing their scientific skills to build upon throughout their education.