

Science Interleaving of Concepts

	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Autumn	Earth and Space Light and dark, day and night	Humans Name parts of body, use senses	Materials Suitability of materials based on stretch, flexibility, squashing, transparency etc	Materials Rocks, fossils, soils	Materials Solids, liquids, gases, water cycles, changes of state water.	Living Things and Habitats Life cycles of mammals, amphibians, bird and insect. Asexual and sexual reproduction	Electricity Parallel, series, circuit effect brightness of bulb
	Humans Explore senses and name basic body parts	Plants Identify common plant, deciduous, evergreen, fungi. Parts flowering plants	Forces Observe, explore non-contact forces, know pushes and pulls in play equipment		Forces Gravity, Newton meter		
			Light and Sound Natural and artificial light Identify how sounds are made (vibration)	Earth and Space Day and night		Plants Reproduction in plants	Light Light travels in straight lines, how we see
Spring	Forces Observe/experience in outdoor provision, push, pull, friction, buoyancy, magnets	Animals Identify, name common animals, fish, amphibians, mammals, birds, carnivores, omnivores, herbivores.	Living Things and Habitats Explore live and dead, food chains, micro-habitats	Forces Magnetism, attract, repel, friction	Electricity Make and identify components of circuit, insulators, conductors	Materials Solubility, separating materials, changes in state, reversible and irreversible	Evolution and Inheritance Offspring, adaptation to environment, change over time due to natural selection and adaptation.
	Materials Different materials, observe changes of state	Forces Floating, sinking, pushes, pulls	Animals/Humans Basic needs of animals, healthy humans, exercise, nutrition	Light Reflection, change in shadows throughout day	Sound Vibration, volume, pitch		Living Things and their Habitats Introduction to classification by characteristics, Classify main groups.
Summer	Plants Observe, use senses, growth, decay	Earth and Space Seasons, identify sun, Earth, moon.	Plants Seeds, bulbs growth, needs of healthy plants	Plants Function of flowering plants, seed dispersal	Animals including Humans Digestive system, teeth, food chains, predators, consumers, producers	Animals including Humans Human reproduction, puberty, periods, life stages	Animals including Humans Blood, circulation, healthy lifestyles, harmful substances
	Animals Find minibeasts, identify, life cycles	Materials Name everyday materials, describe properties.	Electricity Simple circuits, how to mend circuit -conductors	Animals including Humans Skeletons, muscles	Living things and Habitats/Plants Classifying using keys Flowering non-flowering plants	Earth and Space Moon, sun, solar system, earth's rotation, day and night, planets, orbit	Earth and Space Phases of moon
	Light Create sounds, observe shadows	Electricity Explore power sources				Forces Gravity, air resistance, friction, up -thrust, mechanisms to aid movement	Forces Levers and pulleys aiding resistance forces. Water buoyancy
		Light Observe shadows, notice different sounds				Light Diagram of object reflecting light, function transparency, translucent, opaque	

Science

Summary and Progression						Working Scientifically	
Nursery	Reception	<u>Y1</u>	<u>Y2</u>	<u>Y3</u>	<u>Y4</u>	<u>Y5</u>	<u>Y6</u>
<ul style="list-style-type: none"> Encourage children to ask questions Talk about what they see using a wide vocabulary Observe and explore the environment 	<ul style="list-style-type: none"> Ask questions to find out more, and to check they understand what has been said to them Talk about what they see using a wide vocabulary Children to answer who, where and when 	<ul style="list-style-type: none"> Ask simple questions linked to the science work we are doing. Observe closely and describe what I see. Perform simple tests, using familiar, everyday equipment. Gather and record information to help answer questions (including using photographs and drawings). 	<ul style="list-style-type: none"> Ask simple questions and recognise that they can be answered in different ways. Observe closely, using given measuring equipment. Perform simple 	<ul style="list-style-type: none"> Ask relevant scientific questions and suggest a scientific way of answering them. Set up, with guidance, simple practical enquiries, comparative and fair tests. Make careful observations 	<ul style="list-style-type: none"> Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests independently. Make systematic and careful observations and 	<ul style="list-style-type: none"> Work as part of a team to plan enquiries to answer questions, including recognising and controlling variables. Take measurements, using a range of equipment, with precision, taking repeat 	<ul style="list-style-type: none"> Plan more sophisticated scientific enquiries to answer questions, including recognising and controlling variables. Justify my choices of data collection

<p>Open ended questions for adults to ask</p> <ul style="list-style-type: none"> •What can you see? •What can you hear? •What can you smell? •I wonder...? •What would happen if...? •Why did that happen? 	<p>questions first before answering 'why' and 'I wonder/how do you know' questions.</p> <ul style="list-style-type: none"> • Describe what they see, hear and feel • Explore the natural world around them • Connect one idea or action to another <p>Open ended questions for adults to ask</p> <ul style="list-style-type: none"> •What can you see? •What can you hear? •What can you smell? •I wonder...? •What would happen if...? •Why did that happen? 		<p>tests without support.</p> <ul style="list-style-type: none"> • Identify and classify. • Use my observations and ideas to suggest answers to questions. • Gather and record accurate data to help in answering questions (incl. numerical data, where appropriate). 	<p>and take accurate measurements using standard units.</p> <ul style="list-style-type: none"> • Gather, record, classify and present data in a variety of ways to help answer questions. • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Use results to draw simple conclusions and make predictions for new values. • Use straightforward scientific evidence to answer questions or to support my findings. 	<p>take accurate measurements using standard units, and use a range of equipment, including thermometers and data loggers.</p> <ul style="list-style-type: none"> • Report on findings, including oral and written explanations, displays or presentations of results and conclusions. • Use results to suggest improvements to enquiries and to raise questions. • Identify differences, similarities or changes related to simple scientific ideas and processes. 	<p>readings when appropriate.</p> <ul style="list-style-type: none"> • Record data and results using scientific diagrams and labels, classification keys, tables, bar and line graphs. • Use test results to make predictions to set up further comparative and fair tests. • Report and present findings, including conclusions, causal relationships and degree of trust, in oral and written forms. 	<p>method and number of observations and measurements.</p> <ul style="list-style-type: none"> • Choose the most appropriate method to record data and results of increasing complexity. • Identify scientific evidence that has been used to support or refute ideas or arguments.
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Summary and Progression

Living Things (Animals, Humans and Plants)

Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
<p>Plants and animals</p> <ul style="list-style-type: none"> • Plant seeds and care for growing plants • Understand key features of a life cycle of a plant and an animal > one life cycle simple e.g. chick • Begin to understand the need to respect and care for the natural environment and all living things. 	<p>Plants and animals</p> <ul style="list-style-type: none"> • Describes what they see, hear and feel outside • Explore the natural world around them • Develop an understanding of growth, decay and changes over time > life cycles (caterpillar) <p>Humans</p> <ul style="list-style-type: none"> • Explore senses • Name the basic parts of the body (head, shoulder, knee, feet, hand, arm, leg, eyes, ears, mouth, nose, teeth, body, toes, fingers) 	<ul style="list-style-type: none"> • Identify and name a variety of plants and animals, identify their parts and describe their basic structure. 	<ul style="list-style-type: none"> • Explore and compare the differences between things that are living, dead. • Understand habitats and how they provide basic needs of plants, animals and humans (including food chains). • Understand lifecycles of plants, animals and humans. 	<ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants, animals and humans describe and their lifecycles. • Explore the requirements of plants, animals and humans for life and growth and understand how they differ. 	<ul style="list-style-type: none"> • Group and classify living things in different ways and understand impact of environment. • Describe the simple functions of the basic parts of the digestive system and teeth in humans. • Construct and interpret a food chains. 	<ul style="list-style-type: none"> • Describe the differences in the life cycles of plants, mammals, amphibians, insects and birds and understand their reproductive processes. • Raise questions about the environment and study the work of naturalists. • Describe the changes as humans develop to old age. 	<ul style="list-style-type: none"> • Give reasons for classifying plants and animals based on specific characteristics. • Understand the human circulatory system and how nutrients and water are transported in human body. • Learn how to keep their bodies healthy and how their bodies might be damaged. • Explore the work of scientists and scientific research.

Summary and Progression

Electricity

Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
<p>Earth and Space and light</p> <ul style="list-style-type: none"> • Know that we live planet Earth. • Discuss the difference between day and night • Observe and interact objects casting shadow • Discuss the difference between light and dark (we 	<p>Earth and Space and light</p> <ul style="list-style-type: none"> • Know that we live planet Earth. • Discuss the difference between day and night • Observe and interact objects casting shadow • Discuss the difference between light and dark (we 	<ul style="list-style-type: none"> • Know the difference between mains and battery operated appliances. • Identify 3 appliances that work on mains and 3 that work on battery. 	<ul style="list-style-type: none"> • Recognise some simple conductors and insulators. • Explain how conductors and insulators are used in everyday life. 	<ul style="list-style-type: none"> • Construct a simple electrical circuit and identify its parts. • Use symbols to make a circuit diagram. 	<ul style="list-style-type: none"> • Draw, construct and use simple circuits. • Identify whether or not a lamp will light. • Recognise that a switch opens and closes a circuit. • Recognise some common conductors and insulators. 	<ul style="list-style-type: none"> • Recognise symbols in a complex circuits. • I understand what a circuit breaker is. 	<ul style="list-style-type: none"> • Compare and give reasons for variations in how components function. • Construct and adapt simple series circuits and answer question about the changes. • Represent a circuit in

cannot see when there is no light). <ul style="list-style-type: none">Know some light sources (sun, torch, candle/fire)	cannot see when there is no light). <ul style="list-style-type: none">Know some light sources (sun, torch, candle/fire)						a diagram using recognised symbols.
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Summary and Progression	Earth & Space
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Summary and Progression	Earth & Space
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Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
<u>Earth, Space and light</u> <ul style="list-style-type: none"> Know what the sun is, know what the moon is. Name light and dark 	<u>Earth and Space and light</u> <ul style="list-style-type: none"> Know that we live planet Earth. Discuss the difference between day and night Observe and interact objects casting shadow Discuss the difference between light and dark (we cannot see when there is no light). Know some light sources (sun, torch, candle/fire) 	<ul style="list-style-type: none"> Understand what the Earth, Sun and Moon are. 	<ul style="list-style-type: none"> Order the Earth, Sun and Moon by size and their rotation. Recognise what planets are. 	<ul style="list-style-type: none"> Explain how we get day and night. 	<ul style="list-style-type: none"> Explain why the sun appears to move across the sky. Describe where the sun rises and sets. 	<ul style="list-style-type: none"> Describe and understand our solar system. Describe the shape movement of the Earth, and other planets, relative to the Sun. Describe the movement of the Moon relative to the Earth. Use the idea of the Earth's rotation to explain day and night. 	<ul style="list-style-type: none"> Know phases of the moon.

Summary and Progression	Materials
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Summary and Progression	Materials
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Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
<ul style="list-style-type: none"> • Use all their senses in hands in exploration of natural materials • Explore collection of materials with similar and/or different properties • Talk about what they see using a wide vocabulary • Talk about differences between materials and changes they notice 	<ul style="list-style-type: none"> • Observe and interact with natural processes such as ice melting • Explore different materials. • Look closely at similarities, differences, patterns and change in materials. 	<ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made. • Identify, name and compare a variety of everyday materials and describe their properties. 	<ul style="list-style-type: none"> • Identify and compare the suitability of a variety of everyday materials for different purposes. • Find out how the shapes of solid objects made from some materials can be changed. 	<ul style="list-style-type: none"> • Compare and group together different kinds of rocks. • 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"> • Explore a variety of everyday materials and develop simple descriptions of the states of matter. • 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 understand evaporation and condensation. 	<ul style="list-style-type: none"> • Compare and group together everyday materials on the basis of their properties. • Know that some materials will dissolve in liquid. • Decide how mixtures might be separated and understand the difference between reversible and irreversible changes. • Understand comparative and fair tests. 	<ul style="list-style-type: none"> • Explain the formation of new materials. • Compare and group materials based on their properties and their response to magnets.

Summary and Progression	Forces
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Summary and Progression	Forces
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Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
<ul style="list-style-type: none"> Explore and talk about different forces they can feel Explore how things work 	<ul style="list-style-type: none"> Explore forces, magnets, floating and sinking in the environment 	<ul style="list-style-type: none"> Identify different forces within the everyday environment. 	<ul style="list-style-type: none"> Understand forces have magnitude and direction. Know that some forces need contact, but magnetism and gravity are non-contact forces. 	<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 and predict how magnets have poles and 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. 	<ul style="list-style-type: none"> Understand that gravity is a force and investigate how it works. Use and apply scientific equipment to measure forces. 	<ul style="list-style-type: none"> Explain that unsupported objects fall towards the Earth because of the force of gravity. Identify and explore the effects of air resistance, water resistance and friction. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Explore the work of how Galileo Galilei and Isaac Newton. 	<ul style="list-style-type: none"> Understand the effects of forces in context and know that some mechanisms allow a smaller force to have a greater effect (levers, pulleys and gears). Explore the effects of water resistance, buoyancy and friction in context.

Summary and Progression	Light & Sound
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Summary and Progression	Light & Sound
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Nursery	Reception	Y1	Y2	Y3	Y4	Y5	Y6
Earth, Space and light <ul style="list-style-type: none"> Know what the sun is, know what the moon is. Name light and dark 	Earth and Space and light <ul style="list-style-type: none"> Know that we live planet Earth. Discuss the difference between day and night Observe and interact objects casting shadow Discuss the difference between light and dark (we cannot see when there is no light). Know some light sources (sun, torch, candle/fire) 	<ul style="list-style-type: none"> Understand that a shadow is formed when an object blocks the light. Discuss what objects make sounds. Use vocabulary to describe different sounds. 	<ul style="list-style-type: none"> Understand the difference between natural and artificial light sources. Begin to identify how sounds are made. 	<ul style="list-style-type: none"> Recognise the need light in order to see things. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Notice that light is reflected from surfaces. Recognise that shadows are formed when the light from a light source is blocked by a solid object. 	<ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating and these vibrations travel through a medium to the ear. Understand how pitch and volume of a sound can be changed. 	<ul style="list-style-type: none"> Explain how an object can reflect light. Draw a scientific diagram to support my explanation. Describe how the eye sees light/colour and how it functions. Understand transparency, translucency and opaqueness. 	<ul style="list-style-type: none"> Recognise that light appears to travel in straight lines. Explain that objects are seen because they give out or reflect light into the eye and explain why shadows have the same shape as the objects that cast them. Work scientifically by investigating a range of phenomena involving light.





EYFS (UTW- The Natural World)

Educational Program

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

	<u>Knowledge for Nursery</u>	<u>Key Texts and Vocabulary for Nursery</u>	<u>Knowledge for Reception</u>	<u>Key Texts and Vocabulary for Reception</u>
Early Years End Points: The Natural World Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants; - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	<u>Plants and animals</u> <ul style="list-style-type: none"> Plant seeds and care for growing plants Understand key features of a life cycle of a plant and an animal > one life cycle simple e.g. chick Begin to understand the need to respect and care for the natural environment and all living things. 	<u>Key Texts</u> Dear Zoo Jasper's beanstalk Brown Bear Who's in the Egg Non-fiction text/poster about a chick and its lifecycle. Farm animal related/Pets/chicks <u>Vocabulary</u> plants, fruit, stick, seed, tree, leaf, vegetable, flower, animals, fish, birds, head, body, eyes, ears, mouth, teeth, leg, senses, touch, see, smell, taste, hear, grow, change, egg, water	<u>Plants and animals</u> <ul style="list-style-type: none"> Describes what they see, hear and feel outside Explore the natural world around them Begin to understand growth, decay and changes over time > life cycles e.g caterpillar Humans <ul style="list-style-type: none"> Explore the senses through sensory experiences such as things to smell, touch, taste, see, hear. Name the basic parts of the body (head, shoulder, knee, feet, hand, arm, leg, eyes, ears, mouth, nose, teeth, body, toes, fingers) 	<u>Key Texts</u> Mad about mini-beasts Jack and the Beanstalk It starts with a seed Animal including birds and fish (non-fiction) The Hungry Caterpillar Non fiction texts (zoo animals) Actual size The body book <u>Vocabulary</u> plants, fruit, root, twig, seed, tree, trunk, leaf, stem, light, soil, vegetable, flower, animals, fish, birds, head, body, shoulder, knee, feet, hand, arm, leg, nose eyes, ears, toes, hands, fingers, mouth, teeth, leg, tail, wing, claw, fin, scales, beak, paws, senses, touch, see, smell, taste, hear
	<u>Light and Dark</u> <ul style="list-style-type: none"> Name light and dark Name day and night 	<u>Key Texts</u> Wow! Said the owl <u>Vocabulary</u> Day, night, light, dark, torch, sun and moon	<u>Light and Dark</u> <ul style="list-style-type: none"> Discuss the difference between day and night Discuss the difference between light and dark (we cannot see when there is no light source) Explore shadows and how they are made. 	<u>Key Texts</u> Night monkey, day monkey Can't you sleep little bear <u>Vocabulary</u> Dark, light, day, night, sun, moon, sky, light source, torch, candle, bulb, fire, star, block, shadow

	<u>Materials</u> <ul style="list-style-type: none"> • Use all their senses in hands in exploration of natural materials • Explore collection of materials with similar and/or different properties • Talk about what they see using a wide vocabulary • Talk about differences between materials and changes they notice 	<u>Key Texts</u> The 3 Little Pigs <u>Vocabulary</u> Straw, brick, stick, soft, hard, hot, cold,	<u>Materials</u> <ul style="list-style-type: none"> • Observe and interact with natural processes such as ice melting • Explore different materials. • Look closely at similarities, differences, patterns and change in materials. 	<u>Key Texts</u> Let's build a house The Three Little Pigs <u>Vocabulary</u> Weak, strong, melting, ice, change, frozen, hot, cold, wood, plastic, glass, metal, fabric
	<u>Forces</u> <ul style="list-style-type: none"> • Explore and talk about different forces they can feel • Explore how things work 	<u>Key Texts</u> Non-fiction books about forces A Squash and a Squeeze <u>Vocabulary</u> Push, pull, snap, stretch, bend	<u>Forces</u> <ul style="list-style-type: none"> • Explore forces, magnets, floating and sinking in the environment 	<u>Key Texts</u> Non-fiction books about forces Enormous turnip <u>Vocabulary</u> Push, pull, float, sink, magnet, repel and attract
	<u>Possible Provision</u> <ul style="list-style-type: none"> - Mini beast investigation area - Floating and sinking objects within water areas - A variety of materials to explore/investigate - Growing area outside - Magnets to explore within the setting 		<u>Working scientifically</u> <u>Nursery</u> <ul style="list-style-type: none"> • Encourage children to ask questions • Talk about what they see using a wide vocabulary • Observe and explore the environment <u>Reception</u> <ul style="list-style-type: none"> • Ask questions to find out more, and to check they understand what has been said to them • Talk about what they see using a wide vocabulary • Children to answer who, where and when questions first before answering 'why' and 'I wonder/how do you know' questions. • Describe what they see, hear and feel • Explore the natural world around them • Connect one idea or action to another Open ended questions for adults to ask <ul style="list-style-type: none"> •What can you see? •What can you hear? •What can you smell? •I wonder...? •What would happen if...? •Why did that happen? 	

Year 1			
 Working Scientifically	 Explore scientific concepts through the following skills and knowledge...	 Examples of enquiry questions:	Vocabulary:
<ul style="list-style-type: none"> Ask simple questions linked to the science work we are doing. Observe closely and describe what I see. Perform simple tests, using familiar, everyday equipment. Gather and record information to help answer questions (including using photographs and drawings) 	<u>Plants (including Living things and their habitats)</u> <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. 	What plants grow in the local environment? Why do deciduous trees drop their leaves in autumn? How does a deciduous tree change throughout the year?	plants, wild, garden, deciduous, blossom, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, evergreen, structure, flowering, trees, vegetables, leaves, flowers, blossom, petals, animals, fish, amphibians, reptiles, birds, mammals, carnivores, herbivores, omnivores, compare, label, human body, sense, classification, structure, features, head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, senses, touch, see, smell, taste, hear
	<u>Animals (including Humans)</u>  <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). Include the term skeleton and know it gives shape. Identify, name, draw and label the basic parts of the human body including the term skeleton and say which part of the body is associated with each sense. 	Why do animals have different diets? How is a mammal different to an amphibian? What do all animals have in common? Could there ever be an animal that doesn't belong to a group? True or false humans are omnivores? Is your hearing better with your eyes closed?	
	<u>Earth and Space (called seasonal changes on PIXL)</u> <ul style="list-style-type: none"> Observe changes across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies. Understand what the Earth, Sun and Moon are. (no moon on pixl) 	How does weather affect what people do? How do you know the seasons are changing? Which season would be ideal for a BBQ and why? What time of day can we make the longest shadow?	Earth, sun, moon, planet, space, star. Weather (sunny, rainy, windy, snowy etc.) Seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length
	<u>Materials</u> <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. 	What is the best material for making an umbrella? What makes a material waterproof? What materials stick to a magnet? We've got a big pile of materials that we can recycle – how are we going to sort them for recycling?	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card, rubber, wool, clay, properties, compare, group, physical, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, opaque transparent, absorbent
	<u>Forces</u> <ul style="list-style-type: none"> Identify pushes and pulls in P.E. Experience floating and sinking in water play 	Do all objects fall at the same speed?	force, push, pull, floating, sinking, environment
	<u>Electricity-make connections</u> <ul style="list-style-type: none"> Know the difference between mains and battery operated appliances. Identify 3 appliances that work on mains and 3 that work on battery. 	What objects in the classroom need electricity?	mains, battery operated, appliances, electricity, safety, switch
	<u>Light and Sound</u> <ul style="list-style-type: none"> Understand that a shadow is formed when an object blocks the light. Discuss what objects make sounds. Use vocabulary to describe different sounds. 	What sounds can you hear in the environment? Observe shadows throughout the year linked to seasons. Link to geography field work.	shadow, light, loud, quiet, noise, silent, low, high, bang, hearing, volume

Y1 Plants – End Points

1. Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.
2. Identify and describe the basic structure of a variety of common flowering plants, including trees.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>Growing locally there will be a vast array of plants, which all have specific names. There 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>Key Vocabulary: plants, wild, garden, deciduous, blossom, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, evergreen, structure, flowering, trees, vegetables, leaves, flowers, blossom, petals</p>	<p>Can name trees and other plants that they see regularly.</p> <p>Can describe some of the key features of these trees and plants e.g. the shape of the leaves, the colour of the flower/blossom.</p> <p>Can point out trees which lost their leaves and those that kept them the whole year.</p> <p>Can point to and name the parts of a plant, recognising that they are not always the same e.g. leaves and stems may not be green.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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>When further afield, spot plants that are the same as those in the local area studied regularly, describing the key features that helped them.</p>	<p>Can sort and group parts of plants using similarities and differences.</p> <p>Can use simple charts etc. to identify plants.</p> <p>Can collect information on features that change during the year.</p> <p>Can use photographs to talk about how plants change over time.</p>

Y1 Animals – End Points

1. Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.
2. Identify and name a variety of common animals that are carnivores, herbivores and omnivores.
3. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals – including pets).

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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>Key Vocabulary: animals, fish, amphibians, reptiles, birds, mammals, carnivores, herbivores, omnivores, compare, label, human body, sense, classification, structure, features, head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</p> <p>Names of animals experienced first-hand from each vertebrate group. 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. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics.</p> <p>The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animal's not just meat.</p>	<p>Can name a range of animals which includes animals from each of the vertebrate groups.</p> <p>Can describe the key features of these named animals.</p> <p>Can label key features on a picture/diagram.</p> <p>Can write descriptively about an animal.</p> <p>Can write a What am I? riddle about an animal.</p> <p>Can describe what a range of animals eat.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Make first hand close observations of animals from each of the groups 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 Classify animals according to what they eat.</p>	<p>Can sort and group animals using similarities and differences.</p> <p>Can use simple charts etc. to identify unknown animals.</p> <p>Can create a drawing of an imaginary animal labelling its key features.</p> <p>Can use secondary resources to find out what animals eat, including talking to experts e.g. pet owners, zoo keepers etc.</p>

Y1 Humans – End Points

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.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>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.</p> <p>Key Vocabulary: head, body, eyes, ears, mouth, teeth, leg, tongue, senses, touch, see, smell, taste, hear</p> <p>NB. Although we often use our fingers and hands to feel objects, the children should understand that we can feel with many parts of our body.</p>	<p>Can play and lead ‘Simon says’.</p> <p>During PE lessons, can follow instructions involving parts of the body.</p> <p>Can label parts of the body on pictures and diagrams.</p> <p>Can explore objects using different senses.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Make first hand close observations of parts of the body e.g. hands, eyes. Compare two people. Take measurements of parts of their body. Compare parts of their own body. Look for patterns between people e.g. do people with big hands have big feet? Classify people according to their features. Investigate human senses e.g.:</p> <ul style="list-style-type: none"> • Which part of my body is good for feeling, which is not? • Which food/flavours can I identify by taste? • Which smells can I match? 	<p>Can use first-hand close observations to make detailed drawings. Can name body parts correctly when talking about measurements and comparisons.</p> <p>‘My arm is X straws long.’</p> <p>‘My arm is X straws long and my leg is Y straws long. My leg is longer than my arm.’</p> <p>‘We both have hands, but his are bigger than mine.’</p> <p>‘These people have brown eyes and these have blue.’</p> <p>Can talk about their findings from investigations using appropriate vocabulary.</p> <p>‘My fingers are much better at feeling than my toes’</p> <p>‘We found that the crisps all taste the same.’</p>

Y1 Materials – End Points




1. Distinguish between an object and the material from which it is made.
2. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.
3. Describe the simple physical properties of a variety of everyday materials.
4. Compare and group together a variety of everyday materials on the basis of their simple physical properties.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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>Key Vocabulary: object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card, rubber, wool, clay, properties, compare, group, physical, hard, soft, stretchy, stiff shiny, dull, rough, smooth, bendy, waterproof, opaque, transparent, absorbent</p>	<p>Can label a picture of diagram of an object made from different materials.</p> <p>Can describe the properties of different materials.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Classify objects made of one material in different ways e.g. a group of objects made of metal.</p> <p>Classify in different ways one type of object made from a range of materials e.g. a collection of spoons made of different materials.</p> <p>Classify materials based on their properties.</p> <p>Test the properties of objects e.g. absorbency of cloths, strength of part hats made of different papers, stiffness of paper plates, and waterproofness of shelters.</p>	<p>Can sort objects and materials using a range of properties.</p> <p>Can choose an appropriate method for testing an object for a particular property.</p> <p>Can use their test evidence to answer the questions about properties e.g. which cloth is the most absorbent?</p>

Y1 Seasonal Change (Earth and Space) – End Points

1. Name four seasons and types of changes which occur, including length of days.
2. Describe types of weather.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>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 mini-beasts found outside, seed and plant growth, leaves on trees and type of clothes worn by people.</p> <p>Key Vocabulary: weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun sunrise, sunset, day length</p>	<p>Can name the four seasons and identify when in the year they occur.</p> <p>Can describe weather in different seasons over a year.</p> <p>Can describe days as being longer (in time) in the summer and shorter in the winter.</p> <p>Can describe other features that change through the year.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Collect information about the weather regularly throughout the year.</p> <p>Present this information in table and charts to compare the weather across the seasons.</p> <p>Collect information, regularly throughout the year, of features that change with the seasons e.g. plants, animals, humans.</p> <p>Present this information in different ways to compare the seasons.</p> <p>Gather data about day length regularly throughout the year and present this to compare the seasons.</p>	<p>Use their evidence gathered to describe the general types of weather and changes in day length over the seasons.</p> <p>Use their evidence to describe some other features of their surroundings, themselves, animals, plants that change over the seasons.</p> <p>Demonstrate their knowledge in different ways e.g. making a weather forecast video, writing seasonal poetry, creating seasonal artwork.</p>

Year 2			
 Working Scientifically	 Explore scientific concepts through the following skills and knowledge...	 Examples of enquiry questions:	Vocabulary:
<ul style="list-style-type: none"> Ask simple questions linked to the science work we are doing. Observe closely and describe what I see. Perform simple tests, using familiar, everyday equipment. Gather and record information to help answer questions (including using photographs and drawings) 	<u>Living Things and their Habitats</u> <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. 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. Understand a simple food chain, and identify and name different sources of food. 	Children to generate a question about where they might find or attract certain minibeasts. What is a human's ideal habitat? Explain why? What does a plant need to grow and stay healthy? Which is the odd one out – a shell, a rock and a plant? Explain your ideas. How are animals and plants in a habitat dependent on each other for food? What can a baby elephant do that baby human cannot? Are some drinks better for our teeth than others? What would happen to flowering plants if the pollinating insects disappeared? Why are the onion plants sown close together weaker and smaller than those sown far apart?	living, dead, never been alive, suited, suitable, basic needs, food chain, shelter, move, feed, animals, observe, local habitats, micro-habitats, plants, light, shade, sun, warm, cool, water, grow, healthy, temperature, seed, bulb, root, petal, stem, offspring, reproduction, growth, child, young/old stages, exercise, heartbeat, breathing, hygiene, germs, disease, food types, opaque, transparent and translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching, identify, compare, suitability, wood, metal, plastic, glass, brick, rock, paper, cardboard, shapes, objects, solid, squashing, bending, twisting, stretching
	<u>Plants</u> <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 suitable temperature to grow and stay healthy. 		
	<u>Animals including Humans</u> <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. 	Which material is the best material for...?	identify, compare, suitability, wood, metal, plastic, glass, brick, rock, paper, cardboard, shapes, objects, solid, squashing, bending, twisting, stretching
	<u>Materials</u> <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. 		
	<u>Earth and Space</u> <ul style="list-style-type: none"> Order the Earth, Sun and Moon by size and their rotation. Recognise what planets are. 	Is the Earth bigger or smaller than the sun?	Earth, sun, moon, rotation, planet, star, galaxy, size
	<u>Electricity</u> <ul style="list-style-type: none"> Introduce simple conductors and insulators. Explain how they are used in everyday life. 	Which materials will mend the break in the circuit?	conductors, insulators, recognize, mains, battery, material, danger, electric shock, source, energy
	<u>Forces</u> <ul style="list-style-type: none"> Understand forces have magnitude and direction. Know that some forces need contact, but magnetism and gravity are non-contact forces. 	Exploring magnets through play. The magnet does not need contact to start to pull the material. Children to feel the force of repelling. Explore forces through large playground equipment (bikes, swings, roundabouts etc.)	force, push, pull, surfaces, magnitude, direction, gravity, non-contact
	<u>Light and Sound</u> <ul style="list-style-type: none"> Understand the difference between natural and artificial light sources. Begin to identify how sounds are made. 	Which surface makes the loudest sound? Link to music – How different instruments create sounds. Notice the vibrations. Introduce natural and artificial and give examples (bulbs, TV screens, phones). Link to Earth and Space. The moon isn't a light source.	artificial, natural, sounds, loud, quiet, noise, silent, pitch, low, high, bang, hearing, volume, torch, shine, sunlight, shadow

Y2 Living things and their habitat – End Points

1. Explore and compare the differences between things that are living, dead, and things that have never been alive.
2. Identify that most living things live in habitats to which they are suited.
3. Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.
4. Identify and name a variety of plants and animals in their habitats, including micro-habitats.
5. Describe how animals obtain their food from plants and other animals.
6. Understand a simple food chain, and identify and name different sources of food.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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 simplification but appropriate for Yr2 children). An object made of wood is classes as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil 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. That 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. There 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>Key Vocabulary living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, animals, observe, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.</p>	<p>Can find a range of items outside that are living, dead and have never lived.</p> <p>Can name a range of animals and plants that live in a habitat and micro-habitats that they have studied.</p> <p>Can talk about how the features of these animals and plants make them suitable to the habitat.</p> <p>Can talk about what the animals eat in a habitat and how the plants provide shelter for them.</p> <p>Can construct a food chain that starts with a plant and has arrows pointing in the correct direction.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Explore the outside environment regularly to find objects that are living, dead and never lived.</p> <p>Classify objects found in the locale 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>Create simple food chains from information given e.g. in picture books (Gruffalo etc.).</p>	<p>Can sort into living, dead and never lived.</p> <p>Can give key features that mean the animal or plant is suited to its micro-habitat.</p> <p>Using a food chain can explain what animals eat.</p> <p>Can explain in simple terms why an animal or plant is suited to a habitat e.g. the caterpillar cannot live under the soil like a worm as it needs fresh leaves to eat; the seaweed we found on the beach cannot live in our pond because it is not salty.</p>

Y2 Plants – End Points

1. Observe and describe how seeds and bulbs grow into mature plants.
2. Find out and describe how plants need water, light and suitable temperature to grow and stay healthy.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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>Seed dispersal</p> <p>Key Vocabulary plants, light, shade, sun, warm, cool, water, grow, healthy, temperature, seed, bulb, root, petal, stem</p>	<p>Can describe how plants that they have grown from seeds and bulbs have developed over time.</p> <p>Can identify plants that grew well in different conditions.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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>Seed dispersal – look at selections of seeds, how may they be dispersed.</p>	<p>Can spot similarities and differences between bulbs and seeds.</p> <p>Can nurture seeds and bulbs into mature plants identifying the different requirements of different plans.</p>

Y2 Animals including Humans – End Points





1. Notice that animals, including humans, have offspring which grow into adults.
2. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).
3. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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 into adults. The young of some animals do not look like their parents e.g. tadpoles. All animals including humans have basic needs of feeding, drinking, and breathing that must be satisfied in order to survive and grow into healthy adults, they also need the right amounts of and types of food and exercise Good hygiene is also important in preventing infections and illnesses.</p> <p>Key Vocabulary offspring, reproduction, growth, child, young/old stages (example – chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)</p>	<p>Can describe how animals including humans have offspring which grow into adults, using the appropriate names for the stages.</p> <p>Can state the basic needs of animals, including humans, for survival.</p> <p>Can state the importance for humans of exercise, eating the right amounts of different types of food and hygiene.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Ask people questions and use secondary sources to find out about the life cycles of some animals.</p> <p>Observe animals growing over a period of time e.g. chicks, caterpillars, a baby.</p> <p>Ask questions of a parent about how they look after their baby.</p> <p>Ask pet owners questions about how they look after their pet.</p> <p>Explore the effect of exercise on their bodies.</p> <p>Classify food in a range of ways, including using the Eatwell guide.</p> <p>Investigate washing hands, using glitter gel.</p>	<p>Can describe, including using diagrams, the life cycle of some animals, including humans, and their growth to adults e.g. by creating a life cycle book from a younger child.</p> <p>Can measure/observe how animals, including humans grow.</p> <p>Show what they know about looking after a baby/animal by creating a parenting/pet owners' guide.</p> <p>Explain how development and health might be affected by differing conditions and needs being met/not met.</p>

Y2 Uses of everyday materials – End Points

1. Can identify properties of materials.
2. Know some materials are flexible and some are rigid.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>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.</p> <p>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.</p> <p>Key Vocabulary Properties of materials – as for Year 1 plus opaque, transparent, translucent, reflective, non-reflective, flexible, rigid. shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching identify, compare, suitability, wood, metal, plastic, glass, brick, rock, paper, cardboard, shapes, objects, solid, squashing, bending, twisting, stretching</p>	<p>Can name an object, say what material it is made from, identify its properties and make a link between the properties and a particular use.</p> <p>Can label a picture or diagram of an object made from different materials.</p> <p>For a given object can identify what properties a suitable material needs to have.</p> <p>Whilst changing the shape of an object can describe the action used</p> <p>Can use the words flexible and/or stretchy to describe materials that can be changed in shape and stiff and/or rigid for those cannot.</p> <p>Can recognise that a material may come in different forms which have different properties.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Classify materials.</p> <p>Make suggestions about alternative materials for a purpose that are both suitable and unsuitable.</p> <p>Test the properties of materials for particular uses e.g. compare the stretchiness of fabrics to select the most appropriate for Elastigirl's costume, test materials for waterproofness to select the most appropriate for a rain hat.</p>	<p>Can sort materials using a range of properties.</p> <p>Can explain using the key properties why a material is suitable or not suitable for a purpose.</p> <p>Can begin to choose an appropriate method for testing a material for a particular property.</p> <p>Can use their test evidence to select appropriate material for a purpose e.g. which material is the best for a rain hat?</p>

Year 3			
 Working Scientifically	 Explore scientific concepts through the following skills and knowledge...	 Examples of enquiry questions:	Vocabulary:
<ul style="list-style-type: none"> Ask relevant scientific questions and suggest a scientific way of answering them. With guidance, set up simple practical enquiries, comparative and fair tests. Make careful observations and take accurate measurements using standard units. Gather, record, classify and present data in a variety of ways to help answer questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. Use results to draw simple conclusions and make predictions for new values. Use straightforward scientific evidence to answer questions or to support my findings 	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. 	Is a plant a living thing? How can you prove this? What do living things need to survive? Does this vary from plant to plant? How is water transported within plants? What would happen to plant populations if there wasn't any wind?	photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal, wind dispersal, animal dispersal, water dispersal, roots, stem/trunk, leaves, flowers, plants, growth, air, light, water, nutrients, soil, transported, life cycle, nutrition, stigma, anther, filament, style
	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 animals have skeletons and muscles for support, protections and movement. 	What are the special functions of different parts of the body? Do all animals have a skeleton? Why don't we digest ourselves?	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints, human, food, animals
	Materials <ul style="list-style-type: none"> I can describe different rocks and recognise describe textures Compare and group together different kinds of rocks (including those in the locality) on the basis of 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. 	Are all rocks from volcanoes? What rocks have been used in buildings and how and why have they changed over time? How are fossils formed?	compare, group, rocks, pebble, grain, layers, locality, physical, properties, soils, peat, sandy/chalk/clay soil, hard, soft, marble, chalk, granite, slate, sandstone, texture, absorb water, fossil, formed, appearance, organic, matter, durable, texture, magma, fossilization, decompose
	Forces <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. 	How do things move? Are all metals attracted to magnets? What would happen if we put lots of magnets together? Which part of the magnet has the strongest force? How do you know?	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, compare, surfaces, friction
	Light <ul style="list-style-type: none"> Recognise that light is needed 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 block by a solid object. Find patterns in the way that the size of shadows change. 	At what time of day will you see the longest shadow? Why are some shadows darker than others? Why can't we see in the dark? How is a rainbow formed?	light, light source, dark, reflect, pattern, artificial, natural, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous
	Electricity <ul style="list-style-type: none"> Construct a simple electrical circuit and identify its part. 	Children to independently construct a circuit. How can you use simple equipment to make the bulb light up? Children to draw their own circuit diagrams from observation in preparation for more abstract symbols in Y4. (chn actually drawing a bulb and wires-not symbols)	electrical appliances, on, off, technology
	Earth and Space Explain how we get day and night.	Where does the sun go at night? Link this to light and shadows unit. Observe how the sun at different times of the day affects their shadow, draw around their shadows with chalk and different times of day, but ensure chn know it is the Earth's rotation which is causing the movement, not the sun.	Earth, sun, day, sky, moon, night, planet

Y3 Plants – End Points

1. Observe and describe how seeds and bulbs grow into mature plants.
2. Find out and describe how plants need water, light and suitable temperature to grow and stay healthy.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>Many plants, but not all, have roots, stem/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>Key Vocabulary photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal, roots, stem/trunk, leaves, flowers, plants, growth, air, light, water, nutrients, soil, transported, life cycle, nutrition, stigma, anther, filament, style</p>	<p>Can explain the function of the parts of a flowering plant.</p> <p>Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination.</p> <p>Can give different methods of pollination and seed dispersal, including examples.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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> <p>Classify seeds in a range of ways including by how they are dispersed.</p> <p>Create a new species of flowering plant.</p>	<p>Can explain observations made during investigations.</p> <p>Can look at the features of seeds to decide on their method of dispersal.</p> <p>Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal.</p>

Y3 Animals including humans – End Points

1. 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.
2. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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>Key Vocabulary nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints, human, food, animals</p>	<p>Can name the nutrients found in food.</p> <p>Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients.</p> <p>Can name some bones that make up their skeleton giving examples that support, help them move or provide protection.</p> <p>Can describe how muscles and joints them to move.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Classify food in a range of ways.</p> <p>Use food labels to explore the nutritional content of a range of food items.</p> <p>Use secondary sources to find out the types of food that contain 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 containing 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>Can classify food into those that a high or low in particular nutrients.</p> <p>Can answer their questions about nutrients in food based on their gathered evidence.</p> <p>Can talk about the nutrient content of their daily plan.</p> <p>Use their data to look for patterns (or lack of) when answering their enquiry question.</p> <p>Can give similarities e.g. they all have joints to help the animal move, and differences between skeletons.</p>

Y3 Rocks – End Points

1. Name rocks and describe physical features.
2. Know the components of soils /made of rocks.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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 came covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.</p> <p>Key Vocabulary compare, group, rocks, pebble, grain, layers, locality, physical, properties, soils, peat, sandy/chalk/clay soil, hard, soft, marble, chalk, granite, slate, sandstone, texture, absorb water, fossil, formed, appearance, organic, matter, durable, texture, magma, fossilisation, decompose</p>	<p>Can name some types of rock and give physical features of each.</p> <p>Can explain how a fossil is formed.</p> <p>Can explain that soils are made from rocks and also contain living/dead matter.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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>Research using secondary sources how fossils are formed.</p> <p>Observe soils closely.</p> <p>Classify soils in a range of ways based on their appearance.</p> <p>Devise a test to investigate the water retention of soils.</p> <p>Observe how soil can be separated through sedimentation.</p> <p>Research the work of Mary Anning.</p>	<p>Can classify rocks in a range of different ways using appropriate vocabulary.</p> <p>Can devise tests to explore the properties of rocks and use data to rank the rocks.</p> <p>Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily.</p> <p>Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animations etc.</p> <p>Can identify plant/animal matter and rocks in samples of soil.</p> <p>Can devise a test to explore the water retention of soils.</p>

Y3 Forces and magnets – End Points





1. Compare how things move on different surfaces
2. Notice that some forces need contact between two objects, but magnetic forces can act at a distance.
3. Observe how magnets attract or repel each other and attract some materials and not others.
4. 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.
5. Describe magnets as having two poles.
6. Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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 ow 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. 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 attracts.</p> <p>Key Vocabulary force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshow magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, compare, surfaces, friction</p>	<p>Can give examples of forces in everyday life.</p> <p>Can give examples of objects moving differently on different surfaces.</p> <p>Can name a range of types of magnets and show how the poles attract and repel.</p> <p>Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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 market 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, jumper paper clip up off the table.</p> <p>Devise an investigation to test the strength of magnets.</p>	<p>Can use their results to describe how objects move on different surfaces.</p> <p>Can use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface.</p> <p>Can use classification evidence to identify that some metals but not all, are magnetic.</p> <p>Through their exploration they can show how like poles repel and unlike poles attract and name unmarked poles.</p> <p>Can use test data to rank magnets.</p>

Y3 Light – End Points

1. Recognise that they need light in order to see things and that dark is the absence of light.
2. Notice that light is reflected from surfaces.
3. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.
4. Recognise that shadows are formed when the light from a light source is blocked by a solid object.
5. Find patterns in the way that the size of shadows change.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>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 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.</p> <p>Key Vocabulary light, light source, dark, reflect, pattern, artificial, natural, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p>	<p>Can describe how we see objects in light and can describe dark as the absence of light.</p> <p>Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses</p> <p>Can define transparent, translucent and opaque.</p> <p>Can describe how shadows are formed by objects blocking light.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Explore how different objects are more or less visible in different levels of lighting</p> <p>Explore how objects with different surfaces e.g. shiny vs matt are more or less visible.</p> <p>Explore how shadows vary as the distance between a light source, an object or surface is changed.</p> <p>Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground.</p> <p>Choose suitable materials to make shadow puppets.</p> <p>Create artwork using shadows.</p>	<p>Can describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change.</p> <p>Can clearly explain, giving examples, that objects are not visible in complete darkness.</p> <p>Can describe and demonstrate how shadows are formed by blocking light.</p> <p>Can describe, demonstrate and make predictions about patterns in how shadows vary.</p>

Year 4			
 Working Scientifically	 Explore scientific concepts through the following skills and knowledge...	 Examples of enquiry questions:	Vocabulary:
<ul style="list-style-type: none"> Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests independently. Make systematic and careful observations and take accurate measurements using standard units, and use a range of equipment including thermometers and data loggers. Report on findings, including oral and written explanations, displays or presentations of results and conclusions. Use results to suggest improvements to enquiries and to raise questions. Identify differences, similarities or changes related to simple scientific ideas and process 	Living Things and their Habitats <ul style="list-style-type: none"> Recognise that living things (including those in the locality) 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. Plants <ul style="list-style-type: none"> Group plants into flowering and non-flowering. 	Where does our food come from?	classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, locality, identify, local, dangers, living things, function
	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 human teeth and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. 	What is the effect of different liquids on teeth? What happens to a grape once it is swallowed? Do all animals need teeth? What would happen in a food chain if one of the links became scarce?	digestive system, digestion, mouth, teeth, saliva, esophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain, chewing, crushing, grinding, tearing, biting, ripping, producers, predators, prey, enzymes, hygiene
	Electricity <ul style="list-style-type: none"> Identify common appliances that run on electricity. Construct a simple series circuit, identifying/naming its basic parts, including cell, wire, bulb, switch and buzzer. Identify whether or not a lamp will light in a simple series circuit. 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 I can recognise some insulators and know how they are used in everyday life 	What is electricity? Why is electricity dangerous? What would happen if we did not have electricity? Why are switches needed in a circuit? How can you make your own switch? Which material will act as a switch to complete the circuit?	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, wire, devices, symbols, conventional, precautions, safely, open, close, lamp resistance
	Materials/ States of Matter. <ul style="list-style-type: none"> Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	Is there always the same amount of water on Earth? Why are tyres made of rubber? Where do puddles go? Does gas have weight? Do particles melt?	solid, liquid, gas, state change, melting, freezing, melting point, boiling point, temperature, water cycle, explore, materials, matter, observe, change, heat, cool, measure, Celsius, evaporation, condensation, association, rate, conductor, insulator
	Sound <ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise sounds get fainter as the distance from the sound source increase	How is sound similar to light? What material is best for blocking light? Can you travel faster than sound?	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, travel, medium, features, object, patterns, distance, waves, tone, speed
	Forces <ul style="list-style-type: none"> Introduce gravity is a force and observe how it works through a variety of observations Introduce a Newton meter. 	Which falls faster: a feather or a bowling ball? (video Apollo on moon) Brian Cox video in vacuum dropping bowling ball and feather), explain why this would be different on Earth due to air resistance.	force, push, pull, surfaces, magnitude, direction, gravity, non-contact, investigate, measure, Newton, Newton

Y4 Living things and their habitats – End Points

1. Recognise that living things can be grouped in a variety of ways.
2. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
3. Recognise that environments can change and that this can sometimes pose dangers to living things.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>Living things can be groups (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 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>Key Vocabulary classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate, locality, identify, local, dangers, living things, function</p>	<p>Can name living things living in a range of habitats, giving the key features that helped them to identify them.</p> <p>Can give examples of how an environment may change both naturally and due to human impact.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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 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>Can keep a careful record of living things found in different habitats throughout the year (diagrams, tally charts etc.).</p> <p>Can use classification keys to identify unknown plants and animals.</p> <p>Can present their learning about changes to the environment in different ways e.g. campaign video, persuasive letter.</p>

Y4 Animals including humans – End Points

1. Describe the simple functions of the basic parts of the digestive system in humans.
2. Identify the different types of teeth in humans and their simple functions.
3. Construct and interpret a variety of food chains, identifying producers, predators and prey.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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>Key Vocabulary 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, chewing, crushing, grinding, tearing, biting, ripping, producers, predators, prey, enzymes, hygiene</p>	<p>Can sequence the main parts of the digestive system.</p> <p>Can draw the main parts of the digestive system onto a human outline.</p> <p>Can describe what happens in each part of the digestive system.</p> <p>Can point to the three different types of teeth in their mouth and talk about their shape and what they are used for.</p> <p>Can name producers, predators and prey within a habitat.</p> <p>Can construct food chains.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Research the function of the parts of the digestive system.</p> <p>Create a model of the digestive system 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.</p> <p>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>Can use diagrams or a model to describe the journey of food through the body explaining what happens in each part.</p> <p>Can record the teeth in their mouth (make a dental record).</p> <p>Can explain the role of the different types of teeth.</p> <p>Can explain how the teeth in animal skulls show they are carnivores, herbivores or omnivores.</p> <p>Can create food chains based on research.</p>

Y4 States of matter – End Points

1. Can name properties of solids, liquids, gases.
2. Give everyday examples of freezing and melting.
3. Describe water cycle and give everyday examples of evaporation and condensation.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes its 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 heating to a specific temperature and bubbles of 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. 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 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>Key Vocabulary solid, liquid, gas, state change, melting, freezing, melting point, boiling point, temperature, water cycle, explore, materials, matter, observe, change, heat, cool, measure, Celsius, evaporation, condensation, association, rate, conductor, insulator</p>	<p>Can create a concept map, including arrows linking the key vocabulary.</p> <p>Can name properties of solids, liquids and gases.</p> <p>Can give everyday examples of melting and freezing.</p> <p>Can give everyday examples of evaporation and condensation.</p> <p>Can describe the water cycle.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Observe closely and classify a range of solids.</p> <p>Observe closely and classify a range of liquids. 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 paper towels, liquids in containers.</p> <p>Use secondary sources to find out about the water cycle.</p>	<p>Can give reasons to justify why something is a solid, liquid or gas.</p> <p>Can give examples of things that melt/freeze and how their melting points vary.</p> <p>From their observations, can give the melting points of some materials.</p> <p>Using their data, can explain what affects how quickly a solid melts.</p> <p>Can measure temperatures using a thermometer.</p> <p>Can explain why there is condensation on the inside of the hot water cup but on the outside of the icy water cup.</p> <p>From their data, can explain how to speed up or slow down evaporation.</p> <p>Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet.</p>

Y4 Sound – End Points





1. Identify how sounds are made, associating some of them with something vibrating.
2. Recognise that vibrations from sounds travel through a medium to the ear.
3. Find patterns between the pitch of a sound and features of the object that produced it.
4. Find patterns between the volume of a sound and the strength of the vibrations that produced it.
5. Recognise that sounds get fainter as the distance from the sound source increases.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>A sound source 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 high pitched sounds.</p> <p>Key Vocabulary sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation, travel, medium, features, object, patterns, distance, waves, tone, speed</p>	<p>Can name sound sources and state that sounds are produced by the vibration of the object.</p> <p>Can state that sounds travel through different mediums such as air, water, metal.</p> <p>Can give examples to demonstrate how the pitch of a sound are linked to the features of the object that produced it.</p> <p>Can give examples of how to change the volume of sound e.g. increase the size of vibrations by hitting or blowing harder.</p> <p>Can give examples to demonstrate that sounds get fainter as the distance from the sound source increase.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Classify sound sources.</p> <p>Explore making sounds with a range of objects such as musical instruments and other household objects.</p> <p>Explore how string telephones or ear gongs work.</p> <p>Explore using 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.</p> <p>Measure sounds through different insulation materials.</p>	<p>Can explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear.</p> <p>Can demonstrate how to increase or decrease pitch and volume using musical instruments or other objects.</p> <p>Can use data to identify patterns in pitch and volume.</p> <p>Can explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium.</p>

Y4 Electricity – End Points

1. Identify common appliances that run on electricity.
2. Construct a simple series circuit, identifying/naming its basic parts, including cell, wire, bulb, switch and buzzer.
3. Use their circuits to create simple devices.
4. Draw the circuit as a pictorial representation (not necessarily using conventional circuit symbols) about precautions for working safely with electricity.
5. Identify whether or not a lamp will light in a simple series circuit.
6. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
7. Recognise some common conductors and insulators, and associate metals with being good conductors.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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>Key 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, wire, devices, symbols, conventional, precautions, safely, open, close, lamp, conductor, insulator, resistance</p>	<p>Can name the components in a circuit.</p> <p>Can make electric circuits.</p> <p>Can control a circuit using a switch.</p> <p>Can name some metals that are conductors.</p> <p>Can name materials that are insulators.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Construct a range of circuits.</p> <p>Explore which materials can be used instead of wires to make a circuit.</p> <p>Classify the materials that were suitable/not suitable for wires.</p> <p>Explore how to connect a range of different switches and investigate how they function in different ways.</p> <p>Choose switches to add to circuits to solve particular problems such as a pressure switch for a burglar alarm.</p> <p>Apply their knowledge of conductors and insulators to design and make different types of switch.</p> <p>Make circuits that can be controlled as part of a D&T project.</p>	<p>Can communicate structures of circuits using drawings which show how the components are connected.</p> <p>Use classification evidence to identify that metals are good conductors and non-metals are insulators.</p> <p>Can incorporate a switch into a circuit to turn it on and off.</p> <p>Can connect a range of different switches identifying the parts that are insulators and conductors.</p> <p>Can add a circuit with a switch to a DT project and can demonstrate how it works.</p> <p>Can give reasons for choice of materials for making different parts of a switch.</p> <p>Can describe how their switch works.</p>

Year 5			
Working Scientifically 	 Explore scientific concepts through the following skills and knowledge	 Examples of enquiry questions:	Vocabulary:
<ul style="list-style-type: none"> • Work as part of a team to plan enquiries to answer questions, including recognising and controlling variables. • Take measurements, using a range of equipment, with precision, taking repeat readings when appropriate. • Record data and results using scientific diagrams and labels, classification keys, tables, bar and line graphs. • Use test results to make predictions to set up further comparative and fair tests. • Report and present findings, including conclusions, casual relationships and agree of trust, in oral and written forms. 	Living things and their Habitats <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. • Raise questions about their local environment throughout the year. • Find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. 	How is the life cycle of the butterfly like a human's life cycle? What would happen if one of the parts of the flower was missing? How does a strawberry reproduce? Which animal has the longest gestation period? Why do you think that?	life cycles, mammal, amphibian, insect, bird, reproduction, plants, animals, environment, naturalists, behaviourists, sexual/asexual reproduction, sexual, sperm, fertilises, egg, humans, old age, timeline, growth, puberty, stigma, anther, filament, style, embryo, metamorphosis, live young, runners, bulbs, cuttings
	Animals including Humans  <ul style="list-style-type: none"> • Describe the changes as humans develop to old age. • Draw a timeline to indicate stages in the growth and development of humans. • Learn about the changes experienced in puberty. 		
	Earth and Space <ul style="list-style-type: none"> • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. • Learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. (Pluto was reclassified as a 'dwarf planet' in 2006). • Understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). 	If you are watching a ship sail away, what do you observe? What does that tell you about the shape of the Earth? Why do we have a leap year? Can we still see some sunlight at night? How? Why did people used to think the Earth was flat?	Earth, sun, solar system, planets, movement, spherical body, moon, rotation, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, dwarf planet, celestial, orbits, axis, hemisphere, diameter, rotates, star
	Materials <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. • Explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognizing that melting and dissolving are different processes. • Explore changes that are difficult to reverse, for example, burning, rusting and other reactions for example, vinegar with bicarbonate of soda. 	Can you see gravity? What would happen if there wasn't any gravity on Earth? Why do aeroplanes stay in the sky?	compare, materials, properties, hardness, solubility, transparency, conductivity (electrical and thermal), magnets, dissolve, liquid, solution, substance, solid, gas, separate, filtering, sieving, evaporating, fair, comparative, mixing, reversible, irreversible, changes of state, formation, melting, processes
	Forces <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. • Can identify the effects of air resistance, water resistance and friction that act between moving surfaces. • Can recognize that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. • Can explore the effects of air resistance by observing how different objects such as parachutes • Can explore the effects of friction on movement and find out how it slows or stops moving objects. • Can find out how scientists, for example, Isaac Newton. 	Which shape parachute should I choose?	gravity, objects, air resistance, water resistance, surfaces, friction, push, pull, force, Earth, mechanisms, lever, pulley, gear, simple machines Newton, Newton meter, Isaac Newton, gravitation, theory, unbalanced
	Light and Sound <ul style="list-style-type: none"> • Draw scientific diagrams (labelled with correct vocab) to show how an object can reflect light. • Can draw a scientific diagram to support my explanation. • Identify the function of transparency, translucency and opaqueness and how they are used in everyday life (with examples) 	Can you light a fire by reflecting light?	reflect, light, diagram, light, colour, function, transparency, translucent, opaque, iris, cornea, pupil, optic, nerve
	Electricity <ul style="list-style-type: none"> • Recognise symbols in complex circuits. Understand what a circuit breaker is. Link in with DT Projects on a Page – 'complex switches' - program a crumble	How many ways can you make the bulb brighter?	symbols, circuits, conduct, circuit, breaker, voltage crumble, monitoring, control, tilt, switch, complex switches

Y5 Living things and their habitats – End Points

1. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
2. Describe the life process of reproduction in some plants and animals.
3. Raise questions about their local environment throughout the year.
4. Find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.
5. Find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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 change before coming 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>Key Vocabulary life cycles, mammal, amphibian, insect, bird, reproduction, plants, animals, environment, naturalists, behaviourists, sexual/asexual reproduction, sexual, sperm, fertilises, egg, humans, old age, timeline, growth, puberty, stigma, anther, filament, style, embryo, metamorphosis, live young, runners, bulbs, cuttings</p>	<p>Can draw the life cycle of a range of animals identifying similarities and differences between the life cycles.</p> <p>Can explain the difference between sexual and asexual reproduction and give examples of how plants reproduce in both ways.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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>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>Can present their understanding of the life cycle of a range of animals in different ways e.g. drama, pictorially, chronological reports, creating a game.</p> <p>Can identify patterns in life cycles.</p> <p>Can compare two or more animal life cycles studied.</p> <p>Can explain how a range of plants reproduce asexually.</p>

Y5 Animals including Humans – End Points

1. Describe the changes as humans develop to old age.
2. Draw a timeline to indicate stages in the growth and development of humans.
3. Learn about the changes experienced in puberty.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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. Useful guidance can be obtained at: http://www.ase.org.uk/news/aseviews/teaching-about-puberty/ http://www.ase.org.uk/documents/2016-joint-statement-on-reproduction/ </p> <p>Key Vocabulary puberty: the vocabulary to describe sexual characteristics</p>	<p>Can explain the changes that take place in boys and girls during puberty. Can explain how a boy changes physically as it grows and also what it is able to do.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	This unit is likely to be taught through direct instruction due to its sensitive nature.	

Y5 Properties and changes of materials – End Points

1. 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.
2. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
3. Use knowledge of solids, liquids, gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
4. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
5. Demonstrate that dissolving, mixing and changes of state are reversible changes.
6. 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.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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. 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> <p>Key Vocabulary compare, materials, properties, hardness, solubility, transparency, conductivity (electrical and thermal), magnets, dissolve, liquid, solution, substance, solid, gas, separate, filtering, sieving, evaporating, fair, comparative, mixing, reversible, irreversible, changes of state, formation, melting, processes</p>	<p>Can use understanding of properties to explain everyday uses of materials. For example, how bricks, wood, glass and metals are used in buildings. Can explain what dissolving means, giving examples. Can name equipment used for filtering and sieving. Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving. Can describe some simple reversible and non-reversible changes to materials, giving examples.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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. Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate. Investigate rates of dissolving by carrying out comparative and fair test. Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture. Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning. 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? Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).</p>	<p>Can create a chart or table grouping/comparing everyday materials by different properties. Can use test evidence gathered about different properties to suggest an appropriate material for a particular purpose. Can group solids based on their observations when mixing them with water. Can give reasons for choice of equipment and methods to separate a given solution or mixture such as salt or sand in water Can explain the results from their investigations involving dissolving and non-reversible change.</p>

Y5 Earth and space – End Points





1. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
2. Describe the movement of the Moon relative to the Earth.
3. Describe the Sun, Earth and Moon as approximately spherical bodies.
4. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
5. Learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006).
6. Understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones).

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>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 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 (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>Key Vocabulary Earth, Sun, solar system, planets, movement, spherical body, moon, rotation, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, dwarf planet, celestial, orbits, axis, hemisphere, diameter, rotates, star</p>	<p>Can create a voice over for a video clip or animation.</p> <p>Can show using diagrams the movement of the Earth and Moon.</p> <p>Can explain the movement of the Earth and Moon.</p> <p>Can show using diagrams the rotation of the Earth and how this causes day and night.</p> <p>Can explain what causes day and night.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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 changed 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>Can use the model to explain how the Earth moves in relation to the Sun and the Moon moves in relation to the Earth.</p> <p>Can demonstrate and explain verbally how day and night occur.</p> <p>Can explain evidence gathered about the position of shadows in term of the movement of the Earth. Can show this using a model.</p> <p>Can explain how a sundial works.</p> <p>Can explain verbally using a model why we have time zones.</p> <p>Can describe the arguments and evidence used by scientists in the past.</p>

Y5 Forces – End Points

1. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
2. Can identify the effects of air resistance, water resistance and friction that act between moving surfaces.
3. Can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
4. Can explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall.
5. Can explore the effects of friction on movement and find out how it slows or stops moving objects.
6. Can find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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. 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> <p>Key Vocabulary gravity, objects, air resistance, water resistance, surfaces, friction, push, pull, force, Earth, mechanisms, lever, pulley, gear, simple machines</p>	<p>Can demonstrate the effect of gravity acting on an unsupported object.</p> <p>Can give examples of friction, water resistance and air resistance.</p> <p>Can give examples of when it is beneficial to have high or low friction, water resistance and air resistance.</p> <p>Can demonstrate how pulleys, levers and gears work.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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 used gravity to move the ball.</p> <p>Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.</p>	<p>Can explain the results of their investigations in terms of the force, showing a good understanding that as the object tries to move through the water or air or across the surface, the particles in the water, air or on the surface slow it down.</p> <p>Can demonstrate clearly the effects of using levers, pulleys and gears.</p>

Year 6			
Working Scientifically 	 Explore scientific concepts through the following skills and knowledge...	 Examples of enquiry questions:	Vocabulary:
<ul style="list-style-type: none"> Plan more sophisticated scientific enquiries to answer questions, including recognising and controlling variables. Justify my choices of data collection method and number of observations and measurements. Choose the most appropriate method to record data and results of increasing complexity. Identify scientific evidence that has been used to support or refute ideas or arguments. 	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. Know that broad groupings, such as micro-organisms, plants and animals can be subdivided. Classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals) I know microorganism's may be beneficial or harmful. Find out about significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. 	How are animals similar and how are they different? Why do reptiles and birds lay eggs? How did Carl Linnaeus influence the world? How do mammals in the water survive? Can we have 'good' bacteria? How does bacteria spread? How do micro-organisms help in the environment? How does blood travel through your body? Is the circulatory system the same in all animals? What do you think would happen if you didn't have a heart? Is blood red? Is Reuben being healthy if he takes some vitamins to give him more strength? What would the body look like without any water?	vertebrates, fish, amphibians, micro-organisms, subdivided, invertebrates, reptiles, arthropods, birds, mammals, invertebrates, insects, classification, spiders, snails, worms, Carl Linnaeus, classification, flowering, non-flowering
	Animals including Humans <ul style="list-style-type: none"> Identify and name the main parts of the 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. Learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. Can describe the ways in which nutrients and water are transported within humans. Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. 		heart, pulse, rate, pumps, function, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, substance, drugs, lifestyle
	Evolution and Inheritance <ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring, 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. 	How did Darwin influence the world? How old is a fossil? How do you know? Why do you think fossils have changed over time? If a person like Usain Bolt had a daughter – would she be fast as well? Why? Is adaptation immediate or does it take time? Why did living things change over time?	offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils, evolution, adaptation, inhabited, Earth
	Electricity <ul style="list-style-type: none"> Associate the brightness of a lamp or the volume of a buzzer with the number of 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. Recognise symbols when representing a simple circuit in a diagram. Construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. Learn how to represent a simple circuit in a diagram using recognized symbols. 	What is electricity and how can you describe its movement in a circuit? What are the benefits of a parallel rather than series circuit? If you put a second battery in a simple circuit, how will it affect the volume of a buzzer? How can I control a buzzer and a bulb in a circuit separately?	circuit, complete circuit, energy, variations, components, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, conductor, insulator, switch, voltage
	Light <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 object that cast them. 	What is light? Can light travel round corners? How could you prove or disprove your answer? How would life be different in a world without man made light? How does a mirror work? Can you explain why if you hold a pen in your right hand, your reflection will hold the pen in your left?	light, straight lines, dark, light source, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, light rays, objects, reflect, refraction, travels, shadows, periscope, phenomena, rainbow, filter
	Earth and Space <ul style="list-style-type: none"> Explain the phases of the moon. Explain how and why the moon appears to change shape over 28 days. 	Why does the moon appear to change over 28 days? What is a moon phase?	moon phase, shape, crescent, waning, waxing, eclipse, full/half-moon, astrology, planets, gravity
	Forces <ul style="list-style-type: none"> Understand the effects of forces in context and know that some mechanisms allow a smaller force to have a greater effect (levers, pulleys and gears). Link to D&T Project on a Page and Natural Disasters Geography. Explore the effects of water resistance, buoyancy and friction in context. (link to Natural disasters) 	How did the (famous ship) sink? What effects do forces have in our world?	forces, mechanisms, lever, pulley, gear, air/water resistance, friction, gravity, push, pull, buoyancy

Y6 Living things and their habitats– End Points

1. 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.
2. Give reasons for classifying plants and animals based on specific characteristics.
3. Know that broad groupings, such as micro-organisms, plants and animals can be subdivided.
4. Classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds, and mammals).
5. Find out about significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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 – 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>Key Vocabulary vertebrates, fish, amphibians, micro-organisms, subdivided, invertebrates, reptiles, arthropods, birds, mammals, invertebrates, insects, spiders, snails, worms, classification, Carl Linnaeus, flowering, non-flowering</p>	<p>Can give examples of animals in the five vertebrate groups and some of the invertebrate groups.</p> <p>Can give the key characteristics of the five vertebrate groups and some invertebrate groups.</p> <p>Can compare the characteristics of animals in different groups.</p> <p>Can give examples of flowering and non-flowering plants.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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 observations 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 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>	<p>Can use classification materials to identify unknown plants and animals.</p> <p>Can create classification keys for plants and animals.</p> <p>Can give a number of characteristics that explain why an animal belongs to a particular group.</p>

Y6 Animals including humans – End Points

1. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
2. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
3. Describe the ways in which nutrients and water are transported within animals, including humans.
4. Explore questions to understand how the circulatory system enables the body to function.
5. Learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.
6. Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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> <p>Key Vocabulary heart, pulse, rate, pumps, function, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, substance, drugs, lifestyle</p>	<p>Can draw a diagram of the circulatory system and label the parts and annotate it to show what the parts do.</p> <p>Produces a piece of writing that demonstrates the key knowledge e.g. explanation text, job description of the heart.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Create a role play model for the circulatory system.</p> <p>Carry out a range or pulse rate 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 the 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 the direct instruction due to its sensitive nature.</p>	<p>Use the role play model to explain the main parts of the circulatory system and their role.</p> <p>Can use subject knowledge about the heart whilst writing conclusions for investigations.</p> <p>Can explain both the positive and negative effects of diet, exercise, drugs and lifestyle on the body.</p> <p>Present information e.g. in a health leaflet describing impact of drugs and lifestyle on the body.</p>

Y6 Evolution and inheritance – End Points

1. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
2. Recognise that living produce offspring vary and are not identical to their parents.
3. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<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 onto 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 years 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> <p>Key Vocabulary offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils evolution, adaptation, inhabited, Earth</p>	<p>Can explain the process of evolution.</p> <p>Can give examples of how plants and animals are suited to an environment.</p> <p>Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth.</p> <p>Give examples of living things that lived millions of years ago and the fossil evidence we have to support this.</p> <p>Can give examples of fossil evidence that can be used to support the theory of evolution.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<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>	<p>Can identify characteristics that will make a plant or animal suited or not suited to a particular habitat.</p> <p>Can link the patterns seen in the model to the real examples.</p> <p>Can explain why the dominant colour of the peppered moth changed over a very short period of time.</p>

Y6 Light – End Points

1. Recognise that light appears to travel in straight lines.
2. 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.
3. 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.
4. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
5. Work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.
6. Look at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>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.</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.</p> <p>Key Vocabulary light, straight lines, dark, light source, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, light rays, objects, reflect, refraction, travels, shadows, periscope, phenomena, rainbow, filter</p>	<p>Can describe with diagrams or models as appropriate how light travels in straight lines either from sources or reflected from other objects into our eyes.</p> <p>Can describe with diagrams or models as appropriate how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Explore different ways to demonstrate that light travels in straight lines e.g. shining a light down a bent and straight hose pipe, shining a torch through different shaped holes in card.</p> <p>Explore the uses of the behaviour of light, reflection and shadows such as in periscope design, rear view mirrors and shadow puppets.</p>	<p>Can explain how evidence from enquiries shows that light travels in straight lines.</p> <p>Can predict and explain with diagrams or models as appropriate how the path of light rays can be directed by reflection to be seen, for example reflection in car rear view mirrors or in a periscope.</p> <p>Can predict and explain with diagrams or models as appropriate how the shape of shadows can be varied.</p>

Y6 Electricity– End Points

1. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
2. 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.
3. Recognise symbols when representing a simple circuit in a diagram.
4. Construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.
5. Learn how to represent a simple circuit in a diagram using recognised symbols.

Assessment Guidance	Key learning – what children must know, do and remember?	Possible evidence to demonstrate working at the Expected Standard
Shows understanding of a concept using scientific vocabulary correctly	<p>Adding more cells to complete a circuit will make a bulb brighter, a motor spins 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>Key Vocabulary circuit, complete circuit, energy, variations, components, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, conductor, insulator, 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>Can make electric circuits and demonstrate how variation in the working of particular components, such as the brightness of bulbs can be changed by increasing or decreasing the number of cells or using cells of different voltages.</p> <p>Can draw circuit diagrams of a range of simple series circuits using recognised symbols.</p>
Applying knowledge in familiar related contexts, including a range of enquiries	<p>Explain how a circuit operates to achieve particular operations, such as control the light for a torch with different brightness's or make a motor go faster or slower.</p> <p>Make circuits to solve particular problems such as a quiet and a loud burglar alarm.</p> <p>Carry out fair tests exploring changes in circuits.</p> <p>Make circuits that can be controlled as part of a D&T project.</p>	<p>Can incorporate a switch into a circuit to turn it on and off.</p> <p>Can change cells and components in a circuit to achieve a specific effect.</p> <p>Can communicate structures of circuits using circuit diagrams with recognised symbols.</p> <p>Can devise ways to measure brightness of bulbs, speed of motors, and volume of a buzzer during a fair test.</p> <p>Can predict results and answer questions by drawing on evidence gathered.</p>