



Curriculum Overview for Science

Nursery	Humans Changing Materials	Sound Electricity	Changing Materials	Animal Life Cycles	Light and Dark Plants	Forces
	Season Awareness					
Reception	Humans	Animals, excluding humans Living things and their habitats Seasonal Changes	Sound Light	Life Cycles Plants	Changing Materials	Forces Animals, Excluding humans
	Seasonal Exploration					
Year 1	Animals including humans			Everyday materials		
	Seasonal Changes & Plants					
Year 2	Animals, including humans		Uses of Everyday materials		Living things & their habitats	
	Plants					
Year 3	Forces & Magnets	Animals, including humans	Rocks	Plants	Light	
Year 4	Living Things & their habitats	Animals, including humans	States of matter	Sound	Electricity	
Year 5	Earth & space	Forces	Properties & changes of materials	Living things & their habitats	Animals, including humans	
Year 6	Light	Electricity	Living things & their habitats	Evolution & inheritance	Animals, including humans	

Early Years

Educational Programmes (Statutory)	<p>Understanding the World</p> <p>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.</p>
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Characteristics of Effective Learning

Playing and Exploring	Active Learning	Creating and Thinking Critically
Children investigate and experience things, and ‘have a go’	Children concentrate and keep on trying if they encounter difficulties, and enjoy achievements	Children have and develop their own ideas, make links between ideas, and develop strategies for doing things

Nursery (Non-statutory Development Matters)	<p>3-4 year olds will be learning to:</p> <p>Understand the key features of the life cycle of a plant and an animal.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Begin to make sense of their own life-story and family’s history.</p> <p>Understand the key features of the life cycle of a plant and an animal.</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore collections of materials with similar and/or different properties.</p> <p>Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Plant seeds and care for growing plants.</p> <p>Talk about the differences between materials and changes they notice.</p> <p>Explore how things work.</p>
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Knowledge and Skills

	What adults might do to encourage scientific enquiry	Common Misconceptions	Possible Evidence	Vocabulary
Animals excluding Humans	<p>Observing over time</p> <p>How does the ... change over time?</p> <p>Researching using secondary sources</p> <p>Find out more about the life cycles of the animals observed.</p> <p>Classification</p> <p>Match animals and their young.</p>	<p>Some children may think:</p> <p>all animals lay eggs</p> <p>the young animal is fully formed inside an egg and just waiting to hatch</p>	<p>Can name and describe animals they have encountered.</p> <p>Can talk about how they cared for the eggs/animals.</p> <p>Can describe how the animals changed over time.</p>	<p>egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young, fur, feathers, scales, tail, wings, beak, claws, paws, hooves,</p>

		<p>the young animal is fully formed inside an egg and just grows until it is big enough to hatch</p> <p>animals are assembled from body parts within the egg</p> <p>all animal young are just small versions of the adult and get bigger</p> <p>animals such as cows and hens “make” milk and lay eggs for us [humans]</p> <p>humans are not animals.</p>	<p>Can match animals to their young and name them.</p>	<p>swim, walk, run, jump, jump, fly, patterns, spots, stripes</p> <p>Expose children to supplementary vocabulary such as:</p> <p>life cycle, mane, webbed feet</p>
Humans	<p><i>Classification</i></p> <p>Sort images of humans according to their age.</p> <p>Sort using different senses. Which do you like/not like?</p> <p>Observing over time</p> <p>How does a baby change over time?</p> <p>Research using secondary sources</p> <p>Find out about the human life-cycle from an expectant mother, parent with a baby and elderly person.</p>	<p>Some children may think: babies are in a mummy’s stomach.</p>	<p>Can talk about how they have changed since they were babies.</p> <p>Can describe humans at different ages/life stages.</p> <p>Can talk about how they look after themselves and compare this to how a baby is looked after.</p> <p>Can compare smells, sounds, tastes and textures.</p> <p>Can talk about what they see when using a magnifying glass or an app on a tablet.</p> <p>Can talk about how they use their senses when exploring the world around them and natural objects.</p>	<p>grow, change, baby, toddler, child, adult, old person, smell, taste, touch, feel, hear, see, blind, deaf</p> <p>Expose children to supplementary vocabulary such as:</p> <p>life cycle, senses, elderly, die (if appropriate)</p>
Living things and their habitats	<p><i>Classification</i></p> <p>Find and identify natural objects to include in the collection.</p> <p>Which natural objects are from plants, animals or neither?</p>	<p>Some children may think: shells are only found at the beach</p> <p>feathers are from dead birds.</p>	<p>Can name and describe objects in the collection, including patterns they notice on them.</p> <p>Can group similar objects together.</p> <p>Can draw natural objects, including some patterns observed on them.</p> <p>Can identify natural objects that have come from plants and animals.</p> <p>Children do not damage the living things they encounter in the natural environment.</p> <p>Children show care and encourage others to care for things they encounter in the natural environment.</p>	<p>Model and encourage children to use vocabulary such as:</p> <p>natural, plant, animal, leaves, seeds, conkers, acorns, twigs, bark, shells, feathers, pebbles, stones, same, different, pattern</p> <p>Expose children to supplementary vocabulary such as:</p> <p>living, dead, similar</p>
Materials, including	<p><i>Classification</i></p> <p>Sort materials using simple properties.</p>	<p>Some children may think that: a material is better to use because it is ‘bigger’ not thicker, rigid etc.</p>	<p>Can name the material they are using.</p>	<p>Model and encourage children to use vocabulary such as:</p>

<p>changing materials</p>	<p><i>Observing over time</i> How does the cake mixture change? How does chocolate change when heated? How does fruit juice change when put in the freezer? How does fruit change when blended?</p>	<p>the material is 'box' not cardboard.</p>	<p>Can talk about one property of a material. Can talk about ingredients for recipes. Can talk about how mixtures change when ingredients are added. Can talk about how materials change when cooked. Can talk about how materials change when heated. Can talk about how materials change when frozen.</p>	<p>mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric Expose children to supplementary vocabulary such as: solid, liquid, rigid, stronger, weaker</p>
<p>Electricity</p>	<p><i>Classification</i> Identify objects that use electricity to work. Identify devices that use batteries and/or mains electricity.</p>	<p>Some children may think: all batteries can be recharged rechargeable devices do not have batteries.</p>	<p>Can identify devices that use batteries. Can identify devices that use mains electricity. Can switch battery-powered devices on and off. Can describe what electrical devices do.</p>	<p>Model and encourage children to use vocabulary such as: battery, plug, socket, electricity, wire, sound, light, move Expose children to supplementary vocabulary such as: mains electricity, device, appliance, electrical</p>
<p>Light</p>	<p><i>Comparative testing</i> Compare the shape of shadows made by different objects. <i>Classification</i> Which objects/materials make dark shadows? <i>Observing over time</i> How does a toy's shadow change during the day? <i>Researching using secondary sources</i> Find out about shadows.</p>	<p>Some children may think: shadows are only caused by the Sun all shadows are black.</p>	<p>Can point out shadows in the playground. Can explain when shadows can be seen in the playground. Can talk about how shadows changes during the day. Can identify the light source and the object making a shadow. Can identify shadows that are dark and pale.</p>	<p>Model and encourage children to use vocabulary such as: Sun, sunny, light, shadow, shady, clouds, torch, see-through, non-see-through, source, light source Expose children to supplementary vocabulary such as: casting a shadow, pale, dark, transparent, opaque</p>
<p>Forces</p>	<p><i>Comparative testing</i> Compare the path of different wind-up toys. Compare how far different wind-up toys move. Compare the speed and direction of gears. Compare how easy or hard it is to lift an object with or without a pulley. Compare how easy it is to ride a scooter or bike on different surfaces.</p>	<p>Some children may think: big objects sink heavy objects sink an object such as an ice cube which is partially submerged is floating and sinking at the same time.</p>	<p>Can identify objects that float and sink. Can identify objects whose shape can be changed and talk about how they changed their shape. Can describe what they feel when exploring magnets. Can describe what they feel and see when pushing, pulling, bending and twisting objects e.g. springs, elastics, wind-up toys, gears, pulleys etc.</p>	<p>Model and encourage children to use vocabulary such as: object, float, sink, water, up, down, top, bottom, push, pull, magnet, spring, squash, bend, twist, stretch, turn, spin, smooth, rough, fast, slow Expose children to supplementary vocabulary such as: rising, falling, attract, repel, faster, slower, pulley, gear, elastic</p>

	<p><i>Classification</i> Sort objects according to whether they float or sink. Sort objects/materials according to whether their shape can be changed.</p>		Can describe what they feel when riding bikes and scooters on different surfaces and ramps.	
Sound	<p><i>Comparative testing</i> Compare the sound produced by shakers made with different materials. Compare the sound produced by different drums. Compare the sound produced by different elastic bands on their 'guitar'.</p>	Some children may think: for a sound to be heard the listener has to actively concentrate on it first sounds travel only to someone who is listening for them sounds cannot go through obstacles volume and pitch are the same thing not all sounds are caused by vibrations.	Can make sounds using a range of objects. Can recognise and describe the sounds made by different objects.	Model and encourage children to use vocabulary such as: sound, noise, loud, quiet, high, low, music, bang, blow, pluck, soft, hard, fast, slow, names of instruments Expose children to supplementary vocabulary such as: musician, notes, vibrate, vibration, pitch, rhythm, pulse, volume
Reception (Non-statutory Development Matters)	<p>Reception children will be learning to:</p> <p>Understanding the World Recognise some environments that are different to the one in which they live. Talk about members of their immediate family and community. Name and describe people who are familiar to them. Draw information from a simple map. Explore the natural world around them. Describe what they see, hear and feel whilst outside. Explore the natural world around them. Understand the effect of changing seasons on the natural world around them.</p> <p>Personal, Social and Emotional Development</p> <ul style="list-style-type: none"> • See themselves as a valuable individual. • Manage their own needs. <p>Physical Development</p> <ul style="list-style-type: none"> • Know and talk about the different factors that support their overall health and wellbeing: regular physical activity; healthy eating; tooth brushing; sensible amounts of 'screen time'; having a good sleep routine; being a safe pedestrian. • Further develop the skills they need to manage the school day successfully: lining up and queuing; mealtimes; personal hygiene. <p>Mathematics</p> <ul style="list-style-type: none"> • Compare length, weight and capacity. 			
Knowledge and Skills				
	What adults might do to encourage scientific enquiry	Common Misconceptions	Possible Evidence	Vocabulary
Animals, excluding humans	<p><i>Classification</i> Sort animals according to where they live. <i>Researching using secondary sources</i> Learn how animals from a different habitat are cared for.</p>	Some children may think: animals are furry and have four legs a bee is not an animal because it is an insect	Can name and describe animals that live in different habitats. Can describe different habitats. Can talk about animals that are active at night.	Model and encourage children to use vocabulary such as: names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice

	<p>Learn about animals in a different habitat. Find out about nocturnal animals.</p>	<p>animals adapt to their surroundings, e.g. a brown bear turns white and becomes a polar bear animals living in the soil breathe by coming to the surface dragons and other mythical creatures are real animals.</p>		<p>Expose children to supplementary vocabulary such as: environment, polar regions, ocean, camouflage</p>
Humans	<p><i>Classification</i> Sort images of people according to their characteristics. <i>Researching using secondary sources</i> Find out information from visitors (dentist, nurse etc.). <i>Pattern seeking</i> Are taller children faster? Are taller children stronger?</p>	<p>Some children may think: sons look like their fathers and daughters look like their mothers.</p>	<p>Can describe themselves, family, friends and community. Can create pictures of themselves, family, friends and community and identify their distinguishing features. Can talk about what they see when using a mirror. Can compare hand, foot and fingerprints and talk about how they are different. Can talk about how they look after themselves and how other people look after them.</p>	<p>Model and encourage children to use vocabulary such as: hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman Expose children to supplementary vocabulary such as: bald, elderly, wrinkles, male, female, freckles</p>
Living things and their habitats	<p><i>Classification</i> Name and describe plants and animals they find in the school grounds. <i>Pattern seeking</i> Look for minibeasts in different areas of the school grounds. Look for plants in different areas of the school grounds.</p>	<p>Some children may think: trees are not plants trees are not living as they do not seem to change or grow weeds are bad plants.</p>	<p>Can name and describe plants and animals in the school grounds and their environment. Can talk about how another environment is different to their surrounding natural environment. Children do not damage the living things they encounter in the natural environment.</p>	<p>Model and encourage children to use vocabulary such as: plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment e.g. beach, forest Expose children to supplementary vocabulary such as: environment</p>
Plants	<p><i>Observing over time</i> How does a plant change as it grows? What happens to fruit, vegetables and flowers when left over time? <i>Researching using secondary sources</i> Look at seed and bulb packets to learn how to plant and care for them.</p>	<p>Some children may think: trees are not plants there is a young plant inside a seed or bulb bulbs are big seeds big plants grow from big seeds and big bulbs fruit and vegetables come from the supermarket plants grow at night or when we are not watching them.</p>	<p>Can describe some differences between seeds and bulbs. Can identify seeds and bulbs. Can talk about how they planted and cared for seeds and bulbs. Can explain that a seed or bulb grew into a plant and then died. Children do not damage the living things they encounter in the natural environment.</p>	<p>Model and encourage children to use vocabulary such as: plant, leaf, stem, trunk, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil Expose children to supplementary vocabulary such as:</p>

			Children show care and encourage others to care for things they encounter in the natural environment.	seedling, healthy, unhealthy, strong, sturdy, wilting, decay, mould, life cycle
Seasonal changes	<p><i>Classification</i> Which clothes are suitable for each season?</p> <p><i>Observing over time</i> How does a puddle change over time? How does a snowman change as it melts? How does the natural world change with the seasons?</p> <p><i>Researching using secondary sources</i> Find out about how animals behave in different seasons. Find out about the weather and seasons.</p>	<p>Some children may think: it always snows in winter it is always hot in the summer all babies and young animals are born in spring plants only have flowers in the spring and summer animals sleep during winter it rains to help the plants grow when it is hotter, it is because the Sun is closer God controls the weather.</p>	<p>Can talk about different types of weather. Can talk about the four seasons. Can talk about the living things they see in the playground and on visits during each season.</p>	<p>Model and encourage children to use vocabulary such as: spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers Expose children to supplementary vocabulary such as: hibernate, migrate, snowflake</p>
Materials, including changing materials	<p><i>Comparative testing</i> How does popcorn made in a microwave compare to popcorn made on a fire? How quickly do ice cubes melt in different areas of the playground?</p> <p><i>Observing over time</i> How does the block of ice change over time? How does a snowman change over time? How does cake mixture/bread dough change as it is cooked?</p>	<p>Some children may think: material only means fabric all plastic/wood etc. is the same.</p>	<p>Can name the material they are using and why. Can talk about multiple properties of the material and why it is suited for its purpose. Can observe changes in their natural world and say why it is different now or will change in the future. Can compare and describe how materials change over time and in different conditions.</p>	<p>Model and encourage children to use vocabulary such as: ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back Expose children to supplementary vocabulary such as: solid, liquid, gas, most suited</p>
Light	<p><i>Comparative testing</i> Compare how bright different light sources are. Compare how reflective different materials are.</p> <p><i>Classification</i> Which fabrics are reflective to help us be seen at night? Which materials block light to help us protect ourselves from the Sun?</p>	<p>Some children may think: light is only found in bright places shiny objects are light sources the moon is a light source.</p>	<p>Can name different light sources. Can describe and compare the brightness of light sources. Can identify reflective and non-reflective materials. Can identify materials that block light. Can spot their own reflection in objects.</p>	<p>Model and encourage children to use vocabulary such as: light, torch, bulb, lamp, spotlight, shiny, bright, brighter, brightest, Sun, shine, glow, mirror Expose children to supplementary vocabulary such as: light source, reflective, non-reflective, dim, dimmer, dimmest</p>

<p>Forces</p>	<p><i>Comparative testing</i> Compare how cars move down ramps/gutters. Compare how wheels turn when sand or water is poured through. Compare how different balls bounce. Compare how different paper aeroplanes fly.</p>	<p>Some children may think: all light objects float and all heavy objects sink objects made of the same material will always float or sink.</p>	<p>Can talk about how they changed objects to make them float or sink. Can talk about how they changed how cars move down ramps or gutters. Can talk about how they changed how wheels turn when sand or water is poured through them. Can talk about how they changed how balls bounce. Can compare how different boats and aeroplanes performed. Can describe how objects fall with and without a parachute. Can describe how a marble moves through different liquids.</p>	<p>Model and encourage children to use vocabulary such as: float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce Expose children to supplementary vocabulary such as: force, solid, liquid,</p>
<p>Sound</p>	<p><i>Comparative testing</i> How does rain sound different when it lands in different containers? <i>Observing over time</i> Listen to the siren of an emergency vehicle as it approaches and moves away.</p>	<p>Some children may think: sounds do not travel through solids and liquids.</p>	<p>Can describe sounds they hear. Can identify the source of sounds. Can describe how they make sounds.</p>	<p>Model and encourage children to use vocabulary such as: sound, noise, listen, hear, music, voices, bird song, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar Expose children to supplementary vocabulary such as: source, crescendo, vibration, pitch</p>
<p>Early Learning Goals (ELG) -END of Reception</p>	<p>ELG: 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.</p>			

<p>YEAR 1 & 2 working scientifically</p>	<p>Type of Enquiry observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information</p> <p>Plan (P) ask simple questions and recognising that they can be answered in different ways</p> <p>Do (D) observe closely, using simple equipment perform simple tests identify and classify</p> <p>Record (R) gather and record data to help in answering questions</p> <p>Review (RV) use their observations and ideas to suggest answers to questions</p>			
<p>Year 1</p> <p>NC and additional skills and knowledge</p>	<p>Animals including Humans</p> <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p>Key Learning The children need to be able to name and identify a range of animals in each</p>	<p>Everyday Materials</p> <p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p>Key Learning 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</p>	<p>Plants (Forest School)</p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>identify and describe the basic structure of a variety of common flowering plants, including trees</p> <p>Key Learning Growing locally, there will be a vast array of plants which all have specific names. These can be identified by looking at the key characteristics of the plant. Plants have common parts, but they vary between the different types of plants. Some trees keep their leaves all year while other trees drop their leaves during autumn and grow them again during spring.</p> <p>Common misconceptions</p>	<p>Seasonal Changes (Forest School)</p> <p>Observe changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p> <p>Key Learning In the UK, the day length is longest at mid-summer (about 16 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again. The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside;</p>

	<p>group e.g. name specific birds and fish.</p> <p>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 animals, not just meat.</p> <p>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>Common misconceptions only four-legged mammals, such as pets, are animals humans are not animals insects are not animals all 'bugs' or 'creepy crawlies', such as spiders, are part of the insect group amphibians and reptiles are the same.</p>	<p>etc. Some materials e.g. plastic can be in different forms with very different properties.</p> <p>Common misconceptions Some children may think: only fabrics are materials only building materials are materials only writing materials are materials the word 'rock' describes an object rather than a material 'solid' is another word for hard.</p>	<p>Some children may think: plants are flowering plants grown in pots with coloured petals and leaves and a stem trees are not plants all leaves are green all stems are green a trunk is not a stem blossom is not a flower.</p>	<p>seed and plant growth; leaves on trees; and type of clothes worn by people.</p> <p>Common misconceptions Some children may think: it always snows in winter it is always sunny in the summer there are only flowers in spring and summer it rains most in the winter.</p>
<p>Destination questions</p>	<p>Recap: Last time you learnt about animals was in Reception. Can you name some parts of your body?</p> <p>What are the names of these animals? (<i>Pictures provided must include common fish, amphibian, reptile, bird and mammal</i>)</p> <p>What are the key features of these (named) animals? What do these animals eat? How could you sort these animals? Which part of your body is associated with each of your senses? What can our different senses do?</p> <p>Next steps: Next time you learn about animals will be in year 2. What features of animals have you learnt this year?</p>	<p>Recap: Last time you learnt about materials was in Reception. Can you remember any ways to describe materials?</p> <p>What are these objects made from? What are the properties of the different materials? How would you compare and sort the items? (based on properties) What is the best material for a puppy's bedding? (absorbent /non-absorbent) (investigation - 2 sessions)</p> <p>Next steps: Next time you learn about materials will be in year 2. What properties of materials have you learnt this year?</p>		
	<p>NB: Seasonal Changes & Plants – these DQs are addressed throughout the year within the Forest School setting</p> <p>Recap: Last time you learnt about seasons was in Reception. Can you remember the names of the different seasons?</p> <p>What are the four seasons and when in the year do they occur? (Metrological seasons are to be taught) Spring – Mar/Apr/May Summer – Jun/Jul/Aug Autumn – Sept/Oct/Nov Winter – Dec/Jan/Feb</p>			

	<p>When are the days longer – Summer or Winter? What trees and plants did you see at Forest School? What are the key features of the trees and plants you see at forest school? How is (chosen plant/tree) different from that (chosen plant/tree)? Which trees lost their leaves and which kept them the whole year? What are the names of the parts of a plant? Point to them. Can you sort and group parts of plants using similarities and differences? How does the apple trees change over the year? What weather did we have in Autumn/Winter/Spring/Summer?</p> <p><i>Next steps: Next time you learn about living things and their habitats will be in year 2. What things have you found that change in different seasons?</i></p>			
Vocabulary	Head, body, eyes, ears , mouth, tongue, nose , teeth, leg, tail, wing , claw, fin, scales, feathers, fur, beak, paws, hooves	object, material, wood, plastic, glass, metal, water, rock , brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through		
	<p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Names of trees in School Grounds: Oak, Silver Birch, Beech, Holly, Apple Hazel Names of garden and wild flowering plants in the local area School Grounds: Daisy, Dandelion, Buttercup, fungi, Geranium Clover, lavender Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length</p>			
Year 2	Animals, including humans	Everyday materials	Plants	Living things and their habitats
NC and additional skills and knowledge	<p>Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>Key Learning Animals, including humans, have offspring which grow into adults. In humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects, there may be eggs laid that hatch to young or other stages which then grow to adults. The young of some animals do not look like their parents e.g. tadpoles. All animals, including humans, have the basic needs of feeding, drinking</p>	<p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Key Learning 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</p>	<p>Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Key Learning Plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.</p> <p>Common misconceptions</p>	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</p> <p>Key Learning 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</p>

	<p>and breathing that must be satisfied in order to survive. To grow into healthy adults, they also need the right amounts and types of food and exercise.</p> <p>Good hygiene is also important in preventing infections and illnesses.</p> <p>Common Misconceptions</p> <p>Some children may think: an animal’s habitat is like its ‘home’ all animals that live in the sea are fish respiration is breathing breathing is respiration.</p>	<p>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>Common Misconceptions</p> <p>Some children may think: only fabrics are materials only building materials are materials only writing materials are materials the word rock describes an object rather than a material solid is another word for hard.</p>	<p>Some children may think: plants are not alive as they cannot be seen to move seeds are not alive all plants start out as seeds seeds and bulbs need sunlight to germinate.</p>	<p>and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers (This is a simplification, but appropriate for Year 2 children.)</p> <p>An object made of wood is classed as dead. Objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels).</p> <p>Animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants – shelter, food and water.</p> <p>Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves. These micro-habitats have different conditions e.g. light or dark, damp or dry. These conditions affect which plants and animals live there. 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>Common Misconceptions</p> <p>Some children may think: an animal’s habitat is like its ‘home’ plants and seeds are not alive as they cannot be seen to move fire is living arrows in a food chain mean ‘eats’.</p>
<p>Destination questions</p>	<p>Recap: Last time you learnt about animals including humans was in year 1 what animals can you remember?</p>	<p>Recap: Last time you learnt about materials was in year 1. Can you tell me the properties of wood, plastic, glass, metal, water,?</p>	<p>Recap: Last time you learnt about plants was in year 1. Can you remember the names of any of the parts of plants?</p>	<p>Recap: Last time you learnt about living things and their habitats was in year 1. Can you remember how things change in the different seasons of the year? (e.g weather, plants)</p>

	<p>What do animals, including humans, need to survive? What foods should you have to stay healthy? Why is it important to exercise? How do animals change over a period of time? (e.g. chicks, caterpillars, a baby) What questions would you ask a parent about how they look after their baby? Why should you wash your hands?</p> <p><i>Next steps: Next time you learn about animals including humans will be in year 3. What have you learnt about keeping healthy?</i></p>	<p>What is wood used for and why? How flexible are plastics? How well can you change the shapes of some solid objects? (squashing, bending, twisting and stretching.) Which material is best for letting in light? (glass, metal, brick, rock, paper and cardboard)</p> <p><i>Next steps: Next time you learn about materials will be in year 3. What properties of materials do you know now?</i></p>	<p>What are different seeds like and how can we sort them? What do bulbs need so that they can grow healthily? (NB should NOT be conducting a fair test or predicting what they think will happen at KS1.) Do all seeds germinate in the same way? Do seeds need water so that they can grow? What type of temperature do plants need so that they can grow? Do plants need light so that they can grow?</p> <p><i>Next steps: Next time you learn about plants will be in year 3. What different conditions have you found that plants grow well in?</i></p>	<p>How many different living things can we find? What are different habitats like? Do habitats change during a year? Why would an animal live in that habitat? Which animals are camouflaged to blend in their habitats? Does the number of animals found in a habitat change? How do plants and animals depend on each other? Who eats what in a food chain? (note common misconceptions)</p> <p><i>Next steps: Next time you learn about living things and their habitats will be in year 4. What features did you observe about animals and plants?</i></p>
Vocabulary	<p>Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples - meat, fish, vegetables, bread, rice, pasta)</p>	<p>Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape (verb: give a particular shape or form to), push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>	<p>As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy</p>	<p>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed Names of local habitats e.g. pond, woodland etc. Names of micro-habitats e.g. under logs, in bushes etc.</p>
Year 3 & 4 working scientifically	<p>Type of Enquiry (T) observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information</p> <p>Plan (P) ask relevant questions and using different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests</p> <p>Do (D) make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers</p> <p>Record (R) gather, record, classify and present data in a variety of ways to help in answering questions</p>			

record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Review (RV)

report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
 use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
 identify differences, similarities or changes related to simple scientific ideas and processes
 use straightforward scientific evidence to answer questions or to support their findings

Year 3 National Curriculum and additional skills and knowledge	Forces & Magnets Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. Key Learning A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing	Animals, including humans Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food – they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. Key Learning Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support. Common Misconceptions	Rocks Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. Key Learning Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered	Plants 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. Key Learning Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable	Light Recognise that they need light in order to see things, and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. Key Learning We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing
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	<p>these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.</p> <p>Common Misconceptions Some children may think: the bigger the magnet the stronger it is all metals are magnetic.</p>		<p>and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.</p> <p>Common Misconceptions Some children may think: rocks are all hard in nature rock-like, man-made substances such as concrete or brick are rocks materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer ‘natural’ certain found artefacts, like old bits of pottery or coins, are fossils a fossil is an actual piece of the extinct animal or plant soil and compost are the same thing.</p>	<p>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>Common Misconceptions Some children may think: plants eat food food comes from the soil via the roots flowers are merely decorative rather than a vital part of the life cycle in reproduction plants only need sunlight to keep them warm roots suck in water which is then sucked up the stem.</p>	<p>sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface.</p> <p>Common Misconceptions Some children may think: we can still see even where there is an absence of any light our eyes ‘get used to’ the dark the moon and reflective surfaces are light sources a transparent object is a light source shadows contain details of the object, such as facial features on their own shadow shadows result from objects giving off darkness.</p>
<p>Destination questions</p>	<p>Recap: Last time you learnt about forces was in reception. Can you remember how different cars move down ramps?</p> <p>How does the type of surface on the table affect the speed of the object travelling on it? What are magnets used for and which materials are attracted to magnets? Which magnet is the strongest? Which materials can magnets attract through?</p>	<p>Recap: Last time you learnt about animals including humans was in year 2. What can you remember about different types of food?</p> <p>How do living things get their food? Why do animals need to eat different foods? Which food do animals need in order to survive? What are the functions of a skeleton? What is the function of muscles?</p>	<p>Recap: Do you remember learning about Mary Anning in History last year. Why might she be linked to our topic on rocks?</p> <p>How were rocks formed? Which rock is the most permeable? How hard are different rocks? How are fossils made? How can you tell which types of soil you have? How can you separate the different parts that make up a soil? How much water do different soils absorb?</p>	<p>Recap: Last time you learnt about plants was in year 2. Can you name a plant that grows from a bulb/seed?</p> <p>Does the number of roots affect the amount of water that is absorbed? What happens to the leaves of plants when their roots are placed in dye? How can we prove that stems transport water? What happens when we deprive the leaf from light? What affect do nutrients have on the plant?</p>	<p>Recap: Last time you learnt about light was in reception. Can you remember any different sources of light?</p> <p>What do you need to be able to see and where can shadows be found? Which is the darkest shadow? How can you change the size of a shadow? How does the angle at which the light source shines on an object affect the length of shadow of that object? How does the length and place of a shadow change?</p>

	<p>How could you make a compass? What have poles got to do with magnets?</p> <p>Next steps: Next time you learn about forces will be in year 5. What forces have you learnt about this year?</p>	<p>Do people with the longest legs jump the furthest?</p> <p>Next steps: Next time you learn about animals including humans will be in year 4. What can you tell me about he move?</p>	<p>How can the way the farmer uses the field affect how much water is absorbed by the soil?</p> <p>Next steps: Next time you learn about materials will be in year 4. Can you give me a key fact about materials?</p>	<p>What do the parts in a flower do?</p> <p>Next steps: The next time you learn about plants will be in year 5 (living things and their habitats). What have you learnt about the life cycle of a plant?</p>	<p>Next steps: Next time you learn about light will be in year 6. What can you tell me about shadows that might be important to remember?</p>
Vocabulary	<p>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</p>	<p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine</p>	<p>Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil</p>	<p>Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)</p>	<p>Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p>
Year 4 National Curriculum and additional skills and knowledge	<p>Living Things & their habitats Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. Key Learning Living things can be grouped (classified) in different ways according to their features. Classification keys can be used to identify and name living things.</p>	<p>Animals, including humans Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. Key Learning 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</p>	<p>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 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. Key Learning A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but</p>	<p>Sound Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. Key Learning A sound produces vibrations which travel through a medium from the source to</p>	<p>Electricity Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators,</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>Common Misconceptions Some children may think: the death of one of the parts of a food chain or web has no or limited consequences on the rest of the chain there is always plenty of food for wild animals animals are only land-living creatures animals and plants can adapt to their habitats, however they change all changes to habitats are negative.</p>	<p>churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet. Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).</p> <p>Common Misconceptions Some children may think: arrows in a food chains mean 'eats' the death of one of the parts of a food chain or web has no, or limited, consequences on the rest of the chain there is always plenty of food for wild animals your stomach is where your belly button is food is digested only in the stomach when you have a meal, your food goes down one tube and your drink down another the food you eat becomes "poo" and the drink becomes "wee".</p>	<p>changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid. Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling. 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</p>	<p>our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound. The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.</p> <p>Common Misconceptions Pitch and volume are frequently confused, as both can be described as high or low. Some children may think: sound is only heard by the listener sound only travels in one direction from the source sound can't travel through solids and liquids high sounds are loud and low sounds are quiet</p>	<p>and associate metals with being good conductors.</p> <p>Key Learning Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off. Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators except for graphite (pencil lead). Water, if not completely pure, also conducts electricity.</p> <p>N.B. Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.</p> <p>Common Misconceptions Some children may think: electricity flows to bulbs, not through them electricity flows out of both ends of a battery electricity works by simply coming out of one end of a battery into the component.</p>
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<p>Destination questions</p>	<p>Recap: Last time you learnt about living things and their habitats was in year 2. Can you remember the habitats you learnt about and what lived in them?</p>	<p>Recap: Last time you learnt about animals including humans was in year 3. What can you remember about the skeletons of different animals?</p> <p>What producers, predators and prey live in (a chosen</p>	<p>Recap: Last time you learnt about materials was in year 3. Can you remember how you tested the water retention of soil?</p> <p>Are these solids, liquids or gases?</p>	<p>Recap: Last time you learnt about sound was in Reception. Can you remember how sounds are made?</p> <p>How are sounds made?</p>	<p>Recap: Last time you learnt about electricity was in Reception. Can you name something that uses electricity?</p> <p>What appliances run on electricity? (this should be</p>

	<p>How can we classify different animals? How are the animals suited to where they live? Can you use the flowers/leaves to identify the name of the plant/ tree? How do you use a classification key to identify a plant/tree? What would a classification key for (these) land invertebrates look like? How could you identify the trees in our school grounds? How does a change in the environment affect the things that live there? What changes have affected environments throughout the world?</p> <p><i>Next steps: Next time you learn about classification (living things and their habitats) will be in year 6. What ways have you learnt of classifying plants and animals?</i></p>	<p><i>habitat</i>) and what do they eat? What are the functions of different types of teeth? What are the teeth like for herbivores, carnivores and omnivores? What is the function of each part of the digestive system? How does food move through the human body?</p> <p><i>Next steps: Next time you learn about animals including humans will be in year 5. What have you learnt about how humans eat food?</i></p>	<p>What are solids, liquids and gases like? What happens when solids are heated? Do all liquids freeze? What happens when water is heated? What is the water cycle?</p> <p><i>Next steps: Next time you learn about materials will be in year 5. What have you learnt this year that you think will be important to remember?</i></p>	<p>How do sounds travel? (including through different mediums) What happens when you get further away from the source of a sound? How can you change the loudness of a sound? How can you change the pitch of a sound?</p> <p><i>Next steps: Next time you learn about sound will be in KS3. What do you know about how sounds travel through different mediums?</i></p>	<p><i>done as a starter - not a whole lesson</i> What are these electrical components? How would you put the components together to make a simple circuit? Which circuits will work? How can you repair the ones that do not work? How does a switch affect the lighting of the lamp? Which of these materials conduct electricity and which are insulators?</p> <p><i>Next steps: Next time you learn about electricity will be in year 6. What have you learnt about insulators and conductors?</i></p>
Vocabulary	<p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p>	<p>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</p>	<p>Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p>	<p>Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p>	<p>Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol</p>
Year 5 & 6 working scientifically	<p>Type of Enquiry observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information</p> <p>Plan (P)</p>				

	<p>plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>Do (D) take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>Record (R) record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Review (RV) use test results to make predictions to set up further comparative and fair tests report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identify scientific evidence that has been used to support or refute ideas or arguments</p>				
<p>Year 5</p> <p>National Curriculum and additional skills and knowledge</p>	<p>Earth & space 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. Key Learning 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 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun,</p>	<p>Forces Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Key Learning A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.</p>	<p>Properties & changes of materials 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</p>	<p>Living things & their habitats 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. Key Learning 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 osprey or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.</p>	<p>Animals, including humans Describe the changes as humans develop to old age. Key Learning When babies are young, they grow rapidly. They are very dependent on their parents. As they develop, they learn many skills. At puberty, a child's body changes and develops primary and secondary sexual characteristics. This enables the adult to reproduce. This needs to be taught alongside PSHE. Common Misconceptions Some children may think: a baby grows in a mother's tummy a baby is "made".</p>

	<p>Earth and Moon are approximately spherical.</p> <p>Common Misconceptions Some children may think: the Earth is flat the Sun is a planet the Sun rotates around the Earth the Sun moves across the sky during the day the Sun rises in the morning and sets in the evening the Moon appears only at night night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.</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>Common Misconceptions Some children may think: the heavier the object the faster it falls, because it has more gravity acting on it forces always act in pairs which are equal and opposite smooth surfaces have no friction objects always travel better on smooth surfaces a moving object has a force which is pushing it forwards and it stops when the pushing force wears out a non-moving object has no forces acting on it heavy objects sink and light objects float.</p>	<p>reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p> <p>Key Learning 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>Common Misconceptions Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible.</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>Common Misconceptions Some children may think: all plants start out as seeds all plants have flowers plants that grow from bulbs do not have seeds only birds lay eggs.</p>	
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<p>Destination questions</p>	<p>Recap:</p> <p>How do the planets in our solar system move in relation to the Sun? How can we prove the shape of the Earth, Sun and Moon? How does the shape of the Moon appear to change over time? How do we have day and night on planet Earth? How does the length of shadows change over day?</p> <p>Next steps: Next time you learn about Earth and Space will be in KS3. What have you learnt about day and night in relation to how the Earth moves?</p>	<p>Recap: Last time you learnt about forces was in year 3. What can you remember about how objects move on different surfaces?</p> <p>What effect does gravity have on an unsupported object? How does surface area affect the amount of air resistance? How does friction affect the movement of an object? How does the shape of an object affect how it moves through water? T - use test results to make predictions to set up further fair-tests. How do pulleys, levers and gears work, and what do they do?</p> <p>Next steps: Next time you learn about forces will be in KS3. What have you learnt about how forces can affect the movement of objects?</p>	<p>Recap: Last time you learnt about materials was in year 4. Can you remember the differences between a solid, liquid and gas?</p> <p>Which materials are soluble in water and how would you recover a substance from a solution? How would you group materials according to their properties? How would you investigate the hardness of materials? How many different ways can mixtures be separated? Why are these objects made from particular materials? Which material is best at conducting heat? What effect will an insulator (coat) have on a person and an ice man? Which metals are the best conductors of electricity?</p>	<p>Recap: Last time you learnt about animals including humans was in year 4. Can you name part of the human body involved in digestion?</p> <p>Plant plants for asexual reproduction at beginning of topic (alliums - bulb, dahlia - tuber, spider plant - runner (borrow from someone?)) What are the stages of a mammal's life cycle? What is the relationship between a mammal's size and its gestation period? What are the stages of an amphibian's life cycle? What are the stages of an insect's life cycle? What are the stages of a bird's life cycle? (Osprey link to live webcam!) What are the similarities and differences in the life cycles of a mammal, an amphibian, an insect and a bird?</p>	<p>Recap: Last time you learnt about how babies are different to adults was in year 2. What can you remember about the ways that they change?</p> <p>How do humans change as they age? What changes take place during puberty for boys and girls?</p> <p>Next steps: Next time you learn about science related to puberty will be in KS3.</p>

			<p>Which changes can be reversed? What happens when we mix bicarbonate of soda with vinegar? What happens to a material when it burns? What affects how quickly carbon dioxide is created in the reaction between a vitamin tablet and water?</p> <p>How would you compare and group these materials based on their properties and the investigations carried out? (hardness, solubility, transparency, electrical and thermal conductivity, response to magnets)</p> <p><i>Next steps: Next time you learn about materials will be in KS3. What have you learnt so far that you think will be important?</i></p>	<p>How does sexual reproduction take place in plants? How does asexual reproduction take place in plants? (<i>tubers - dahlia, plantlets - cactus, runner - spider plant</i>)</p> <p><i>Next steps: Next time you learn about living things and their habitats will be in year 6. What ways of grouping plants have you learnt about this year?</i></p>	
Vocabulary	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings	Puberty – the vocabulary to describe sexual characteristics
Year 6 National Curriculum and additional skills and knowledge	<p>Light 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.</p>	<p>Electricity Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function,</p>	<p>Living things & their habitats Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including</p>	<p>Evolution & inheritance Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same</p>	<p>Animals, including humans Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle</p>

	<p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Key Learning Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.</p> <p>Common Misconceptions Some children may think: we see objects because light travels from our eyes to the object.</p>	<p>including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram.</p> <p>Key Learning Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well. You can use recognised circuit symbols to draw simple circuit diagrams.</p> <p>Common Misconceptions Some children may think: larger-sized batteries make bulbs brighter a complete circuit uses up electricity components in a circuit that are closer to the battery get more electricity.</p>	<p>micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.</p> <p>Key Learning Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot. Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.</p> <p>Common Misconceptions Some children may think: all micro-organisms are harmful mushrooms are plants.</p>	<p>kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>Key Learning All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution. Fossils give us evidence of what lived on the Earth millions of year ago and</p>	<p>on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Key Learning The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins.</p> <p>Common Misconceptions Some children may think: your heart is on the left side of your chest</p>
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				<p>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>Common Misconceptions Some children may think: adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life offspring most resemble their parents of the same sex, so that sons look like fathers all characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills, can be inherited cavemen and dinosaurs were alive at the same time.</p>	<p>the heart makes blood the blood travels in one loop from the heart to the lungs and around the body when we exercise, our heart beats faster to work the muscles more some blood in our bodies is blue and some blood is red we just eat food for energy all fat is bad for you all dairy is good for you protein is good for you, so you can eat as much as you want foods only contain fat if you can see it all drugs are bad for you.</p>
<p>Destination questions</p>	<p>Recap: Last time you learnt about light was in year 3. What can you remember about how shadows are formed and changed?</p> <p>How does light travel? How do we see objects? What makes shadows the shape that they are? How can we show how we see things in a mirror? How can the detective see over the wall?</p>	<p>Recap: Last time you learn about electricity was in year 4. What components of circuits can you remember?</p> <p>What are the recognised symbols for drawing components in a circuit? How does voltage affect the brightness of a bulb? How can the position of a switch change what it does? What affects the volume of a buzzer in a circuit? – (1st lesson) controlling variables, (2nd lesson)</p>	<p>Recap: Last time you learnt about classification was in year 4. What can you remember about how to classify animals?</p> <p>How can you classify animals? (including vertebrates and invertebrates – this may take more than 1 lesson) How can you classify plants? How can you classify microorganisms? What is the classification system used by Carl Linnaeus and why is it important?</p>	<p>Recap: Last time you learnt about fossils (living things and their habitats) was in year 3. Can you remember how fossils are formed?</p> <p>How do we know about living things that have lived in the past? (fossils) Are all siblings of living things identical? How are birds suited to survive in the habitat in which they live?</p>	<p>Recap: Last time you learnt about keeping healthy (animals including humans) was in year 3. Can you remember what we need to do to eat healthily?</p> <p>What are the main parts of the circulatory system? What is the function of the heart? What happens to the rate at which our hearts beat when we perform different exercises? What is the</p>

	<i>Next steps: Next time you learn about light will be in KS3. What do you think will be important to remember?</i>	<i>Next steps: Next time you learn about electricity will be in KS3. What have you learnt about how circuits work?</i>	<i>Next steps: Next time you learn about living things and their habitats will be in KS3. What do you know now about classifying animals?</i>	How are plants suited to, and adapted to their environment? What is evolution? (e.g. Alfred Russel Wallace, Charles Darwin, Mary Anning, Richard Owen) <i>Next steps: Next time you learn about evolution will be in KS3. What have you learnt about evolution that may support your learning?</i>	function of blood and blood vessels? What effects can drugs have on the body? What are the benefits of a healthy lifestyle? <i>Next steps: Next time you learn about animals including humans will be in KS3. What 3 things can you do to keep yourself healthy?</i>
Vocabulary	As for Year 3 - Light, plus straight lines, light rays	Circuit , complete circuit, circuit diagram, circuit symbol, cell/battery, bulb, buzzer, motor, switch , voltage N.B. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words “cells” and “batteries” are now used interchangeably.	Vertebrates , fish, amphibians, reptiles, birds, mammals, invertebrates , insects, spiders, snails, worms, flowering, non-flowering	Offspring , sexual reproduction, vary, characteristics , suited, adapted, environment, inherited , species, fossils	Heart , pulse, rate, pumps, blood, blood vessels , transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs , lifestyle

Further points in relation to Relations and Sex Education:

Animal, including humans is also taught through the schools RSE curriculum (The Christopher Winters Project). See PSHE curriculum planner

Y1	identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense
Y2	Notice that animals, including humans, have offspring which grow into adults.
Y5	Describe the life process of reproduction in some plants and animals. Describe the changes as humans develop to old age.
Y6	recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents