

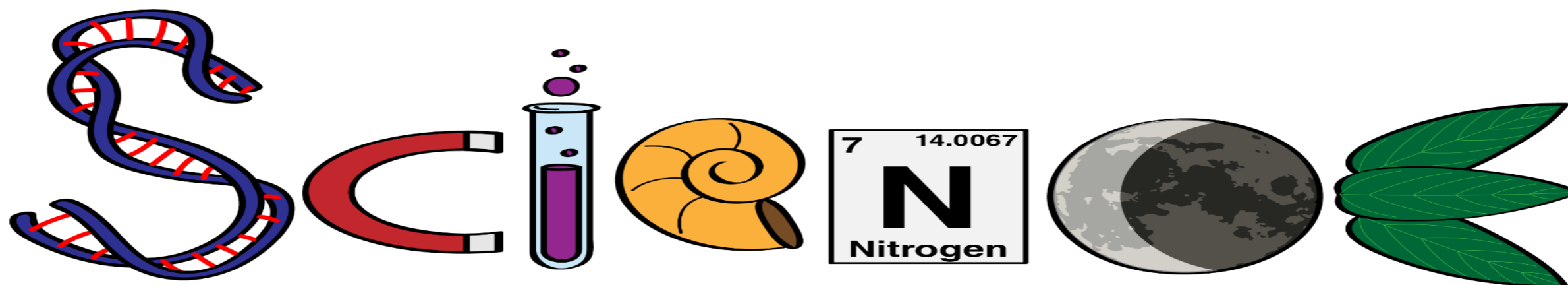


Barham Primary School



Science

Curriculum Overview



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery Development matters	<p>Children get used to their new environment, indoors and outdoors.</p> <p>We talk about changes in routine and changes in our own life as we grow from babies to toddlers to children coming to Nursery.</p> <p>Children explore a range of natural materials, eg sand, water and mud.</p> <p>Children learn about looking after ourselves, going to the toilet and washing our hands, eating fruit and drinking milk and water.</p>	<p>Visit from the Dental Nurse, children learn about brushing our teeth and thinking about the food that we eat.</p> <p>We observe the changes in weather such as falling of leaves and how their colour changed.</p> <p>Children learn about sound, animal sounds, environmental sounds, voice, body percussion, instruments, loud, quiet and sounds made in different ways.</p> <p>We observe changes in weather and explore ice, how to make ice and melting.</p>	<p>We look at the butterfly lifecycle. (live caterpillars ordered for April after half term)</p> <p>Children learn about healthy and unhealthy food. They taste fruits as well as other food, using words sweet and sour. Children wash hands before preparing to cut or peel fruit to make fruit kebabs. We talk about how important it is to drink water, that we need water.</p> <p>Children plant seeds and bulbs in the garden, take out the weeds and remember to water their plants.</p>	<p>Children learn about the features of an elephant, his tusks, trunk, rough skin, how many legs he has, as well as where he lives and what he eats.</p> <p>We look at other jungle animals, naming and identifying where they live.</p> <p>Children learn to sort by habitat. We talk about same and different.</p> <p>Children explore change in materials as we make toast.</p> <p>We observe changes in weather as the buds and blossom start to grow.</p>	<p>Children will use observational skills to search for treasure outdoors, sorting and talking about what they have found.</p> <p>We will identify some common birds and trees.</p> <p>Children will watch the process of eggs hatching into ducklings, we will explore the lifecycle of ducks, where they live, what they need to survive.</p>	<p>Children will learn about growth, how we have changed and what we have learnt to do since starting Nursery.</p> <p>Science will be explored through their interests as well as the topics touched on in the book, eg, space, weather and planting.</p>
Reception Development matters Early learning goals	<p>Autumn 1 - Humans</p> <p>Key concept: Systems Global Goal: 4 Quality education</p> <ul style="list-style-type: none"> Children talk about members of their immediate family and community. They look at examples from real life and from books, name and describe people who are familiar to them. Children talk about people that they may have come across within their community, such as delivery and shop staff, hairdressers, the police, the fire service, nurses, doctors and teachers. 	<p>Seasonal changes (Understanding the world) Taught throughout the year.</p> <p>Key concept: Nature Global Goal: 13 climate action</p> <ul style="list-style-type: none"> Children understand the effect of changing seasons on the natural world around them. Opportunities are provided for children to note and record the weather. Selected texts talk about the changing seasons and throughout the year, children go outside and 	<p>Earth and Space Key concept: System Global Goal: 4 Quality education</p> <ul style="list-style-type: none"> Images, video clips, shared texts and other resources bring the wider world into the classroom. Children describe things they see using a wide vocabulary and comment on images of familiar situations in the past. Observing that the Sun appears to move across the sky Observing that it is warmer and brighter when the Sun is shining than when it is behind the clouds Observing that they can see the Moon at night and sometimes in the day 	<p>Spring 2 - Living Things Key concept: Nature Global Goal: 13 climate action</p> <ul style="list-style-type: none"> Children explore the natural world around them and have frequent opportunities for outdoor play and exploration such as Forest School and seasonal walks. They sing songs and join in with rhymes and poems about the natural world. After close observation, they draw pictures of the natural world, including animals and plants and name and describe some plants and 	<p>Summer 1 – Materials (changing state of matters) Key concept: Matter and energy Global Goal: 4 Quality education</p> <p>Children observe and interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water.</p> <p>Common Misconception</p> <p>Some children may think: • light goes through all materials</p>	<p>Summer 2 - The 5 Senses Key concept: Systems Global Goal: 4 Quality education</p> <ul style="list-style-type: none"> Children describe what they see, hear and feel whilst outside and are encouraged to do focused observation of the natural world. They describe and comment on things they have seen whilst outside, including plants and animals. Children take supported risks, appropriate to themselves and the environment within which they are in <p>Common Misconception</p> <p>There are only 2 senses</p>

	<p>Common Misconception</p> <p>Some children may think: • sons look like their fathers and daughters look like their mothers.</p>	<p>attend Forest School to observe the natural world and how animals behave differently as the seasons change.</p> <p>Common Misconception</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>	<ul style="list-style-type: none"> Observing that they can only see the stars at night <p>Common Misconception</p> <p>Some children may think: • the Earth is flat • the Moon and Sun are discs • stars are a pointed 'star' shape • the Moon appears only at night • at night, the Sun is turned off • at night, the Sun goes behind the clouds.</p>	<p>animals children are likely to see.</p> <p>Common Misconception</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>		
Year 1	<p>My body Key concept: Systems Global Goal:3 Health and well-being</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes. <p>Working scientifically ideas: Compare two people by taking measurements of parts of their body.</p>	<p>Animals & Humans Key concept: Systems Global Goal: 3 Health and well-being</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals 	<p>Seasonal changes. Revisited throughout the year. Key concept: Nature Global Goal: 13 Climate action</p> <p>Pupils should be taught to:</p> <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 <p>Working scientifically ideas: Collect information about the weather regularly throughout the year.</p> <p>Present this information in tables and charts to compare the weather across the seasons</p> <p>Present this information in different ways to compare the seasons.</p>	<p>Everyday Materials Key concepts: Matter and energy Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties <p>Working scientifically ideas</p>	<p>Plants Key concept: Nature Global Goal: 13 climate action</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees <p>Working scientifically ideas: Classify leaves, seeds, flowers etc. using a range of characteristics.</p> <p>Make observations of how plants change over a period of time. Use Ipads to take photographs of plants throughout seasons. Comparing and contrasting familiar plants</p> <p>Common misconceptions 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>Look for patterns between people e.g. Do people with big hands have big feet?</p> <p>Investigate human senses e.g. 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>	<p>(fish, amphibians, reptiles, birds and mammals including pets)</p> <p>Working scientifically ideas:</p> <p>Compare animals using videos and photos.</p> <p>Grouping animals according to what they eat. Can present data in pictograms/tally charts</p> <p>Common Misconceptions:</p> <p>Some children may think:</p> <ul style="list-style-type: none"> • 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>Common misconceptions</p> <p>Some children may think:</p> <ul style="list-style-type: none"> • 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>Classify objects made of one material in different ways e.g. a group of object 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 party hats made of different papers, stiffness of paper plates, and waterproofness of shelters.</p> <p>Common misconceptions</p> <p>Some children may think:</p> <ul style="list-style-type: none"> • 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. Apply 	
Year 2	<p>Animals including Humans Key concept: Systems Global Goal: 3 Good health and Well-being</p> <p>EXPERIMENT: EXERCISE – HEART RATE</p> <p>Pupils should be taught to:</p> <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 	<p>Everyday materials. Key concept – Matter and energy Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <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, 	<p>Living things and Habitats Key concepts: Nature and Evolution</p> <p>Global Goal: Climate action</p> <p>Explore one Tree Hill different microhabitats and minibeasts.</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • 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>Plants</p> <p>Key concept: Nature Global Goal: 13 Climate action</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy • introduced to the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants. <p>Working Scientifically ideas:</p> <p>Set up a comparative test to show that plants need light and water to stay healthy.</p> <p>Observe similar plants at different stages of growth</p> <p>Common Misconceptions</p> <p>Some children may think:</p> <ul style="list-style-type: none"> • plants are not alive as they cannot be seen to move

	<p>Working scientifically ideas: Observing through videos how different animals grow Classify foods in range of different ways Parent questionnaire with questions about how to look after a baby</p> <p>Common misconceptions 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>bending, twisting and stretching</p> <p>Working Scientifically ideas: Sorting and classifying materials</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>Children recognise 'biggest and smallest', 'best and worst' etc. from their data.</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>Working scientifically ideas:</p> <p>Sorting and classifying living things</p> <p>Recording their findings on charts</p> <p>Construct simple food chains that include humans</p> <p>Describe conditions in different habitats and microhabitats</p> <p>Common misconceptions 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>seeds are not alive • all plants start out as seeds • seeds and bulbs need sunlight to germinate</p>		
Year 3	<p>Animals including Humans</p> <p>Key concepts – Systems and Energy</p> <p>Global Goal: 3 Good health and Well-being</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify that animal, including humans, need the right types and amount of nutrition, and that they cannot make their 	<p>Animals including humans</p> <p>Key concepts: Systems and Evolution</p> <p>Global Goal: 3 Good health and Well-being</p> <ul style="list-style-type: none"> identify that humans and some other animals have skeletons and muscles for support, protection and movement 	<p>Rocks & Soil (Soils, fossils, rocks)</p> <p>Key concepts: Nature, matter and energy</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties 	<p>Plants</p> <p>(Check prior knowledge of plants from year 2)</p> <p>Key concepts: Nature</p> <p>Global Goal: 13 Climate action</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 	<p>Magnets & Forces</p> <p>Key concepts: Matter and energy</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> compare how things move on different surfaces notice that some forces need contact between 2 objects, but magnetic forces can act at a distance 	<p>Light</p> <p>Key concepts: Matter and energy</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> Recognise that they need light in order to see things and that dark is the absence of light. notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes

	<p>own food; they get nutrition from what they eat</p> <ul style="list-style-type: none"> • know what a balanced diet is and why it is important. • identify a model for a balanced diet (Food pyramids, Food group plate) • identify different food groups and their impact on the human body <p>Working Scientifically ideas Researching – looking at different food packages and identifying the nutritional value Design meals on what they have discovered Compare and contrast diets of different animals</p> <p>Common misconceptions Some children may think: • certain whole food groups like fats are ‘bad’ for you • certain specific foods, like cheese are also ‘bad’ for you • diet and fruit drinks are ‘good’ for you • snakes are similar to worms, so they must also be invertebrates • invertebrates have no form of skeleton.</p>	<ul style="list-style-type: none"> • identify the main purpose of a skeleton and explain what parts do (skull, ribs and pelvis) • identify how are muscles help us to move (biceps, triceps, quads and hamstrings) <p>Working Scientifically ideas Activity- record the sizes of different bones and compare between animals Identifying and grouping animals with and without skeletons and observing and comparing their movements</p>	<ul style="list-style-type: none"> • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter • explore rocks and soils in our local area <p>Working Scientifically ideas Observe different soils and explain why they are different Identifying the uses of different rocks based on their properties (e.g Use of marble, granite etc...)</p> <p>Separating rocks based on their properties and identifying the three different types of rocks (Igneous, metamorphic and sedimentary) Raise and answer questions about the way soils are formed</p> <p>Classifying rock according to whether they have grains or crystals</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>	<ul style="list-style-type: none"> • 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 <p>Working Scientifically ideas</p> <ul style="list-style-type: none"> • Comparing effect of different factors on plant growth e.g light, fertiliser • Observe how water is transported up different plants • Patterns in structure of fruits that relate to seed dispersal <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>	<ul style="list-style-type: none"> • 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 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing <p>Working Scientifically ideas Devise an investigation to test the strength of magnets. 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. Identify ways in which could adapt their method as they progress or how they would do it differently if they repeated the enquiry. Sorting materials into magnetic and non-magnetic</p> <p>Common misconceptions Some children may think: • the bigger the magnet the stronger it is • all metals are magnetic</p>	<ul style="list-style-type: none"> • 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 <p>Working Scientifically ideas Looking at patterns in what happens to shadows when the light source moves. Exploring the way light behaves, including light sources, reflection and Shadows investigate the relationship between light sources, objects and shadows by using shadow puppets.</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>
Year 4	<p>Animals including Humans: Key concept; Systems and energy Global Goal: 3 Good health and Well-being</p>		<p>States of matter Key concept: Matter and energy Global Goal: 4 Quality education, Clean water and sanitation</p>	<p>Sound Key concepts: Matter and energy Global Goal: 4 Quality education</p>	<p>Living things & Their Habitats. Key concepts: Nature and systems check prior knowledge from year 2 simple food chains)</p>	<p>Electricity Key concept: Matter and energy Global Goal: 4 Quality education</p>

<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify the different types of teeth in humans and their simple functions identify teeth and their function in animals understand how to keep teeth healthy name the simple functions of the different parts of the digestive system in humans and describe what each part does construct and interpret a variety of food chains, identifying producers, predators and prey describe how reduction or increase in numbers in one part of a food chain can affect the other parts of the food chain Explore different food-webs and how they are adapted to their different eco systems <p>Working Scientifically ideas</p> <p>Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls</p> <p>Use secondary sources to identify animals in a habitat and find out what they eat.</p> <p>Draw and discuss ideas about the digestive system and compare them with models or images</p> <p>Present consumers, producers, tertiary consumers of an ecosystem in a chart . Discuss ways in which can present same data but in different ways</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>Pupils should be taught to:</p> <ul style="list-style-type: none"> compare and group materials together, according to whether they are solids, liquids or gases observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature <p>Working Scientifically ideas : Exploring the effect of temperature on different substances e.g chocolate, butter, cream</p> <p>Research at what temperature materials change state e.g iron melting point...</p> <p>Observe and record evaporation over a period of time</p> <p>Common misconceptions Some children may think: • ‘solid’ is another word for hard or opaque • solids are hard and cannot break or change shape easily and are often in one piece • substances made of very small particles like sugar or sand cannot be solids • particles in liquids are further apart than in solids and they take up more space • when air is pumped into balloons, they become lighter • water in different forms – steam, water, ice – are all different substances • all liquids boil at the same temperature as water (100 degrees) • melting, as a change of state, is the same as dissolving • steam is visible water vapour (only the condensing water droplets can be seen) • clouds are made of water vapour or steam • the substance on windows etc. is condensation rather than water • the changing states of water (illustrated by the water cycle) are irreversible •</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases <p>Working scientifically ideas:</p> <p>Explore altering the pitch or volume of objects, such as the length of a guitar string, amount of water in bottles, size of tuning forks.</p> <p>Measure sounds over different distances. Show results on a line graph.</p> <p>Measure sounds through different insulation materials.</p> <p>Explore patterns in sounds made by different objects</p> <p>Make earmuffs with different materials to investigate best insulators for sounds</p> <p>Explore how technology can be used to measure sounds (apps)</p> <p>Common misconceptions Pitch and volume are frequently confused, as both can be described as high or</p>	<p>Global Goal: 13 Climate Action</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things Explore examples of human impact on both positive and negative o the environment. E.g. Nature reserves, ecologically parks and litter or deforestation. <p>Working scientifically ideas:</p> <p>Group animals into different group vertebrates and non-vertebrates.</p> <p>Identifying and classifying living things and their habitats</p> <p>Keys to explore and identify plants and animals</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</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors Explain to the children about precautions working safely with electricity <p>Working Scientifically ideas</p> <p>Children can work scientifically by observing patterns e.g. bulbs get brighter s more cells are added</p> <p>Investigate which materials can be used to correct gaps in circuits</p> <p>Draw conclusions based on their evidence and current subject knowledge.</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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		evaporating or boiling water makes it vanish • evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material	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.	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.	
Year 5	<p>Earth & Space</p> <p>Key concepts: Systems</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the movement of the Earth and other planets relative to the sun in the solar system describe the movement of the moon relative to the Earth describe the sun, Earth and moon as approximately spherical bodies use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky understand and describe the phases of the moon understand why the length of the day and night changes throughout the year <p>Working Scientifically ideas</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>Properties and changes of materials</p> <p>Key concepts: Matter and energy</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, 	<p>Animals including Humans</p> <p>Key concepts: Systems and evolution</p> <p>Global Goal:3 Health and well-being.</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age Drawing timeline to indicate stages in growth and development Changes experienced in puberty <p>Working Scientifically ideas</p> <p>Research gestation periods of other animals and compare them with humans</p> <p>Find out of and recording the length and mass of a baby as it grows</p> <p>Common misconceptions</p> <p>Some children may think: • a baby grows in a mother's tummy • a baby is "made".</p>	<p>Living things and their habitats</p> <p>Key concept: Nature</p> <p>Global Goal: 13 Climate action</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals Children to find out about different types of reproduction, including sexual and asexual reproduction in plants <p>Working Scientifically ideas</p> <p>Research about the work of naturalist and animals e.g David Attenborough and Jane Goodall</p> <p>Observe and compare the life cycle of plants in their local environment and other environments around the world e.g rainforest, oceans and pre-historic times</p> <p>Compare how different animals reproduce and grow</p>	<p>Forces</p> <p>Key concept: Matter and energy</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect <p>Working Scientifically ideas</p> <p>Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.</p> <p>Investigate how force meters are used and if they give accurate results</p> <p>Investigate the effect of friction in a range of contexts e.g. trainers, bathmats, mats for a helter-skelter.</p> <p>Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests</p> <p>Investigate the effects of water resistance in a range of contexts e.g. dropping shapes through water and pulling shapes, such as boats, along the surface of water.</p> <p>Design and make products that use levers</p> <p>Designing and making a variety of parachutes and carrying out fair tests to test effectiveness</p>

	<p>Comparing time of day at different places on Earth</p> <p>Common misconceptions</p> <p>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>sieving and evaporating</p> <ul style="list-style-type: none"> • 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 <p><u>Working Scientifically ideas</u></p> <p>Create a chart or table grouping/comparing everyday materials by different properties</p> <p>Magnetic(building year 3), Conductors (building on year 4)</p> <p>Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?</p>		<p>Observe changes in an animal over a period of time (e.g hatching chicks)</p> <p>Common misconceptions</p> <p>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>	<p>Common misconceptions</p> <p>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>
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Carry tests making blackout curtains/ warm jackets

Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).

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. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed. Some children may think:

- thermal insulators keep cold in or out
- thermal insulators warm things up
- solids dissolved in liquids have vanished and so you cannot get them back
- lit candles only melt, which is a reversible change.

<p>Year 6</p>	<p><u>Animals including humans</u></p> <p>Key concept – Systems</p> <p>Global Goal: 3 Good health and Well-being</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Describe the role of the circulatory system in exercise Revise the food group within a balanced diet and how different types of food help the body. recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans Identify the effect of a diet lacking in a particular food group. <p>Working Scientifically ideas</p> <p>Research the negative effects of drugs (e.g. tobacco) and the benefits of a healthy diet and regular exercise by asking an expert or using carefully selected secondary sources.</p> <p>Carry out a range of pulse rate investigations: ▪ fair test – effect of different activities/ 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) ▪</p>	<p><u>Evolution and inheritance</u></p> <p>Key concept – Evolution</p> <p>Global Goal: 13 Climate Action</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution Recognise different adaptations in the same animal and explain why understand and identify why these variations exist (inheritance/environment) Investigate some of the major issues facing our planet <p>Working Scientifically ideas</p> <p>Make observations of fossils to identify living things that lived on Earth millions of years ago.</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><u>Electricity</u></p> <p>Key concept – Matter and energy</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches use recognised symbols when representing a simple circuit in a diagram Construct simple series circuits to help them answer questions about what happens when they try different components e.g switches, bulbs, buzzers and motors. <p>Working Scientifically ideas</p> <p>Carry out fair tests exploring changes in circuits.</p> <p>Evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements</p> <p>They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.</p> <p>Make circuits that can be controlled as part of a DT project.</p> <p>Common misconceptions</p> <p>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><u>Light</u></p> <p>Key concept – Matter and energy</p> <p>Global Goal: 4 Quality education</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> recognise that light appears to travel in straight lines use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them Explore the way light behave, including light sources, reflection and shadows. <p>Working Scientifically ideas</p> <p>Explore ways to place rear view mirrors on cars and designing and making a periscope.</p> <p>Investigate the relationship between light sources, object and shadows by using show puppets</p> <p>Communicate their findings to an audience using relevant scientific language and illustrations.</p> <p>Common misconceptions</p> <p>Some children may think: • we see objects because light travels from our eyes to the object.</p>	<p><u>Living things and their habitats</u></p> <p>Key concept – Nature</p> <p>Global Goal: 13 Climate action</p> <p>Pupils should be taught to:</p> <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 Introduce to the idea that board groupings, such as micro-organisms, plants and animals can be subdivided. <p>Working Scientifically ideas:</p> <p>Use classification system and keys to identify some animals and plants in the immediate environment.</p> <p>Use secondary sources to research the characteristics of animals that belong to a group.</p> <p>Research work of scientists such as Carl Linnaeus</p> <p>Research unfamiliar animals and plants from broad ranges of other habitats and decide where they belong in a classification system. When doing this, discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes key scientists work</p> <p>Common misconceptions</p> <p>Some children may think: • all micro-organisms are harmful • mushrooms are plants. A</p>
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	<p>pattern seeking – exploring recovery rate for different groups of people. Identify any limitations that reduce the trust they have in their data.</p> <p>Common misconceptions</p> <p>Some children may think: • your heart is on the left side of your chest • 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>Comparing how some living things are adapted to survive in extreme conditions</p> <p>Analyse advantages and disadvantages of specific adaptations e.g long, short beak.</p> <p>Discuss how new discoveries change scientific understanding.</p> <p>Common misconceptions</p> <p>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>			
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Statements highlighted in red are additional to further the children's knowledge