

Science Knowledge Progression Map 2024-2025



This document shows the Science learning journey for pupils from EYFS to Year 6. Additional details about the learning journey can be found in the Science Knowledge Matrices and Big Ideas documents for each year group.

Questioning **observing** **fair and comparative testing (use of equipment)** **identifying, classifying and grouping** **reporting** **analysing and presenting data**

Statutory

Non-statutory

DSAT

EYFS

	National Curriculum – Early Learning Goals	Granular Knowledge	Greater Depth	Vocabulary
EYFS Biology	<p>ELG- People, culture and communities -Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.</p> <p>ELG- The natural world -Explore the natural world around them making observations and drawing pictures of animals and plants.</p> <p>ELG- managing self</p> <ul style="list-style-type: none"> Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. 	<ul style="list-style-type: none"> I can recognise and discuss similarities and differences in environment, animals and living things. I can name some environments, animals and plants. I can name some parts of my body I can show care and concern for all living things. I can make observations of animals and plants and explain why some things occur and talk about changes. I can eat a range of food and identify healthy foodstuff. I can explore and describe my environment through my senses I can talk about how to stay healthy through physical exercise and healthy eating I can talk about and show some ways of keeping my body safe I can care for plants and animals in my environment and know how to keep them healthy 	<ul style="list-style-type: none"> I can identify that the environment and living things are influenced by human activity. I can sort animals by their features and make links to their habitat 	
EYFS Chemistry	<p>ELG- People, culture and communities</p> <ul style="list-style-type: none"> Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps. 	<ul style="list-style-type: none"> I can identify some materials (metal, paper, plastic) I can identify similarities and differences between materials I can sort materials using my own classifications I can say which materials are best for a purpose (to be waterproof, for strength, for magnetism etc) 	<ul style="list-style-type: none"> I can identify the properties of some materials I can suggest some of the purposes materials are used for. 	
EYFS Physics	<p>ELG- People, culture and communities -Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.</p> <p>ELG-The natural world -Understand some important processes and changes in the natural world around them including the seasons and changing states of matter.</p>	<ul style="list-style-type: none"> I can explore and question the relationship between physics and the world around me, through my play (water- sinking and floating, construction- forces etc) I can find and use resources to explore light and magnetism I can dress appropriately for the weather I can observe and comment on changes in the environment and from my explorations I can recommend clothing depending on the season 	<ul style="list-style-type: none"> I can discuss basic scientific concepts such as floating, sinking, experimentation. I can give simple explanations. 	
EYFS Working Scientifically	<p>ELG- The natural world -Explore the natural world around them making observations and drawing pictures of animals and plants.</p>	<p>Through provision, focus groups and with adult support...</p> <p>Observing Closely</p> <ul style="list-style-type: none"> I can discuss what they can see, touch, smell, hear or taste 	<p>Through provision, focus groups and with adult support...</p> <p>Observing Closely</p>	<p>observe, test, object</p>

	<p>ELG-Listening, Attention and Understanding</p> <ul style="list-style-type: none"> -Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions; - Make comments about what they have heard and ask questions to clarify their understanding; <p>ELG- Speaking</p> <p>Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary;</p> <ul style="list-style-type: none"> - Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate; - Express their ideas and feelings about their experiences using full sentences, including use of past, present, and future tenses and making use of conjunctions, with modelling and support from their teacher. 	<ul style="list-style-type: none"> • Use simple equipment to help them make observations <p>Performing Tests</p> <ul style="list-style-type: none"> • I can perform a simple test • I can describe/ explain what they have done <p>Identifying and Classifying</p> <ul style="list-style-type: none"> • I can identify and classify things they observe • I can think of some questions to ask • I can answer some scientific questions • I can give a simple reason for their answer • I can explain what they have found out • 	<ul style="list-style-type: none"> • I can find out by watching, listening, tasting, smelling and touching <p>Performing Tests</p> <ul style="list-style-type: none"> • I can give reasons for their answers <p>Identifying and Classifying</p> <ul style="list-style-type: none"> • I can discuss similarities and differences • I can explain what they have found out using scientific vocabulary <p>Recording Findings</p> <ul style="list-style-type: none"> • I can make accurate measurements 	
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Year 1

	National Curriculum – Early Learning Goals	Granular Knowledge	Greater Depth	Vocabulary
Year 1 Biology	Autumn Term Block 3: Pupils should be taught to: <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. 	Autumn Term Block 3: <ul style="list-style-type: none"> I can identify, name, draw and label the parts of the human body that I can see to include wrist, ankle, head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth. I know that eyes are associated with sight. I know that ears are associated with sound. I know the nose is associated with smell. I know the tongue is associated with taste. I know the skin is associated with touch. 	<ul style="list-style-type: none"> I can name some parts of the human body that cannot be seen. I can say what different parts of the human body might be used for. 	head, body, eyes, ears, mouth, teeth, leg, sight, hearing, touch, hair, eyes, face, nose, ears, teeth, mouth, head, neck, arm, elbow, hand, knee, foot, sight
	Real life links <ul style="list-style-type: none"> Labelling their own body Songs and nursery rhymes 	Working scientifically <ul style="list-style-type: none"> Asking simple questions and recognising that they can be answered in different ways. Gathering and recording data to help in answering questions. Identifying and classifying. 	Sustainability	
	Spring Term Block 1 Pupils should be taught to: <ul style="list-style-type: none"> identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 	Spring Term Block 1 <ul style="list-style-type: none"> I can identify fish, amphibians, reptiles, birds and mammals. I can name a variety of common animals including fish, amphibians, reptiles, birds and mammals Suggested possibilities: I know that a clownfish and goldfish are examples of a fish; a frog is an example of an amphibian; a snake and a lizard are examples of a reptile; seagulls, owls and robins are examples of a bird; a rabbit, squirrels and a human are examples of a mammal. I know that herbivorous animals eat plants; carnivorous animals eat other animals; omnivorous animals eat both animals and plants I can identify and name a variety of common animals that are carnivores, herbivores and omnivores Suggested possibilities: I know that a cat is an example of a carnivore; that a rabbit is an example of a herbivore; that 	Spring Term Block 1: <ul style="list-style-type: none"> I can say why certain animals have certain characteristics I can name a range of wild animals I can convince someone that the following statement “only birds lay eggs” is false using scientific examples I can classify animals by what they eat (carnivore, herbivore and omnivore) 	animal, mammal, fur, wild mammal, pet, bird, wings, beak, feathers, webbed feet, flippers, tail, fins, scales, gills, amphibian, frog, toad, newt, reptile, lizard, crocodile, turtle, carnivore, sharp teeth, herbivore, plants, vegetable, fruit, omnivore

		<p>many humans are examples of omnivores (though not vegetarians).</p> <ul style="list-style-type: none"> I can describe and compare the basic body parts of different animals, including fish, amphibians, reptiles, birds, and mammals for example their wings, scales, hair, moist skin. 			
	<p>Real life links</p> <ul style="list-style-type: none"> Trip to pond (Using their observations and ideas to suggest answers to questions.) Petting zoo 	<p>Working scientifically</p> <ul style="list-style-type: none"> I can sort animals into categories (including fish, amphibians, reptiles, birds and mammals) I know that reptiles are different to other animals in that they breathe air and have scaly skin. I know that birds are different to other animals in that they have feathers and wings I know that mammals are different to other animals in that they have fur/hair and they feed milk to their young I know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone I know that fish are different to other animals in having gills so that they can breathe underwater and scaly skin I know that amphibians are different to other animals in that they begin their lives with gills but then develop lungs and breathe on land 	<p>Sustainability</p> <p>Caring for the planet</p> <p>Why is it important to care for our planet? How can we care for our planet?</p> <p>Vocabulary: Earth, helpful, harmful, recycle, reuse</p>		
	<p>Spring Term Block 2: 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>Spring Term Block 2:</p> <ul style="list-style-type: none"> I can name a variety of common wild and garden plants – Suggested possibility: know a rose bush, a sunflower and a dandelion by sight. I know an oak tree (acorns), a birch tree and a horse chestnut (conker) tree (conkers) by sight. I know that evergreen trees maintain their leaves throughout the year and that deciduous trees shed their leaves in autumn. I can describe a plant by identifying its petals, stem, leaves and roots. I can describe a tree by identifying its trunk, branches and leaves. I know that trees have roots. I know that the stem of a tree is known as the trunk. I know that branches and twigs grow out of the trunk to support leaves, flowers and fruit. 	<p>Spring Block 2:</p> <ul style="list-style-type: none"> I can begin to describe what each part of a plant does (e.g. leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem) I can compare the similarities and differences between trees and plants. 	<p>plant, flower, leaf, petals, stem, roots, branch, trunk, wildflower, daisy, garden plant, sunflower, nettle, buttercup, dandelion, deciduous tree, horse chestnut, oak, sycamore, evergreen tree, pine, holly, needles, seed.</p>	

	Real life links <ul style="list-style-type: none"> - Grow fruit/veg (sustainability link) - Go into the playground/field/local environment to look at plants and what is growing. Can they identify any plants and trees? 	Working scientifically <ul style="list-style-type: none"> • Use magnifying glasses to observe similarities and differences in plants • Group plants and say why • Draw diagrams to show parts of different plants including trees 	Sustainability <p>Growing and cooking Where does my food come from? What have I planted and grown this year?</p> <p>Vocabulary Crops, farmers, cook</p>	
Year 1 Physics	Summer Block 2 Seasonal Changes - Pupils should be taught to: <ul style="list-style-type: none"> • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. 	Summer Block 2 <ul style="list-style-type: none"> • I know what the weather is. (Weather is what it's like outside at any given time- sun, rain, cloud, snow, wind etc.) • I know that the four seasons are Spring, Summer, Autumn and Winter and I know the order of the cycle. • I can suggest the type of weather in each season. • I can observe and comment on changes in the seasons. • I know that weather changes through the year, getting hotter in the summer and colder in the winter. • I know that days are longer in the summer and shorter in the winter. • I know that the winter is likely to bring ice on the ground when water freezes due to the cold. 	Summer Block 2 <ul style="list-style-type: none"> • I can say what happens to the world around me (plants/trees/animals) during different seasons. 	weather, sunny, rainy, windy, snowy, cloudy, freezing, hot, warm, cold, storm, thunder, snow, icy, puddles, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length
	Real life links <ul style="list-style-type: none"> - Make a rain gauge using a plastic bottle - Observe the weather outside 	Working scientifically <ul style="list-style-type: none"> - Make tables / charts about the weather and their observations e.g. length of the day. - Make displays of what happens in the world around them as seasons change. - Measure temperature using a thermometer (as a class). 	Sustainability	

<p>Year 1 Chemistry</p>	<p>Spring Term: Block 4 Everyday Materials - 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>Spring Term: Block 4</p> <ul style="list-style-type: none"> I know a material is what objects are made of. I know that an object is made from/of a material. I can distinguish between an object and the material from which it is made. I know some examples of materials in the real world. I can identify and name wood, plastic, glass, metal, water and rock. I can describe the physical properties of everyday materials: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. I can compare and group objects based on the materials (using the above properties). 	<p>Spring Term: Block 4</p> <ul style="list-style-type: none"> I can explain why certain materials are used to make certain objects. For example, a glass table at school or a door made from rock. 	<p>property, wood, plastic, glass, metal, water, rock, object, material, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, waterproof, absorbent, opaque/transparent</p>
	<p>Real life links</p> <ul style="list-style-type: none"> Looking at real life objects and their properties. Able to feel the properties of the different materials. 	<p>Working scientifically Pupils might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'</p>	<p>Sustainability</p>	

Year 2

Year 2 Biology	<p>Summer Term: Block 4 Plants - 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. 	<p>Summer Term: Block 4</p> <ul style="list-style-type: none"> I can describe what plants need in order to grow and stay healthy (water, light & suitable temperature) I can describe how seeds and bulbs grow into plants I know that seeds and bulbs need to be buried underground in soil and that they will grow into adult plants under the right conditions (water, warmth) I know that plants that are deprived of light, food or air will not grow and will die. I can conduct an experiment to find out what plants need to survive 	<p>Summer Term: Block 4</p> <ul style="list-style-type: none"> I can describe what plants need to survive and link it to where they are found 	<p>offspring, adult, bulb, seed, survival, temperature, hygiene, exercise, light, shade, sun, warm, cool, water, grow, healthy</p>
	<p>Real life links</p> <ul style="list-style-type: none"> Plant seeds and bulbs and observe 	<p>Working scientifically</p> <p>Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.</p>	<p>Sustainability</p>	
	<p>Summer Term: Block 2 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, 	<p>Summer Term: Block 2</p> <ul style="list-style-type: none"> I can identify things that are living, dead and never lived and compare the differences between them I know that living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things. I know that a habitat is the place where an animal or plant lives. It's like their home. Animals and plants have habitats where they find everything they need to survive, like food, water, and shelter. I can describe how a specific habitat provides for the basic needs of things living there (plants and animals) I can identify and name plants and animals in a range of habitats I can name some different sources of food for animals 	<p>Summer Term Block 2:</p> <ul style="list-style-type: none"> I can name some characteristics of an animal that help it to live in a particular habitat I can describe what animals need to survive and link this to their habitats I can describe what plants need to survive and link it to where they are found 	<p>birth, decay, energy, reproduction, microhabitat, dead, life cycle, food chain, source, nutrients, consumption, environment, producer, prey, predator, suited, suitable, basic needs, rainforest canopy, forest floor, shrub</p>

	and identify and name different sources of food.	<ul style="list-style-type: none"> I know that plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals I can describe how animals find their food I can explain a simple food chain I know that the arrows on a food chain show the direction that the energy travels 		
	Real life links	Working scientifically Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts. They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there	Sustainability Wildlife What does wildlife do for us? What can we do for wildlife? Vocabulary wildlife, nature, local	
	Animals, including humans Pupils should be taught to: <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 	Granular Knowledge <ul style="list-style-type: none"> I can order and explain the basic stages in a life cycle for animals, including humans I can describe what animals and humans need to survive (water, food and air) I know what a balanced diet is I know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods I know that more than half of our diet should be made up of carbohydrates, fruit and vegetables I know that fats and sugary foods should be eaten rarely and in small amounts I can describe the importance of exercise for humans to help us stay strong and fit I can explain what good hygiene is I know that good hygiene is keeping clean, including washing and brushing teeth, and is an important part of staying healthy 	Greater Depth <ul style="list-style-type: none"> I know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy bones and teeth) 	
	Real life links Family	Working scientifically	Sustainability	

<p>Year 2 Chemistry</p>	<p>Autumn Term: Block 4 Uses of everyday materials - 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, bending, twisting and stretching. 	<p>Autumn Term: Block 4</p> <ul style="list-style-type: none"> • I know and can identify the name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard • I can use properties of a range of materials to sort them • I can suggest why a material might or might not be used for a specific job • I know that applying forces to objects can change their shape, by squeezing, stretching, bending and twisting 	<p>Autumn Term: Block 4</p> <ul style="list-style-type: none"> • I can compare which materials would be most suitable for different purposes and explain my reasons 	<p>conductor, brick, paper, cardboard, friction, movement, suitability, surface, force, stretch, twist, waterproof, deformation, flexible, rigid, opaque, transparent and translucent, reflective, non-reflective</p>
	<p>Real life links</p> <ul style="list-style-type: none"> • Looking at materials used around school • Looking at a range of items and why they are made from their materials 	<p>Working scientifically Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely, identifying and classifying the uses of different materials, and recording their observations.</p>	<p>Sustainability Plastic How is plastic harmful and helpful? How can we reduce our waste in school?</p> <p>Vocabulary: Single-use plastic, wildlife, nature,</p>	

Year 3

Year 3 Biology	Summer Term: Block 5 Pupils should be taught to: <ul style="list-style-type: none"> identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat (covered in a short science block in addition to PSHE block) 	Summer Term: Block 5 <ul style="list-style-type: none"> I know that food is important to humans and animals and that it provides nutrition I know that food can contain different quantities of nutritional values by investigating labels on packaging I know that calcium helps our bones stay healthy and strong I know that protein helps my muscles to stay healthy and strong I know that animals and humans require food – they cannot make their own like plants I know that different animals require different types of food depending on whether they are carnivorous, herbivores or omnivores. 	Summer Term: Block 5 <ul style="list-style-type: none"> I can make connections between healthy diets and predict what could happen to our bodies when we do not have enough of a food source (link back to India in Y2) 	Relax, contract, tricep, bicep, heart, diaphragm, quadriceps, calf, nutrition, malnourished, deficiency	
	Real life links Link to Design and Technology and designing a healthy meal	Working scientifically Pupils might work scientifically by: They might compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out.	Sustainability Food waste What is food waste? How can we reduce our food waste? Vocabulary food waste, landfill, food waste recycling, edible, inedible,		
	Spring Term: Block 3 Pupils should be taught to: <ul style="list-style-type: none"> identify that humans and some other animals have skeletons and muscles for support, protection and movement 	Spring Term: Block 3 <ul style="list-style-type: none"> I know that animals, including humans, have a skeleton made up of a collection of bones that provides protection and supports movement I know that skeletons provide support for muscles and protect the body; for example, the rib cage protects the vital organs in the human body I can name some bones in the human body (e.g. skull, ribcage, spine, pelvis and femur) and I know their specific role 	Spring Term: Block 3 <ul style="list-style-type: none"> I can explain how our skeleton can change overtime and the effect this can have on our body and mobility 	skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine	

		<ul style="list-style-type: none"> • I know that some animals (such as insects) have an exoskeleton – a solid covering on the outside of their body • I know that many animals without a spine (such as earthworms and slugs) have water held inside by muscles which acts like a skeleton • I can identify, sort and group animals in different ways based on their skeletal systems (e.g. with and without a spine) 		
	<p>Real life links</p>	<p>Working scientifically</p> <p>Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.</p> <p>Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons</p>	<p>Sustainability</p>	
	<p>Summer Term: Block 3</p> <p>Plants - 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 • 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>Summer Term: Block 3</p> <ul style="list-style-type: none"> • I know the parts of a flowering plant (roots, stem/trunk, leaves and flowers) • I can describe the function of different parts of flowering plants and trees • I can explore and describe how water is transported within plants • I can 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 • I know that the stem holds up the leaves so that they can gather light to make food and holds up the flowers so that they can receive pollen and disperse their fruits; know that the stem also transports water and minerals from the roots to the other parts of the plant; I know that the roots collect water and minerals from the soil, and hold the plant firmly in the ground • I can describe the plant life cycle, especially the importance of flowers • I know that the function of a flower is reproduction, where flowers of the same kind exchange pollen – made by an anther – in a process called fertilisation, and a structure in the flower’s ovary called an ovule becomes a seed; the ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal 	<p>Summer Term: Block 3</p> <ul style="list-style-type: none"> • 	<p>extinction, fruit, nectar, anther, ovary, ovule, petal, pollen, stigma, style, stamen, function, exchange, dispersal, fertilization, Photosynthesis, support, anchor, reproduction, transportation</p>

		<ul style="list-style-type: none"> I can explore and describe the needs of different plants for survival 		
	Real life links	<p>Working scientifically</p> <p>Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.</p>	<p>Sustainability</p> <p>Biodiversity What is biodiversity? How can we increase biodiversity in our local area?</p> <p>Vocabulary biodiversity, rewilding, endangered, extinct</p>	

Year 3 Chemistry	<p>Spring Term: Block 1</p> <p>Rocks - 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 describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter 	<p>Spring Term: Block 1</p> <ul style="list-style-type: none"> I know what a fossil is I know that fossils form when a plant or animal dies and is quickly covered with silt or mud so that it cannot be rotted by microbes or eaten by scavenging animals; in time layers of sediment build, squashing the mud and turning it to stone around the dead plant or animal; the materials in the body are replaced by minerals that flow in water through the rock, leaving a rock in the shape of the animal or plant that was once there I know that fossils can help us learn about things that lived long ago I know that soil is made from tiny particles of rock broken down by the action of weather (weathering) I can identify some of the properties of rocks and soils I know that there are three kinds of rocks: igneous, sedimentary and metamorphic I know that granite and basalt are types of igneous rock and that igneous rocks form from molten rock below the Earth's crust I know that limestone and sandstone are types of sedimentary rock which form when small, weathered fragments of rock or shell settle and stick together, often in layers I know that marble and slate are types of metamorphic rock which form when rocks in Earth's crust get squashed and heated in processes such as when tectonic plates press against each other 	<p>Spring Term: Block 1</p> <ul style="list-style-type: none"> I can classify igneous and sedimentary rocks <p>I can begin to relate the properties of rocks with their uses</p>	<p>extinction, particle, igneous, metamorphic, sedimentary, paleontologist, weathering, molten rock, crust, tectonic plates, scavengers, fossil, permeable, impermeable, organic matter, marble, chalk, granite, sandstone, slate, soil, peat</p>

		<ul style="list-style-type: none"> I can compare and group rocks based on their appearance and physical properties 		
	<p>Real life links</p> <p>Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.</p>	<p>Working scientifically</p> <p>Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.</p>	<p>Sustainability</p>	
<p>Year 3 Physics</p>	<p>Autumn Term: Block 2</p> <p>Light - 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 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>Autumn Term: Block 2</p> <ul style="list-style-type: none"> I can describe what dark is (the absence of light) I can explain that light is needed in order to see I know that the Sun is a light source, but that the Moon is not and is merely reflecting light from the Sun I know that many light sources give off light and heat I know that opaque objects block light creating shadows and that light passes easily through transparent objects I know that opacity/transparency and reflectiveness are properties of a material I can explain that light is reflected from a surface I can explain and demonstrate how a shadow is formed I know that as objects move towards a light source, the size of the shadow increases I know how to show the changing of shadow size by drawing a diagram with straight lines representing light I know that sunglasses can protect eyes from sunlight but looking at the Sun directly – even with sunglasses – can damage the eyes I can explain the danger of direct sunlight and describe how to keep protected 	<p>Autumn Term: Block 2</p>	<p>wave, mirror, visible, incident ray, travel, image, beam, photons, solid, opaque, transparent, translucent, object, source, data logger.</p>

	<ul style="list-style-type: none"> notice that some forces need contact between two objects, but magnetic forces can act at a distance observe how magnets attract or repel each other and attract some materials and not others compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<ul style="list-style-type: none"> I can explore and describe how objects move on different surfaces I know that objects move differently on rough and smooth surfaces; objects resist movement more on rough surfaces because there is higher friction as the object moves I know that magnets create a force when around other magnets or magnetic materials I know that there are also non-contact forces that can act between objects without them touching and that magnetism is an example of a non-contact force I know that magnets have two poles called north and south I know that like poles (south-south and north-north) of two magnets repel each other and that opposite poles of two magnets (north-south) attract each other I know that there is a magnetic field around a magnet which is strongest at each pole I know that some materials are magnetic, meaning that they are attracted to a magnet, while other materials are non-magnetic I can explore how objects attract and repel in relation to objects and other magnets I can predict whether objects will be magnetic and carry out an enquiry to test I can explain how objects attract and repel in relation to objects and other magnets I can predict whether magnets will attract or repel and give a reason 		
	<p>Real life links</p> <p>They could explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).</p>	<p>Working scientifically</p> <p>Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.</p>	<p>Sustainability</p>	

Year 4

Year 4 Biology	Summer Term: Block 1 Animals, including humans - Pupils should be taught to: <ul style="list-style-type: none"> • describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey 	Summer Term: Block 1 <ul style="list-style-type: none"> • I know that food passes through the body with the nutrients being extracted and the waste products excreted, and that this process is called digestion • Digestion is the breaking down of larger pieces of food into smaller pieces so the body can use it for energy. • The digestion process begins when food is bitten by the teeth. • Saliva turns smaller pieces of food into a more liquid substance so it travels smoothly down the oesophagus to the stomach. • The stomach churns the food, and adds acid to break it down further before the partially digested food passes to the small intestine. • The small intestine absorbs nutrients from the food and passes the remaining food to the large intestine. • The large intestine absorbs water from the remaining food and then passes the remaining waste to the rectum • I know that a human has three types of teeth – incisors, canines and molars – and that these each perform different functions • I know that incisors slice food, canines tear food (especially meat) and that molars grind food • I know that children develop an initial set of teeth which are gradually replaced between the ages of 6 and 12 • I know that food is squeezed down the oesophagus towards the stomach in a wave-like action called peristalsis • I know that a food chain traces the path of energy through a habitat • I know that the arrows in a food chain show the direction that energy is travelling through a habitat • I know that all energy for a food chain initially comes from the Sun which is absorbed and turned into energy by plants which are called producers • I know that consumers take in energy by eating • I know that an animal that is eaten by another is called prey, and that an animal that eats other animals is called a predator • I know that the first consumer in a food chain is called a primary consumer, the second is called a secondary consumer and above it is called a tertiary consumer 	Summer Term: Block 1 <ul style="list-style-type: none"> • 	digestion, excretion, peristalsis, anus, duodenum, small intestine, large intestine, stomach, rectum, oesophagus, tongue, saliva, acid, bile, enzymes, incisors, canines, molars, predator, prey, producer, consumer, primary, secondary, tertiary, Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water,
	Real life links	Working scientifically	Sustainability	

<p>Link to healthy lifestyle and healthy eating</p>	<p>Pupils might work scientifically by: comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.</p>		
<p>Autumn Term: Block 3 Living things and their habitats - 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 	<p>Autumn Term: Block 3</p> <ul style="list-style-type: none"> I can group living things in different ways I can use classification keys to group, identify and name living things I can create classification keys to group, identify and name living things (for others to use) I can describe how changes to an environment could endanger living things I know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behaviour (e.g. herbivores, carnivores and omnivores) I know that living things are divided into kingdoms: the animal kingdom, plants, fungi, bacteria, and single-celled organisms I know that a species is a group of living things have many similarities that can reproduce together produce offspring I know how a habitat changes throughout the year. I can group a wide selection of living things that include animals, flowering plants and non-flowering plants. I can begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. <p>Note: plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, for example ferns and mosses.</p>	<p>Autumn Term: Block 3</p>	<p>kingdom, classification key, species, fungi, bacteria, climate change, characteristics, offspring, extinction, pollution, human impact, nature reserves, deforestation</p>
<p>Real life links</p> <p>Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat.</p>	<p>Working scientifically</p> <p>Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.</p>	<p>Sustainability Deforestation</p> <p>What is deforestation? What are the impacts in the UK and the rest of the world?</p> <p>Vocabulary habitat destruction, palm oil, sustainable</p>	

			<p>Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.</p>	
<p>Year 4 Chemistry</p>	<p>Autumn Term: Block 1 States of matter - 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>Autumn Term: Block 1</p> <ul style="list-style-type: none"> I can group materials based on their state of matter (solid, liquid, gas) I know how to measure temperature I can measure the temperature at which materials change state I know that materials can change state when temperature changes I know that solids have a defined shape and a fixed volume and that a solid material will keep its shape if it is transferred from one container to another. I know that a liquid keeps the same volume when it is poured into a different container. I know that a gas moves to fill any space available, so it will move in and out of open windows and can move around the room. I know that when solids turn into liquids, this is called melting and that the reverse process is called freezing I know that when liquids turn into gases, this is called evaporation and that the reverse process is called condensation I know that the melting point of water is 0°C and that the boiling point of water is 100°C I know that water flows around our world in a continuous process called the water cycle I can describe the water cycle I can explain the part played by evaporation and condensation in the water cycle I know that water is recycled in the water cycle and no new water is made and that water does not have to boil to turn into water vapour and that precipitation includes hail, sleet and snow. 	<p>Autumn Term: Block 1</p>	<p>bond, condensation, evaporation, reversible, boiling point, melting point, liquid, gas, thermometer, water cycle, continuous precipitation, transpiration, surface runoff process, water vapour</p>

		<ul style="list-style-type: none"> I know that, along with evaporation, water on the Earth's surface moves to the air in a process called transpiration in which water turns into water vapour (gas) on the surface of leaves on plants 		
	<p>Real life links</p> <p>Look at the water cycle in action in the world around them</p>	<p>Working scientifically</p> <p>Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting</p>	<p>Sustainability</p> <p>There are possibilities to look at the impact that climate change is having on the water cycle. As air temperatures increase, more water evaporates into the air. Warmer air can hold more water vapour, which can lead to more intense rainstorms and extreme flooding.</p>	
<p>Year 4 Physics</p>	<p>Autumn Term: Block 5</p> <p>Electricity - 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. 	<p>Autumn Term: Block 5</p> <ul style="list-style-type: none"> I know that current electricity is the flow of charged particles called electrons around a circuit I can identify common appliances that run on electricity I know that current electricity is the form of electricity that we use in our lives in lights, computers, televisions, etc I know that electrical current flows well through some materials, called electrical conductors, and poorly through other materials, called electrical insulators I know that metals are good electrical conductors I know what a circuit is Cells, batteries and the mains are all sources of electrical energy I know that electrical current can flow if there is a complete circuit I know that wires – which contain a conductor inside them, usually made of metal – can allow electrical current to flow around a circuit I know that when electrical current flows through a circuit components within that circuit – such as buzzers which make a noise and bulbs which emit light – begin to work I know that a switch functions by completing or breaking a complete circuit I know how to construct a simple circuit using components 	<p>Autumn Term: Block 5</p> <ul style="list-style-type: none"> I can explain how a bulb might get lighter I can recognise if all metals are conductors of electricity I can work out which metals can be used to connect across a gap in a circuit I can explain why caution is necessary for working safely with electricity <p>I know that static electricity is an imbalance of charged particles on a material; it does not operate by flowing around a complete circuit</p>	<p>Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch</p>

		<ul style="list-style-type: none"> • I can construct a series circuit • I can identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers) • I can identify and name appliances that require electricity to function • I can draw a circuit diagram • I can predict and test whether a lamp will light within a circuit • I know that exposure to high levels of electrical current can be dangerous • I know how to stay safe near electricity pylons 		
	Real life links	Working scientifically	Sustainability Energy What is energy? How can we reduce our energy usage? Vocabulary: mains electricity, battery-powered, renewable energy, non-renewable energy, energy usage	
	Summer Term: Block 3 Sound - Pupils should be taught to: <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. 	Summer Term: Block 3 <ul style="list-style-type: none"> • I know that energy comes in different forms and can be neither created nor destroyed, only changed from one form to another (retrieval) • I know that sound is generated when an object vibrates; some of the energy from the vibrating object is transferred to the air, making the air particles move • I know that sound is a form of energy that transfers in a longitudinal wave - like that seen in a slinky - not a transverse wave - like that seen in water ripples (see diagram below) • I know that sound travels through a medium (e.g. particles in the air) and thus sounds does not travel through a vacuum which has no particles in it at all • I know that sound travels at different speeds through different objects; it travels at around 340 metres per second in air, much slower than light travels; this is why we often hear thunder after we see lightning as the light reaches our eye before the sound reaches our ears • I know the terms pitch & volume • I know that pitch is how high or low a sound is and that this is determined by how many vibrations per second are being 	Summer Term: Block 3 <ul style="list-style-type: none"> • I can explain why sound gets fainter or louder according to the distance • I can explain how pitch and volume can be changed in a variety of ways • I can work out which materials give the best insulation for sound 	vibration, percussion instrument, wind instrument, string instrument, frequency, volume, pitch, transverse wave, longitudinal wave, medium, vacuum

		<p>made by the vibrating object; the number of vibrations per second is called frequency</p> <ul style="list-style-type: none"> I know that volume is how loud or quiet a sound is and that this is determined by the amount of energy in the wave (e.g. from how hard or soft a percussion instrument is hit) I know that the volume of a sound is quieter if the listener is further away from the object <p>I can explain how sound travels from a source to our ears</p>		
	Real life links	Working scientifically	Sustainability	

Statutory

Non-statutory

DSAT

Year 5

<p>Year 5 Biology</p> <ul style="list-style-type: none"> Autumn Term: Block 4 Living things and their habitats - Pupils should be taught to: <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 	<p>Autumn Term: Block 4</p> <ul style="list-style-type: none"> I can remember the process of reproduction in plants I can describe the process of reproduction in animals I can compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, for example comparing a rainforest with a desert I know that the life cycle of a living thing is a series of stages of development starting with a fertilized egg in animals or a seed in many plants I know that in most mammals (e.g. dogs) a fertilized egg develops in the womb into an embryo and is then born and fed on milk before it is weaned onto the food that is adapted to eat; it then develops to maturity in a period called adolescence after which it can reproduce and the cycle can begin again I know that in amphibians (e.g. frogs) a fertilized egg develops into an embryo and then hatches into a tadpole; the tadpole develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin again 	<p>Autumn Term: Block 4</p> <ul style="list-style-type: none"> I can create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies When pond dipping, I can identify different species and suggest which stage of the life cycle they are in (e.g. frogspawn) 	<p>life cycle, life span, weaned, adolescence, metamorphosis, pupa, larva, chrysalis, caterpillar, tadpole, hatchling, fledgling, insect, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, gestation, monotreme, mammary gland, metamorphosis, larva, chrysalis, hatchling, nestling, fledgling, fertilisation, embryo, sperm cells, egg cells, sexual reproduction, anther, stigma, style, filament, ovary, ovule, clone, runner, tuber,</p>
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		<ul style="list-style-type: none"> I know that in many insects (e.g. butterflies) a fertilized egg develops into wingless feeding form called a larva (caterpillar); the larva feeds then later becomes a pupa (chrysalis) with a protective cocoon; inside this cocoon, the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can begin again I know that in birds (e.g. robins) a fertilized egg hatches in a nest (a hatchling) and is fed by its parents until it is ready to fly (i.e. becomes a fledgling); it then leaves the nest and grows into an adult after which it can reproduce and the cycle can begin again I can describe the differences between different life cycles 		asexual reproduction, cutting, parent plant
	Real life links <ul style="list-style-type: none"> Pond dipping Observing life cycles in local area 	Working scientifically Gather, record and classify, evaluate and present findings, answer questions and make conclusions, plan, take measurements Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow. Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method	Sustainability	
	Summer Term: Block 5 Animals, including humans - Pupils should be taught to:	Summer Term: Block 5 <ul style="list-style-type: none"> I know that humans go through stages of development; they begin as fertilized eggs and then develop into embryos before developing into babies; once they are 	Summer Term Block 5 <ul style="list-style-type: none"> 	foetus, elderly adult, milestone, womb, period, reproduce, hormone, puberty,

	<ul style="list-style-type: none"> describe the changes as humans develop to old age Pupils should draw a timeline to indicate stages in the growth and development of humans They should learn about the changes experienced in puberty 	<p>born, these new born babies become infants (roughly 2 months to 2 years) then into young children (roughly 2-12 years old); children develop into adults during adolescence (roughly 12-16 years old) at which age they become physically capable of reproduction; as adults develop into old age (roughly 55+ years old) they experience changes in their body which require them to move more carefully and rest more frequently</p> <ul style="list-style-type: none"> I can describe the changes experienced in puberty (PSHE) 		<p>life expectancy, gestation period, gestation Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional foetus, elderly adult, milestone, womb, period, reproduce, hormone, puberty, life expectancy, gestation period, gestation</p>
	<p>Real life links</p> <ul style="list-style-type: none"> Siblings at home Baby growths (red book)- time line or line graph 	<p>Working scientifically Plan, answer questions and make conclusions, gather, record and classify, present findings</p> <p>Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method</p>	Sustainability	
Year 5 Chemistry	<p>Summer Term: Block 2: Properties and changes of materials - 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, 	<p>Summer Term: Block 2:</p> <ul style="list-style-type: none"> I know and can demonstrate that some changes are reversible and some are not I can compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets) I can describe how a material dissolves to form a solution; explaining the process of dissolving I can describe and show how to recover a substance from a solution I can describe how some materials can be separated 	<p>Summer Term: Block 2:</p> <ul style="list-style-type: none"> I can describe methods for separating mixtures (filtration, distillation) I can work out which materials are most effective for keeping us warm or for keeping something cold I can use my knowledge of materials to suggest ways to classify (solids, liquids, gases) I can explore the work of chemists who created new materials, e.g. Spencer Silver 	<p>irreversible, dissolve, soluble, insoluble, solvent, solute, solution, filter, sieve, saturation, crystallization, thermal, permeable electrical conductor, electrical insulator, thermal insulator, properties, lifespan,</p>

	<p>and describe how to recover a substance from a solution</p> <ul style="list-style-type: none"> • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 	<ul style="list-style-type: none"> • I can demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating) • I can discuss reversible and irreversible changes • I can give evidenced reasons, through testing, why materials should be used for specific purposes • I can explain how some changes result in the formation of a new material and that this is usually irreversible • I know how to separate a mixture of sand, salt and small stones by sieving (to remove the small stones), followed by dissolving in water (so the salt is absorbed), followed by filtering to remove the sand from the mixture, followed finally by evaporation of the water to recover the salt • I can explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda 	<p>(glue on sticky notes) or Ruth Benerito (wrinkle free cotton)</p>	<p>dissolve, soluble, insoluble, solution, mixture, reversible changes, reverse, chemical reaction, irreversible change, burning, heating, vinegar, bicarbonate of soda, hardness, transparency, transparent, opaque, translucent, magnets</p>
	<p>Real life links</p> <ul style="list-style-type: none"> • Cooking and D&T 	<p>Working scientifically Plan, answer questions and make conclusions, gather, record and classify,, evaluate</p> <p>Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude,</p>	<p>Sustainability Plastic Pollution What is plastic pollution? What are the impacts of plastic pollution on the planet?</p> <p>Vocabulary plastic pollution, pollution, microplastic</p>	

		capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method		
Year 5 Physics	Autumn Term: Block 1 Earth and space - Pupils should be taught to: <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. 	Autumn Term: Block 1 <ul style="list-style-type: none"> I know the names of the planets I can describe the movement of the Earth and other planets relative to the Sun I can describe the movement of the Moon relative to the Earth I can describe the Sun, Earth and Moon (using the term spherical) I can explain the movement of the Moon relative to the Earth I can explain and demonstrate how night and day are created I know that the universe comprises all matter and space in existence I know that a celestial body is a large object in the universe I know that the Sun is a star I know that a star is an exceptionally hot ball of gas, originally made from hydrogen and helium I know that a planet (e.g Earth) is defined as a spherical celestial body that orbits a star and that has cleared the neighbourhood of its orbit of other objects, some of which crash into the planet and others that become moons of that planet I know it was once thought that everything orbited the Earth, but that scientists like Copernicus and Galileo used telescopes and measurement to show that the Earth orbited the Sun I know that the Earth spins around an imaginary line through its centre called an axis and that this axis is tilted relative to the Earth's orbit I know that night and day are the result of the Earth rotating on its axis I know that the tilt of the Earth towards and away from the Sun's light as the Earth orbits the Sun leads to the seasons as during winter the light is spread over a wider area I know that as the Moon orbits the Sun, different parts of it are lit up by the Sun, which is why we see a different shape lit up on the Moon as the lunar cycle progresses; these are called phases of the Moon I know that a solar eclipse occurs when the Moon is between the Sun and the Earth, casting a shadow on the Earth; a lunar 	Autumn Term: Block 1 <ul style="list-style-type: none"> I know that all the planets in the solar system orbit the Sun and that the further away they are from the Sun, the longer their orbit I know that the Moon orbits the Earth roughly every 28 days 	planet, satellite, sphere, solar system, eclipse, star, universe, constellation, axis, celestial body, Moon, rotating, lunar, solar, telescope, rotation Solar System, orbit, Sun, planets, Pluto, celestial body, gravity, heliocentric model, geocentric model, rotate, axis, North Pole, South Pole, Earth, night, day, moon, gravitational force, satellite

		<p>eclipse occurs when the Earth is between the Sun and the Moon, casting a shadow on the Moon</p> <ul style="list-style-type: none"> I can begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Egyptians I can explore the work of some scientists (Ptolemy, Alhazen, Copernicus) 		
	<p>Real life links</p> <ul style="list-style-type: none"> Trip to Space Centre Shadows outside at different times of day Looking at the moon and sky 	<p>Working scientifically Present findings, plan, answer questions and make conclusions, gather, record and classify</p> <p>Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method</p>	<p>Sustainability Global Warming</p> <ul style="list-style-type: none"> What is global warming? What are the impacts of global warming on living things? <p>Vocabulary global warming, greenhouse gases, fossil fuels, climate change, glacier, carbon footprint</p>	
	<p>Autumn Term: Block 2 Forces (Gravity and air resistance) - 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>Autumn Term: Block 2</p> <ul style="list-style-type: none"> I know that a force is measured in a unit called Newtons, named after a British scientist called Sir Isaac Newton who discovered lots about gravity and how planets move I know that pull forces can be measured using a device called a force meter I know that the amount of matter (stuff) in an object is its mass I know that unsupported objects are pulled towards the Earth by the force of gravity I know that acceleration is a change in speed and that unbalanced forces acting on an object cause it to accelerate I know that air resistance is a force felt by an object as it moves through the air; 	<p>Autumn Term: Block 2</p> <ul style="list-style-type: none"> I know that gravity is a force that acts between all objects in the universe, but that it acts much more strongly between objects that have more mass and that are close together Air resistance is caused by the object colliding into the gas particles that make up air; the quicker an object moves, the more gas particles it collides into and the more air resistance it experiences I can describe and explain how motion is affected by forces (including gravitational attractions, magnetic attraction and friction) 	<p>acceleration, air resistance, effort, force meter, gravity, load, mass, mesh, Newton, streamlined, terminal velocity, unsupported, weight frictional force, motion, air resistance, parachute, surface area, water resistance, streamlined, non-contact force, gravity, weight, lever, gear,</p>

		<ul style="list-style-type: none"> • I know that a falling object will accelerate until its air resistance matches the gravitational force pulling it down; at this point, the object will continue to move at this speed (called its terminal velocity) without getting any quicker or slowing down • I know that a parachute's shape increases the air resistance that a falling object experiences, giving it a much lower terminal velocity • I know that water resistance is a force felt by an object as it moves through water; it is caused by the object colliding into the water particles • I know that the shape of an object determines how much air resistance or water resistance it experiences; shapes of object that experience little air resistance or water resistance are described as streamlined • I can work out how water can cause resistance to floating objects • I know that a lever is a rigid length pivoting around a fulcrum • I know that a pulley is a wheel with a fulcrum that supports a moving cable or belt • I know that a gear is a rotating wheel with cut teeth that mesh with the teeth of another gear so that turning one gear turns an adjacent gear in the opposite direction • I know that gears, levers and pulleys are simple machines that are used to allow a smaller force to have a greater effect; they do this by moving a smaller force over a longer distance at one end of the machine, which the machine turns into a larger forcer over a small distance at the other end 	<ul style="list-style-type: none"> • I can explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravity 	<p>pulley, machine, acceleration, buoyancy, effort, force meter, fulcrum, gravity, load, mass, pivot, rigid, streamlined, water resistance</p>
	<p>Real life links</p> <ul style="list-style-type: none"> • Looking at bikes • Looking at how we use forces to move heavy things e.g. move chairs around the hall • See-saw 	<p>Working scientifically Present findings, plan, take measurements, answer questions and make conclusions</p> <p>Pupils might work scientifically by: exploring falling paper cones or cupcake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.</p> <p>Vocabulary:</p>	<p>Sustainability</p>	

		line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method		
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Year 6

Year 6 Biology	<p>Spring Term: Block 2: Evolution and inheritance - 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. 	<p>Spring Term: Block 2:</p> <ul style="list-style-type: none"> • I can describe how the earth and living things have changed over time (year 3 link) • I can explain how fossils can be used to find out about the Earth millions of years ago and show a gradual change • I can explain evolution as a result of adaptation • I can explain about reproduction and offspring (recognising that offspring usually vary and are not identical to their parents) • I can explain how animals and plants are adapted to their environment • I know that all life on Earth began from a single point around 4.5 thousand million years ago • I know that natural selection is the cause of this how living things change over time (leading to evolution); natural selection works as there is natural variation within a species; there is also competition to survive and reproduce and that members of a species with advantageous characteristics survive and reproduce - these characteristics are passed down to their offspring; members of a species with less advantageous characteristics do not survive and reproduce – these characteristics are not passed down to offspring (see diagram below) • I know that offspring that result from sexual reproduction (i.e. two parents) vary and are not identical to their parents • I can research and discuss the work of famous scientists, such as Charles Darwin, Mary Anning and Alfred Wallace 	<p>Spring Term: Block 2:</p> <ul style="list-style-type: none"> • I can explain how some living things adapt to survive extreme conditions and analyse the advantages/disadvantages of specific adaptations, e.g. being on 2 rather than 4 feet 	<p>evolution, natural selection, variation, advantageous variation, species, inheritance, desirable characteristics, polar habitat, desert habitat, adaptations, evolution, common ancestor, natural selection, finch, Galapagos Islands, decompose, Charles Darwin, palaeontologist, Mary Anning</p>
	<p>Real life links</p> <ul style="list-style-type: none"> - Looking at job of a palaeontologist 	<p>Working scientifically</p> <p>Present findings, answer questions and make conclusions, plan,</p>	<p>Sustainability</p>	

	<ul style="list-style-type: none"> - How current animals have adapted and evolved - Museums 	<p>Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method</p>		
	<p>Spring Term: Block 3 Living things and their habitats - 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 microorganisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics. 	<p>Spring Term: Block 3</p> <ul style="list-style-type: none"> • I can classify living things into broad groups according to observable characteristics and based on similarities & differences and give reasons why they have been classified this way • I can readily group animals into reptiles, fish, amphibians, birds and mammals • I can explain why classification is important • I know that there are three types of micro-organism: viruses, fungi and bacteria; of these three, viruses are often not really considered to be alive by many scientists mainly because they don't have the 'machinery' to reproduce inside them • I know that germs are disease-causing micro-organisms • I know that an arthropod is an invertebrate with a hard, external skeleton and jointed limbs • I know that insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings (e.g. wasp) • I know that an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wings 	<p>Spring Term: Block 3</p> <ul style="list-style-type: none"> • I can sub divide their original groupings and explain their divisions, such as vertebrates and invertebrates • 	<p>micro-organism, virus, thorax, arthropod, abdomen, arachnid, antenna, jointed limbs, Variation Organisms Populations</p> <p>monotreme, mammary gland, metamorphosis, larva, chrysalis, hatchling, nestling, fledgling, fertilisation, embryo, sperm cells, egg cells, sexual reproduction, anther, stigma, style, filament, ovary, ovule, clone, runner, tuber, asexual reproduction, cutting, parent plant</p> <p>organism, excretion, reproduction, mollusc, arachnid, classification,</p>

				coniferous tree, microorganism, bacteria, virus, fungi, characteristics
	<p>Real life links</p> <ul style="list-style-type: none"> - Research an animal of interest and describe using classification vocabulary 	<p>Working scientifically Gather, record and classify, evaluate and present findings, answer questions and make conclusions, present findings</p> <p>Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method</p>	Sustainability	
	<p>Summer Term: Block 2 Animals, including humans - 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 • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans. 	<p>Summer Term: Block 2</p> <ul style="list-style-type: none"> • I know and can name the main parts of the human circulatory system • I know the names of key bones in the body, including the rib cage, cranium, mandible, sternum, vertebrae, femur, tibia, fibula, patella, humerus, radius and ulna; know how to label these on a diagram of the human body • I know that an adult human body has 206 bones, the longest of which is the femur • I remember that the heart and lungs are organs protected by the ribcage and understand this as a part of the skeleton • I know that the heart beats, pumping blood around the body and that blood vessels carry the blood; arteries carry blood away from the heart; veins carry blood towards the heart; capillaries are tiny blood vessels that connect arteries and veins 	<p>Summer Term: Block 2</p> <ul style="list-style-type: none"> • I can explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies • I can compare the organ systems of humans to other animals • I can name and locate the major organs in the human body and make a diagram of the human body and explain how different parts work and depend on one another 	<p>artery, aorta, atrium, blood vessels capillary, oxygenated, deoxygenated, valve, respiration, circulatory system, vein, pulse, ventricle, replenished, resting heart rate, body, cranium, mandible, sternum, vertebrae, femur, tibia, fibula, patella, humerus, radius, ulna, alcohol, drugs, tobacco</p> <p>circulatory system, blood vessels, arteries, veins, capillaries, red blood cells, white blood cells, lungs, plasma, oxygen, atria,</p>

		<ul style="list-style-type: none"> I know that the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major arteries branch off from it (see diagram below) I know that blood travels around the body transporting nutrients that have been absorbed into the bloodstream from digestion; blood also absorbs oxygen from the lungs and carries it around the body which is used to power the body; this use of oxygen to create energy is called respiration I know that when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart rates 		ventricles, right atrium, left atrium, right ventricle, left ventricle, oxygenated blood, deoxygenated blood, calories, saturated fats, unsaturated fats, trans fats, drug, painkiller, depressant, stimulant, cigarette, tar, nicotine, vape, carbon monoxide, addiction, heart rate
	Real life links <ul style="list-style-type: none"> Experiment looking into heart rate and exercise 	Working scientifically Ask questions, answer questions and make conclusions, make observations, take measurements present findings, evaluate Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health. Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory, causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method	Sustainability	
Year 6 Physics	Autumn Term: Block 2 (3 weeks): Light - Pupils should be taught to: <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 	Autumn Term: Block 2: <ul style="list-style-type: none"> I know that light travels in straight lines I can explain how we see objects I can explain why shadows have the same shape as the object that casts them I know how to draw a diagram to show why the shape of a shadow will match the shape of an object I know why there are shadows 	Autumn Term: Block 2: <ul style="list-style-type: none"> I can describe how different colours of light can be created I know that white light comprises all the colours of light I know that white light refracted by two surfaces in a prism will spread out so that all of its constituent colours can be seen; this 	angle of incidence, angle of reflection, refraction, spectrum, translucent, medium, periscope, retina, iris, pupil, lens, ray diagram, solar eclipse, refraction,

	<ul style="list-style-type: none"> explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. 	<ul style="list-style-type: none"> I can explain how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc I know that translucent objects allow some light to pass through, but some of the light changes direction as it passes through the object; this means that something seen through a translucent object is not clearly defined (year 3) I know that when light passes from one medium to another (e.g. from air to water), it changes direction; this is called refraction; this happens because light travels at different speeds in different media I know that when light reflects off an object, the angle of incidence is equal to the angle of reflection I know that a periscope takes advantage of the predictable angles of incidence and reflection to allow an image to be shown to a viewer 	<p>array of colours is called a spectrum; it happens because the different colours that constitute white light travel at different speeds</p> <ul style="list-style-type: none"> I can explore a range of phenomena, including rainbows/ Northern Lights 	<p>medium, rainbow, prism, coloured filter, spectrum of light</p>
	<p>Real life links</p> <ul style="list-style-type: none"> Northern Lights Rainbows Periscopes 	<p>Working scientifically Gather, record and classify,, evaluate and present findings, answer questions and make conclusions, plan, take measurements</p> <p>Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water, and coloured filters (they do not need to explain why these phenomena occur).</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method</p>	<p>Sustainability Light pollution What is light pollution? How can we reduce light pollution?</p> <p>Vocabulary migration, glare, light pollution, light trespass, skyglow, urban, rural, light emission</p>	
	<p>Autumn Term: Block 2 (3 weeks): Electricity - 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 	<p>Autumn Term: Block 2:</p> <ul style="list-style-type: none"> I can explain how the number & voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer I can draw circuit diagrams using correct symbols 	<p>Autumn Term: Block 2:</p> <ul style="list-style-type: none"> I can explain what a fuse is Create a burglar alarm 	<p>series circuit, parallel circuit, resistance, voltage, short circuit, insulator</p>

	<p>number and voltage of cells used in the circuit</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> I can compare and give reasons for why components work and do not work in a circuit I know how to draw simple circuit diagrams I know the recognized symbols for a battery, bulb, motor, buzzer and wire I know how to predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit I know that voltage is a measure of the power of a cell to produce electricity; it is a measure of the 'push' of electric current, not the size of the electric current I know that as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase (though too high a voltage may 'blow' the bulb or buzzer) I can explain the danger of short circuits 		<p>series circuit, voltage, current, complete circuit, incomplete circuit</p>
	<p>Real life links</p> <ul style="list-style-type: none"> Use mini solar power to charge an item 	<p>Working scientifically Gather, record and classify, evaluate and present findings, plan, take measurements, evaluate</p> <p>Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory causal relationships, decimals, analyse, interpret, conclude, capacity, mass, approximate, justify, secondary source, evidence, duration, mean, calculate, method</p>	<p>Sustainability</p> <p>Renewable energy What is renewable energy? Using renewable energy?</p> <p>Vocabulary solar power, wind power, solar panels, wind turbine</p>	

Working Scientifically

	National Curriculum – Early Learning Goals	Granular Knowledge	Greater Depth	Vocabulary
	<ul style="list-style-type: none"> • 		<ul style="list-style-type: none"> • 	
Year 1/ 2	<p>Working Scientifically:</p> <ul style="list-style-type: none"> • Sc1/1.1 asking simple questions and recognising that they can be answered in different ways 	<p>Working Scientifically:</p> <ul style="list-style-type: none"> • I know that we can ask questions about the world and that when we observe the world to answer these questions, this is science • I know that we can use magnifying glasses to observe objects closely • I know that we can test our questions to see if they are true 		<p>properties, magnifying glass, object, record, equipment</p>

	<ul style="list-style-type: none"> Sc1/1.2 observing closely, using simple equipment Sc1/1.3 performing simple tests Sc1/1.4 identifying and classifying Sc1/1.5 using their observations and ideas to suggest answers to questions Sc1/1.6 gathering and recording data to help in answering questions <p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways observing closely, using simple equipment performing simple tests identifying and classifying using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions 	<ul style="list-style-type: none"> I know that objects can be identified or sorted into groups based on their observable properties I know that we can write down numbers and words or draw pictures to record what we find <p>Observing Closely</p> <ul style="list-style-type: none"> I can discuss what I can see, touch, smell, hear or taste I can use simple equipment to help them make observations <p>Performing Tests</p> <ul style="list-style-type: none"> I can ask simple scientific questions I can use simple equipment to make observations I can carry out simple tests <p>Identifying and Classifying</p> <ul style="list-style-type: none"> I can identify and classify things I can give a simple reason for their answer <p>Recording Findings</p> <ul style="list-style-type: none"> I can use simple data to answer questions I can suggest what I have found out I can record their findings using standard units I can record some information in a chart or table, or using ICT 	<p>Observing Closely</p> <ul style="list-style-type: none"> I can find out by watching, listening, tasting, smelling and touching <p>Performing Tests</p> <ul style="list-style-type: none"> I can give reasons for their answers <p>Identifying and Classifying</p> <ul style="list-style-type: none"> I can discuss similarities and differences I can explain what they have found out using scientific vocabulary <p>Recording Findings</p> <ul style="list-style-type: none"> I can make accurate measurements 	<p>questions, answers, gather, measure, results, sort, group, test, explore, compare, describe, similar/ities, different/ces, beaker, pipette, syringe</p> <p>measure, observe, compare, measurement, growth, trowel, temperature, bend, squash, twist, stretch, absorb</p> <p>draw, label, change, same, table, record, tally, pipette, size, predict, similar, different, sort, group, identify, pattern, height, number, amount, hand lens, ruler, counting cubes, centimetres, meters, suitable, unsuitable, match, test, scientific enquiry, comparative test, research, pattern seeking</p>
<p>Year 3/ 4</p>	<ul style="list-style-type: none"> Sc4/1.1 asking relevant questions and using different types of scientific enquiries to answer them Sc4/1.2 setting up simple practical enquiries, comparative and fair tests 	<p>Working Scientifically</p> <ul style="list-style-type: none"> I know that we can ask questions and answer them by setting up scientific enquiries I know how to make relevant predictions that will be tested in a scientific enquiry I know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same 		<p>prediction, measurement, enquiry, dependent variable,</p>

	<ul style="list-style-type: none"> Sc4/1.3 making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Sc4/1.4 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Sc4/1.5 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Sc4/1.6 reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Sc4/1.7 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Sc4/1.8 identifying differences, similarities or changes related to simple scientific ideas and processes Sc4/1.9 using straightforward scientific evidence to answer questions or to support their findings. <p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests 	<ul style="list-style-type: none"> I know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches I know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table I know – with structured guidance - how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion I know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry I know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true I know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry I know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc) I know that they can draw conclusions from the findings of other scientists I know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry <p>Planning</p> <ul style="list-style-type: none"> I can use different ideas and suggest how to find something out I can make and record a prediction before testing I can plan a fair test and explain why it was fair I can set up a simple fair test to make comparisons I can explain why they need to collect information to answer a question <p>Obtaining and presenting evidence</p> <ul style="list-style-type: none"> I can take accurate measurements using different equipment and units of measure I can record their observations in different ways, labelled diagrams, charts etc I can describe what they have found using scientific language <p>Considering evidence and evaluating</p> <ul style="list-style-type: none"> I can explain what they have found out and use their measurements to say whether it helps to answer their question <p>Types of investigations Children should have the opportunity to investigate:</p>	<p>independent variable, fair test, similar, theory, hypothesis over time, notice patterns, secondary sources, comparative tests, accurate, conclusions, predictions</p> <p>hardness, reaction, bar chart, pictogram, data, increase, decrease, prediction, dissection, scales, filter paper, filter funnel, measuring cylinder, thermometer, conclusion, evaluation, data, volume, decibel meter, stopwatch, beaker, temperature, Petri dish, block chart, bar graph, classifying, classification key</p> <p>fair test, identify, group and</p>	
	<p>Planning</p> <ul style="list-style-type: none"> I can record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables <p>Obtaining and presenting evidence</p> <ul style="list-style-type: none"> I can explain their findings in different ways (display, presentation, writing) I can use their findings to draw a simple conclusion I can suggest improvements and predictions for further tests <p>Considering evidence and evaluating</p> <ul style="list-style-type: none"> I can suggest how to improve their work if they did it again 			

	<ul style="list-style-type: none"> making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identifying differences, similarities or changes related to simple scientific ideas and processes using straightforward scientific evidence to answer questions or to support their findings. 	<ul style="list-style-type: none"> Observing changes over different periods of time Noticing patterns Grouping and classifying Carrying out comparative and fair tests Finding things out using secondary resources 		<p>classify, model, modelling, investigate, changed, measured, stayed the same, millimetres, millilitres, data logger, tape measure, features, scientists, diagram, sorting diagram, block diagram, distance, results</p>
<p>Year 5/6</p>	<ul style="list-style-type: none"> Sc5/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Sc5/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision Sc5/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs 	<ul style="list-style-type: none"> I know how to choose appropriate variables to test a hypothesis (e.g. plant height as a dependent variable when measuring effect of light on plant growth) I know how to identify conditions that were imperfectly controlled and can explain how these might affect results I know how to accurately use further measuring devices, including digital and analogue scales, measuring cylinders and beakers, recognizing the relative accuracy of each device I know how and when to repeat measurements, how to find an average of a set of measurements and how to recognize and remove outliers from a set of data, justifying the removal as a potential mis-measurement I know how to independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion I know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary 		<p>line graph, relationship, outlier</p>

	<ul style="list-style-type: none"> • Sc5/1.4 using test results to make predictions to set up further comparative and fair tests • Sc5/1.5 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations • Sc5/1.6 identifying scientific evidence that has been used to support or refute ideas or arguments. <p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting 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 	<ul style="list-style-type: none"> • I know examples of instances where scientific evidence has been used to support or refute ideas or arguments (e.g. fossil records as evidence of natural selection) <p>Planning</p> <ul style="list-style-type: none"> • I can plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary • I can make a prediction with reasons • I can use test results to make predictions to set up comparative and fair tests <p>Obtaining and presenting evidence</p> <ul style="list-style-type: none"> • I can take measurements using a range of scientific equipment with increasing accuracy and precision • I can take repeat readings when appropriate • I can record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs <p>Considering evidence and evaluating</p> <ul style="list-style-type: none"> • I can use a graph to answer scientific questions • I can present a report of their findings through writing, display and presentation <p>Types of investigations Children should have the opportunity to investigate:</p> <ul style="list-style-type: none"> • Observing changes over different periods of time • Noticing patterns • Grouping and classifying • Carrying out comparative and fair tests • Finding things out using secondary resources 	<p>Planning</p> <ul style="list-style-type: none"> • I can explore different ways to test an idea, choose the best way and give reasons • I can vary one factor whilst keeping the others the same in an experiment • I can use information to help make a prediction • I can explain, in simple terms, a scientific idea and what evidence supports it • I can use their findings to draw a simple conclusion <p>Obtaining and presenting evidence</p> <ul style="list-style-type: none"> • I can decide which units of measurement they need to use • I can explain why a measurement needs to be repeated <p>Considering evidence and evaluating</p> <ul style="list-style-type: none"> • I can find a pattern from their data and explain what it shows • I can link what they have found out to other science • I can suggest how to improve their work and say why they think this 	<p>Previous vocab plus, notice patterns, relationships, independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute, data loggers</p> <p>Vocabulary: line graph, microscope, anomaly, anomalous result, control, control beaker, sieve, filtering, repeatability, accuracy, correlation, precision, angle, periscope, line graph, scatter graph, independent variable, dependent variable, controlled variables, duration, theory</p>

	<ul style="list-style-type: none">identifying scientific evidence that has been used to support or refute ideas or arguments.			
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