

EYFS Science



The most relevant early years outcomes for science are taken from the following areas of learning:

- Physical Development
- Understanding the World - The World
- Expressive Arts and Design - Creating with Materials

Science			
Range 5 (36-48mths)	Physical Development	Health and Self-Care	<ul style="list-style-type: none"> • Observes and can describe in words or actions the effects of physical activity on their bodies. • Can name and identify different parts of the body. • Can wash and can dry hands effectively and understands why this is important. • Willing to try a range of different textures and tastes and expresses a preference. Can name and identify different parts of the body. • Working towards a consistent, daily pattern in relation to eating, toileting and sleeping routines and understands why this is important.
	Understanding the World	The World	<ul style="list-style-type: none"> • Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. • To talk about why things happen and how things work. • Developing an understanding of growth, decay and changes over time. • Show care and concern for living things and the environment. • Begin to understand the effect their behaviour can have on the environment.

		Technology	<ul style="list-style-type: none"> Shows skills in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements, or new images. Plays with a range of materials to learn cause and effect, for example, makes a string puppet using dowels and string to suspend the puppet.
	Expressive Arts and Design	Creating with Materials	<ul style="list-style-type: none"> Explores and learns how sounds and movements can be changed. Continues to explore colour and how colours can be changed. Uses tools for a purpose.
Range 6 (48-60mths)	Physical Development	Health and Self-Care	<ul style="list-style-type: none"> Eats a healthy range of foodstuffs and understand a need for variety in food. Describes a range of different food textures and tastes when cooking and notices changes when they are combined or exposed to hot and cold temperatures. Has established a consistent, daily pattern in relation to eating, toileting and sleeping routines and can explain why this is important. Shows some understanding that good practices regarding exercise, eating, drinking water, sleeping and hygiene can contribute to good health.
	Understanding the World	The World	<ul style="list-style-type: none"> Looks closely at similarities, differences, patterns and change in nature. Knows about similarities and differences in relation to places, objects, materials and living things. Talks about the features of their own immediate environment and how environments might vary from one another. Makes observations of animals and plants and explains why some things occur, and talks about changes.

		Technology	<ul style="list-style-type: none"> Can use the internet with adult supervision to find and retrieve information of interest to them.
	Expressive Arts and Design	Creating with Materials	<ul style="list-style-type: none"> Develops their own ideas through experimentation with diverse materials, e.g. light, projected image, loose parts, watercolours, powder paint, to express and communicate their discoveries and understanding.
Range 6 - ELG (60-71mths)	Physical Development	Health and Self-Care	Statutory ELG: Managing Self <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.
	Understanding the World	The World	Statutory ELG: The Natural World <ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environment, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing state of matter.
	Expressive Arts and Design	Creating with Materials	Statutory ELG: Creating with Materials <ul style="list-style-type: none"> Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Year 1



Y1 Science Programme of Study

Area of Study	Key Knowledge	Key Vocabulary
Plants		
Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	Some common wild plants are daisies and dandelions . Some garden plants are roses and tulips .	deciduous, evergreen, seasons, wild, garden
	Some deciduous trees lose their leaves in Autumn every year. Evergreen trees have green leaves all year round.	
Identify and describe the basic structure of a variety of common flowering plants, including trees	The parts of a flowering plant are roots, stem, leaves and a flower.	roots, stem, leaf, flower, trunk, twig, flowering, structure
Animals including Humans		
Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	A goldfish is a fish. A frog is an amphibian. A snake is a reptile. A penguin is a bird. A human is a mammal.	fish, amphibians, reptiles, birds, mammals
Identify and name a variety of common animals that are carnivores, herbivores and omnivores	A lion is a carnivore. A rabbit is a herbivore. A raccoon is an omnivore.	carnivore, herbivore, omnivore
Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)	Fish have gills . Amphibians spend part of their life on water and part on land . Reptiles are cold blooded . Birds have wings . Mammals are warm blooded .	fish, amphibians, reptiles, birds, mammals
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	I can point out my head, arm, ears, leg, eyes, hand, nose, foot, mouth and neck. The nose is used for smell. Eyes are used to see. Hands are used to feel. Ears are used to hear. Mouth is used to taste.	human, body, head, arm, ears, leg, eyes, hand, nose, foot, mouth, neck
Everyday Materials		
Distinguish between an object and the material from which it is made	This is a chair , it is made from wood .	object, materials, wood, plastic, glass, metal, water, rock, brick, paper, fabric, foil, elastic
Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock	Everyday materials are wood, plastic, glass, metal, water, and rock.	
Describe the simple physical properties of a variety of everyday materials	Wood is opaque and hard .	properties, hard, hard, soft; stretchy, stiff; shiny, dull; rough, smooth; bendy, not bendy; waterproof, not waterproof; absorbent, not absorbent; opaque, transparent.
Compare and group together a variety of everyday materials on the basis of their simple physical properties	Metal and wood are both opaque .	
Seasonal Changes		
observe changes across the 4 seasons	In the autumn leaves change colours .	season, autumn, winter, spring, summer, months, temperature
observe and describe weather associated with the seasons and how day length varies	In the winter it snows .	seasons, hot, warm, cold, cool, freezing, frosty, wet, dry, sunny, cloudy, showery, stormy, windy, breeze, gale
Working Scientifically KS1		

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:

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

Y2 Science Programme of Study

Area of Study	Key Knowledge	Key Vocabulary
<u>Living Things and their Habitats</u>		
explore and compare the differences between things that are living, dead, and things that have never been alive	<p>Living is anything that is currently alive. Once-lived is something that used to be alive but is no longer living.</p> <p>Examples of things that have never lived may be naturally occurring, such as rocks, soil, air, water, or manufactured materials such as metal and plastic.</p>	habitat, alive, living, once-lived, dead, never-lived, plants, animals, decay, rocks, soil, air, water
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	A habitat is a natural environment or home of a variety of plants and animals. In the desert there are camels who store fat in their humps when food is scarce. Cactus store water in their stem.	suited, habitat, features, names of habitats, living things, animal body parts
identify and name a variety of plants and animals in their habitats, including microhabitats	A micro-habitat is a very small habitat which supports the survival of tiny animals or plants and example of this is a piece of grass is the microhabitat.	habitat, microhabitat, suited
describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	Some animals get their food from eating plants. These animals are called herbivores. Some animals get their food from eating other animals, they are called carnivores. Some animals get their food from eating plants and animals, they are called omnivores.	food chain, plants, animals, herbivores (eat plants and parts of plants), carnivores (eat other animals), omnivores (eat plants/ parts of plants and other animals), direction, source of food



<u>Plants</u>		
observe and describe how seeds and bulbs grow into mature plants	Seed - The seed is at the start of the life cycle, then germination, a seedling through to a mature plant. Bulb - bulb, shoot, stem, through to a mature plant.	seeds, plants, gardener, grow, observations, describe, identify, expert
find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Plants need air, light, warmth, water and nutrients to be healthy. If a plant doesn't have one of these requirements it could affect its growth or even die.	seedling, mature plant, wilting, healthy, unhealthy, water, light, warmth, plan, change, care, predict
<u>Animals including Humans</u>		
notice that animals, including humans, have offspring which grow into adults	Humans give birth to babies . Cats give birth to kittens . Cows give birth to calves .	offspring, baby, adult, grow, change, chick, calf, cub, kid and other baby animal terms
find out about and describe the basic needs of animals, including humans, for survival (water, food and air)	Animals need food, shelter and water in order to survive.	baby, need, want, living, alive, essential, food, milk, water, drink, eat, air, breathe, shelter, warmth, survival, depend
describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Humans need a balanced diet to stay healthy. Exercise makes your muscles and bones stronger. Humans should clean their teeth to have good hygiene.	food, healthy diet, dairy, fruits, vegetables, meat, fish, beans, fat, sugar, bread, potatoes, cereals, hygiene, exercise, nutrients, muscles, bones, balanced
<u>Uses of Everyday Materials</u>		
identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	Wood is strong , it is long lasting . It comes from trees . Glass is transparent and is fragile and hard . Paper is lightweight and flexible . Plastic is waterproof and can be made in different colours . Metal is hard and shiny .	smooth, rough, soft, squashy, hard, bendy, stiff, warm, cold) and how it looks (shiny, dull, thin, flat, bumpy, thick, pointed), wood, metal, plastic, glass, rock, brick, paper
find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	Solids can be changed by bending, twisting and stretching.	squash, bend, twist, stretch, pull, push,

Working Scientifically KS1

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Y3 Science Programme of Study

Area of Study	Key Knowledge	Key Vocabulary	
Plants			
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flower	The two main functions of roots are to absorb water and dissolved nutrients and to secure the plant in the ground.	plant, roots, stem, trunk, leaf/leaves, flower, leaflet, stalk, veins, surface, edge, lobes, tip, food, root hair, nutrients, anchor, support, seed, germination, seedling, growth, mature plant, flowering, pollination, seed formation, bud, petal, sepal, carpel, stamen, pollen, reproduce, nectar, seed, fruit, dispersal, animal, wind, water, self-dispersal, explosion, sprinkling, competition, air, light, stigma, style, ovary, anther, filament, observe, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions	
	The stem, also known as the trunk in trees, supports the parts of the plant which are above ground and enables water and nutrients and other substances to be transported throughout the plant.		
	The main function of the leaves is to make food for the plant by the process of photosynthesis.		
	The function of the flower is sexual reproduction. Flowers may have only male parts, only female parts, or both.		
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	Different plants need different amounts of water, sunlight, nutrients, room to grow and temperature depending on the type of plant.		
Investigate the way in which water is transported within plants	The stem, also known as the trunk in trees, supports the parts of the plant which are above ground and enables water and nutrients and other substances to be transported throughout the plant.		
Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	sepals, which protect the flower bud petals, which are coloured and shaped to attract insect pollinators "stamens, each made up of an anther and a filament. These are the male parts where pollen is produced." "Pollen is transferred to the female parts of the flower during the process of pollination." carpels, consisting of stigma, style and ovary. These are the female parts.		
Animals Including Humans			
Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat	Animals, including humans, are unable to make their own food and that they get their nutrition from what they drink and eat. Different food groups include fruit and vegetables, bread, rice, potatoes, pasta and other starchy foods, milk and dairy, oils and spreads, meat, fish, eggs, beans and other non-dairy sources of protein. Human body needs food for energy, to keep warm, and for growth and repair. We need many nutrients on a daily basis in order to stay healthy. There are seven nutrient groups are protein, carbohydrates, fats, oils, vitamins, minerals, fibre and water. Healthy, balanced diets lead to healthy, active people.		active, activity, balanced, carbohydrates, dairy, diet, exercise, fats, fibre, fruits, healthy, hygiene, minerals, nutrition, oils, proteins, vegetables, vitamin
Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Babies are born with about 300 bones, almost a third of which eventually fuse together to form the 206-bone skeleton of an adult. Vertebrates are animals that have a backbone. These skeletons are called endoskeletons - this means that the skeletons are on the inside of the bodies. These skeletons grow with the bodies. When the skeleton exists outside the body, it is called an exoskeleton. An exoskeleton is a covering that supports and protects animals. These have to be shed and a new skeleton is grown. The three most important things a skeleton does are to provide support and shape to an animal's body, allow movement through the joints and protect organs. Joints allow the body to make movements. The body has many bones and are connected through the joints. Muscles are attached to the bone by tendons and help them to move. When a muscle contracts it gets shorter and pulls on the bone it is attached to.		skeleton, bones, muscles, joint, endoskeleton, ankle, exoskeleton, hip, pelvis, rib cage, spine, organs, protect, clavicle, cranium, tendons, femur, ribs, elbow, spine, vertebrates, invertebrates

Rocks		
Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties	<p>Limestone is a grey/white rock that was formed from the bones of tiny sea creatures that dropped down to the bottom of the sea when they died. It is used as a building stone, and to make concrete.</p> <p>Chalk is a softer, white rock and is a type of limestone.</p> <p>Granite is harder and tough, usually grey to pink in colour and often used for buildings. Granites are made up of crystals, which can often be seen clearly on the surface.</p> <p>Slate is fine-grained and when expertly cut it will form smooth flat sheets of stone, which have long been used for roofing, floor tiles and other purposes. Slate is frequently grey in colour, especially when seen covering roofs, but can be found in other colours.</p> <p>Marble is made of limestone that has experienced extreme heat and changed to form a hard rock that is used in buildings and to create sculptures. It can be white but varies in colour, depending on where it comes from.</p> <p>Most sandstone is composed of quartz and feldspar because these are the most common minerals found in the Earth's crust. Like sand, sandstone may be any colour, but the most commonly occurring are tan, brown, yellow, red, grey, pink, white and black.</p>	
Describe in simple terms how fossils are formed when things that have lived are trapped within rock	<p>Most of the creatures that fossils were formed from would have lived in the sea, died or been killed and dropped to the ocean floor, where layers of sediment built up on top of them over many centuries.</p> <p>Types of fossils</p> <p>Ammonites were marine creatures with a spiral-shaped shell. The fossilised remains of their shells are common and often found on beaches. They are around 65 million years old. One of the largest ever collected was over 2 metres in diameter.</p> <p>Trilobites lived in large groups, so where one fossil is found, there may well be more. There are lots of different trilobites, with different shaped heads or tails. Trilobite fossils are some of the oldest, living about 540 million years ago.</p> <p>Clams and oysters look very similar to those seen today. They are sometimes found with two shells still joined together, or as single shells. Most clams and oysters live in the sea. If they are found inland, then the location must have been under the sea many millions of years ago.</p> <p>Corals look like plants, but are actually made up of tiny animals that live together in colonies. They grow in warm, shallow seas and form big reefs. Some coral fossils are more than 400 million years old.</p> <p>Living sea urchins have a round shell covered in spines. Fossilised sea urchins usually show evidence of the body only, as the spines fall off after it dies. Starfish fossils are rare, because they are very fragile and break easily.</p> <p>Fossil remains of different kinds of dinosaurs, such as bones, teeth, footprints and faeces, can reveal a lot about where and how they lived. They were living around the same time as ammonites, about 65 million years ago.</p>	sandstone, granite, chalk, limestone, marble, pumice, rough, smooth, hard, soft, rock, stone, pebble, texture, particle, crystal, granule, properties, soil, clay, sandy, loam, peat, organic material, weather, weathering, frost, beach, cliff, trilobite, starfish, sea urchin, ammonite, fossil, fossilise, remains
Recognise that soils are made from rocks and organic matter	<p>There are six main soil types: clay, sandy, silty, peaty, chalky, loamy.</p> <p>Clay soil feels lumpy and sticky when very wet. It is rock-hard when dry. It does not let through water easily and has few air spaces. It is very hard to dig.</p> <p>Sandy soil feels gritty to the touch and lets water through easily. It is easy to dig and dries out rapidly.</p> <p>Silty soil is smooth and soapy to the touch. It retains moisture but allows water to drain away easily. It is richer in organic matter than sandy soil, easier to dig than clay soil and heavier than chalky soil.</p> <p>Peaty soil contains a lot of organic matter (peat) but very few nutrients. It is very dark in colour and is easy to dig.</p> <p>Chalky soil is alkaline, with a pH of 7.5 or more. It is usually stony, sometimes chalky-white in colour and allows water to drain easily. It contains very few nutrients.</p> <p>Loamy soil has a good structure. It drains well, retains moisture and is full of nutrients. It is easy to dig and doesn't dry out too much in hot weather. It is the ideal soil for growing plants.</p>	

Light

Recognise that they need light in order to see things and that dark is the absence of light	The absence of light means that we cannot see
	The term dark means 'absence of light'
	The pupil can control the amount of light entering the eye
Notice that light is reflected from surfaces	All objects will reflect some light
Recognise that light from the sun can be dangerous and that there are ways to protect their eyes	Sunglasses serve two main functions. The first is to reduce the intensity of light, which makes it easier to see things and not to be overwhelmed by glare. The second is to provide a filter to reduce the potentially damaging amount of UV light that enters the eye.
Recognise that shadows are formed when the light from a light source is blocked by an opaque object	Opaque materials are those that are said to absorb all of the light that falls on them and so objects made of them make a clearly defined shadow.
Find patterns in the way that the size of shadows change	The shape of a shadow will be defined by the shape of an object causing it
	If you move the object creating the shadow towards the light source the shadow will get bigger, although it remains the same shape. If you move the object towards the screen then the shadow will become smaller. If the light source is very large or the distance is quite small then the shadows can become so ill defined and unclear that this behaviour is not observable.

light, dark, shadow, mirror, bright, dim, reflect, eye, opaque, transparent, translucent, ultraviolet, ray, beam, absorb, luminous, non-luminous, infrared, question, investigation, fair test, change, measure, predict, prediction, explain, explanation, observations, draw conclusions

Area of Study	Key Knowledge	Key Vocabulary
<div>Formula Bar</div> <div>Recognise that living things can be grouped in a variety of ways</div>	<u>Living Things and their Habitats</u>	
	Vertebrates are animals with backbones	
	There are five main groups of vertebrates	
	Fish are aquatic. They breathe using gills and are unable to live out of water. They are cold-blooded animals, which means that they cannot regulate their body temperature, which is close to that of their surroundings. Fish are covered in scales. They have fins (modified limbs) and a tail for swimming. They lay eggs that are fertilised externally, and that develop and hatch in the water. There are different classes of fish. One important distinction is between bony fish and cartilaginous fish, such as sharks and rays, which have skeletons that are made of cartilage.	
	Amphibians need water to complete their life cycles. Their skin may be smooth or slightly rough but has no hair, scales or feathers, and needs to be kept moist. It often feels slimy. They lay eggs, which are fertilised externally in water and then hatch into a larval form, e.g. tadpole, which is unlike the adult in appearance and which usually breathes with gills. The adult animal has lungs and can live on land. Adult amphibians usually have four legs and have toes without claws; some also have tails. Amphibians are cold-blooded.	
	Reptiles have dry, leathery, scaly skin with no hair or feathers. Those with legs have claws on their toes. They have lungs and are adapted to live on land, although some can be found in water. They are cold-blooded. Fertilisation is internal, after which the female lays her eggs, which have leathery shells that prevent them from drying out so they can be laid and incubated on land. The young hatch as small versions of the adult.	
	Birds are distinguished by the presence of beaks and feathers. Although a few birds are flightless they all have wings and two legs. They are warm-blooded, which means that they are able to regulate their body temperature and maintain it at a particular level. The female lays hard-shelled eggs which are hatched on land. Although some birds swim and find their food in water they all breathe with lungs. Most birds have light, hollow bones as an adaptation for flight.	
	Mammals are warm-blooded and have sweat glands to help them regulate their temperature. Their skin is covered with fur or hair, although in some animals this is so fine or sparse as to be almost absent. Fertilisation is internal and most mammals give birth to live young, although a few, such as the spiny anteater and platypus, lay eggs. Marsupials such as the kangaroo give birth to immature young that mature in the mother's pouch. All mammals suckle their young, producing milk in mammary glands. Mammals have teeth adapted for different diets so they do not need to swallow their food whole. Mammals breathe with lungs; even aquatic mammals need to surface for air although some can remain submerged for a considerable time.	
	Invertebrates are animals that do not have an internal skeleton.	
	Insects have six legs and usually two pairs of wings. Their bodies are divided into three parts (head, thorax and abdomen) and they have one pair of antennae on their heads.	
	Arachnids have eight legs, no wings and no antennae. They typically have two body parts with the head and thorax combined.	
	Crustaceans usually live in water, although the woodlouse is a land-dwelling example that children will probably be familiar with. Crustaceans generally have two main body parts; the abdomen is usually segmented, with 19 segments being typical. They have 10 or more jointed legs and no wings. They have two pairs of antennae although the second pair is small or internal in some crustaceans.	
	Myriapods (such as millipedes and centipedes) have many body segments, each bearing one or two pairs of legs. They have a single pair of antennae.	
	Molluscs have soft bodies with no segments, wings or legs. They have a muscular foot and/or tentacles. Most molluscs live in water; slugs and snails live on land. Molluscs typically have a single or double shell although in some animals the shell is internal or absent.	
	There are several types of worm. Earthworms and leeches are annelids; they have segmented bodies with no legs or antennae. They have bristles that are small and hard to see in some species.	
Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	A key is a common way to structure identification charts.	
	Classification is assigning an item to a group based on common characteristics.	sort, classify, identify, features, sequence, key, distinguish, observations,
Recognise that environments can change and that this can sometimes pose dangers to living things	Humans can have a negative impact on the local environment through different types of pollution and through destruction of habitats through building housing, roads etc.	
	Humans can also have a positive impact when developments are designed to be environmentally friendly , when they improve brownfield sites and where parks, nature reserves and other green spaces are deliberately created or actively maintained to increase biodiversity .	environment, impact positive, negative, litter, pollution, waste, biodiversity, habitat destroy, location, human impact, global issue, deforestation, climate change, zoo, endangered, conservation
	Global issues affecting biodiversity include habitat destruction through deforestation, pollution and global warming, which can be explored through its impact on polar habitats.	



features, sequence, key, distinguish, similarities, differences, vertebrate, fish, amphibian, reptile, bird, mammal, backbone, hair, scales, feathers, eggs, wings, beak, lungs, gills, cold blooded, warm blooded, suckle, head, thorax, abdomen, wing, segment, antennae, insects, arachnids (spiders), crustaceans, myriapods, molluscs, worms, observations, sort, group, classify, identify

Animals including Humans		
Area of Study	Key Knowledge	Key Vocabulary
Describe the simple functions of the basic parts of the digestive system in humans	Animals, including humans, cannot make their own food; they get nutrition from what they eat. We need to eat different types of food so that our bodies get sufficient nutrients for growth and repair and as a source of energy. These nutrients are absorbed by the body as it passes through the digestive system. The digestive system consists of the mouth, oesophagus, stomach, small intestine, large intestine, rectum, anus.	mouth, teeth, oesophagus, stomach, small intestine, large intestine, rectum, anus, digestive system, digestion, carbohydrate, fat, sugar, protein, roughage, dairy, fruit, vegetables, vitamins, minerals, balanced diet, healthy, mechanical process, chemical process, absorb, nutrients, water, saliva, chemicals, enzyme
Identify the different types of teeth in humans and their simple functions	Humans have two sets of teeth – milk teeth and permanent teeth. The role of the teeth is to break the food into smaller pieces so that it can be swallowed.	teeth, canine, incisor, premolar, molar, jaw, cutting, tearing, grinding, dental hygiene, decay, dentist, brushing, toothpaste, floss, mouthwash, food
	Incisors are for cutting and snipping	
	Canines are for ripping and tearing	
	Molars are for crushing and grinding	
	The size and number of the different types of teeth in animals vary from species to species.	
	Herbivores eat only plants and have incisors and molars.	
	Carnivores eat only meat and have incisors and canines.	
	Omnivores eat plants and meat and have incisors, canines and molars.	
Construct and interpret a variety of food chains, identifying producers, predators and prey	A food chain is used to describe feeding relationships. A food chain isolates one linear relationship from within the web.	plants, animals, food chain, food web, producer, consumer, predator, prey, herbivore, omnivore, carnivore
	The food chain starts with a species that eats no other species known as a producer usually a green plant.	
	All other species in the chain are known as consumers and the food chain ends with a species that is eaten by no other species in the web - top consumer.	
States of Matter		
Area of Study	Key Knowledge	Key Vocabulary
Compare and group materials together, according to whether they are solids, liquids or gases	Substances occur in three states, solid, liquid and gas	Solid, liquid, hard, soft, pour, flow, pile, pool, surface, horizontal, runny, viscous, sticky, grain
	Solids retain their shape unless a force is applied to them	
	Liquids when transferred from place to place take the shape of the container they are in but do not change in volume	
	Gases change in shape and volume to fill the space they are in.	
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)	Changes of state occur as a result of heating or cooling.	powder, ice, water, temperature, cool, cooling, warm, warming, hot, degree Celsius, melt, melting, freeze, freezing, solidify, solidifying, heating, states of matter, change of state, melting point, freezing point, process, gas, air, carbon dioxide, helium, oxygen, bubbles, empty, particle, weight, compress, squash, shape, volume, dry, evaporate, evaporation, water vapour, boil, boiling, boiling point, steam, thermometer, data logger, sensor, droplets, condense, condensation, water, droplets
	Melting is the change from solid to liquid caused by heating	
	Freezing or solidifying is the change from liquid to solid caused by cooling.	
	Boiling is a change from liquid to gas when the liquid is heated to a specific temperature known as its boiling point.	
	Evaporation is the change from liquid to gas.	
	Condensation is the change from gas to liquid at temperatures between its boiling and freezing points.	
Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	The water cycle shows how water in the environment evaporates into the air then the warm air cools as it rises leading to condensation and the formation of clouds. Water droplets in the clouds fall as rain (or as snow or hail if cooled below freezing point). The water returns to the sea via streams, lakes and rivers to continue the cycle.	water, water vapour, droplets, evaporation, condensation, cooling, warming, cycle, states of matter, liquid, gas, changes of state, model

Sound		
Area of Study	Key Knowledge	Key Vocabulary
Identify how sounds are made, associating some of them with something vibrating	Sounds are caused by a material vibrating.	sound, loud, quiet, high, low, repeating, continuous, strike, blow, shake, pluck, vibration, vibrate, solid, gas, volume, strength of vibrations, sound source, fainter, distance, pitch, particles, question, investigation, fair test, change, measure, predict, prediction, explanation, observations, draw conclusions
Recognise that vibrations from sounds travel through a medium to the ear	For sounds to travel they require a medium to pass through, which can be a solid, liquid or gas.	
	We hear/detect sounds because the vibrations produced by the source pass through the air.	
	When they reach our ears they cause our eardrums to vibrate, stimulating the nerve endings in the ear so we hear the sound.	
Find patterns between the pitch of a sound and features of the object that produced it	Sounds can be high or low. This is known as the pitch of the sound.	
Find patterns between the volume of a sound and the strength of the vibrations that produced it	The speed of the vibrations is known as their frequency.	
	Sounds can also be loud or quiet. This is known as the volume of the sound.	
	The loudness of a sound is dependent on how strong the vibrations are.	
Recognise that sounds get fainter as the distance from the sound source increases	As the vibrations pass through the air away from the sound source the vibrations become weaker (their amplitude decreased) and therefore the volume (loudness) of the sound decreases.	


Electricity		
Area of Study	Key Knowledge	Key Vocabulary
Identify common appliances that run on electricity	Electricity (or electrical current) is a flow of electrons which transfers energy.	electricity, electrical, mains, plugged in, battery, power, rechargeable, solar, wind up, sound, light, heat, movement, cell, wire, bulb, bulb holder, buzzer, motor, component, circuit, complete circuit, short circuit, flow, break, make, metal, connect, disconnect, terminal, positive, negative, switch, press switch, toggle switch, tilt switch, pendulum switch, properly, electrical conductor, electrical insulator, electron, filament, sets, Venn diagram, Carroll diagram, table, conclusion, evidence, annotate
	Mains electricity is dangerous because it has a high voltage.	
Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	A cell is the correct term for what is commonly called a battery.	
	A complete circuit is required for electricity to flow and that the cell is the power source for the circuit, which creates the flow of electricity.	
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	A switch is a means of controlling the flow of electricity in the circuit.	
	When the switch is open the circuit is broken: there is a gap which prevents electricity from flowing. When the switch is closed the circuit is made and electricity flows.	
Recognise some common conductors and insulators, and associate metals with being good conductors	Metals are good electrical conductors.	
	Materials which do not allow electricity to flow through them are known as electrical insulators.	

Working Scientifically		
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:		
asking relevant questions and using different types of scientific enquiries to answer them		
setting up simple practical enquiries, comparative and fair tests		
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.		

Year 5

Y5 Science Programme of Study

Area of Study	Key Knowledge	Key Vocabulary
<u>Living Things and Their Habitats</u>		
describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Life cycles vary in length, but all animal life cycles include the same main stages – birth, growth, reproduction, aging, and death – in some form.	reproduction, reproduce, flower, organ, carpel, stamen, pollen, seeds, seed head, berry, fruit, pollinator, pollination, fertilisation, reproduction, reproduce, propagate, stem, leaf and root cuttings, runners, tubers, bulbs, rhizomes, gender, male, female, sex, sexual, asexual, metamorphosis, mate, sperm, pregnant, give birth, young, pup, calf, foal, chick, hatch, fledge, fledgling
describe the life process of reproduction in some plants and animals	Mammal mothers give birth to live young and produce milk to feed their babies. The reproductive organ of flowering plants is the flower. All plants do not produce 'perfect flowers' with both male and female organs, but that there are some plants with different sex flowers on the same or separate plants. Many plants can also reproduce without forming seeds. This is called asexual or vegetative reproduction, which results in new plants that are genetically identical to the parent.	
<u>Animals including Humans</u>		
describe the changes as humans develop to old age	Confirm that other mammals go through similar stages but that they take different amounts of time. Young animals are born with varying abilities to walk, see and so on, and are dependent on the mother for different lengths of time. All animals reach sexual maturity as they enter adulthood; the term 'puberty' is used for this life cycle stage in humans	life cycle, birth, growth, reproduction, ageing, death, baby, toddler, teenager, adult, adulthood, childhood, pregnancy, gestation, puberty, sexual, mammal
<u>Properties and Changes of Materials</u>		
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	Any substance that is used to make something is a material. Natural materials such as stone, wood and cotton are used or worked with in the way they are found in nature. Synthetic or human-made materials are made from natural materials, but are altered with the help of heat or chemicals. Each material has its own set of properties. these properties make different materials useful for different purposes.	properties, material, building, construction, structure, organic, natural, manufactured, man-made, weathering, decay, decompose, break down, brittle, fragile, metal, plastic, wood, ceramic, concrete, compare, contrast, group, organise, criteria, strong, strength, weakness, durability, wear, tear, stretch, flexible, flexibility, hardness, light, heavy, durable, durability, waterproof, washable, stain resistant, reusable, bicycle, suspension, brakes, tyre tread, saddle, weight, mass, criteria, ovenproof, heat, temperature, room temperature, thermal conductor, thermal insulator, insulate, insulation, viscosity, viscous, sticky, stickiness, tackiness, adhesive, glue, saturated, powder, particle, polymer, volume, quantity
know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	dissolving occurs when the particles of certain solids mix with the particles of certain liquids. When a material dissolves it looks like it disappears but it has actually just dissolved in the liquid to make a transparent solution. A solution is formed when a solid dissolves in a liquid.	
use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Some materials can be separated after they have been mixed based on their properties - this is called a reversible change. Some methods of separation include the use of a magnet, a filter (for insoluble materials), a sieve (based on the size of the solids) and evaporation. When a mixture cannot be separated back into the original components, this is called an irreversible change.	
give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Materials used in building construction, although selected for use because of their durability, will show signs of wear and tear over time. This may be due to weathering or regular use (or abuse). Organic materials, for example wood, will decompose once the surface seal or varnish is broken, whereas plastics start to break down and can become brittle. Plastics are polymers made up of chains of molecules joined together in long strings, which can begin to break down over time. Most metals, unless protected by paint or treated in another way, will start to oxidise, forming rust.	
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	Some materials, when heated or cooled, or when they interact with other materials, change without resulting in new products being formed. By reversing the conditions or separating the mixture of materials, the original substances can be recovered. These are known as reversible changes and include changes of state and dissolving. Other materials, when heated or brought together, will react and produce new materials as products of the reaction. These are known as non-reversible (irreversible) changes and include burning and other chemical reactions.	





	<u>Earth and Space</u>	
describe the movement of the Earth and other planets relative to the sun in the solar system	Stars are held together in a galaxy by gravity. (Our star, the Sun, is in the Milky Way galaxy.)The stars stay in the same places in the sky, but as the Earth orbits the Sun, their heights in the sky change each day.	Aldebaran, Arctic, Antarctic, British Summer Time, Earth, Greenwich Meridian, International Date Line, Jupiter, Mars, Mercury, Milky Way, Moon, North Pole, Saturn, South Pole, Sun, Neptune, Universe, Uranus, Venus, asteroid, autumn, axis, compass, crescent, dawn, degrees, dusk, equator, equinox, fixed stars, Full Moon, galaxy, gibbous, hemisphere, horizon, illuminate, leap year, longitude, lunar month, meridian, nebula, New Moon, northern, orbit, planet, reflect, rotate, rotation, solar system, solstice, southern, spin, spring, star, summer, sunrise, sunset, telescope, temperature, tilt, time zone, waning, waxing, winter, year, change, compare, draw conclusions, explain, explanation, investigation, line graph, measure, model, observations, plan, predict, prediction, presentation, question, record, review, scientific diagram, table
describe the movement of the moon relative to the Earth	The phases of the Moon that we see when we look at the night sky are shaped the way they are because from Earth we may only be able to see a portion of the Moon that is illuminated by the Sun. In space the Sun illuminates half of the Moon at any one time, but from Earth we can't always see the entire illuminated half. This is because both the Moon's orbit of the Earth and its rotation on its axis take the same length of time.	
describe the sun, Earth and moon as approximately spherical bodies	The sun, moon and earth are 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	The Earth takes 24 hours to rotate once on its axis (anticlockwise). The Sun rises due east on only two days of the year: the equinoxes of March 20th/21st and September 22nd/23rd. In the UK, sunrise is almost northeast in June and almost southeast in December – a 90 degree change in direction.	
	<u>Forces</u>	
explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	When objects fall, gravity pulls them towards the centre of the Earth. The speed of the descent is affected not by an object's mass, but by the opposing drag force – air resistance.	air resistance, aristotle, balanced, balanced forces, bevel gears, clockwork, cogs, compress, extend, effort, force arm, forces, force, friction, force arrow, fulcrum, gravity, Galileo, gear ratio, gears, gear trains, lever, lift, machine, mechanisms, movement, Newton, Newton meter, pinion, pivot, pulley, pull, push, rack, resistance, rotary motion, simple machines, speed, time, unbalanced force, upthrust, water resistance, weight arm, wheel
identify the effects of air resistance, water resistance and friction, that act between moving surfaces	There are different types of forces. Some work in contact with objects, such as friction, air resistance and water resistance; others work at a distance (non- contact forces), such as magnetism and gravity. Friction is a force that opposes motion between moving surfaces in contact. The size of this force depends on the properties of the surfaces (for example, roughness). Without air resistance any objects dropped simultaneously hit the ground simultaneously.	
recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	A mechanism is a device that changes an input force or motion into a different output force or motion. There are three types of mechanisms, levers are the simplest type of mechanism. They are really good at lifting objects. Gears are toothed wheels that lock together and turn one another. Gears are used to change the direction of movement. Pulleys are like gears but the two wheels do not lock together. Pulleys can be used to change the speed, direction or force of a movement.	
	<u>Working Scientifically</u>	
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:		
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 a degree of trust in results, in oral and written forms such as displays and other presentations		
reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations		

Year 6

Y6 Science Programme of Study

Area of Study	Key Knowledge	Key Vocabulary
<u>Living Things and their Habitats</u>		
describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals	Living things can be formally grouped according to their characteristics, plants and animals are two main groups but there are other groups such as micro-organisms and mushrooms. Vertebrates can be divided into five smaller groups- fish, amphibians, reptiles, birds, mammals. Invertebrates can be divided into a number of groups including insects, spiders, snails and worms. Plants can be divided into two main groups- flowering and non-flowering. There are 6 main types of microorganism: bacteria, archaea, fungi (yeasts and molds), algae, protozoa, and viruses. Some microorganisms are beneficial and some are harmful.	algae, bacteria, Carl Linnaeus, classification, fungi, habitat, invertebrates, life processes, living things, microhabitat, microorganism, nutrition, organism, species, vertebrates
give reasons for classifying plants and animals based on specific characteristics	Carl Linnaeus developed a classification system,	
<u>Animals including Humans</u>		
identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	The circulatory system includes the heart, blood vessels and blood, and is vital for fighting diseases and maintaining proper temperature. The heart is a muscular organ in most animals, which pumps blood through the blood vessels of the circulatory system. Blood is the red liquid that circulates in the arteries and veins of humans and other vertebrate animals, carrying oxygen to and carbon dioxide from the heart. A blood vessel is a tube that carries blood in the circulatory system. Arteries carry oxygenated blood from the heart to the rest of the body. Veins carry deoxygenated blood from the body to the heart.	alcohol, arteries, artery, bloodm blood vessels, capillaries, capillary, carbon dioxide, cardiovascular circulatory system, deoxygenated, diseasem drug, healthier, heart, lungs, mentally, muscles, nutrients, oxygen, oxygenated, physicalm smoking, vein, ventricles
recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function	Exercise and diet can tone our muscles, reduce fat, increase fitness, make you feel physically and mentally healthier, strengthens the heart and improves lung function. Some lifestyle choices, such as smoking and drinking alcohol can be harmful to our health causing short-term effects like loss of control and long-term effects like organ damage, cancer and death.	
describe the ways in which nutrients and water are transported within animals, including humans	Nutrients, oxygen and carbon dioxide are exchanged via the capillaries the circulatory system works as a whole to provide oxygen, nutrients and water to the body.	



Evolution and Inheritance		
recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	Children will know that if the environment changes slowly, animals and plants which are best suited survive in greater numbers to pass their characteristics on to their young. Children will know that fossils give us evidence of what lived on Earth millions of years ago and provide evidence to support evolution.	Offspring, sexual, reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils
recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	Children will know that all living things have offspring of the same kind as their features are inherited from their parents. Children will know that offspring are not identical to their parents and vary from each other because of sexual reproduction.	
identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	Children will know that plants and animals have characteristics which make them suited to their environment (adaptation). Children will know that if the environment changes rapidly, some species will die out. Children will know that over a long time new species can be created, this is called evolution.	
Light		
recognise that light appears to travel in straight lines	Light travels in a straight line.	chemical reactions, concave, convex, dark, dim, direction, electricity, emits, filters, light, light wave, mirror, opaque, reflect, reflect, reflection, shadow, source, surface, translucent, transparent, travels
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	Reflection is when light bounces off a surface this changes the direction in which the light travels. Refraction is when light travels from air through water or glass and bends.	
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	We see things because light travels from a 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	Because light travels in straight lines, when there is an opaque object blocking the light, a shadow is formed. These shadows have the same shape as the objects that cast them. The size of a shadow changes as the light source moves. Shadows can also change their shape. As light moves closer, the shadow becomes longer and wider.	

Electricity			
associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	Changing other components in a circuit may change how a bulb, motor or buzzer performs. Children will know that adding more bulbs to a complete circuit will make the bulbs dimmer.	ammeter, appliance, battery, bulb, cells, circuit, components, conductor, electrical, current, electricity, electrons, flow, fuses, generator, insulator, light, materials, motor, resistor series circuit, switch, voltage, volts, wires	
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	Children will know that turning a switch off breaks a circuit so the electricity cannot flow. More motors will spin slower and more buzzers will be quieter. Children will know that adding more cells to a complete circuit will make a bulb brighter/buzzer louder/ motor spin faster.		
use recognised symbols when representing a simple circuit in a diagram	Children will know how to draw simple circuit diagrams. Children will know the symbols that represent bulbs, wires, buzzers, cells and motors.		
Working Scientifically			
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:			
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 a degree of trust in results, in oral and written forms such as displays and other presentations			
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