



Science curriculum sticky facts based on NC. To be used in conjunction with our progression documentation.

	Plants	Animals including humans	Everyday materials	Seasonal changes
Year 1 NC	<p><i>To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</i></p> <p><i>To identify and describe the basic structure of a variety of common flowering plants, including trees.</i></p>	<p><i>To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</i></p> <p><i>To identify and name a variety of common animals that are carnivores, herbivores and omnivores</i></p> <p><i>describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</i></p> <p><i>To 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></p>	<p><i>To distinguish between an object and the material from which it is made</i></p> <p><i>To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</i></p> <p><i>To describe the simple physical properties of a variety of everyday materials</i></p> <p><i>To compare and group together a variety of everyday materials on the basis of their simple physical properties.</i></p>	<p><i>To observe changes across the four seasons</i></p> <p><i>To observe and describe weather associated with the seasons and how day length varies</i></p>
Y1 Sticky facts We want our children to know...	<ul style="list-style-type: none"> Name and describe the basic parts of a plant – roots, stem, leaves, flower, petals, bud, seed Name the describe the basic structure of a tree- roots, trunk, branches, twigs, leaves Wild plants - A wild plant seed grows where it falls. It doesn't need to be planted or cared for as it grows. Name 2 wild flowers. Garden plants are plants that people choose to grow in their gardens. Weeds are wild plants that grow in places where people don't want them. A deciduous tree loses its leaves each year. Name an example. An evergreen tree keeps its green leaves all year round, even in the winter. Name an example. 	<ul style="list-style-type: none"> Amphibians live in the water as babies and on land as they grow older. They have smooth, slimy skin. All birds have a beak, two legs, feathers and wings. Fish live and breathe under water. They have scaly skin, fins to help them swim and they breathe through gills. Mammals are animals that breathe air, grow hair or fur and feed on their mother's milk as a baby. All reptiles breathe air. They have scales on their skin. Animals that mostly eat other animals (meat) are carnivores. Animals that only eat plants are herbivores. Animals that eat both plants and other animals are omnivores. 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. Sight - Your eyes let you see all the things around you. Hearing - Your ears let you listen to all the things around you. Your brain is able to tell what different sounds are. Touch - Your skin gives you the sense of touch. You can tell if something is warm, cold, smooth or rough without even looking at it! Taste - Your sense of taste comes from your tongue. You can tell if something tastes bitter or sweet. You might have some tastes you like and some you don't. Smell - You smell using your nose. Your nose can tell if things smell nice or not nice. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 	<ul style="list-style-type: none"> Name and identify the following materials; wood, plastic, glass, metal and paper Identify at least 2 objects made of each material wood, plastic, glass, metal and paper Shiny - Reflects light easily. Dull - Doesn't reflect light. Doesn't look bright or shiny. Rough If something is rough, it feels and looks uneven or bumpy. Smooth objects have no lumps or bumps. Bendy things can be bent easily into a curved or folded shape. If something is waterproof, it keeps water out. It keeps things dry. Not waterproof materials let water in. Transparent objects can be seen through. Opaque objects can't be seen through. Materials are what an object is made from. Hard - Not easily broken or bent. If something is soft, it is easy to cut, fold or change the shape of. If something is stretchy it can be pulled to make it longer or wider without breaking. If something is absorbent, it soaks liquid up. 	<ul style="list-style-type: none"> Name the four seasons in order Spring, Summer, Autumn, Winter. Describe the seasonal changes. Examples include; it is warmer and sunnier in summer. It is usually colder in winter. Things begin to grow in Spring. Leaves fall and change colour in Autumn. Months of the year Daylight – daylight is when it is light outside. The amount of daylight changes within each season.

	Plants	Animals including humans	Uses of everyday materials	Living things and their habitats
Y2 NC	<p><i>observe and describe how seeds and bulbs grow into mature plants</i></p> <p><i>To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</i></p>	<p><i>To notice that animals, including humans, have offspring which grow into adults</i></p> <p><i>To find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</i></p> <p><i>To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</i></p>	<p><i>To identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</i></p> <p><i>To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</i></p>	<p><i>To explore and compare the differences between things that are living, dead, and things that have never been alive</i></p> <p><i>To 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</i></p> <p><i>To identify and name a variety of plants and animals in their habitats, including micro habitats</i></p> <p><i>To 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.</i></p>
Y2 Sticky facts We want our children to know...	<ul style="list-style-type: none"> • That a plant can grow from a seed or bulb. • Seeds and bulbs germinate and grow into seedlings • The lifecycle of a plant • Give at least one example of a plant that has grown from a) a seed and b) a bulb • Explain the term ‘germinate’. For example, a child might say ‘Germination is the process by which seeds begin to grow into plants.’ • Know that a flower can develop seeds, berries, fruits etc. • Five conditions for successful growth are include: water, light, a suitable temperature, air and time. • Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. • Some plants are better suited to growing in full sun and some grow better in partial or full shade. • Plants also need different amounts of water and space to grow well and stay healthy. 	<ul style="list-style-type: none"> • Name at least 4 animals and their offspring. • That some offspring do not look like their parents e.g. tadpoles, caterpillars • What is meant by the term ‘offspring’ • Recall the lifecycle of either a caterpillar or tadpole. • That all living things must have these basic requirements to grow and survive i.e. breathing, feeding and drinking. • That in order to be healthy and survive, animals and humans need the rights amount of food and exercise. • Good hygiene is an important factor in preventing infection and illnesses. • Identify different food groups i.e. carbohydrates, proteins, dairy, fats, fruit and vegetables 	<ul style="list-style-type: none"> • Materials are what an object is made from. • The names of at least 5 materials (rock, wood, glass, metal, plastic, paper, cardboard, brick • Suitability means having the properties which are right for a specific purpose. • In science, ‘properties’ refers to what a material is like and how it behaves i.e. soft, stretchy, waterproof) • That some materials can be manipulated to affect their shape and size e.g. squashed, bent, stretched, twisted. • Why a material has been chosen due to its properties. For example, a glass window is transparent allowing you to see through it. 	<ul style="list-style-type: none"> • That all objects are either living, dead or have never been alive. • A living thing can refer to a human, animal, tree, plant or seed. • A dead thing can include dead animals or plants and parts of animals and plants that are no longer attached e.g. leaves, twigs, shells etc. • An object that has never been alive includes things such as metal, plastic, rock. • Give a definition of what a habitat is, e.g. A habitat is a place where an organism lives. The habitat provides the basic needs of the animals and plants – shelter, food and water. • Give an example of a habitat and a living thing that is suited to that habitat. • There are four different categories of organisms in a food chain: producers, consumers, prey, predators. • Give at least 2 examples of something that is a) living b) dead and c) never been alive • An animal or plant lives in a habitat to which they are suited. Children should be able to provide an example of this. For example, a polar bear has thick white fur which is necessary for living in the Antarctic due to the cold weather. They also have hair on their paws which prevents them from slipping on the ice. • Explain what a food chain is. For example, A food chain is a sequence describing how different animals eat each other, showing the order in which living things depend on each other for food. Give an example of a food chain such as, carrots, rabbit, fox. • Explain what a micro-habitat is. For example, a microhabitat is a small area which differs somehow from the surrounding habitat. For instance, the damp underside of a stone in the forest could provide shelter for a woodlouse, as well as decaying leaf and plant matter for them to eat. • Give an example of a microhabitat and a living thing that is suited to that microhabitat. • An organism is an individual animal, plant, or single-celled life form

<p>KS1 Working scientifically</p> <p><i>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:</i></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 <p><i>Gathering and recording data to help in answering questions</i></p>	<p>Year 1</p> <ul style="list-style-type: none"> • Ask questions such as: <ul style="list-style-type: none"> • Why are flowers different colours? • Why do some animals eat meat and others don't? • Set up a test to see which materials keeps things warmest, know if the test has been successful and can say what has been learned • Explain to someone what has been learned from an investigation they have been involved with and draw conclusions from the answers to the questions asked • Measures (within Year 1 mathematical limits) to help find out more about the investigations undertaken 	<p>Year 2</p> <ul style="list-style-type: none"> • Ask questions such as: <ul style="list-style-type: none"> • Why do some trees lose their leaves in Autumn and others do not? • How long are roots of tall trees? • Why do some animals have underground habitats? • Use equipment such as thermometers and rain gauges to help observe changes to local environment as the year progresses • Use microscopes to find out more about small creatures and plants • Know how to set up a fair test and do so when finding out about how seeds grow best • Classify or group things according to a given criteria, e.g. deciduous and coniferous trees • Draw conclusions from fair tests and explain what has been found out • Use measures (within Year 2 mathematical limits) to help find out more about the investigations they are engaged with

	Plants	Animals including humans	Rocks	Light	Forces and Magnets
<p>Year 3 NC</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 	<ul style="list-style-type: none"> • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 	<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. 	<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. 	<ul style="list-style-type: none"> • Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing

<p>Y3 Sticky facts We want our children to know...</p>	<ul style="list-style-type: none"> • Roots absorb water and nutrients from the soil and anchor the plant in the ground. • The stem supports the plant above the ground, and carries the water and nutrients to the leaves. • The leaves collect energy from the sun and make food for the plant. This process is called photosynthesis. • Flowers are the reproductive part of a plant. It makes seeds which in turn make new plants. Along with reproduction, flowers are also a rich source of food for other living organisms such as insects, birds, animals and humans. • A seed is the reproductive part of a plant. It is the part of plant that we plant in the ground and from which a new plant grows. • In order for a seed to grow healthily it requires the correct amount of water, light, temperature, air and time and space. • Know the basic 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. • Know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal 	<ul style="list-style-type: none"> • Living things need food to grow and to be strong and healthy. • Plants can make their own food, but animals cannot. They get nutrition from what they eat. • Animals get their nutrition they need by eating plants, meat or both (recall knowledge of carnivores, herbivores, omnivores from Year 2) • Foods contain a range of nutrients such as carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water and fibre. • Skeletons do three important jobs; protect organs inside the body, allow movement, support the body and stop it from falling on the floor. • Can name some of the human bones that make up a skeleton. • Muscles are attached to the bone by tendons and work in pairs to allow for smooth movement. To move a joint, one muscle contracts while the other muscle relaxes and becomes longer. • Joints are points where our skeletons move. The joints in the human body enable the body to move. Our individual bones don't bend or move, and they need to be connected by joints to make something which can move. 	<ul style="list-style-type: none"> • There are three types of naturally occurring rocks: Igneous, Sedimentary, Metamorphic • At least one example of Igneous rock (obsidian, granite, basalt) • At least one example Sedimentary rock (chalk, sandstone, limestone) • At least one example Metamorphic rock (marble, slate, quartzite) • An animal skeleton or trace is buried under small particles of rock, called sediment. • As more layers of sediment build up on top, the sediment around the object begins to compact and turn to rock. • As water seeps through the sedimentary rock, any bones or organic matter are dissolved gradually. • Minerals in the water replace the bone or organic matter, leaving a rock replica of the original. This is called a fossil. • Weathering and erosion may eventually expose the fossil • Soil is the uppermost layer of the Earth. • Soil is a mixture of minerals, air, water, and organic matter (including living and dead plants and animals). • The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. • Layers of soil include, topsoil, subsoil, rock grains and bedrock. 	<ul style="list-style-type: none"> • Light is a form of energy that travels in a wave from a source. • We see objects because our eyes can sense light. • Dark is the absence of light. • Sources of light include; the sun, light bulbs, torches and candles. • Ray – waves of light are called light rays. • Light travels in a straight line. • When light hits an object it is reflected (bounces off). • To protect the eyes, you can wear sunglasses with a UV rating. Or a hat. • A shadow is caused when light is blocked by an opaque object. • A shadow is larger when an object is closer to the light source. This is because it blocks more of the light. • The size of the shadow depends on the position of the source, object and surface. 	<ul style="list-style-type: none"> • A force is a push or a pull. • Friction – a force that acts between two surfaces or objects that are moving, or trying to move across each other. • Surface – the top layer of something. • Different surfaces create different amounts of friction. • When an object moves on a surface, the texture of the surface and the object affect how it moves. • Magnet – an object which produces a magnetic force that pulls certain objects towards it. • Magnetic – objects which are attracted to a magnet are magnetic. • Objects containing iron, nickel or cobalt metals are magnetic. • Magnets have two poles – a north pole and a south pole. • Repel – a force that pushes objects away. For example, if two north poles are brought together they will push away from each other. • Attract – a force that pulls objects together. For example, a north and south pole are brought together they will pull together.
	<p>Electricity</p>	<p>Animals including humans</p>	<p>States of Matter</p>	<p>Living things and their habitats</p>	<p>Sound</p>
<p>Y4 NC</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 	<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 	<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 	<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 	<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

	<p>the lamp is part of a complete loop with a battery</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Construct and interpret a variety of food chains, identifying producers, predators and prey 	<p>temperature at which this happens in degrees Celsius (°C)</p> <ul style="list-style-type: none"> Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<ul style="list-style-type: none"> Recognise that environments can change and that this can sometimes pose dangers to living things 	<ul style="list-style-type: none"> Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibrations that produced it Recognise that sounds get fainter as the distance from the sound source increases.
<p>Y4 Sticky facts We want our children to know...</p>	<ul style="list-style-type: none"> Electricity is the flow of an electric current through a material e.g. from a power source through a wire to an appliance. Many household devices and appliances run on electricity. Children should be able to identify some. (Examples include; kettle, toaster, washing machine, computers, televisions). Some electrical appliances plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. A circuit is a pathway that electricity can flow around. Components means the parts involved in an electrical circuit. These are known as cells (batteries), bulbs, buzzers, wires, motors, switches. A battery is sometimes referred to as a cell. A series circuit is a circuit where the components are connected in a loop. Electricity flows through each component in a single pathway. A complete circuit means, Electricity can flow. The components will work. An incomplete circuit means, there is a break in the circuit that prevents the electricity from flowing. The components will not work. If there is a break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off. A conductor of electricity is a material that will allow electricity to flow through it. Metals are good conductors so they can be used as wires in a circuit. 	<ul style="list-style-type: none"> The digestive system helps our bodies to digest our food. When we eat, our body breaks down the food, turns it into energy and gets useful nutrients from it. The names of body parts associated with the digestive system (mouth, teeth, tongue, salivary gland, oesophagus, liver, gall bladder, pancreas, duodenum, rectum, anus, small and large intestine, stomach). The teeth of an animal are designed to eat different foods depending on the diet of the animal. Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). A food chain is a diagram which shows how food energy moves from one living thing to another with arrows showing the transfer of energy. Food chains always start with a producer – a living thing which can make its own food. The producer is eaten by a primary consumer, this could be a herbivore or an omnivore. The primary consumer is eaten by a secondary consumer, this could be an omnivore or a carnivore. (prey) The secondary consumer is eaten by a tertiary consumer, this could be an omnivore or a carnivore. (predator) 	<ul style="list-style-type: none"> Materials can be one of three states: solids, liquids or gases. Some materials can change from one state to another and back again A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A gas fills all available space; it has no fixed shape or volume. Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Condensation is the change back from a gas to a liquid caused by cooling. Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. 	<ul style="list-style-type: none"> Living things can be grouped (classified) in different ways according to their features. Vertebrates – animals with a backbone. Invertebrates – animals without a backbone. Vertebrates can be separated into 5 broad groups (mammals, fish, birds, reptiles, amphibians) Examples of invertebrates include; insects, spiders, worms, slugs and snails. Specimen – A particular plant or animal that scientists study to find out about its species. Classification keys can be used to identify and name living things Living things live in a habitat which provides an environment to which they are suited Changes to an environment can be natural or caused by humans. Changes to an environment can have both positive and negative effects on the environment. Natural changes to an environment could include; earthquakes, storms, floods, droughts, wildfires, seasonal changes. Man made changes to an environment could include; deforestation, pollution, urbanisation, littering, the introduction of a new animal to an environment or creating new nature reserve. 	<ul style="list-style-type: none"> Vibration is a quick movement back and forth. Sound waves are vibrations travelling from a sound source. Volume is the loudness of a sound. Amplitude is the size of a vibration. A larger amplitude = a louder sound. Pitch is a measure of how high or low a sound is. You can change the pitch of a sound in different ways depending on the type of instrument you are playing Sound is a type of energy. Sounds are created by vibrations. The louder the vibration, the louder the sound. The ear is the organ used for hearing sound. Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound. Sound travels much slower than light, whether in air or in water. You often hear things after you see them, for example, you see the lightning before you hear the thunder. The closer you are to the source of a sound, the louder the sound will be. The further away you are

	<ul style="list-style-type: none"> Materials that are electrical insulators do not allow electricity to flow through them 		<p>This is known as precipitation.</p>	<ul style="list-style-type: none"> Plants and animals rely on the environment to give them everything they need. Changes to a habitat can be very dangerous to the survival of plants and animals 	<p>from the source of a sound, the quieter the sound will be.</p>
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<p>LKS2 Working scientifically</p> <p><i>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:</i></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 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 	<p>Year 3</p>	<p>Year 4</p>
	<ul style="list-style-type: none"> Ask questions such as: • Why does the moon appear as different shapes in the night sky? • Why do shadows change during the day? • Where does a fossil come from? Use a thermometer to measure temperature and know there are two main scales used to measure temperature Gather and record information using a chart, matrix or tally chart, depending on what is most sensible Observe at what time of day a shadow is likely to be at its longest and shortest Group information according to common factors e.g. plants that grow in woodlands or plants that grow in gardens Observe which type of plants grow in different places e.g. bluebells in woodland, roses in domestic gardens, etc. θ Use bar charts and other statistical tables (in line with Year 3 mathematics statistics) to record findings Use research to find out how reflection can help us see things that are around the corner Know how to use a key to help understand information presented on a chart Use research to find out what the main differences are between sedimentary and igneous rocks Be confident to stand in front of others and explain what has been found out, for example about how the moon changes shape Test to see which type of soil is most suitable when growing two similar plants Present findings using written explanations and include diagrams when needed Test to see if their right hand is as efficient as their left hand Make sense of findings and draw conclusions which help them to understand more about scientific information Set up a fair test with different variables e.g. the best conditions for a plant to grow Amend predictions according to findings Explain to a partner why a test is a fair one e.g. lifting weights with right and left hand, etc. Be prepared to change ideas as a result of what has been found out during a scientific enquiry Measure carefully (taking account of mathematical knowledge up to Year 3) and add to scientific learning 	<ul style="list-style-type: none"> Ask questions such as: • Why are steam and ice the same thing? • Why is the liver important in the digestive systems? • What do we mean by ‘pitch’ when it comes to sound? Gather and record information using a chart, matrix or tally chart, depending on what is most sensible Group information according to common factors e.g. materials that make good conductors or insulators Use research to find out how much time it takes to digest most of our food Use bar charts and other statistical tables (in line with Year 4 mathematics statistics) to record findings Use research to find out which materials make effective conductors and insulators of electricity Present findings using written explanations and include diagrams, when needed Carry out tests to see, for example, which of two instruments make the highest or lowest sounds and to see if a glass of ice weighs the same as a glass of water Write up findings using a planning, doing and evaluating process Set up a fair test with more than one variable e.g. using different materials to cut out sound Make sense of findings and draw conclusions which helps them understand more about the scientific information that has been learned Explain to others why a test that has been set up is a fair one e.g. discover how fast ice melts in different temperatures When making predictions there are plausible reasons as to why they have done so Measure carefully (taking account of mathematical knowledge up to Year 4) and add to scientific learning Able to amend predictions according to findings Use a data logger to check on the time it takes ice to melt to water in different temperatures Prepared to change ideas as a result of what has been found out during a scientific enquiry Use a thermometer to measure temperature and know there are two main scales used to measure temperature

	Living things and their habitats	Animals including humans	Properties and changes of materials	Earth and Space	Forces
Year 5 NC	<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 	<ul style="list-style-type: none"> Describe the changes as humans develop to old age. 	<ul style="list-style-type: none"> Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Demonstrate that dissolving, mixing and changes of state are reversible changes Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda 	<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. 	<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
Y5 Sticky facts We want our children to know...	<ul style="list-style-type: none"> In humans and some animals, offspring are born live, such as babies or kittens, and then grow into adults. Humans develop inside their mothers and are dependent on their adults to care for them until adult hood. Amphibians such as frogs are laid in eggs, once hatched they go through many changes until they become an adult. Birds are laid from eggs and are cared for by their parents until they are able to live independently. Some animals undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis. Metamorphosis – the change in structure of an animal's body and their behaviour 	<ul style="list-style-type: none"> When babies are young, they grow rapidly. They are very dependent on their parents. As babies develop, they learn many skills. This includes rapid growth as well as learning to walk and talk. During childhood children learn new skills and learn to be independent. At puberty, a child's body changes and develops primary and secondary sexual characteristics. During this period of growth both genders grow taller, produce more sweat and all body parts start to grow Adolescence – the social and emotional stage of 	<ul style="list-style-type: none"> Solids - Solid particles are very close together, meaning solids, such as wood and glass, hold their shape. Liquids - This state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Gas - Gas particles are further apart than solid or liquid particles and they are free to move around. A gas fills its container, taking both the shape and the volume of the container. Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by; Sieving - Smaller materials are able to fall through the holes in the sieve, 	<ul style="list-style-type: none"> The Sun is a star. It is at the centre of our solar system. A star is a giant ball of gas held together by its own gravity Moon – a natural satellite which orbits earth or other planets. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365½ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is 	<ul style="list-style-type: none"> Gravity – a pushing force exerted by the Earth, it attracts objects towards the centre of the Earth. Air resistance – the force that air exerts on a moving object. Water resistance – the force that water exerts on a moving object. Friction – the force between 2 moving surfaces. Mechanisms – machines or devices which help to achieve a result. Air resistance, water resistance and friction are contact forces that act between moving surfaces.

<ul style="list-style-type: none"> • Pollination – the transfer of pollen to a stigma to allow fertilisation • Plants reproduce both sexually and asexually. • Reproduction – the process of new living things being made • Sexual reproduction – two parents are needed to create offspring which are similar but not identical to either parent. • Mammals use sexual reproduction to produce their offspring. • The male sex cell, called sperm fertilises the female sex cells. • Fertilise is the action of fusing the male and female sex cells in order to develop an egg. • The fertilised cell divides into different cells and will form a baby with a beating heart. • The baby will grow inside the female until the end of the gestation (pregnancy) period. • Most plants contain both male (pollen) and female (ovules) sex cells but most plants can't fertilise themselves. • Wind and insects help to transfer pollen to a different plant. • The pollen from the stamen of one plant is transferred to the stigma of another. • The pollen then travels down a tube through the style and fuses with an ovule. 	<ul style="list-style-type: none"> • Puberty – The physical stage of development between childhood and adulthood • Menstruation – when the female body discharges the lining of the uterus. This happens approximately once a month. • Adulthood – the stage of development when a human is fully grown and mature. • Reproduction – to produce new life. • Life expectancy – the length of time that a particular animal is expected to live. 	<p>development between childhood and adulthood</p> <ul style="list-style-type: none"> • separating them from larger particles; Filtering - The solid particles will get caught in the filter paper but the liquid will be able to get through; Evaporating - The liquid changes into a gas, leaving the solid particles behind. • Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic. • Materials that will dissolve are known as soluble. • Materials that won't dissolve are known as insoluble. • A conductor is a material that heat or electricity can easily travel through. Most metals are both thermal conductors (they conduct heat) and electrical conductors (they conduct electricity) • An insulator is a material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical insulators. 	<p>facing away from the Sun (night).</p> <ul style="list-style-type: none"> • As the Earth rotates, the Sun appears to move across the sky. • The Moon orbits the Earth. It takes about 28 days to complete its orbit. • The Sun, Earth and Moon are approximately spherical. • Pluto used to be known as a planet but was reclassified as a dwarf planet in 2006 	<ul style="list-style-type: none"> • Pulleys, levers and gears are all mechanisms, also known as simple machines. • Levers - allow us to do heavy work with less effort . For example, trying to pick up a large heavy box is difficult, however if a lever is used it becomes much easier to move it. • Pulleys also allow us to do heavy work - objects are attached to ropes and pulley wheels, and so instead of lifting heavy object upwards, we can pull on the pulley rope downwards. • Gears are toothed wheels. Their 'teeth' can fit into each other so that when the first wheel turns, so does the next one. This allows forces to move across a surface.
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	Living things and their habitats	Animals including humans	Evolution and Inheritance	Light	Electricity
Y6 NC	<ul style="list-style-type: none"> • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro organisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics. 	<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 	<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 	<ul style="list-style-type: none"> • Recognise that light appears to travel in straight lines • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes 	<ul style="list-style-type: none"> • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • Use recognised symbols when representing a simple circuit in a diagram.

**Y6
Sticky
facts
We want
our
children
to
know...**

				<ul style="list-style-type: none"> • 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"> • Living things can be formally grouped according to characteristics. Plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. • Bacteria - A single-celled microorganism • Microorganism - An organism that can only be seen using a microscope, e.g. bacteria, mould and yeast. • Microscope - A piece of equipment that is used to view very tiny (microscopic) things by magnifying their appearance • That there can be helpful and harmful microbes. Example of helpful microbes include bacteria in cheese, yeast in wine. Harmful microbes include bacteria such as salmonella which can lead to food poisoning or the bacteria /viruses affecting illness and disease. • Microorganisms are viruses, bacteria, moulds and yeast. Some animals (dust mites) and plants (phytoplankton) are also microorganisms. • Plants can make their own food whereas animals cannot. • Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). • Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. • Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms. 	<ul style="list-style-type: none"> • The circulatory system – a system which includes the heart, veins, arteries and blood transporting substances around the body. • Heart - An organ which constantly pumps blood around the circulatory system. • Blood vessels - The tube-like structures that carry blood through the tissues and organs. Veins, arteries and capillaries are the three types of blood vessels. • Oxygenated blood has more oxygen. It is pumped from the heart to the rest of the body. • Deoxygenated blood is blood where most of the oxygen has already been transferred to the rest of the body. • The heart pumps blood in the blood vessels around to the lungs. • Oxygen goes into the blood and carbon dioxide is removed. • The blood goes back to the heart and is then pumped around the body. • Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. • Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. • Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how 	<ul style="list-style-type: none"> • Offspring – Animals and plants produce offspring that are similar but not identical to them. • Offspring often look like their parents because features are passed on. • Variation – In the same way that there is variation between parents and offspring, you can also see variation amongst species. For example there are different species of dogs. • Adaptive Traits - Characteristics that are influenced by the environment the living things live in. These adaptations can develop as a result of many things including food and climate. • Inherited Traits – Eye and hair colour are examples of traits that can be passed on. • Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. • If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. • Evolution – adaptation over a long period of time · Natural selection – The process where organisms that are better adapted to their environment tend to survive and produce offspring. • Fossils give us evidence of what lived on the Earth millions of years ago and provide evidence to support the theory of evolution. • Fossils are preserved remains or partial remains of ancient animals and plants. • More recently, scientists such as Darwin observed how living things adapt to different environments to become distinct varieties with their own characteristics 	<ul style="list-style-type: none"> • Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. • The light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen. • Objects that block light (are not fully transparent) will cause shadows. • Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object. • Light travels as a wave. But unlike waves of water or sound waves, it does not need a medium to travel through. This means light can travel through a vacuum - a completely airless space. • Refraction - This is when light bends as it passes from one medium to another. E.g. Light bends when it moves from air into water. • Transparent - Describes objects that let light travel through them easily, meaning you can see through the object. • Translucent - Describes objects that let some light through, but scatters the light so we can't see through them properly. • Opaque - Describes objects that do not let any light pass through them. • A shadow is always the same shape as the object that casts it. This is because when an opaque object is in the path of light travelling from a light source, it will block the light rays that hit it, 	<ul style="list-style-type: none"> • Circuit - A path that an electrical current can flow around. • Symbol - A visual picture that stands for something else. • Cell/battery - A device that stores chemical energy until it is needed. A cell is a single unit. A battery is a collection of cells. • Current - The flow of electrons, measured in amps. How electric current is measured • Voltage - The force that makes the electric current move through the wires. The greater the voltage, the more current will flow. • Resistance - The difficulty that the electric current has when flowing around a circuit. • Electrons - Very small particles that travel around an electrical circuit. • Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. • Adding more bulbs to a circuit will make each bulb less bright. • Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter. • Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. • Any bulbs, motors or buzzers will then turn off as well.

	<ul style="list-style-type: none"> Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants. 	clearly we think, and generally how fit and well we feel.		while the rest of the light can continue travelling. <ul style="list-style-type: none"> Shadows can also be elongated or shortened depending on the angle of the light source. A shadow is also larger when the object is closer to the light source. This is because it blocks more of the light. 	
<p>UKS2 Working scientifically</p> <p><i>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:</i></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 Identifying scientific evidence that has been used to support or refute ideas or arguments. 		<p style="text-align: center;">Year 5</p> <ul style="list-style-type: none"> Set up an investigation when it is appropriate e.g. finding out which materials dissolve or not Set up a fair test when needed e.g. which surfaces create most friction? Set up an enquiry based investigation e.g. find out what adults / children can do now that they couldn't when a baby Know what the variables are in a given enquiry and can isolate each one when investigating e.g. finding out how effective parachutes are when made with different materials Use all measurements as set out in Year 5 mathematics (measurement), including capacity and mass Use other scientific instruments as needed e.g. thermometer, rain gauge, spring scales (for measuring Newtons) Able to record data and present them in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs Make predictions based on information gleaned from investigations Create new investigations which take account of what has been learned previously Use diagrams, as and when necessary, to support writing Is evaluative when explaining findings from scientific enquiry Clear about what has been found out from recent enquiry and can relate this to other enquiries, where appropriate Their explanations set out clearly why something has happened and its possible impact on other things Able to give an example of something focused on when supporting a scientific theory e.g. how much easier it is to lift a heavy object using pulleys Able to relate causal relationships when, for example, studying life cycles Frequently carry out research when investigating a scientific principle or theory 		<p style="text-align: center;">Year 6</p> <ul style="list-style-type: none"> Know which type of investigation is needed to suit particular scientific enquiry e.g. looking at the relationship between pulse and exercise Set up a fair test when needed e.g. does light travel in straight lines? Know how to set up an enquiry based investigation e.g. what is the relationship between oxygen and blood? Know what the variables are in a given enquiry and can isolate each one when investigating. Justify this. Use all measurements as set out in Year 6 mathematics (measurement), including capacity, mass, ratio and proportion Able to record data and present them in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs Make accurate predictions based on information gleaned from their investigations and create new investigations as a result Use a range of written methods to report findings, including focusing on the planning, doing and evaluating phases Clear about what has been found out from their enquiry and can relate this to others in class Explanations set out clearly why something has happened and its possible impact on other things Aware of the need to support conclusions with evidence Use diagrams, as and when necessary, to support writing and be confident enough to present findings orally in front of the class Able to give an example of something they have focused on when supporting a scientific theory e.g. classifying vertebrate and invertebrate creatures or why certain creatures choose their unique habitats 	