



St Mary's Church of England Primary School

Science Curriculum

Our science curriculum allows children to develop secure understanding through the specific disciplines of biology, chemistry and physics and provides the foundations for understanding the world. Our children will have access to different types of science enquires and be able to answer specific questions about the world around them. Children will also have the opportunity to build up an extended specialist vocabulary. Children in Key Stage 1 will be able to experience and observe phenomena and look closely at the natural and human constructed world around them. They will use scientific enquiry to answer their own questions and observe changes, notice patterns and carry out simple comparative tests. Children in Key Stage 2 will develop a deeper understanding of a wide range of scientific ideas by selecting the most appropriate ways to answer scientific questions using different types of scientific enquiry. Pupils will draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. All children will have regular opportunities to work scientifically alongside substantive science content

<p>Year 1</p> <p>Working Scientifically</p>	<ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions 	<p><u>New Vocabulary</u> <u>properties, observe, test, magnifying glass, object, record, equipment</u></p> <p>Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science</p> <p>Know that we can use magnifying glasses to observe objects closely</p> <p>Know that we can test our questions to see if they are true</p> <p>Know that objects can be identified or sorted into groups based on their observable properties</p> <p>Know that we can write down numbers and words or draw pictures to record what we find</p>
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<p>Year 1 Plants</p>	<ul style="list-style-type: none"> • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees. 	<p><u>New Vocabulary</u> <u>deciduous, evergreen, roots, stem, leaves, flower, trunk</u></p> <p>Know a daisy, pansy, sunflower, dandelion and a rose by sight. Know an oak tree, horse chestnut tree and Alder tree. Know that deciduous trees shed its leaves annually. Know that evergreen trees have leaves throughout the year that are always green. Know that flowering plants including trees consist of roots, stem, leaves and flower. Know that a tree's stem is called a trunk.</p>
<p>Year 1 Animals including Humans</p>	<ul style="list-style-type: none"> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • identify, name, draw 	<p><u>New Vocabulary</u> <u>fish, amphibian, reptile, bird, mammal, human, herbivore, carnivore, omnivore, vertebrates, skeleton.</u></p> <p>Know a salmon is an example of a fish. Know a frog is an example of an amphibian. Know a snake is an example of a reptile. Know a robin is an example of a bird. Know a cat and dog are examples of mammals. Know humans are an example of a mammal.</p> <p>Know that herbivores eat plants, know that carnivores eat other animals and that omnivores eat both plants and meat. Know that a rabbit is an example of a herbivore. Know that cats are an example of a carnivore Know that humans are an example of omnivores. (Although not vegetarians)</p> <p>Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal</p>

	<p>and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>skeletons. These are all vertebrates which means they all have a backbone. Know that fish have gills to breathe underwater and scaly skin. Know that amphibians begin their lives with gills and then develop lungs. Know that reptiles breathe air and have scaly skin. Know that birds are different to other animals as they have feathers and wings. Know that mammals are different to other animals as they have fur/hair and feed milk to their young.</p> <p>Know, identify, draw and label: feet, hands, legs, arms, head, skin, ears, eyes, nose, mouth, tongue.</p> <p>Know that eyes are associated with sight; ears with sound; nose with smell; tongue with taste and skin (usually hands) with touch.</p>
<p>Year 1 Everyday Materials</p> <p>Link to Year 1 – Wolf Proof</p>	<ul style="list-style-type: none"> distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties. 	<p><u>New Vocabulary</u> <u>material, object, wood, plastic, glass, metal, rock, water</u></p> <p>Know that a door, a toy, a window, a spoon and a house are objects. Know that wood, plastic, glass, metal, rock and water are a material. Know that objects are made from/of materials. Know that materials can be hard, soft, strong, weak, absorbent, heavy, light, smooth, rough.</p>
<p>Year 1 Seasonal Changes</p>	<ul style="list-style-type: none"> observe changes across the four seasons 	<p><u>New Vocabulary</u> <u>Seasons, spring, summer, autumn, winter</u></p>

Link to Year 1 Geography - Lighthouse Keepers Lunch	<ul style="list-style-type: none">• observe and describe weather associated with the seasons and how day length varies.	Know that weather changes through the year. Know that weather gets hotter in the summer and colder in the winter. Know that day time is shorter in the winter and longer in the summer. Know that one year is 365/366 days
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<p>Year 2</p> <p>Working Scientifically</p>	<ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions 	<p><u>Vocabulary – continuing from year 1</u> <u>properties, observe, test, magnifying glass, object, record, equipment</u></p> <p>Know that we can ask questions about the world and that when we observe the world to answer these questions, this is science</p> <p>Know that we can use magnifying glasses to observe objects closely</p> <p>Know that we can test our questions to see if they are true</p> <p>Know that objects can be identified or sorted into groups based on their observable properties</p> <p>Know that we can write down numbers and words or draw pictures to record what we find</p>
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<p>Year 2 Living Things are their Habitats</p> <p>Link to Year 2 – Where do different animals live?</p>	<ul style="list-style-type: none"> • explore and compare the differences between things that are living, dead, and things that have never been alive • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 	<p><u>New Vocabulary</u> <u>Living, move, grow, consume, nutrients, reproduce, dead, never lived, habitat, ocean, savannah, woodland, rainforest, microhabitat, food chain, energy</u></p> <p>Know that living things move, grow, consume nutrients and reproduce. Know that dead things used to do these things but don't anymore. Know that things that have never lived have never done these things.</p> <p>Know that living things live in different habitats. Know that the ocean is the habitat of sharks, whales, fish Know that the savannah is the habitat of lions, giraffes and elephants. Know that woodland is the habitat of deer, hedgehog, rabbit Know that the rainforest is the habitat of snake, monkey, jaguars, tiger, frog</p> <p>Know that woodlice live under logs – an example of a microhabitat – as they need somewhere damp and dark so that they do not dry out. Know that frogs live in ponds – an example of a microhabitat – as they need water to lay their eggs (frogspawn).</p> <p>Know that arrows on a food chain show the direction that the energy travels.</p>
<p>Year 2 Plants</p>	<ul style="list-style-type: none"> • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<p><u>New Vocabulary</u> <u>seed, bulb, survival, temperature, warmth</u></p> <p>Know that seeds and bulbs need to be under soil and that they will grow into mature plants in the right conditions. Know that plants need water and warmth to grow. Know that plants that are deprived of light, food or air will not grow and will die.</p>
<p>Year 2</p>	<ul style="list-style-type: none"> • notice that animals, including 	<p><u>New Vocabulary</u></p>

<p>Animals including Humans</p>	<p>humans, have offspring which grow into adults</p> <ul style="list-style-type: none"> • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. 	<p><u>offspring, adult, exercise, carbohydrates, protein, dairy, fat, sugar, diet</u></p> <p>Know that animals have offspring that grow into adults. Know that animals, including humans, need food, water and air to survive.</p> <p>Know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods.</p> <p>Know that fats and sugary foods should be rarely eaten and only in small amounts.</p> <p>Know that exercise is important for humans to stay fit and strong. Know that keeping clean, including brushing teeth, is important to staying healthy.</p>
<p>Year 2 Uses of Everyday Materials</p> <p>Link to Year 2 – Kings, Castles, Queens</p>	<ul style="list-style-type: none"> • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<p><u>New Vocabulary</u> <u>properties, friction, suitable, force</u></p> <p>Know that materials can have useful properties for a given job (waterproof, strong, hard, soft, flexible, rigid, light, heavy) Know that different types of plastic are waterproof, that steel (a type of metal) is strong, that rock is hard, that rubber is flexible and that iron (a type of metal) is heavy. Know that everyday materials have different properties that make them suitable for different uses.</p> <p>Know that applying forces to objects can change their shape.</p>

<p>Year 3</p> <p>Working Scientifically</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 	<p><u>New Vocabulary</u> <u>prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis</u></p> <p>Know that we can ask questions and answer them by setting up scientific enquiries Know how to make relevant predictions that will be tested in a scientific enquiry Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table Know – with structured guidance - how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry Know that scientific enquiries can suggest relationships, but that they do <u>not</u> prove whether a prediction is true Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc) Know that they can draw conclusions from the findings of other scientists Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry</p>
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<p>Year 3 Plants</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 	<p><u>New Vocabulary</u> <u>function, water, minerals, roots, stem, pollen, dispersal, leaves, absorbing, energy, reproduction, fertilisation, anther, ovule, ovary, seed</u></p> <p>Know that different parts of a plant have one or more function</p> <p>Know the function of the roots is to collect water and minerals from the soil; hold the plant firmly in the ground.</p> <p>Know the function of the stem is to: transport water and minerals from the roots to other parts of the plants; hold up the leaves so they can gather light; holds up the flower so it can receive pollen and disperse their fruits.</p> <p>Know the function of the leaves is to make food by absorbing light and using its energy to turn carbon dioxide and water into carbohydrates.</p> <p>Know the function of the flower is reproduction.</p>
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	<p>flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Know that flowers of the same kind exchange pollen made by anther – fertilisation. Know that an ovule becomes a seed. Know that the ovary then becomes a fruit which helps the seed leave the plant – dispersal</p>
<p>Year 3 Animals including Humans</p>	<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. 	<p><u>Key Vocabulary</u> <u>Protein, carbohydrates, fruit, vegetable, vitamins, minerals, balanced diet, skeleton, exoskeleton, invertebrates, muscles, contract</u></p> <p>Know that proteins are good for growth. Know that carbohydrates are good for energy. Know that fruit and vegetables provide vitamins and minerals which keep us healthy (e.g. calcium for healthy bones and teeth) Know that getting the right amount of each food group is called a balanced diet. Know that more than half of our diet should be made up of carbohydrates and fruit and vegetables. Know that lack of nutrients can cause ill health. Know that excess of certain food groups can cause ill health. (tooth decay, obesity, heart disease)</p> <p>Know that animals, including humans, have internal skeletons. know that some animals, such as insects have an exoskeleton – a solid covering outside of their body. Know that many invertebrates have water inside which act like a skeleton Know that skeletons provide support for muscles and protect the body. (e.g. The ribcage to protect vital organs) Know that muscles work in pairs so that one contracts the other loosens.</p>
<p>Year 3 Rocks</p>	<ul style="list-style-type: none"> compare and group together different kinds of rocks on 	<p><u>New Vocabulary</u> <u>igneous, sedimentary, metamorphic, weathering, fossil, molten, crust, pressure, permeable,</u></p>

<p>Link to Year 3 – Stone Age, Bronze Age, Iron Age</p>	<p>the basis of their appearance and simple physical properties</p> <ul style="list-style-type: none"> describe in simple terms how fossils are formed when things that have lived are trapped within rock recognise that soils are made from rocks and organic matter. 	<p><u>durable, density</u></p> <p>Know there are three different types of rock: igneous, sedimentary and metamorphic.</p> <p>Describe a range of rocks properties: permeable, durable, density, hard or soft.</p> <p>Know that granite and basalt are types of igneous rock and that igneous rocks are formed from molten rock below the Earth's crust that has cooled.</p> <p>Know that sandstorm and coal are types of sedimentary rocks and that sedimentary rocks are formed when small weathered bits of rock settle and stick together, often in layers.</p> <p>Know that marble and slate are examples of metamorphic rocks and that these are formed from pressure under the earth's surface are squashed and heated in processes.</p> <p>Know that fossils are formed when a plant or animal dies and is covered with silt or mud so it can't rot or be eaten. Over time, layers of sediment build, squash the mud and then stone around the animal or plant, leaving a rock in the shape of the animal or plant.</p> <p>Know that soil is made from tiny particles of rock broken down by weathering.</p>
<p>Year 3 Light</p> <p>Link to Year 3 – Ancient Egypt</p>	<ul style="list-style-type: none"> recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object 	<p><u>Key Vocabulary</u></p> <p><u>Reflection, source, heat, opaque, transparent, shadows</u></p> <p>Know that light is a form of energy</p> <p>Know that we need light to see things.</p> <p>Know that darkness is the absence of light</p> <p>Know that light travels in straight lines</p> <p>Know that light is reflected when it travels from a light source and hits a surface</p> <p>Know that everything we see is either a light source or is reflecting light from a light source into our eyes.</p> <p>Know that the sun is a light source but the moon is not. Know the moon reflects light from the sun.</p> <p>Know that many light sources give off heat as well as light.</p> <p>Know that sunglasses can protect your eyes from the sunlight but looking at the sun directly</p>

	<ul style="list-style-type: none"> find patterns in the way that the size of shadows change. 	<p>(even with sunglasses) can damage your eyes.</p> <p>Know that opaque objects block light and create shadows. Know that light passes through transparent objects. Know that as an object moves towards a light source the size of the shadow increases. Know how to show the changing of shadow size by drawing a diagram with straight lines representing lines.</p>
<p>Year 3 Forces and Magnets</p>	<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><u>Key Vocabulary</u> <u>Friction, rough, smooth, magnets, magnetism, north, south, pole, magnetic, attract, repel</u></p> <p>Know that when objects move across a surface there is friction. Know that sometimes there can be more or less friction. Know that objects move differently on rough and smooth surfaces. Know objects resist movement more on rough surfaces because there is more friction as the object moves. Know that forces can be thought of as a push or a pull Know there are also non-contact forces that can act between objects without them touching and that magnetism is an example of a non-contact force. Know that magnets have two poles called north and south. Know that like poles of two magnets repel each other and that opposite poles of two magnets attract each other. Know that there is a magnetic field around a magnet which is strongest at each pole. Know that some materials are magnetic while other materials aren't magnetic.</p>

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<p>Year 4</p> <p>Working Scientifically</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 	<p><u>New Vocabulary</u> <u>prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis</u></p> <p>Know that we can ask questions and answer them by setting up scientific enquiries Know how to make relevant predictions that will be tested in a scientific enquiry Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table Know – with structured guidance - how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry Know that scientific enquiries can suggest relationships, but that they do <u>not</u> prove whether a prediction is true Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc) Know that they can draw conclusions from the findings of other scientists Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry</p>
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<p>Year 4 Living Things are their Habitats</p> <p>Link to Year 4 – Amazon Explorers</p>	<ul style="list-style-type: none">• recognise that living things can be grouped in a variety of ways• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment• recognise that environments can change and that this can sometimes pose dangers to living things.	<p><u>Key Vocabulary</u> <u>classification key, climate change, characteristics, offspring, extinction, pollution</u></p> <p>Know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behaviour (e.g. herbivores, carnivores and omnivores)</p> <p>Know that a species is a group of living things have many similarities that can reproduce together produce offspring</p> <p>Know that a classification key uses questions to sort and identify different living things</p> <p>Know how to use a classification key to identify living things</p> <p>Know how to create a classification key</p> <p>Know that changes to the environment can make it more difficult for animals to survive and reproduce; in extreme cases this leads to extinction, where an entire species dies</p> <p>Know that human activity – such as climate change caused by pollution - can change the environment for many living things, endangering their existence</p> <p>Know that the polar bear is a famous example of climate change endangering the existence</p>
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		of a species; as the climate changes and gets warmer, the sea ice on which polar bears live reduces in amount making it harder for them to survive and reproduce
Year 4 Animals including Humans	<ul style="list-style-type: none"> describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey. 	<p><u>Key Vocabulary</u> <u>nutrients, excreted, digestion, process, oesophagus, enzymes, bile, undigested, anus, incisors, canines, molars, producer, predator, prey</u></p> <p>Know that food passes through the body with nutrients being extracted and waste products excreted. Know that this process is called digestion. Know that the process of digestion involves breaking down food so the body can absorb it. Know that the process of digestion begins with food being chewed in the mouth by the teeth and saliva added. Know that food is squeezed down the oesophagus towards the stomach Know that the stomach releases acid and enzymes to continue to break down food. Know that further enzymes and bile break down as it moves to the small intestines. Know that large intestines absorb water from undigested food Know that undigested food is stored in the rectum before being excreted through a muscle called the anus.</p> <p>Know that a human has three types of teeth – incisors, canines and molars and that each perform different functions. Know that incisors slice food, canines tear food and that molars grind food. Know that children develop an initial set of teeth which are gradually replaced between 6 and 12 years old.</p> <p>Know that a food chain traces the path of energy through a habitat. Know that all energy for a food chain comes initially from the sun which is turned into energy by plants known as producers. Know that consumers take in energy by eating. Know that an animal that is eaten by another is called prey Know that an animal that eats other animals is called a predator. Know that the first consumer in a food chain is called the primary consumer, the second is</p>

		<p>called the secondary consumer and above it is a tertiary consumer. Know that the arrows in a food chain show the direction that energy is travelling through a habitat.</p>
<p>Year 4 States of Matter</p> <p>Link to Year 4</p>	<ul style="list-style-type: none"> compare and group materials together, according to whether they are solids, liquids or gases observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<p><u>Key Vocabulary</u> <u>solid, liquid, gas, particles, state, temperature, boiling point, freezing point, Celsius, continuous, evaporation, transpiration, precipitation, condense</u></p> <p>Know that things are composed of a material in one of three states: solid, liquid, gas. Know that things are made of particles and these are organised differently in different states. Know that materials can change state when temperature changes. Know that when solids turn into liquids, this is called melting and that the reverse process is called freezing. Know that when liquids turn into gases, this is called evaporation and the reverse process is called condensation. Know that the freezing point of water is 0°C and that the boiling point of water is 100°C</p> <p>Know that water flows around our world in a continuous process called the water cycle. Know that water from the world's surface moves to the air by evaporation. Know that water from the surface of plant leaves moves to the air by transpiration. Know that rain condenses in clouds and falls to earth as rain, snow or hail in a process called precipitation.</p>
<p>Year 4 Sound</p> <p>Link to Year 4 – Gangsta Granny</p>	<ul style="list-style-type: none"> identify how sounds are made, associating some of them with something vibrating recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it 	<p><u>Key Vocabulary</u> <u>vibrate, particles, frequency, volume</u></p> <p>Know that a sound is created when an object vibrates. Know that some of the energy from the vibrating object is transferred to the air making the air particles move. Know that sounds travel through a medium (particles in the air) so sounds do not travel through a vacuum which has no particles in it. Know that sounds travel at different speeds through different objects. It travels through the air at around 340 metres per second. This is much slower than light so this is why we hear</p>

	<ul style="list-style-type: none"> 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>thunder after we see lightning as the light reaches our eye before the sound reaches our ear. Know that pitch is how high or low a sound is and this is determined by how many vibrations per second are being made. Know the number of vibrations per second is called frequency. Know that volume is how loud or quiet a sound is and that this is determined by the amount of energy in the wave. Know that the volume of a sound is quieter if the listener is further away from an object.</p>
<p>Year 4 Electricity</p> <p>Link to Year 4 – Gangsta Granny</p>	<ul style="list-style-type: none"> identify common appliances that run on electricity construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit recognise some common conductors and insulators, and associate metals with being good conductors. 	<p><u>Key Vocabulary</u> <u>electrical energy, current, charged particles, electrons, conductor, insulators, battery, complete circuit, wires, buzzer, switch, components</u></p> <p>Know that electrical energy is one form of many forms of energy. Know that current electricity is the flow of charged particles called electrons around a circuit. Know that electrical current flows well through some materials, called electrical conductors, and poorly through other materials, called electrical insulators. Know that electrical conductivity is an example of a property. Know that metals are good electrical conductors. Know that a chemical reaction inside a cell produces charged particles that can flow around a circuit. Know that more than one cell that works together is called a battery. Know that electrical current flows in a complete circuit. Know that wires – which contain a conductor inside them, usually made of metal – can allow electrical current to flow around a circle. Know that when electrical current flows through a circuit component with a circuit – such as buzzers which make a noise and bulbs which emit light – begin to work. Know that a switch functions by completing or breaking a complete circuit. Know how to construct a simple circuit using components. Know that exposure to high levels of electrical current can be dangerous.</p>

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<p>Year 5</p> <p>Working Scientifically</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 	<p><u>New Vocabulary</u> <u>prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis</u></p> <p>Know that we can ask questions and answer them by setting up scientific enquiries Know how to make relevant predictions that will be tested in a scientific enquiry Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table Know – with structured guidance - how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry Know that scientific enquiries can suggest relationships, but that they do <u>not</u> prove whether a prediction is true Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc) Know that they can draw conclusions from the findings of other scientists Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry</p>
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<p>Year 5 Living Things are their Habitats</p>	<ul style="list-style-type: none"> describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird describe the life process of reproduction in some plants and animals. 	<p><u>Key Vocabulary</u> <u>fertilised, egg, womb, embryo, adolescence, reproduce, metamorphoses, larva, chrysalis, cocoon, hatchling, fledgling.</u></p> <p>Know that a life cycle of a living thing is a series of stages of development starting with a fertilised egg in animals and a seed in plants.</p> <p>Know that in mammals (e.g dog) a fertilised egg develops in the womb, into an embryo and is then born and fed on milk before it is weaned onto the food it is adapted to eat. It then matures in a period called adolescence after which it can reproduce and the cycle can begin again.</p> <p>Know that in amphibians (e.g. frog) a fertilised egg develops into an embryo and then hatches into a tadpole; the tadpole develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin again.</p> <p>Know that in many insects (e.g. butterflies) a fertilised egg develops into wingless feeding form called a larva (caterpillar); the larva feeds then later becomes a chrysalis with a</p>
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		<p>protective cocoon. Inside the cocoon the chrysalis metamorphosis into the adult butterfly after which it can reproduce and the cycle can begin again.</p> <p>Know that in birds (e.g. robins) a fertilised egg hatches in a nest (a hatchling) and is fed by its parents until it is ready to fly (fledgling); it then leaves the nest and grows into an adult after which it can reproduce and the cycle can begin again.</p>
<p>Year 5 Animals including humans.</p>	<ul style="list-style-type: none"> describe the changes as humans develop to old age. 	<p><u>Key Vocabulary</u> <u>adolescence, puberty</u></p> <p>Know that humans go through stages of development; they begin as fertilised eggs and then develop into embryos before developing into babies. Once they are born, these new born babies become infants then young children. Children develop into adults during adolescence. At that age they become physically capable of reproduction. Adults then develop into old age.</p> <p>Know what changes happen to the body at all these stages.</p>
<p>Year 5 Properties and Changes to Material</p>	<ul style="list-style-type: none"> compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be 	<p><u>Key Vocabulary</u> <u>Solute, solvent, solution, soluble, insoluble, saturated, evaporate, reversible, irreversible, dissolve, filter</u></p> <p>Know that materials can be sorted in a variety to ways based on their properties</p> <p>Know that in some solid materials the bonds between particles break when surrounded by a liquid; this allows the liquid to absorb the solid; when this happens, the solid is called a solute, the liquid is called a solvent and the result is a solution; when a solid does dissolve in a liquid it is described as being soluble in that solvent (e.g. sugar in water); when it cannot it is insoluble (e.g. sand in water)</p> <p>Know that a given amount of solvent can only absorb a certain amount of solid before no more will dissolve; when this happens the liquid is said to be saturated</p> <p>Know that when a solvent is evaporated from a solution, the original solute is left behind; the remaining solid will often form crystals – the slower the solvent evaporates, the larger the crystals that will be formed</p>

	<p>separated, including through filtering, sieving and evaporating</p> <ul style="list-style-type: none"> • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 	<p>Know how to dissolve and a solute in a solvent and then how to evaporate the solvent to recover the solute Know that a reversible change is one that can be reversed and that examples of this are mixing, dissolving and changes of state where no chemical reaction takes place</p> <p>Know that an irreversible change is one that cannot be reversed and that examples of this often involve a chemical change where a new material is made, often a gas (e.g. burning, boiling an egg, the reaction of bicarbonate of soda and acid)</p> <p>Know that filtering allows solids and liquids to be separated and that sieving allows solids made up of different sizes parts to be separated Know how to separate a mixture of sand, salt and small stones by sieving (to remove the small stones), followed by dissolving in water (so the salt is absorbed), followed by filtering to remove the sand from the mixture, followed finally by evaporation of the water to recover the salt.</p> <p>Know that materials' different properties can be tested through acting upon them, including testing to find whether materials are magnetic, thermally conductive and electrically conductive; know that the various properties of different materials make them suitable for a given function</p> <p>Know how to explain orally and in writing the reasons why various materials are suited or unsuited to a function</p>
<p>Year 5 Earth and Space</p>	<ul style="list-style-type: none"> • describe the movement of the Earth, and other planets, relative to the Sun in the solar system • describe the movement of the Moon relative to the Earth • describe the Sun, Earth and Moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night and the apparent 	<p><u>Key Vocabulary</u> <u>Celestial body, hydrogen, orbit, telescope, planet, universe, solar system, orbit, axis, eclipse.</u></p> <p>Know that a celestial body is a large natural object in the universe.</p> <p>Know that a star is an exceptionally hot ball of gas, originally made from hydrogen and helium.</p> <p>Know that the sun is a star</p> <p>Know that a planet is a spherical celestial body that orbits a star.</p> <p>Know that it was once thought that everything orbited the earth but scientists such as Copernicus and Galileo used telescopes and measurement to show that Earth orbited the Sun.</p> <p>Know that there are 8 major planets in our solar system: Mercury, Venus, Earth, Mars,</p>

	<p>movement of the sun across the sky.</p>	<p>Jupiter, Saturn, Uranus, Neptune. Know that our solar system makes up a tiny fraction of the vast universe. Know that the moon orbits the Earth every 28 days Know that all planets in the solar system orbit the sun and that the further away they are from the sun, the longer they orbit. Know that the Earth spins on an imaginary line through its centre called an axis. Know an axis is tilted relative to the Earth's orbit. Know that night and day are a result of the Earth rotating on its axis Know that the tilt of the Earth towards and away from the sun's light leads to seasons as during winter months light is spread out over a wide area. Know that a solar eclipse occurs when the moon is between the sun and the earth.</p>
<p>Year 5 Forces</p>	<ul style="list-style-type: none"> • explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	<p><u>New Vocabulary</u> <u>Newton, force meter, gravity, air resistance, water resistance, gravitational force, terminal velocity, levers, pulleys, gears</u></p> <p>Know that Newton is a unit that measures a force. Know it is named after a British scientist called Sir Isaac Newton. Know that pull forces can be measured using a device called a force meter. Know that gravity is a force that acts on all objects in the universe. Know that unsupported objects are pulled towards the Earth by the force of gravity. Know that air resistance is a force is a force felt by an object as it moves through the air. Know how air resistance happens Know that a falling object will accelerate until its air resistance matches the gravitational force pulling it down. The object will then continue to move at this speed (terminal velocity). Know that the quicker an object moves through the air, the more air resistance it experiences, giving it much lower terminal velocity. Know that a parachute's shape increases the air resistance that a falling object experiences. Know that water resistance is a force felt by an object as it moves through water. Know how water resistance happens</p>

		<p>Know that the shape of an object determines how much air resistance or water resistance it experiences, shapes that experience little air or water resistance are described as streamlined.</p> <p>Know how to draw a force diagram.</p> <p>Know that levers, pulleys and gears are simple machines that are used to allow a smaller force to have a greater effect.</p> <p>Know that they do this by moving a smaller force over a longer distance at one end of the machine which the machine turns into a larger force over a small distance at the other end.</p>
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<p>Year 6</p> <p>Working Scientifically</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 	<p><u>New Vocabulary</u> <u>prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis</u></p> <p>Know that we can ask questions and answer them by setting up scientific enquiries Know how to make relevant predictions that will be tested in a scientific enquiry Know that in a fair test one thing is altered (independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same Know how to use a range of equipment to measure accurately, including thermometers, data loggers, rulers and stopwatches Know how to draw bar charts; how to label a diagram using lines to connect information to the diagram; how to use a coloured key how to draw a neat table; how to draw a classification key; how to show the relationship between an independent variable in a two-way table; and how to label specific results in a two-way table Know – with structured guidance - how to write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion Know how to precis a scientific enquiry write-up into a brief oral discussion of what was found in a scientific enquiry Know that scientific enquiries can suggest relationships, but that they do <u>not</u> prove whether a prediction is true Know that scientific enquiries are limited by the accuracy of the measurements (and measuring equipment) and by the extent to which conditions can vary even, and that repeating enquiries, measurements and taking measures to keep conditions as consistent as possible can improve an enquiry Know that the conclusions of scientific enquiries can lead to further questions, where results can be clarified or extended to different contexts (e.g. effect of changing sunlight on a plant – does this work with other plants / different types of light / etc) Know that they can draw conclusions from the findings of other scientists Know that a theory is an explanation of observations that has been tested to some extent and that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry</p>
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<p>Year 6 Living Things and their Habitats</p>	<ul style="list-style-type: none"> describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals give reasons for classifying plants and animals based on specific characteristics. 	<p><u>Key Vocabulary</u> <u>micro-organism, virus, fungi, bacteria, germs, thorax, arthropod, abdomen, arachnid, antenna, jointed limbs</u></p> <p>Know that there are three types of micro-organism: viruses, fungi and bacteria. Know that germs are disease-causing bacteria</p> <p>Know that an arthropod is an invertebrate with a hard , external skeleton and jointed limbs Know that insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings Know that an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wings Know that a crustacean is a type of arthropod with two pairs of antennae (e.g. woodlouse) Know that a myriadpod is an arthropod with a flat and long or cylindrical body and many legs</p>
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		(e.g. centipede) Know how to give reasons for classifying plants and animals based on different characteristics.
Year 6 Animals including Humans	<ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans. 	<p><u>Key Vocabulary</u> artery, aorta, atrium, blood vessels capillary, circulatory system, vein, pulse, ventricle, replenished, resting heart rate</p> <p>Know that the heart and lungs are organs protected by the ribcage Know that blood travels around the body transporting nutrients that have been absorbed into the blood stream from digestion; blood also carries oxygen around the body which is used to power the body; this use of oxygen to create energy is called respiration Know that the heart beats, pumping blood around the body and that blood vessels carry the blood; arteries carry blood away from the heart; veins carry blood towards the heart; capillaries are tiny blood vessels that connect arteries and veins Know that the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major arteries branch off from it Know that when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart rates Know that drugs are chemicals that have an impact on the natural chemicals in a person's; know that drugs can be harmful or helpful, depending on what they are and how they are used; know that all drugs can be harmful if overused Know that paracetamol and aspirin are examples of drugs that can be helpful as a painkiller Know that cannabis and cocaine are examples of illegal drugs that can have serious negative effects Know that alcohol and tobacco are examples of drugs that are legal to adults but that can have serious negative effects, such as liver disease and lung disease, respectively</p>
Year 6 Evolution and Inheritance	<ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living 	<p><u>Key Vocabulary</u> evolution, natural selection, variation, adaptation</p> <p>Know that all life on Earth began from a single point around 4.5 billion years ago Know that</p>

	<p>things that inhabited the Earth millions of years ago</p> <ul style="list-style-type: none"> • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution 	<p>living things changes over time and that this gradual change is called evolution</p> <p>Know that natural selection is the cause of this change; natural selection works across a species there is natural variation within a species; there is also competition to survive and reproduce and that members of a species with advantageous characteristics survive and reproduce.</p> <p>Know that offspring are varied and are not identical to their parents</p> <p>Know that Charles Darwin posited this theory of evolution</p> <p>Know that the gradual change of species over millions of years can be observed by looking at examples of fossil</p>
Year 6 Light	<ul style="list-style-type: none"> • recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. 	<p><u>Key Vocabulary</u> translucent, medium, white light, prism, spectrum, refraction</p> <p>Know that translucent objects allow some light to pass through, but some of the light changes direction as it passes through the object; this means that an something seen through a translucent object is not clearly defined</p> <p>Know that when light passes from one medium to another (e.g. from air to water), it changes direction; this is called refraction; this happens because light travels at different speeds in different media.</p> <p>Know that white light comprises all the colours of light</p> <p>Know that white light refracted by two surfaces in a prism will spread out so that all of its constituent colours can be seen; this array of colours is called a spectrum; it happens because the different colours of that constitute white light travel at different speeds.</p> <p>Know how to draw a diagram to show why the shape of a shadow will match the shape of an object</p>
Year 6 Electricity	<ul style="list-style-type: none"> • associate the brightness of a lamp or the volume of a 	<p><u>Key Vocabulary</u> voltage, current, battery, bulb, motor, buzzer, wire, switch, series circuit, parallel circuit</p>

	<p>buzzer with the number and voltage of cells used in the circuit</p> <ul style="list-style-type: none"> • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram. 	<p>Know that voltage is a measure of the power of a cell to produce electricity; it is a measure of the 'push' of electric current, not the size of the electric current</p> <p>Know that as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase (though too high a voltage may 'blow' the bulb or buzzer)</p> <p>Know how to draw simple circuit diagrams</p> <p>Know the recognised symbols for a battery, bulb, motor, buzzer and wire</p> <p>Know how to predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit</p> <p>Know that two bulbs in a circuit can be wired up to create a series circuit or a parallel circuit; if one bulb blows in a series circuit the other will not shine as the circuit has been broken; in contrast, if one bulb blows in a parallel circuit, there will still be a complete circuit for the other bulb so it will continue to shine; use this knowledge to explain the advantages of using parallel circuits (e.g. in the lighting in homes)</p>
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