



Progress in Science: Key Stage 2

Intent:

Here at Ashton St. Peter's we believe that a high-quality Science education is fundamental to developing a child's understanding of the world through the key disciplines of biology, chemistry and physics. Scientific advancements are happening every day and are key to the world's future prosperity so it is vital for children to understand essential aspects of the knowledge, methods, processes and uses of science. We provide children with a solid understanding of key foundational knowledge and concepts, immersing them in a vocabulary-rich environment that allows them to build their understanding of the topic being studied as well as the diverse planet we live on. The staff here at Ashton St. Peter's ensure that all children are exposed to high-quality teaching and learning experiences that provide them with opportunities to develop their scientific enquiry and investigative skills through exploring their outdoor environment and locality. Children are encouraged to make predictions and observations, to question what they see and offer possible explanations for events and causes.

Science - Key Stage 2				
	Working Scientifically	Biology	Chemistry	Physics
National Curriculum Year 3	<p>During Years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the Programme of Study content:</p> <ul style="list-style-type: none"> - asking relevant questions and using different types of scientific enquiries to answer them; 	<p><u>Plants - pupils should be taught to:</u></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 the soil, 	<p><u>Rocks - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. - describe in simple terms how fossils are formed when things that have lived are trapped within 	<p><u>Light - pupils should be taught to:</u></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

	<ul style="list-style-type: none"> - 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, making predictions for new values, suggest improvements and raise further questions; - identifying differences, similarities or changes related to simple scientific ideas and processes; - and using straightforward scientific evidence to answer questions or to support their findings. 	<p>and room to grow) and how they vary from plant to plant.</p> <ul style="list-style-type: none"> - investigate the way in which water is transported within plants. - explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <p><u>Animals, including humans - pupils should be taught to:</u></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 animals have skeletons and muscles for support, protection and movement. 	<p>rock.</p> <ul style="list-style-type: none"> - recognise that soils are made from rocks and organic matter. 	<p>and that there are ways to protect their eyes.</p> <ul style="list-style-type: none"> - recognise that shadows are formed when the light from a light source is blocked by a solid object. - find patterns in the way that the size of shadows change. <p><u>Forces and magnets - pupils should be taught to:</u></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.
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<p>National Curriculum</p> <p>Year 4</p>	<p>During Years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the Programme of Study content:</p> <ul style="list-style-type: none"> - asking relevant questions and using different types of scientific enquiries to answer them; - setting up simple practical enquiries, comparative and fair tests; - 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 	<p><u>Living things and their habitats - pupils should be taught to:</u></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>Animals, including humans - pupils should be taught to:</u></p> <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>States of matter - pupils should be taught to:</u></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>Sound - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - identify how sounds are made, associating some of them with something vibrating. - recognise that vibrations from sounds travel through a medium to the ear. - find patterns between the pitch of a sound and features of the object that produced it. - find patterns between the volume of a sound and the strength of the vibrations that produced it. - recognise that sounds get fainter as the distance from the sound source increases. <p><u>Electricity - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - identify common appliances that run on electricity. - construct a simple series electrical circuit,

	<p>and written explanations, displays or presentations of results and conclusions;</p> <ul style="list-style-type: none"> - using results to draw simple conclusions, making predictions for new values, suggest improvements and raise further questions; - identifying differences, similarities or changes related to simple scientific ideas and processes; - and using straightforward scientific evidence to answer questions or to support their findings. 			<p>identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</p> <ul style="list-style-type: none"> - 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>National Curriculum</p> <p>Year 5</p>	<p>During Years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the Programme of Study content:</p> <ul style="list-style-type: none"> - planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; - taking measurements, using a range of scientific equipment, with increasing accuracy and 	<p><u>All living things and their habitats - pupils should be taught to:</u></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>Animals, including humans - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - describe the changes as humans develop to old age. 	<p><u>Properties and changes of materials - pupils should be taught to:</u></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. 	<p><u>Earth and space - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - describe the movement of 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

	<p>precision, taking repeat readings where appropriate;</p> <ul style="list-style-type: none"> - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and 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 results, in oral and written forms such as displays and other presentations; - and identifying scientific evidence that has been used to support or refute ideas or arguments. 		<ul style="list-style-type: none"> - use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. - give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. - demonstrate that dissolving, mixing and changes of state are reversible changes. - explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 	<p>rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p><u>Forces - pupils should be taught to:</u></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>National Curriculum</p> <p>Year 6</p>	<p>During Years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the Programme of Study content:</p> <ul style="list-style-type: none"> - planning different types of scientific enquiries to 	<p><u>Living things and their habitats - pupils should be taught to:</u></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 		<p><u>Light - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - recognise that light appears to travel in straight lines. - use the idea that light travels in straight lines to explain that objects are seen because they give

	<p>answer questions, including recognising and controlling variables where necessary;</p> <ul style="list-style-type: none"> - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate; - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and 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 results, in oral and written forms such as displays and other presentations; - and identifying scientific evidence that has been used to support or refute ideas or arguments. 	<p>microorganisms, plants and animals.</p> <ul style="list-style-type: none"> - give reasons for classifying plants and animals based on specific characteristics. <p><u>Animals, including humans - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - identify and name the main parts of the human circulatory systems, 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>Evolution and inheritance - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. - recognise that living things produce offspring of the same kind, but normally offspring vary 		<p>out or reflect light into the eye.</p> <ul style="list-style-type: none"> - explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. - use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <p><u>Electricity - pupils should be taught to:</u></p> <ul style="list-style-type: none"> - associate the brightness of a lamp or the volume of a buzzer with the name 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 positions of switches. - use recognised symbols when representing a simple circuit in a diagram.
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		<p>and are not identical to their parents.</p> <ul style="list-style-type: none"> - identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. 		
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Skill	Year 3	Year 4	Year 5	Year 6
Working Scientifically	<p><u>Ask relevant questions and using different types of scientific enquiries to answer them:</u></p> <ul style="list-style-type: none"> - Know that we can ask questions and answer them by setting up scientific enquiries. - Know how to make predictions that can be tested in a scientific enquiry. • Know that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry. <p><u>Set up simple practical enquiries:</u></p> <ul style="list-style-type: none"> - Know that in a fair test one thing is changed (the independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same. 	<p><u>Ask relevant questions and using different types of scientific enquiries to answer them:</u></p> <ul style="list-style-type: none"> - Know that we can ask questions and answer them by setting up scientific enquiries. - Know how to make predictions that can be tested in a scientific enquiry. • Know that a hypothesis is an explanation that has not yet been tested, but that can be tested through a scientific enquiry. <p><u>Set up simple practical enquiries:</u></p> <ul style="list-style-type: none"> - Know that in a fair test one thing is changed (the independent variable) and one thing that may change as a result is measured (dependent variable) while all other conditions are kept the same. 	<p><u>Plan a scientific enquiry to answer questions:</u></p> <ul style="list-style-type: none"> - Know how to choose appropriate variables to test a hypothesis. - Know how to identify conditions that were imperfectly controlled and can explain how these might affect results. <p><u>Take measurements with a variety of scientific equipment:</u></p> <ul style="list-style-type: none"> - Know how to accurately use further measuring devices (e.g. digital and analogue scales) and recognise the relative accuracy of each device. - Know how and when to repeat measurements, how to find an average set of measurements and how to recognise and remove outliers from a set of data, justifying the removal as a potential mis-measurement. <p><u>Report and present findings:</u></p>	<p><u>Plan a scientific enquiry to answer questions:</u></p> <ul style="list-style-type: none"> - Know how to choose appropriate variables to test a hypothesis. - Know how to identify conditions that were imperfectly controlled and can explain how these might affect results. <p><u>Take measurements with a variety of scientific equipment:</u></p> <ul style="list-style-type: none"> - Know how to accurately use further measuring devices (e.g. digital and analogue scales) and recognise the relative accuracy of each device. - Know how and when to repeat measurements, how to find an average set of measurements and how to recognise and remove outliers from a set of data, justifying the removal as a potential mis-measurement. <p><u>Report and present findings:</u></p>

	<p><u>Make systematic and careful observations with a range of equipment:</u></p> <ul style="list-style-type: none"> - Know how to use a range of equipment to measure accurately (e.g. thermometers, data loggers, stopwatches, etc.) <p><u>Gather and record data to answer questions:</u></p> <ul style="list-style-type: none"> - Know how to draw bar charts; how to label a diagram using a ruler to draw lines to connect information to the diagram; how to use a 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 the specific results in a two-way table. <p><u>Report on findings:</u></p> <ul style="list-style-type: none"> - Know how to write a simple scientific write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion (all with scaffolding/guidance). - Know how to plan a scientific enquiry write-up through oral 	<p><u>Make systematic and careful observations with a range of equipment:</u></p> <ul style="list-style-type: none"> - Know how to use a range of equipment to measure accurately (e.g. thermometers, data loggers, stopwatches, etc.) <p><u>Gather and record data to answer questions:</u></p> <ul style="list-style-type: none"> - Know how to draw bar charts; how to label a diagram using a ruler to draw lines to connect information to the diagram; how to use a 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 the specific results in a two-way table. <p><u>Report on findings:</u></p> <ul style="list-style-type: none"> - Know how to write a simple scientific write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion (all with scaffolding/guidance). - Know how to plan a scientific enquiry write-up through oral discussion of what was found during the scientific enquiry. 	<ul style="list-style-type: none"> - Know how to independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion. - Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary. <p><u>Identify scientific evidence:</u></p> <ul style="list-style-type: none"> - Know examples of instances of where scientific evidence has been used to support/refute ideas or arguments. 	<ul style="list-style-type: none"> - Know how to independently write a simple scientific enquiry write-up including an introduction, a list of equipment, a numbered method, a detailing of results and a conclusion. - Know how to present brief oral findings from an enquiry, speaking clearly and with confidence and using notes where necessary. <p><u>Identify scientific evidence:</u></p> <ul style="list-style-type: none"> - Know examples of instances of where scientific evidence has been used to support/refute ideas or arguments.
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	<p>discussion of what was found during the scientific enquiry.</p> <p><u>Use results to draw conclusions, make predictions and suggest improvements:</u></p> <ul style="list-style-type: none"> - Know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true. - Know that scientific enquiries are limited by the accuracy of the measurements 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 conclusions of scientific enquiries can lead to further questions. 	<p><u>Use results to draw conclusions, make predictions and suggest improvements:</u></p> <ul style="list-style-type: none"> - Know that scientific enquiries can suggest relationships, but that they do not prove whether a prediction is true. - Know that scientific enquiries are limited by the accuracy of the measurements 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 conclusions of scientific enquiries can lead to further questions. 		
Biology	<p><u>Plants - Children should:</u></p> <ul style="list-style-type: none"> - Know that leaves make food by trapping light and using its energy to turn carbon dioxide and water into carbohydrates. - Know that different parts of plants have one or more functions. - Know that roots collect water and minerals from the soil, and hold the plant firmly in the ground. 	<p><u>Living things and their habitats - Children should:</u></p> <ul style="list-style-type: none"> - Know that animals can be classified based on their physical characteristics and based on their behaviour. - Know that classification key uses questions to sort and identify living things. - Know how to use a classification key to identify living things. 	<p><u>All living things and their habitats - Children should:</u></p> <ul style="list-style-type: none"> - Know that the life cycle of a living thing is a series of stages of development starting with a fertilized egg in animals or seed in many plants. - Know that in most mammals a fertilized egg develops into an embryo in the womb and is then born and fed on milk 	<p><u>Living things and their habitats - Children should:</u></p> <ul style="list-style-type: none"> - Know that there are three types of micro-organism: viruses, fungi and bacteria. Scientists mainly don't consider viruses to be alive because they don't have the ability to reproduce inside them. - Know that germs are disease-causing bacteria.

	<ul style="list-style-type: none"> - Know that the stem holds up the leaves so that they can gather light to make food and holds up the flowers so that they can receive pollen and disperse their fruits. - Know that the stem also transports water and minerals from the roots to the other parts of the plant. - Know that the function of a flower is reproduction, where flowers of the same kind exchange pollen in a process called fertilisation. - Know that the ovule becomes a seed; the ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal. - Know how bees play a role in the reproduction of flowering plants. <p><u>Animals, including humans - Children should:</u></p> <ul style="list-style-type: none"> - Know that getting the right amount of each food group is called a balanced diet. - Know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium for healthy teeth and bones). 	<ul style="list-style-type: none"> - Know how to create a classification key to sort a variety of animals from a habitat/microhabitat in the local area. - Know that human activity - such as pollution and littering - can change the environment for many living things, endangering their existence. - Know examples of animals that have been affected by human impact on their environment e.g. polar bears. - Know that changes to an environment can make it harder for creatures to survive and can lead to species becoming extinct. <p><u>Animals, including humans - Children should:</u></p> <ul style="list-style-type: none"> - Know the different types of teeth: incisor, canine, premolar and molar. - Know that children develop an initial set of teeth (milk teeth) which are slowly replaced by adult teeth between the ages of 6 and 12. - Know that incisors slice food, canines tear food and that molars grind food. - Know that it is important to brush our teeth and visit the 	<p>before it is weaned onto the food that it is adapted to eat. It then develops to maturity in a period called adolescence after which it can reproduce and the cycle can begin again.</p> <ul style="list-style-type: none"> - Know that in amphibians a fertilized egg develops into an embryo and then hatches into a tadpole, the tadpole develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin again. - Know that in many insects a fertilized egg develops into a wingless feeding form called a larva. The larva feeds then later becomes a pupa (chrysalis) with a protective cocoon; inside this cocoon, the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can begin again. - Know that in birds a fertilized egg hatches a nest and is fed by its parents until it is ready to fly; it then leaves the nest and grows into an adult after which it can reproduce and the cycle can begin again. 	<ul style="list-style-type: none"> - 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 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. - Know that myriapods are an arthropod with a flat and long or cylindrical body and many legs. <p><u>Animals, including humans - Children should:</u></p> <ul style="list-style-type: none"> - Know the name of the parts of the circulatory system and identify them. - Know that the heart is made of muscle and is composed of four chambers. - Know that the heart beats, pumping blood around the
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	<ul style="list-style-type: none"> - Know the effect too little or too much of each food group has on our bodies (e.g. tooth decay, rickets, obesity, etc.) - Know that humans and some animals have skeletons to protect their bodies and support their muscles. - Know that animals, including humans, have a skeleton made up of solid objects. - Know that some animals have an exoskeleton (e.g. insects). - Know that many invertebrates have water held inside by muscles which act like a skeleton (e.g. worms/slugs). - Identify and name some of the muscles in our bodies. 	<p>dentist regularly to ensure dental hygiene.</p> <ul style="list-style-type: none"> - Know that a food chain traces the path of energy through a habitat and that the arrows in a food chain show the direction that energy is travelling through a habitat. - Know that all energy for a food chain initially comes from the Sun which is absorbed and turned into energy by plants which are called producers. - Know that consumers take in energy by eating. - Know that an animal that is eaten by another is called prey, and that an animal that eats other animals is called a predator. - Know that digestion begins in the mouth where food is chewed down by the teeth and saliva. - Know that food passes through the body with the necessary nutrients being extracted and the waste products excreted, and that this process is known as digestion. - Know that the process of digestion involves breaking down complex foods into simpler building blocks that can be absorbed by the body. 	<p><u>Animals, including humans - Children should:</u></p> <ul style="list-style-type: none"> - Know that humans go through stages of development: they begin as fertilized eggs and then develop into embryos before developing into babies. Once they are born, these new born babies become infants (2 months – 2 years), then into young children (2 years – 12 years), children develop into adults during adolescence (12 years – 16 years) at which age they become physically capable of reproduction; as adults develop into old age (55+ years) they experience changes in their body which require them to move more carefully and rest more frequently. 	<p>body and that blood vessels carry the blood.</p> <ul style="list-style-type: none"> - Know the function of blood: carries nutrients absorbed from digestion and oxygen around the body to power the body. - Know that during exercise the heart pumps faster to blood and oxygen more rapidly to the muscles. - Know that the pulse rate is a measure of how fast the heart is beating and know how to measure the pulse rate. - Know that blood comes from the heart in arteries and returns to the heart in veins. - Know some of the harmful effects of smoking. - Know the impact of diet, exercise, drugs and lifestyle on the way our bodies function, making links with effects on specific organs (e.g. heart, lungs, liver, etc.) - Suggest several reasons why taking medicine is sometimes necessary. - Know simple examples of everyday medicines (e.g. paracetamol).
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- Know that food is squeezed down the oesophagus towards the stomach in a wave-like action called **peristalsis**.
- Know that in the stomach food is broken down by acids and enzymes and know that the stomach is an organ.
- Know that further enzymes and bile break down food further as it moves through the duodenum towards the small intestine.
- Know that the small intestine uses further enzymes to break down the food and absorbs the necessary nutrients.
- Know that the large intestine absorbs water from the undigested food.
- Know that the undigested food is stored in the rectum before being excreted through the anus muscle.

- Know that care should be taken with medicine and that they can be dangerous.
- Know some of the harmful effects of legal and illegal drugs.
- Suggest reasons why advice on diet changes over time.

Evolution and inheritance - Children should:

- Know that all life on Earth began from a simple point around 4.5 billion years ago.
- Know that living things change over time and that this gradual change is called evolution.
- Know that natural selection is the cause of this change; natural selection works as 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. These characteristics are passed down to their offspring; members of a species with less advantageous characteristics do not survive and reproduce – these characteristics are **not** passed down to offspring.

				<ul style="list-style-type: none"> - Know that offspring are vary and are not identical to their parents. - Know that this theory of evolution by natural selection was theorised by Charles Darwin. - Know that gradual change of species over time can be observed by looking at examples of fossils.
Chemistry	<p><u>Rocks - Children should:</u></p> <ul style="list-style-type: none"> - Know that there are three different types of rock: igneous, sedimentary and metamorphic. - Know that igneous rock is formed from molten rock below the Earth's crust and know examples of igneous rock (e.g. granite and basalt). - Know that sedimentary rock is formed when small, weathered fragments of rock/shell settle and stick together forming layers and know examples of sedimentary rock (e.g. limestone and sandstone). - Know that metamorphic rock is formed when rocks in the Earth's crust get squashed and heated in processes e.g. when tectonic plates press against each other (e.g. marble and slate). 	<p><u>States of Matter - Children should:</u></p> <ul style="list-style-type: none"> - Know the key properties of solids and liquids and be able to distinguish between the two. - Know that things are composed of a material in one of three states: solid, liquid or gas. - Know that the state of matter can be changed when temperature changes. - Know that the process of turning a solid into a liquid is known as melting and the reversing process is known as freezing. - Know that the process of turning a liquid into a gas is known as evaporating and the reversing process is known as condensation. 	<p><u>Properties and changes of materials - Children should:</u></p> <ul style="list-style-type: none"> - Know that materials can be sorted in various different ways based on their properties. - Know that we can test materials' different properties through acting upon them (e.g. are materials magnetic, thermally conductive or electrically conductive?) - Know that various properties of different materials make them suitable for certain functions. - Know how to explain why various materials are suited or unsuited to a certain function (e.g. orally and in writing). - Know that in some solid materials the bonds between particles break when surrounded by a liquid and this 	

	<ul style="list-style-type: none"> - Know that soils are formed, in part, by tiny particles of rock broken down through the process of weathering. - Know the process of fossilization. 	<ul style="list-style-type: none"> - Know that gases are materials with substance and weight. - Know that the melting point of water is 0°C and the boiling point of water is 100°C. - Know that water continually flows around the Earth in a process called the water cycle. - Know that rain condenses in clouds and falls to the earth as rain, snow or hail in a process called precipitation. - Know that water flows across the land in rivers and streams in a process called surface runoff and under the ground as groundwater. - Know that water on the Earth's surface moves to the air in a process called transpiration in which water turns into water vapour on the surface of leaves on plants. 	<p>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.</p> <ul style="list-style-type: none"> - Know that when a solid dissolves in a liquid it is described as being soluble in that solvent and when it cannot it is insoluble. - Know that only a certain 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. - Know that when a solvent is evaporated from a solution, the original solute is left behind and the remaining solid will often form crystals. - Know that the slower a solvent evaporates, the larger the crystals will be formed. - Know how to dissolve a solute in a solvent and then how to evaporate the solvent to recover the solute. 	
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Physics	<p><u>Light - Children should:</u></p> <ul style="list-style-type: none"> - Know that we need light in order to see things and that some objects are easier to see than others. - Know that darkness is the absence of light. - Know that in order to see something it must either be a light source or reflects light from a light source into our eyes. - Knows that the Sun is a source of light. - Know that sunglasses can protect eyes from the sunlight 	<p><u>Sound - Children should:</u></p> <ul style="list-style-type: none"> - Know that sound is generated when an object vibrates. - Know that sound is a form of energy that travels in a longitudinal wave (e.g. like a slinky). - Know that sound travels through a medium (e.g. has particles in the air) and will not travel through a vacuum with no particles at all. - Know that the longitudinal sound waves are detected in the ear by humans and the brain interprets this as the sounds we hear. 	<p><u>Earth and Space - Children should:</u></p> <ul style="list-style-type: none"> - Know that the universe comprises all matter and space in existence. - Know that a celestial body is a large object in the universe. - Know that the universe is utterly vast and that our solar system makes up a tiny fraction of the universe. - Know that a star is an exceptionally hot ball of gas, originally made from hydrogen and helium. 	<p><u>Light - Children should:</u></p> <ul style="list-style-type: none"> - Be able to use torches and periscopes to investigate light. - Know that light appears to travel in straight lines. - Know that reflection is the action of the light 'bouncing off' objects. - Know that in order to be seen all non-luminous objects must reflect light. - Be able to draw diagrams represent light from sources

	<p>but looking at the Sun directly (even with sunglasses) can damage the eyes.</p> <ul style="list-style-type: none"> - Suggest ways to make people/objects more visible in the dark. - Know that light travels in straight lines. - Know that shadows are created by light being blocked by opaque objects and that light passes through transparent objects. - Know that opacity/transparency/reflectiveness is the properties of a material. - Know that as an object moves towards a light source, the size of the shadow increases. - Know that a data logger can keep track of light levels and that this can be plotted on a graph to show how this changes over the course of a day. <p><u>Forces and magnets - Children should:</u></p> <ul style="list-style-type: none"> - Know that a force can be thought of as a push or pull. - Know that there are three types of contact forces: impact forces (when two surfaces collide), frictional forces (when two surfaces are 	<ul style="list-style-type: none"> - Know that sound waves travel at different speeds through different objects. - Know that pitch is how low or high a sound is and that is determined by how many vibrations per second are being made by the vibrating object (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 the object. <p><u>Electricity - Children should:</u></p> <ul style="list-style-type: none"> - Know that electrical items can be powered by mains electricity or by batteries. - Know that electricity can be used to produce light, sound, heat and movement. - Know and identify simple components and use these to construct a simple circuit. - Know that exposure to high-levels of electrical current can be dangerous. - Know that current electricity is the flow of charged particles 	<ul style="list-style-type: none"> - Know that the Sun is a star. - Know the major planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. - Know that all the planets in the solar system orbit the Sun and that the further away they are from the Sun, the longer their orbit. - Know that a planet is defined as a spherical celestial body that orbits a star and that has cleared the neighbourhood of its orbit of other objects, some of which crash into the planet and others that become moons of that planet. - Know that the Earth spins around an imaginary line through its centre called an axis and that this axis is tilted relative to the Earth's orbit. - Know it was once thought that everything orbited the Earth, but that scientists (e.g. Copernicus and Galileo) used telescopes and measurement to show that the Earth orbited the Sun. 	<p>and reflecting off of reflective surfaces using arrows.</p> <ul style="list-style-type: none"> - Be able to draw diagrams to illustrate how light is travelling from the source to the eye. - Suggest a variety of ways of changing the size of the shadow produced by an object. - Know that the distance between the light source and an object affects the size of a shadow. - Know that white light comprises all the colours of light. - Know that white light refracted by two surfaces in a prism will spread out so that all of its constituent colours can be seen. <p><u>Electricity - Children should:</u></p> <ul style="list-style-type: none"> - Know that voltage is a measure of the power of a cell to produce electricity. - Know that the 'amount' of electricity depends on the number of batteries.
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	<p>already in contact) and strain forces (when an elastic material is stretched or squashed).</p> <ul style="list-style-type: none"> - Know that objects move differently on rough and smooth surfaces and that objects resist movement on rough surfaces because there is a higher level of friction when the object moves. - Know that there are also non-contact forces that can act between objects without them touching (e.g. magnetism). - Know that a magnet has a North and a South pole and that the magnetic field is strongest at these points. - Know that like poles (e.g. south-south and north-north) of two magnets repel each other and that opposite poles of two magnets attract each other. - Know that some materials are magnetic which means they are attracted to a magnet, whereas some materials are non-magnetic so they will not be attracted to a magnet. 	<p>called electrons around a circuit.</p> <ul style="list-style-type: none"> - Know that a switch functions by completing or breaking a circuit. - Know that current electricity can flow if there's a complete circuit. - Know that electrical current flows well through some materials, called electrical conductors, and poorly through other materials, called electrical insulators. - Know that metals are good electrical conductors. - Know that conductors have free electrons and that when electrical current flows around a conductor the electrons move. - Know that electrical conductivity is an example of a property. - Know that when electrical current flows through a circuit components within that circuit begin to work. - Know that more than one cell lined up to work together is called a battery. 	<ul style="list-style-type: none"> - Know that night and day are the result of the Earth rotating on its axis. - Know that the tilt of the Earth towards and away from the Sun's light as the Earth orbits the Sun leads to the seasons as during winter the light spread over a wider area. - Know that the Earth orbits the Earth roughly every 28 days. - Know that as the Moon orbits the Sun, different parts of it are lit up by the Sun, which is why we see a different shape lit up on the Moon as the lunar cycle progresses. - Know that a solar eclipse occurs when the Moon is between the Sun and the Earth, casting a shadow on the Earth and a lunar eclipse occurs when the Earth is between the Sun and the Moon, casting a shadow on the Moon. - Know that humans have sent man-made satellites into orbit that assist with telecommunication. 	<ul style="list-style-type: none"> - Know that increasing the voltage in a circuit will increase the brightness of a bulb or the volume of a buzzer. - Know how to draw a simple circuit and use recognised conventional circuit symbols. - Suggest reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and on/off position of switches. - Know what would happen if all the lights in a home were connected in the same circuit and one broke. - Know what would happen if all the lights in a home run on a parallel circuit and one broke.
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			<p>an adjacent gear in the opposite direction.</p> <ul style="list-style-type: none">- Know that gears, pulleys and levers are simple machines that are used to allow a smaller force to have a greater effect and 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.	
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