

Working Scientifically Years 3 & 4 Years 5 & 6		Year 3	Year 4	Year 5	Year 6
<p>Pupils will be taught to use the following skills when carrying out investigations:</p> <ul style="list-style-type: none"> ask relevant questions and using different types of scientific enquiries to answer them set up simple practical enquiries, comparative and fair tests plan different types of scientific enquiries to answer questions, including recognise and controlling variables where necessary make systematic and careful observations and, where appropriate, take accurate measurements using standard 	Plants	<p>The children will:</p> <ul style="list-style-type: none"> identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. <p>Dr Kelsey Byers (Biologist who studies flower smells and how they attract insects)</p>		<p>(See living things and their habitats)</p>	
	Animals, including humans	<p>The children will:</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>Wilhelm Roentgen (Physicist who discovered x-rays)</p>	<p>The children will:</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, identify producers, predators and prey <p>Paul Sharpe (Bioengineer who studies how to regrow teeth if they become damaged)</p>	<p>The children will:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. <p>Virginia Apgar (Doctor & Medical Researcher who developed a method of evaluating the well-being of new-born babies)</p>	<p>The children will:</p> <ul style="list-style-type: none"> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans. <p>William Harvey (discovered the nature of blood circulation and the function of the heart as a pump)</p>

<p>units, using a range of equipment, including thermometers and data loggers</p> <ul style="list-style-type: none"> take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables record data and results of increasing complexity using scientific diagrams and labels, 	<p>Materials</p>		<p>The children will:</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>Joseph Priestley (Clergyman who discovered oxygen at about the same time as Carl Wilhelm Scheele)</p> <p>Carl Wilhelm Scheele (Chemist who discovered oxygen at about the same time as Joseph Priestley)</p>	<p>The children will:</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 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 	
---	------------------	--	--	---	--

<p>classification keys, tables, scatter graphs, bar and line graphs</p> <ul style="list-style-type: none"> report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions use test results to make predictions to set up further comparative and fair tests report and present findings from 				<p>acid on bicarbonate of soda.</p> <p>Jamie Garcia - (Chemist who discovered a fully recyclable plastic)</p> <p>Andre Geim & Konstantin Novoselov (Physicists who discovered graphene)</p>	
	Living things and their habitats		<p>The children will:</p> <ul style="list-style-type: none"> recognise that living things can be grouped in a variety of ways exploring and using 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>Jacques Cousteau (Oceanographer and co-inventor of the aqualung)</p>	<p>The children will:</p> <ul style="list-style-type: none"> describe the life process of reproduction in some plants and animals. describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird <p>Jane Goodall (Wildlife Researcher & Conservationist who studied chimpanzees)</p>	<p>The children will:</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>Carl Linnaeus (Botanist & Zoologist who developed a taxonomy for classifying organisms)</p>
	Rocks	<p>The children will:</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>Florence Bascom (Geologist who studied the origin and formation of mountains)</p>			

<p>enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <ul style="list-style-type: none"> identify differences, similarities or changes related to simple scientific ideas and processes 	<p>Light</p>	<p>The children will:</p> <ul style="list-style-type: none"> recognise that they need light in order to see things and that dark is the absence of light notice that light is reflected from surfaces recognise that light from the sun can be dangerous and that there are ways to protect their eyes recognise that shadows are formed when the light from a light source is blocked by an opaque object find patterns in the way that the size of shadows change. <p>Percy Shaw (Inventor of the cat's eye)</p>			<p>The children will:</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 out or reflect light into the eye explain that we see things because the light that 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>Ibn Sahl - (Mathematician who observed the paths of rays of light as they reflected off different mirrors)</p>
---	--------------	---	--	--	---

<ul style="list-style-type: none"> • use straightforward scientific evidence to answer questions or to support their findings. • identify scientific evidence that has been used to support or refute ideas or arguments 	<p>Forces</p>	<p>The children will:</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>Leonardo Da Vinci - (First person to plan and carry out tests on friction)</p>		<p>The children will:</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>Brahmagupta - (Mathematician & Astronomer who was the first scientist to talk about gravity)</p>	
--	----------------------	--	--	--	--

	Sound		<p>The children will:</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>Isaac Newton - search document for information (Mathematician & Physicist who measured the speed of sound)</p>		
--	--------------	--	---	--	--

	Electricity		<p>The children will:</p> <ul style="list-style-type: none"> • identify common appliances that run on electricity • construct a simple series electrical circuit, identify 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 associating 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>Lewis Howard Latimer (Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the world)</p>		<p>The children will:</p> <ul style="list-style-type: none"> • associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram. <p>Mildred S Dresselhaus (Materials Scientist whose research led to the development of the rechargeable batteries in all modern electronic equipment)</p>
--	--------------------	--	--	--	---

	Earth and space			<p>The children will:</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 movement of the sun across the sky. <p><u>Nicolaus Copernicus</u> (Astronomer who developed the theory that the Sun was at the centre of the Solar System around which the planets orbited)</p>	
--	------------------------	--	--	---	--

	Evolution and inheritance			<p>The children will:</p> <ul style="list-style-type: none"> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. <p>Charles Darwin - links to free resources requiring a login (Natural Historian who developed the theory of evolution by natural selection)</p> <p>Alfred Wallace (Natural Historian who developed the theory of evolution by natural selection)</p> <p>Telma Laurentino (Evolutionary Biologist who measures differences in the colour of lizards that live in white desert sands to find differences in their genes which might have allowed them to survive in such an extreme environment)</p>
--	----------------------------------	--	--	---