



Curiosity Compassion Courage

KS2 Science Long Term Plan

Science Intent: Year 3 and 4

In KS2 we move away from the immediate world around us, and try to observe the miniscule and the massive through the eyes of scientists! We bring the world to Partney through topics such as 'Urban Pioneers' which focusses on Light, within a Geographical context of towns and cities. The natural world around us is represented in Predator! and Blue Abyss. Throughout Cycle A and Cycle B, topics build up investigational skills as well as knowledge about plants, animals including humans, materials and their properties, changes of state and care and compassion for the environment. Our enhanced science curriculum is structured in a way that allows both Year 3 and 4 to study the same topic, by differentiating where appropriate year 3 and 4 expectations within the sequence of lessons.

Science Intent: Year 5 and 6

In Upper KS2 we continue to show our curiosity by thinking like Scientists and asking lots of questions. We build up our knowledge of Light and Forces. We now begin to make sense of our wonderful natural world with classification and further knowledge about evolution and Inheritance. We turn to the Circulatory system to increase our knowledge of the amazing human Body, building on our understanding of internal organs from Class2.

Throughout Cycle A and Cycle B, topics develop our investigational skills, especially independent planning and recording. Our enhanced science curriculum continues to allow both Year 5 and 6 to study the same topic, by differentiating where appropriate year 5 and 6 expectations within the sequence of lessons. Scientific vocabulary is always encouraged and expected.

Science Year 3 and 4: Cycle A

	Autumn Term 1 and 2	Term 3 and 4	Term 5	Term 6
Cycle A	Mighty Metals Magnets and Forces*	Bottoms, Burps and Bile (Human Nutrition) Including: How do smells get up your nose?*	Rocks, Relics and rumbles (Rocks and Soils)	Play List including: What conducts electricity? How do Plugs work? Can you make an electrical circuit out of playdough?*
Information	A mighty start to the year with a Science led topic building on what the children have learned about the properties of materials in KS1.	All the things that children love to learn about! A fun way to find out more about teeth, digestion and – yes – what happens to all that healthy food!	The terrific and terrifying topic of Volcanoes and Earthquakes!	Music and the Science of sound is closely linked in this topic!
Working Scientifically	<p>The following will be applied throughout Science topics. Where a Science topic is starred there is a heavy concentration of planning and carrying out investigations – skills based.</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings 			
<p>National curriculum content</p> <p>Y3/4 curriculum will be taught on a two year cycle linked closely to Cornerstones topics wherever possible to ensure meaningful experiences for the children.</p>	<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Year 4 Objectives</p> <p>(How do smells get up your nose?)</p>	<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>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> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>

<p>Occasionally we may change a topic/order of topic in order to engage the children with a national or local event or in order to work collaboratively with other schools or partners.</p>	<p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>(Year 3 objectives)</p>	<p>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)</p> <p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>(Year 4 objectives)</p>	<p>(Year 3 objectives)</p>	<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>(Year 4 objectives)</p>
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Science Year 3 and 4: Cycle B

Cycle B	Term 1	Term 2	Term 3	Term 4	Term 5 and 6
Topic and Science focus	Urban Pioneer Why do shadows change?* Why do cat's eyes glow at night?*(Light)	1066 – How far can an arrow fly?*	Misty Mountain Winding River (Incorporating States of Matter)	Blue Abyss including: How does pollution affect habitats?*	Predator! Including: What are flowers for?*
Working Scientifically	<p>The following will be applied throughout Science topics. Where a Science topic is starred there is a heavy concentration of planning and carrying out investigations.</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings 				
Information	An engaging topic to start the year. In the autumn term the change in light is part of our shared experience.	A standalone and fun science investigation to build skills and knowledge in 'working scientifically' conducting fair tests and using scientific language. This experience should give good knowledge to support further	This geography topic is the perfect context for introducing and exploring changing states of matter and gain knowledge of the water cycle. It is a perfect cross-curricular way to gain scientific knowledge of states of matter.	Continuing with a water theme: this science based topic explores how and why the sea is habitat to so many creatures. A local based investigation helps us to understand how unfamiliar habitats can change over time and what influences that.	Connected with the Bottoms Burps and Bile, this is the animal and plant version! The knowledge learned in one topic can be built upon in the other and referred back to depending on whether Cycle A or B. It is the perfect time of year to get outside and

		work in forces in Year 5 + 6.			
<p>National curriculum programmes of Study covered</p>	<p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Find patterns in the way that the size of shadows changes.</p>	<p>See 'working scientifically' above.</p>	<p>identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p> <p>(Year 4 objectives)</p>	<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>(Working scientifically as above.)</p>	<p>Predator: 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</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>(Year 3 objectives)</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p>(Year 4 objective)</p> <p>What are flowers for? identify and describe the functions of different parts of flowering plants: roots, stem-trunk, leaves and flowers</p> <p>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</p> <p>investigate the way in which water is transported within plants</p> <p>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p> <p>(Year 3 objectives)</p>

Year 5 and 6 Cycle A

Cycle A	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Topic and Science focus	Scream Machine (Forces)	Frozen Kingdom (Forces)	A Child's War (History driven)	Alchemy Island (Properties and Changes of Materials)	Stargazers (Earth and Space)	Ancient Egypt (Animals inc human)
Working Scientifically	<p>The following will be applied throughout Science topics. Where a Science topic is starred there is a heavy concentration of planning and carrying out investigations.</p> <ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs using test results to make predictions to set up further comparative and fair tests reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments 					
Information	One word: Rollercoaster! What a great way to learn about forces!	We continue learning about the concept of forces particularly resistance, applying through the natural world.	A standalone Science topic, which allows us to really get to grips with our investigations.	The wonderful world of alchemy – chemistry shines through this topic and provides a great basis for future learning in this subject.	A truly out of this world topic, which will forever capture our imagination and fire up those questioning minds . . .	A standalone topic which nevertheless complements the knowledge of ancient civilisations very well.
NC curriculum objectives covered	<p>Recognising that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>(Year 5 objectives)</p>	<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>Identify the effects of air resistance, water resistance</p>	<p>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.</p> <p>(Year 5 objectives)</p>	<p>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including</p>	<p>describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>describe the movement of the Moon relative to the Earth.</p> <p>describe the Sun, Earth and Moon as approximately spherical bodies.</p>	<p>describe to changes as humans develop to old age</p>

		<p>and friction, that act between moving surfaces.</p> <p>(Year 5 objectives)</p>		<p>through filtering, sieving and evaporating</p> <p>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>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 acids on bicarbonate of soda</p> <p>(Year 5 objectives)</p>	<p>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p>(Year 5 objectives)</p>	

Year 5 and 6 Cycle B

Cycle B	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Topic and Science focus	Sow Grow and Farm (Living Things and their habitats)	Hola Mexico! History driven (Light)	Tomorrow's World (Electricity)	Blood Heart (Animals Including Humans)	Darwin's Delights (Evolution and inheritance)	Groundbreaking Greeks (History Driven)
Working Scientifically	<p>The following will be applied throughout Science topics. Where a Science topic is starred there is a heavy concentration of planning and carrying out investigations.</p> <ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs using test results to make predictions to set up further comparative and fair tests reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments 					
Information	A great chance to study our local area, food production on a large scale and on a small scale and compare to other countries!	This stand alone topic builds further on our knowledge of light from class 2. Practical observations, creating models and diagrams are the focus.	Where would the future be without electricity? This develops our knowledge about electrical circuits from what we learned in Class 2. A mixture of practical and problem solving as well as more independent investigation.	The circulatory system is linked to our every day lives and how to maintain our health and wellbeing.	See the world through the eyes of Darwin and reflecting on our knowledge of conflicting theories about the creation story and Science.	Standalone topic to consolidate our knowledge of observation and classification.
NC curriculum objectives covered	<p>describe the difference in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>describe the life process of reproduction in</p>	<p>recognise that light appears to travel in straight lines</p> <p>use the idea that light travels in straight lines to explain that objects are seen because they give out or</p>	<p>associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>compare and give reasons for variations in how components function, including the</p>	<p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>recognise the impact of diet, exercise,</p>	<p>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>recognise that living things produce offspring of the same kind, but normally</p>	<p>describe how living things are classified into broad groups according to common observable characteristics and based on</p>

	<p>some plants and animals.</p> <p>(Year 5 objectives)</p>	<p>reflect light into the eye</p> <p>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</p> <p>use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p> <p>(Year 5 objectives)</p>	<p>brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>use recognised symbols when representing a simple circuit in a diagram</p> <p>(Year 6 objectives)</p>	<p>drugs and lifestyle on the way their bodies function</p> <p>describe the ways in which nutrients and water are transported within animals, including humans</p> <p>(Year 6 objectives)</p>	<p>offspring vary and are not identical to their parents</p> <p>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>	<p>similarities and difference, including micro-organisms, plants and animals</p> <p>give reasons for classifying plants and animals based on specific characteristics</p> <p>(Year 6 objectives)</p>