



Polurrian Class				
	Year 3	Year 4	Year 5	Year 6
Plants	<p>National Curriculum. Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 			
	<ul style="list-style-type: none"> • Flowering plants have evolved specific parts to carry out pollination, fertilisation and seed growth. • Seed dispersal improves chances of enough seeds germinating and growing to mature plants and reproducing. • Seeds and bulbs need the right conditions to germinate. They contain a food store for the first stages of growth (i.e. until the plant is able to produce its own food) • Plants make their own food in their leaves to provide them with energy, grow, repair, and reproduce. • Leaves absorb sunlight and carbon dioxide through leaves. • Plants have roots to provide support and to draw moisture from the soil, through stems to take water to the rest of the plant. • The plant makes its food from water and carbon dioxide, using sunlight as energy, in the green parts of plants (mainly leaves) 			

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Animals including humans	<p>National Curriculum:</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>National Curriculum</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>Living Things & their Habitats</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>National Curriculum</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age. <p>Living Things & 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>National Curriculum</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>Living Things & 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 micro-organisms, plants and animals give reasons for classifying plants and animals based on specific characteristics.
	<p>All vertebrates have internal skeletons that protect vital organs. Invertebrates have exoskeletons that protect vital organs</p> <p>Skeletons support the weight of land animals. Stronger bones can support more weight</p> <p>Bones are connected (but can move relative to each other) at joints. Muscles connect to bones and move them when they contract. Stronger bones can anchor stronger muscles</p> <p>Animals need a variety of foods to help them grow and survive. The main food groups are:</p> <ul style="list-style-type: none"> Meat, dairy and pulses to provide protein for muscles. Grains and root vegetables to provide carbohydrates for energy. Fat for insulation and energy. Fruit and vegetables for minerals, vitamins and fibre. These are essential to keep our bodies working well and protect us from illnesses. <p>Different animals require different foods to survive. Humans require a balanced diet to remain healthy but healthy diets vary depending upon the type of activity that humans do. The nutrients in food have to get to every part of the body. The blood transports them.</p> <p>The role of digestion is to get the nutrients in food to dissolve in the blood, if it doesn't dissolve it can enter the blood and be transported.</p>	<ul style="list-style-type: none"> All animals need oxygen to survive. Air is breathed into the lungs where the oxygen in the air is passed into the blood. Every part of animals bodies need oxygen, especially muscles Muscles need a supply of oxygen and sugar to make them work, they are supplied this by the blood. 		

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Light	<p>National Curriculum</p> <p>Pupils should be taught to:</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>National Curriculum.</p> <p>Pupils should be taught to:</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 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.

	<ul style="list-style-type: none"> • There must be light for us to see. Without light it is dark. • Light comes from a source. • We need light to see things even shiny things. • Transparent materials let light through them and opaque materials don't let light through. • Beams of light bounce off some materials (reflection). • Shiny materials reflect light beams better than non-shiny materials • We can only see things when there is light and the light had to come from somewhere. • All light originally comes from a light source • When light hits an object it can do a number of things • If the object is transparent it will go through it and we will be able to see through it. • If the object is opaque it will block the light and no light will get through. • If the object is perfectly reflective light will bounce back off it and we will see reflections of objects. <p>If the material is translucent it will allow light through but we won't be able to see through it.</p>	<ul style="list-style-type: none"> • Light travels in straight lines. • Light reflects of all objects (unless they are black). • Non-shiny surfaces scatter the light so we don't see a single beam. • Animals see light sources when light travels from the source into their eyes. • Animals see objects when light is reflected off that object and enters their eyes
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Forces and magnets	<p>National Curriculum</p> <p>Pupils should be taught to:</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, 		<p>National Curriculum.</p> <p>Pupils should be taught to:</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>and identify some magnetic materials</p> <ul style="list-style-type: none"> describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing. 			
	<ul style="list-style-type: none"> Magnets exert attractive forces on some materials. Magnets exert attractive and repulsive forces on each other. Magnets exert non-contact forces, which work through some materials. Magnetic forces are affected by the magnets strength. Magnetic forces are affected by the mass of the object being attracted. Magnetic forces are affected by the distance between magnet and object Magnets exert attractive forces on some metals Each end of a magnet is called a pole, opposite poles are called north and south. Magnets exert attractive forces on each other when the poles facing each other are north and south (opposites). Magnets exert repulsive forces on each other when the poles facing each other are the same. Magnetic forces work through other materials including air, so magnets don't need to be touching to exert their force. It is called a non-contact force The strength of magnetic forces are affected by: <ul style="list-style-type: none"> The strength of the magnet. The distance between the magnet and the object. <p>The material the object is made from</p>			<ul style="list-style-type: none"> Air resistance and water resistance are forces against motion caused by objects having to move air and water out of the way. All matter (including gases) has mass. Friction is a force against motion caused by two surfaces rubbing against each other Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move.

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Materials

National Curriculum

- 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 ($^{\circ}\text{C}$)
- identify the part played by evaporation and condensation in the water cycle and associate
- the rate of evaporation with temperature.

National Curriculum

- compare and group together everyday materials on
- the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative
- and fair tests, for the particular uses of everyday
- materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is
- not usually reversible, including changes associated with burning and the action of acid on
- bicarbonate of soda.

Solids, Liquids & Gases

- Materials can be divided into solids, liquids and gases.
- Solids, liquids and gases are described by observable properties
- Heating causes solids to melt into liquids and liquids to evaporate to gases
- Cooling causes gases to condense to liquids and liquids to freeze to solids

Mixtures and separating them

- The temperatures at which given substances change state are always the same.
- Materials change state by heating and cooling.
- Some changes can be reversed and some can't.
- When two or more substances are mixed and remain present the mixture can be separated.

Making New Substances

- Heating can sometimes cause materials to change permanently. When this happens, a new substance is made. These changes are not reversible.
- Sometimes mixed substances react to make a new substance. These changes are usually irreversible.

The big idea

It is possible to change materials into completely different ones. This is very important because new substances might have different properties to materials we currently have. For example plastics can be moulded into intricate shapes, are waterproof, strong and electrical insulators.

When materials are heated or mixed with other materials they sometimes can be made to turn into new materials. The question is how would we know if it was a new material or the same material mixed differently?

Indicators that something new has been made are:

- The properties of the material are different (colour, state, texture, hardness, smell, temperature)
- If it is not possible to get the material back easily it is likely that it is not there any more and something new has been made (irreversible change)

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Sound		<p>National Curriculum. Pupils should be taught to:</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. 		
	<ul style="list-style-type: none"> • Sound travel can be blocked. • Sound spreads out as it travels. • Changing the shape, size and material of an object will change the sound it produces. • Sound is produced when an object vibrates. • Changing the way an object vibrates changes it's sound. • Sound moves through all materials by making them vibrate. • Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds. • Faster vibrations (higher frequencies) produce higher pitched sounds. 			

Electricity

	Year 3	Year 4	Year 5	Year 6
		<p>National Curriculum Pupils should be taught to:</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>National Curriculum. Pupils should be taught to:</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.
	<ul style="list-style-type: none"> • A source of electricity (mains or battery) is needed for electrical devices to work. • A complete circuit is needed for electricity to flow and devices to work. • Electricity sources push electricity round a circuit. • More batteries will push the electricity round the circuit faster. • Some materials allow electricity to flow easily and these are called conductors. Materials that don't allow electricity to flow easily are called insulators. <p>Devices work harder when more electricity goes through them Lots of devices are powered by electricity; these need a source of electricity which could be mains or battery. The battery's job is to push electricity to the device, but it needs something to carry the electricity all the way from the supply to the device, this is what we call a circuit. If there are more batteries they push harder and so the device will work harder e.g. brighter or faster.</p>		<ul style="list-style-type: none"> • Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops pushing. <p>Voltage measures the 'push'. Current is how much electricity is flowing round a circuit. The greater the current flowing through a device the harder it works. When current flows through wires heat is released. The greater the current the more heat is released</p>	

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<p style="text-align: center;">Earth and space</p>			<p>National Curriculum</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 stars, planets and moons have so much mass movement of the sun across the sky. 	
				<ul style="list-style-type: none"> They attract other things, including each other due to a force called gravity. Gravity works over a distance. Stars produce vast amounts of heat and light. All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars. Objects with larger masses exert bigger gravitational forces Objects like planets, moons and stars spin Smaller mass objects like planets orbit large mass objects like stars

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Rocks	<p>National Curriculum</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 rock • Recognise that soils are made from rocks and organic matter 			
	<p>They should start to make their own decisions about the most appropriate type of scientific enquiry; talk about criteria for grouping, sorting and classifying; and use simple keys.</p> <p>They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them.</p> <p>They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.</p> <p>They should learn how to use new equipment, such as data loggers, appropriately.</p> <p>They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.</p> <p>With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.</p> <p>With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.</p> <p>They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p> <p>Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.</p>			

	Year 3	Year 4	Year 5	Year 6
Evolution				<p>National Curriculum:</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.
			<ul style="list-style-type: none"> • Some organisms reproduce sexually where offspring inherit information from both parents. Some organisms reproduce asexually by making a copy of a single parent • Fossils provide evidence that Living things have changed over time. • Environmental change can affect how well an organism is suited to its environment. • Over time the characteristics that are most suited to the environment become increasingly common • Different types of organism have different life cycles. • Life cycles have evolved to help organisms survive to adulthood. 	

	Year 3	Year 4	Year 5	Year 6
Scientific Enquiry	<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. 		<ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments. 	
	<ul style="list-style-type: none"> • Respond to suggestions. • With help, put forward ideas about testing. • Make predictions. • With help, consider what constitutes a fair test. • With help, plan and carry out a fair test. <ul style="list-style-type: none"> • Make observations and comparisons. • Measure length, volume of liquid and time in standard measures using simple equipment. • Use first-hand experience and simple information sources to answer questions. <ul style="list-style-type: none"> • Communicate findings in a variety of ways. • Say whether what happened was expected. • With help, identify simple patterns and suggest explanations. 	<ul style="list-style-type: none"> • Recognise why it is important to collect data to answer questions. • Suggest questions that can be tested. • Put forward ideas about testing and make predictions. • With help, consider what constitutes a fair test. <ul style="list-style-type: none"> • Make relevant observations and comparisons. • Make measurements of temperature, time and force as well as measurements of length. • With help, carry out a fair test- recognizing and explaining why it is fair. <ul style="list-style-type: none"> • Explain what the evidence shows in a scientific way and whether it supports predictions. • Suggest improvements in their work. 	<ul style="list-style-type: none"> • Recognise that scientific ideas are based on evidence and creative thinking. • Make predictions based on scientific knowledge. • Suggest methods of testing including a fair test. • Suggest how to collect evidence. • Select suitable equipment. <ul style="list-style-type: none"> • Carry out a fair test explaining why it is fair. • Understand why measurements need to be repeated. • Select information from provided resources. <ul style="list-style-type: none"> • Communicate findings in a variety of ways. • Identify simple trends and patterns. • Communicate findings in tables, bar graphs and line graphs. • Make use of ICT • Identify trends and patterns and offer explanations for these. • Draw conclusions and communicate them in scientific language. • Suggest improvements in their work giving reasons. 	<ul style="list-style-type: none"> • Consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas, explanations and phenomena. • Make predictions based on scientific knowledge and understanding. • Suggest methods of testing including a fair test and how to collect evidence, ensuring it is sufficient and appropriate. <ul style="list-style-type: none"> • Carry out a fair test- identifying key factors considered. • Make a variety of relevant observations and measurements using simple apparatus correctly. • Decide when observations and measurements need to be checked- repeating to give more accurate data. • Select information from a range of sources. <ul style="list-style-type: none"> • Communicate findings in tables, bar graphs and line graphs. • Make use of ICT. • Identify trends and patterns and recognize results that do not follow a pattern. • Provide explanations for differences in measurements and observations. • Draw conclusions and communicate them in appropriate scientific language. • Make practical suggestions for improving methods in their work- giving suggestions.

Areas of study						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Rocks	Animals inc humans	Materials/ States of matter		Electricity	
Year 2	Animals inc humans		Earth and Space		Forces and magnets	
Year 3	Materials		Plants		Animals inc humans	
Year 4	Evolution	Rocks	Light		Sound	Forces