

Long term plan for Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Health& growth	Light & Dark	Solar System	Floating and Sinking Bubbles Magnets Bath Bombs	Growing seeds Patterns and change	Sorting Life Cycles Taking care of pets/animals/the environment
Year 1	Weather Observations & Seasons The Human Body – identifying and labelling basic parts	Weather Observations & Seasonal changes Animals – identify and name, grouping and sorting	Weather Observations & Seasons Plants – identifying and naming, basic structures, linked to seasonal plants	Weather Observations & Seasonal changes, link with plant changes Plants – identifying and naming, basic structures, linked to seasonal plants 3	Weather Observations & Seasons Everyday materials – physical properties of everyday materials	Weather Observations & Seasonal changes Everyday materials – physical properties of everyday materials
Year 2	<u>Animals including humans</u> Notice that animals, including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for	<u>Animals including humans</u> Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. <u>Plants</u> – on-going investigation - what plants are in the school grounds? Check and	<u>Uses of everyday materials</u> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by	Plants	Living things and their habitats	Living things and their habitats

	<p>survival (water, food and air)</p> <p><u>Plants</u> – on-going investigation - what plants are in the school grounds? Check and photograph each month. What changes can you see?</p>	<p>photograph each month. What changes can you see?</p>	<p>squashing, bending, twisting and stretching.</p> <p><u>Plants</u> – on-going investigation - what plants are in the school grounds? Check and photograph each month. What changes can you see?</p>			
Year 3		<p>Rocks</p> <ul style="list-style-type: none"> - Metamorphic, Igneous and Sedimentary rocks. - Which rock is most permeable? - Which soil is most permeable? - Mary Anning and Fossilisation. <p>Forces and Magnets</p> <ul style="list-style-type: none"> - Magnetic/nonmagnetic materials. - Magnet strength. - Magnetic Poles 		<p>Light</p> <ul style="list-style-type: none"> - Reflected light. - Shadow patterns. - Why can the sun be dangerous? <p>Plants</p> <ul style="list-style-type: none"> - Explain and describe the functions of a plant. - Water within plants. - What does a plant need to survive? 		<p>Living Things</p> <ul style="list-style-type: none"> - Human skeletons. - Nutrition in animals and humans. - Animal classification
Year 4	Animals including humans (week 7 and 8 only)	States of matter (Weeks 5 and 6 only)	Electricity (Weeks 5 and 6)		Sound (Weeks 5 and 6)	Habitats (Week 6 and 7)

Year 5	Forces [levers and gears]	Forces [gravity, air/water resistance]	Materials	Animals + Plants Life Cycles	Animals including humans SRE + Change	Space
Year 6	Evolution and inheritance	Living things and habitats	Electricity – How do components in a series circuit work?	Light – How does light travel?	Animals including Humans Mantle of the Expert 'Blue Water Spa'	Evolution and inheritance

	Y1	Y2	Y3	Y4	Y5	Y6
Animals including humans	<ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores Describe and compare the structure of a variety of common animals 	<ul style="list-style-type: none"> Notice that animals, including humans, have offspring which grow into adults find out about basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene 	<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, 	<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 function construct and interpret a variety of food chains, identifying producers, predators and prey 	<ul style="list-style-type: none"> describe the changes as humans develop to old age 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. 	<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

	<p>(fish, amphibians, reptiles, birds and mammals, including pets)</p> <ul style="list-style-type: none"> Identify, name, draw, and label the basic parts of the human body and say which part of the body is associated with each sense 		<p>protection and movement</p>			<p>animals, including humans</p>
<p>Y1 – Hospital topic for basic parts of human body. Veterinary hospital or pet shop topic or RSPCA?</p> <p>Y2 – Healthy body – could be met through Change for Life activity. Animals and offspring – link to SRE programme.</p> <p>Y3 – work on skeleton – previous Y4 QCA. Nutrition – Change for Life?</p> <p>Y4 –</p> <p>Y5 – SRE</p> <p>Y6 – SRE and Change for Life. Healthy minds, healthy bodies PHScE</p> <p>Literacy links</p> <p>Y1 – writing labels</p> <p>Y2 –</p> <p>Y3 – poster for healthy meal</p> <p>Y4 - Explanation of digestive system</p> <p>Y5 –</p> <p>Y6 -</p>						

	Y1	Y2	Y3	Y4	Y5	Y6
Plants Children should be taught to This is not a topic to be covered over a half term – it needs to be covered over the year to link with seasonal changes	<ul style="list-style-type: none"> identify and name a variety of common wild and garden plants, including deciduous and evergreen trees identify and describe the basic structure of a variety of common flowering plants, including trees. 	<ul style="list-style-type: none"> observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 	<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. 			

The local environment should be used where possible to observe how plants grow. For us this could be the trees within the school grounds and the planting that we can do within the areas we have. All classes to have a growing bed – PTA will support classes with gardening activities.

Beginning with FS and Y1 our children need to be able to identify e.g. the key trees, leaf shape, bark patterns, tree shape during the winter. During Autumn the leaves could provide a variety of stimuli for art and creative work to consolidate learning.

Y2 could be responsible for planting and growing indoor bulbs to bring colour to the school over winter. We would need pots, bulbs and compost and a cool dark place to put them but this would support learning about the conditions needed for indoor growth and could be compared to outdoor bulbs which will grow in early spring. (would need to budget for this)

Y2 would need to build in their work on plants over the seasons. Seeds sown in April in pots indoors could then provide the garden with bedding plants for colour during the summer. The gardening Club could support us with planting vegetables and herbs outside. Potatoes are also an easy crop to grow. A seasonal walk in the locality to collect seeds e.g. sycamore keys could be used to support life cycle learning.

Y3 and Y4 to plant flowers in beds on top yard – start off indoors in pots and plant out when weather is warm enough.

Y4 – link work on food chains to vegetation in school grounds.

Y5 to plant veg in KS2 beds which they can harvest in Sept of Y6 (marrow / pumpkins). Y5 to plant indoor bulbs and place in different conditions to find out best conditions.

Y6 can then clear the bed and dig over in their dig for victory – planting onion sets and other seeds that will over winter. To plant outdoor bulbs and record when growth begins – what conditions are needed. If the life cycle of a plant is covered in a practical sense and recorded as appropriate to the task we should be rearing a generation of gardeners.

	Y1	Y2	Y3	Y4	Y5	Y6
<p>Living things and their habitats (links to plants – see above)</p> <p>Children should be taught to</p> <p>This is not a topic to be covered over a half term – it needs to be covered over the year to link with seasonal changes</p>		<ul style="list-style-type: none"> explore and compare the differences between things that are living, dead, and things that have never been alive identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other identify and name a variety of plants and animals in their habitats, including micro-habitats describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 		<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. 	<ul style="list-style-type: none"> 	<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>Y2 – need to look at the school environment – plenty of minibeasts around. Can link to topic work – e.g. Kenya and seaside</p> <p>Y4 – developing classification skills (similarities and differences) Use local information to look at how a change may impact on plants and animals – e.g. building on a green area in the locality.</p> <p>Y5 – extension of work covered in plants and habitats units in previous years. Continue with using school and local environment. Broaden study to other areas of the world and further extending gardening skills.</p> <p>Y6 – explorers in the mountains finding species and needing to classify</p>						
	Y1	Y2	Y3	Y4	Y5	Y6
Materials	<ul style="list-style-type: none"> distinguish between an 	<ul style="list-style-type: none"> identify and compare 	<ul style="list-style-type: none"> compare and group 	<ul style="list-style-type: none"> compare and group 	<ul style="list-style-type: none"> compare and group 	

<p>Children should be taught to</p>	<p>object and the material from which it is made</p> <ul style="list-style-type: none"> • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials on the basis of their simple physical properties. 	<p>the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <ul style="list-style-type: none"> • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<p>together different kinds of rocks on the basis of their appearance and simple physical properties</p> <ul style="list-style-type: none"> • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter. 	<p>materials together, according to whether they are solids, liquids or gases</p> <ul style="list-style-type: none"> • 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>together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <ul style="list-style-type: none"> • 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. 	
<p>Y1 and Y2 – need to identify how the children’s skills will develop. What will they be asked to do in each year group? Y2 is linked to forces. Y1 – compare materials used in toys past and present. Include magnetic properties, what makes a toy boat float, how toys move – pulls and pushes, wind-up, battery operated etc. Y3 – Specific to rocks. Make moulds of ‘fossils’ Y4 – changing materials – will previous QCA units cover this? Y5 – properties of and changes to materials – will previous QCA units cover this? Y6 - previous QCA units?</p>						
	Y1	Y2	Y3	Y4	Y5	Y6

<p>Forces</p> <p>Children should be taught to</p>		<p>Preliminary work covered in materials</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. 		<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>These units need to be supported through the materials units.</p> <p>Y1 materials units needs to include work on magnetic materials – link to toys</p> <p>Y3 Link with Maths – North and South poles on a compass</p> <p>Y5 –</p>						

	Y1	Y2	Y3	Y4	Y5	Y6
Electricity Children should be taught to				<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. 		<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>Y1 or 2 – link to Katie Morag (geog) make lighthouse using simple circuit. Y6 – investigate early warning mechanism and design a buzzer system to alert when a plane comes over</p>						
	Y1	Y2	Y3	Y4	Y5	Y6

<p>Light and Sound</p> <p>Children 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 a solid object • find patterns in the way that the size of shadows change. 	<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"> • recognise that light appears to travel in straight lines ☑ use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
<p>Y3 – shadow puppets</p> <p>Y6 - Investigate issue of light/blackout in World War 2 – design a circuit for a low brightness light to use in a doorway to the outside</p>						
	Y1	Y2	Y3	Y4	Y5	Y6

<p>Other</p> <p>Children should be taught to</p>	<p>Seasonal changes</p> <ul style="list-style-type: none"> observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies. 				<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. 	<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.
	Y1	Y2	Y3	Y4	Y5	Y6

<p>Working scientifically</p> <p>Children should be taught to</p>	<p>During years 1 and 2, 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 simple questions and recognising that they can be answered in different ways ☑ observing closely, using simple equipment ☑ performing simple tests ☑ identifying and classifying ☑ using their observations and ideas to suggest answers to questions ☑ gathering and recording data to help in answering questions. 	<p>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 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>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 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.
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