

Dearham Primary School

Whole School subject planning – Science

SCIENCE						
Working Scientifically						
EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
<p>Nursery</p> <ul style="list-style-type: none"> use all their senses in hands-on exploration of natural materials explore collections of materials with similar or different properties talk about what they see, using a wide vocabulary Explore how things work <p>Reception</p> <ul style="list-style-type: none"> Explore the natural world around them, making observations and describing about what they see, hear and feel. 	<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 	<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 	<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 	<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 a degree of trust in 	<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 a degree of trust in

			<p>results and conclusions</p> <ul style="list-style-type: none"> • 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>results and conclusions</p> <ul style="list-style-type: none"> • 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>results, in oral and written forms such as displays and other presentations</p> <ul style="list-style-type: none"> • identifying scientific evidence that has been used to support or refute ideas or arguments 	<p>results, in oral and written forms such as displays and other presentations</p> <ul style="list-style-type: none"> • identifying scientific evidence that has been used to support or refute ideas or arguments
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Biology

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
<p>Nursery (& continuing into Reception)</p> <ul style="list-style-type: none"> • explore how things work • plant seeds and care for growing plants • understand the key features of the life cycle of a plant and an animal • begin to understand the need to respect and care for the natural environment and all living things <p>Reception</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants 	<p>Animals including humans</p> <p>I can 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> <p>I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>I can identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Plants</p> <p>I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>I can identify and describe the basic structure of a variety of</p>	<p>Animals, including humans</p> <p>I can notice that animals, including humans, have offspring which grow into adults</p> <p>I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p>All living things and their habitats</p> <p>I can explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>I can 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,</p>	<p>Animals, including humans</p> <p>I can 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>I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p>Plants</p> <p>I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>I can explore the requirements of plants for life and growth (light, water, nutrients from soil and room to grow) and how they vary from plant to plant</p> <p>I can investigate the way in which water is transported within plants</p> <p>I can explore the part that flowers play in the life cycle of flowering</p>	<p>Living things and their habitats</p> <p>I can recognise that living things can be grouped in a variety of ways</p> <p>I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>I can recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>Animals, including humans</p> <p>I can describe the simple functions of the basic parts of the digestive system in humans</p> <p>I can identify the different types of teeth in humans and their simple functions</p> <p>I can construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>(Animals including humans transferred to Y6 in exchange for electricity as it fits into existing Y5 work better.)</p>	<p>Evolution and inheritance</p> <p>I can 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>I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>Living things and their habitats</p> <p>I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>I can describe how living things are classified into broad groups according</p>

	common flowering plants, including trees.	and how they depend on each other I can identify and name a variety of plants and animals in their habitats, including micro-habitats I can 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. Plants I can observe and describe how seeds and bulbs grow into mature plants I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	plants, including pollination, seed formation and seed dispersal.			to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals I can give reasons for classifying plants and animals based on specific characteristics. Animals, including humans I can describe the life process of reproduction in some plants and animals. I can describe the changes as humans develop to old age. I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function I can describe the ways in which nutrients and water are transported within animals, including humans.
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Chemistry

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Nursery <ul style="list-style-type: none"> Talk about the differences between materials and changes they notice Reception <ul style="list-style-type: none"> Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter 	Everyday Materials I can distinguish between an object and the material from which it is made I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock I can describe the simple physical properties of a variety of everyday materials I can compare and group together a variety of everyday materials based on their simple physical properties.	Uses of everyday materials I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Rocks I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties I can describe in simple terms how fossils are formed when things that have lived are trapped within rock I can recognise that soils are made from rocks and organic matter.	States of matter I can compare and group materials together, according to whether they are solids, liquids or gases I can 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) I can identify the part played by evaporation and condensation in the water cycle and associate the rate of	Properties and changes of materials I can 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 I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution I can use knowledge of solids, liquids and gases	(Electricity transferred to Y5 in exchange for animals including humans, as it fits into existing Y6 work better.)

				evaporation with temperature.	to decide how mixtures might be separated, including through filtering, sieving and evaporating I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic I can demonstrate that dissolving, mixing and changes of state are reversible changes I can 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.	
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Physics

EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
<p>Nursery (& continuing into Reception)</p> <ul style="list-style-type: none"> Explore and talk about different forces they can feel 	<p>Earth and Space I can identify similarities and differences between Earth and other planets. I can name some of the planets in our solar system. I can talk about the different planets. I understand why we have night and day. I know what gravity is. I know some key facts about the moon.</p> <p>Seasonal Changes (All Year) Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.</p>		<p>Forces and magnets I can compare how things move on different surfaces I can notice that some forces need contact between two objects, but magnetic forces can act at a distance I can observe how magnets attract or repel each other and attract some materials and not others describe magnets as having two poles I can predict whether two magnets will attract or repel each other, depending on which poles are facing. I can 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>Light</p>	<p>States of matter I can compare and group materials together, according to whether they are solids, liquids or gases I can 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) I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p>Sound I can identify how sounds are made, associating some of them with something vibrating I can recognise that vibrations from sounds</p>	<p>Earth and Space I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system I can describe the movement of the Moon relative to the Earth I can describe the Sun, Earth and Moon as approximately spherical bodies I can 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>Forces I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object I can identify the effects of air resistance, water resistance and friction,</p>	<p>Light I can 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 I can 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 I can 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>I can recognise that they need light in order to see things and that dark is the absence of light</p> <p>I can notice that light is reflected from surfaces</p> <p>I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>I can recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p>I can find patterns in the way that the size of shadows change.</p>	<p>travel through a medium to the ear</p> <p>I can find patterns between the pitch of a sound and features of the object that produced it</p> <p>I can find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>I can recognise that sounds get fainter as the distance from the sound source increases.</p>	<p>that act between moving surfaces</p> <p>I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>Electricity</p> <p>I can 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>I can 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</p> <p>I can use recognised symbols when representing a simple circuit in a diagram.</p>	
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Notes and guidance (non-statutory)

Pupils in years 1 and 2 should explore the world around them and raise their own questions. They should experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions.

They should use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance, they should begin to notice patterns and relationships.

They should ask people questions and use simple secondary sources to find answers.

They should use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language.

These opportunities for working scientifically should be provided across years 1 and 2 so that the expectations in the programme of study can be met by the end of year 2. Pupils are not expected to cover each aspect for every area of study.

Notes and guidance (non-statutory)

Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. 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. They should learn how to use new equipment, such as data loggers, appropriately. 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.

With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. 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. They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.

These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for every area of study.

Notes and guidance (non-statutory)

Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment.

They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

These opportunities for working scientifically should be provided across years 5 and 6 so that the expectations in the programme of study can be met by the end of year 6. Pupils are not expected to cover each aspect for every area of study.