



JOHN WHEELDON PRIMARY ACADEMY

SCIENCE LONG TERM PLAN

EYFS - taken from the Statutory framework for the early years foundation stage

ELG: The Natural World

Children at the expected level of development will:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

ELG: People, Culture and Communities

Children at the expected level of development will:

- Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps;

The national curriculum primary programmes of study and attainment targets for key stages 1 and 2

Science

Aims

The national curriculum for science aims to ensure that all pupils:

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics
- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.



Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.



	AUTUMN TERM	SPRING TERM	SUMMER TERM
EYFS	<p>In Reception we continually revisit the following objectives throughout the year:</p> <p>Explore the natural world around us :</p> <p>Life cycles - chickens, ladybirds, butterflies.</p> <p>Classifying - grouping animals by movement, food choices, habitat etc.</p> <p>Growth - what plants need to be able to grow</p> <p>Describe what I see, hear and feel whilst outside - senses - we have five and they help us in different ways.</p> <p>Recognise some environments that are different from the one in which we live.</p> <p>Understand the effect of changing seasons on the natural world around us.</p> <p>Growth - what humans need to be able to grow</p> <p>Dental Hygiene.</p>		
YEAR 1	END POINTS		
BIOLOGY		<p><u>Animals inc humans</u></p> <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals,</p>	<p><u>Plants</u></p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p><u>Scientific Enquiry skills:</u></p> <p>Planning an enquiry</p>



		<p>including pets).</p> <p>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><u>Scientific Enquiry skills:</u> Planning an enquiry Observing closely Asking scientific questions Gathering and recording results Taking measurements</p>	Observing closely
CHEMISTRY	<p><u>Everyday materials</u></p> <p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p><u>Scientific Enquiry skills:</u> Planning an enquiry Observing closely</p> <p><u>Linked scientist</u> Mae Jameson Caroline Herschel</p>		
PHYSICS	<p><u>Seasonal Change [Autumn]</u></p> <p>Observe changes across the four seasons.</p> <p>Observe and describe weather associated</p>	<p><u>Seasonal Change [Winter and Spring]</u></p> <p>Observe changes across the four seasons.</p>	<p><u>Seasonal Change [Summer]</u></p> <p>Observe changes across the four seasons.</p> <p>Observe and describe weather associated</p>



	with the seasons and how day length varies <u>Scientific Enquiry skills:</u> Observing closely Asking scientific questions Interpreting results Presenting results	Observe and describe weather associated with the seasons and how day length varies <u>Scientific Enquiry skills:</u> Observing closely Asking scientific questions Interpreting results Presenting results	with the seasons and how day length varies <u>Scientific Enquiry skills:</u> Observing closely Asking scientific questions Interpreting results Presenting results
	AUTUMN TERM	SPRING TERM	SUMMER TERM
YEAR 2	END POINTS		
BIOLOGY		<p><u>Living things and their habitats</u> Explore and compare the differences between things that are living, dead, and things that have never been alive.</p> <p>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.</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats.</p> <p>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.</p> <p><u>Scientific Enquiry skills:</u> Planning an enquiry Observing closely Gathering and recording results</p>	<p><u>Animals including humans</u> Notice that animals, including humans, have offspring which grow into adults.</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><u>Linked scientist</u> Katherine Johnson</p>



		<p>Interpreting results Presenting results</p> <p><u>Linked scientist</u> Jane Goodall</p> <p><u>Plants</u> Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p><u>Scientific Enquiry skills:</u> Planning an enquiry Observing closely Asking scientific questions Gathering and recording results Presenting results Taking measurements</p>	
<p>CHEMISTRY</p>	<p><u>Use 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.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p><u>Scientific Enquiry skills:</u> Planning an enquiry Observing closely Asking scientific questions Gathering and recording results Interpreting results</p>		



	Taking measurements		
PHYSICS			
	AUTUMN TERM	SPRING TERM	SUMMER TERM
YEAR 3	END POINTS		
BIOLOGY		<p><u>Animals including humans</u></p> <p>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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results 	<p><u>Plants</u></p> <p>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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results <p><u>Linked scientist</u></p>



			George Washington Carver [the peanut man]
CHEMISTRY	<p style="text-align: center;"><u>States of matter</u></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</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 ($^{\circ}\text{C}$).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results 	<p style="text-align: center;"><u>Light</u></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 light from the sun can be dangerous and that there are ways to protect their eyes.</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in the way that the size of shadows change.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results 	
PHYSICS	<p style="text-align: center;"><u>Forces & Magnets</u></p> <p>Compare how things move on different</p>		



	<p>surfaces.</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</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>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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results 		
	AUTUMN TERM	SPRING TERM	SUMMER TERM
YEAR 4	END POINTS		
BIOLOGY	<p><u>Living things & their habitats</u> Recognise that living things can be grouped in a variety of ways.</p>		<p><u>Animals including humans</u> [Summer 2] Describe the simple functions of the basic</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>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results <p><u>Linked scientist</u> Katherine Johnso</p>		<p>parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Asking scientific questions • Observing closely
<p>CHEMISTRY</p>			<p>[2023/2024] <u>States of matter</u></p> <p>Compare and group materials together, according to whether they are solids, liquids or gases.</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 ($^{\circ}\text{C}$).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely



			<ul style="list-style-type: none"> Gathering and recording results <p>[2024/2025] Rocks 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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> Planning an enquiry Taking measurements Asking scientific questions Observing closely Gathering and recording results Interpreting results <p><u>Linked scientist</u> Mary Anning</p>
<p>PHYSICS</p>	<p><u>Electricity [Autumn 2]</u> 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</p>	<p><u>Electricity [Spring 1]</u> Continued from Autumn 2</p> <p><u>Sound [Spring 2]</u> 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.</p>	



	<p>not the lamp is part of a complete loop with a battery.</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>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results 	<p>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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results <p><u>Linked scientist</u> Alexander Graham Bell</p>	
	AUTUMN TERM	SPRING TERM	SUMMER TERM
YEAR 5	END POINTS		
BIOLOGY			<p style="text-align: center;"><u>Living things</u></p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Drawing conclusions



			<ul style="list-style-type: none"> • Observing closely • Presenting results • Making predictions <p><u>Animals including humans</u></p> <p>Describe the changes as humans develop to old age.</p> <p>*This needs to be taught alongside PSHE using the new statutory requirements for relationships and health education.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Gathering and recording results • Drawing conclusions • Interpreting results • Presenting results
<p>CHEMISTRY</p>	<p><u>Materials</u></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>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 through filtering, sieving and evaporating.</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials,</p>		



	<p>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 acid on bicarbonate of soda.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Making predictions • Observing closely • Gathering and recording results • Drawing conclusions • Interpreting results <p><u>Linked scientist</u> Marie Curie</p>		
<p>PHYSICS</p>		<p style="text-align: center;"><u>Forces</u></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 and friction that act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller</p>	

		<p>force to have a greater effect</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none">• Planning an enquiry• Making predictions• Observing closely• Gathering and recording results• Drawing conclusions• Interpreting results <p><u>Earth & Space</u></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>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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none">• Taking measurements• Drawing conclusions• Presenting results <p><u>Linked scientist</u> Brian Cox</p>	
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	AUTUMN TERM	SPRING TERM	SUMMER TERM
YEAR 6	END POINTS		
BIOLOGY		<p><u>Evolution and inheritance</u></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 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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results <p><u>Linked scientist</u> Charles Darwin Mary Anning</p>	<p><u>Animals including humans</u></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, 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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results <p><u>Living things and their habitats</u></p> <p>Describe how living things are classified into broad groups according to common</p>



			<p>observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none"> • Planning an enquiry • Taking measurements • Asking scientific questions • Observing closely • Gathering and recording results • Interpreting results
CHEMISTRY			
PHYSICS	<p style="text-align: center;"><u>Light</u></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 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</p>		



	<p>lines to explain why shadows have the same shape as the objects that cast them</p> <p><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none">• Planning an enquiry• Taking measurements• Asking scientific questions• Observing closely• Gathering and recording results• Interpreting results <p><u>Electricity</u></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 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><u>Scientific Enquiry skills:</u></p> <ul style="list-style-type: none">• Planning an enquiry• Taking measurements• Asking scientific questions• Observing closely• Gathering and recording results		
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