

Science – Curriculum Map



At WBJs we aim to develop deep-thinking, curious and scientific minds. In weekly science lessons, children are given opportunities to experiment, discover and observe science in action in engaging and practical contexts. Following the National Curriculum allows us to deliver a broad and balanced diet across year groups, though opportunities are seized to extend and develop it in order to tailor it to the needs and interests of our children. Wherever possible, we link science learning into our termly topics and into real-world contexts. Children are extended, focussed and enthused by high quality science lessons which develop investigative skills as well as an understanding of scientific processes. We recognise the importance of inspiring both girls and boys to engage in a lifelong love of STEM subjects and to open future learning and career pathways. We believe that high quality STEM education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Working Scientifically Overview								
Plan	Ask Questions and plan enquiry	<i>Children should ask relevant questions and use different types of scientific enquiries to answer them.</i>	Do	Observe & measure	<i>Children should make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</i>	Review	Interpret and report	<i>Children should report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions identify differences, similarities or changes related to simple scientific ideas and processes.</i>
	Set up enquiry	<i>They should set up simple practical enquiries, comparative and fair tests.</i>		Record	<i>They should gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</i>		Evaluate	<i>They should use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions use straightforward scientific evidence to answer questions or to support their findings.</i>



Year 3 – Knowledge

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<i>Community Explorers</i>		<i>Crazy Cave Dwellers</i>		<i>Roman Rulers and Rebels</i>	
Animals including humans	Plants	Rocks	Forces Friction	Forces Magnets	Light
<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>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 of flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>compare and group together different kinds of rocks on the basis of their simple physical properties</p> <p>recognise that soils are made from rocks and organic matter</p> <p>describe in simple terms how fossils are formed when things that have lived are trapped within rock</p>	<p>compare how things move on different surfaces</p> <p>notice that some forces need contact between two objects but magnetic forces can act at a distance</p>	<p>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 predict whether two magnets will attract or repel each other, depending on which poles are facing</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 a light source is blocked by a solid object</p> <p>find patterns in the way the size of shadows change</p>



Year 4 – Knowledge

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<i>River deep, Mountain High</i>		<i>Traders and Raiders</i>		<i>Ancient Egyptians</i>	
States of matter	Electricity	Animals including humans	Living things and their habitat	Sound	
<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 (°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>identify common appliances that run on electricity</p> <p>construct a simple series electrical circuit identifying and naming the basic parts of a simple electrical circuit, including cells, wires, bulbs, switches and buzzers</p> <p>identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery</p> <p>recognise 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>describe the simple functions of the basic parts of the digestive system in humans</p> <p>identify the different types of teeth in humans and their simple functions.</p>	<p>recognise that living things can be grouped in a variety of ways</p> <p>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>identify how sounds are made, associating some of them with something vibrating</p> <p>recognise that vibrations from sound travel through a medium to the ear</p> <p>recognise that sounds get fainter as the distance from the sound source increases</p> <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>	



Year 5 – Knowledge

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<i>Time Travellers</i>		<i>May the Force be with you</i>	<i>Ancient Greeks</i>	<i>Rainforest Unwrapped</i>	
Properties and changes of materials		Earth and Space	Forces	Living things and their habitats	Animals including humans
<p>compare and group together everyday materials based on evidence from comparative and fair tests, 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, 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, include changes associated with burning and the action of acid on bicarbonate of soda</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>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 effect 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 force to have a greater effect</p>	<p>describe the difference in the life cycles of a mammal, an amphibian an insect and a bird</p> <p>describe the life process of reproduction in some plants and animals</p>	<p>describe the changes as humans develop to old age</p>



Year 6 – Knowledge

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<i>World at War</i>		<i>Frozen Planet</i>		<i>Golden Age of Islam</i>	
Animals including humans		Evolution and Inheritance		Electricity	
<p>identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood (including the pulse and clotting).</p> <p>describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Pattern seeking – impact of exercise on pulse rate</p> <p>Animals including humans recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function (DARE)</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>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>	
		Living things and their habitat		Light	
		<p>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</p> <p>give reasons for classifying plants and animals based on specific characteristics</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 lines to explain why shadows have the same shape as the objects that cast them</p>	



Year 3 & 4 – Working Scientifically

		PLAN		DO		REVIEW	
		Ask Qs and plan enquiry <i>ask relevant questions and use different types of scientific enquiries to answer them</i>	Set up enquiry <i>Set up simple practical enquiries, comparative and fair tests</i>	Observe & measure <i>make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</i>	Record <i>gather, record, classify and present data in a variety of ways to help in answering questions record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</i>	Interpret and report <i>report on findings from enquiries, include oral and written explanations, displays or presentations of results and conclusions identify differences, similarities or changes related to simple scientific ideas and processes</i>	Evaluate <i>use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions use straightforward scientific evidence to answer questions or to support their findings.</i>
Fair and Comparative Testing	Y3		Plants – growing onion bulbs Friction - Comparing how things move on different surfaces		Friction - Comparing how things move on different surfaces		Friction Comparing how things move on different surfaces
	Y4	Comparing different 'beaks' with different 'foods'	Static electricity and balloons: does more rubbing impact on how long it will stay on the wall?	Comparing different 'beaks' with different 'foods'. Patterns between the pitch of a sound and the properties of the object making the sound	Static electricity and balloons: does more rubbing impact on how long it will stay on the wall?	Comparing different 'beaks' with different 'foods'.	Comparing different 'beaks' with different 'foods'. Static electricity and balloons: does more rubbing impact on how long it will stay on the wall?
Pattern Seeking	Y3		Do all flowers have the same number of petals?	Can children with longer legs run faster?	Do all flowers have the same number of petals?		What happens to shadows when the light source is moved?
	Y4	Which materials conduct electricity?	Which materials conduct electricity? Patterns between the pitch of a sound and the properties of the object making the sound	Which materials conduct electricity? Patterns between the pitch of a sound and the properties of the object making the sound	Patterns between the pitch of a sound and the properties of the object making the sound.	Which materials conduct electricity?	
Classification and Identification	Y3			Are all metal objects magnetic? Grouping different rock types according to observable features such as grains or crystals.	Animals inc humans: Identifying invertebrates and vertebrates, exo and endo skeletons. Comparing diets of different animals.		
	Y4			Visit to West Bridgford Park to observe changes over time (done last year and planned for children's return)	Use of different classification keys to identify different animals and plants. Visit to West Bridgford Park to observe changes over time (done last year and planned for children's return)		
Observation over Time	Y3	How have rocks in the environment changed over time?	Plants – growing onion bulbs Observing movement of water in celery.	Growing onion bulbs – different conditions for growth.		Plants – water transport in plants	
	Y4			Visit to West Bridgford Park to observe changes over time (done last year and planned for children's return)	Visit to West Bridgford Park to observe changes over time (done last year and planned for children's return)		
Research	Y3	Asking and answering questions about Mary Anning and her work.				Plants – Lifecycles and parts of flowering plants. Look at a variety of bird beaks and how this will impact what the bird can eat and where their habitats might be.	
	Y4						



Year 5 & 6 – Working Scientifically

		PLAN		DO		REVIEW	
		Ask Qs and plan enquiry	Set up enquiry	Observe & measure	Record	Interpret and report	Evaluate
		plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	use test results to make predictions to set up further comparative and fair tests	take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs,	report and present findings from enquiries, including conclusions, causal relationships in oral and written forms such as displays and other presentations, using appropriate scientific language.	Explain degree of trust in results. Identify <i>and evaluate</i> scientific evidence (their own and others) that has been used to support or refute ideas or arguments
Fair and Comparative Testing	Y5	Does the shape of an object affect the amount of air or water resistance acting against it?	What happens when you drop two different objects from the same height at the same time? Do they hit the ground at different/same time? Which materials provide the least/most friction?	What happens when you drop two different objects from the same height at the same time? Do they hit the ground at different/same time? Which materials provide the least/most friction?	Which materials provide the least/most friction?	Does the shape of an object affect the amount of air or water resistance acting against it? What happens when you drop two different objects from the same height at the same time? Do they hit the ground at different/same time? Which materials provide the least/most friction?	Does the shape of an object affect the amount of air or water resistance acting against it? What happens when you drop two different objects from the same height at the same time? Do they hit the ground at different/same time? Which materials provide the least/most friction?
	Y6	What happens to a shadow if we move an object or the light source? How does temperature affect the gas given off by yeast? How does voltage affect bulb brightness or buzzer noises?	Which type of fruit makes the best fruity battery?	What happens to a shadow if we move an object or the light source? How does temperature affect the gas given off by yeast?	What happens to a shadow if we move an object or the light source? How does temperature affect the gas given off by yeast?	What happens to the size of a shadow if we move an object or the light source? How does temperature affect the gas given off by yeast?	How does temperature affect the gas given off by yeast?
Pattern Seeking	Y5	Does the shape of an object affect the amount of air or water resistance acting against it?	Does the shape of an object affect the amount of air or water resistance acting against it?	Does the shape of an object affect the amount of air or water resistance acting against it?		Does the shape of an object affect the amount of air or water resistance acting against it?	Does the shape of an object affect the amount of air or water resistance acting against it?
	Y6	What is the effect of exercise on pulse rate? Foot flexibility investigation.	Foot flexibility investigation.	What is the effect of exercise on pulse rate? Foot flexibility investigation.	What is the effect of exercise on pulse rate? Foot flexibility investigation.	What is the effect of exercise on pulse rate?	What is the effect of exercise on pulse rate?
Classification and Identification	Y5	How can different materials be separated?	Which materials are good thermal conductors?	How can different materials be separated?	How can materials be grouped? Can they be classified in different ways? How can different materials be separated?	How can different materials be separated? What changes occur in humans from childhood to adulthood? Which of these changes apply to boys, girls and both?	
	Y6	How can we identify a sweet?			How can we classify and identify different sweets/leaves?		Can we identify similarities and differences between early man, Lucy and modern man?
Observation over Time	Y5	What happens to a lit candle? What happens when you mix vinegar and milk?	How can we separate a material from a dissolved solution? Which materials are good thermal conductors?	How can we separate a material from a dissolved solution? Which materials can be separated through evaporation? Which materials are good thermal conductors?	Which materials are good thermal conductors?	How can we separate a material from a dissolved solution? Which materials can be separated through evaporation? Which materials are good thermal conductors?	Understanding of the heliocentric views of the Universe
	Y6	What happens to food over time? Pumpkins or bread?				What are the transitional forms between the pakicetus and the whale?	What are the transitional forms between the Pakicetus and the whale?
Research	Y5		NA	NA	NA	How do the life cycles of different plants and animals compare? What are the features of different planets in the solar system and how are they linked? What is the Mars One mission and what is your opinion of it? What impact did Katherine Johnson have on space travel?	
	Y6		NA	NA	NA	What new idea did Darwin describe? Why were Mary Anning's discoveries important? How do animals adapt to Arctic environments? The journey of the blood around the body.	What new idea did Darwin describe? Why were Mary Anning's discoveries important?

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