

Subject Overview: Science

Progression of Skills and Knowledge

As a KS1 scientist I...

...have knowledge about plants

- ✓ Identify and classify plants
- ✓ Explore what plants need to survive: water, food, light

...have knowledge about Living things and their Habitats

- ✓ What are habitats and how they provide basic need
- ✓ Name animals/plants in different habitats
- ✓ Basic food chains/animals eat plants.

...have knowledge about animals including humans

- ✓ Identify and name a variety of common animals: fish, amphibians, reptiles, birds, mammals (carnivores, herbivores, omnivores)
- ✓ Identify, name, draw, label basic parts of the human body, link to senses

...have knowledge about materials

- ✓ Investigate materials: wood, plastic, metal
- ✓ Understand their uses and properties
- ✓ compare and group together a variety of everyday materials.

...can understand seasonal changes.

- ✓ Observe changes across the four seasons.
- ✓ Observe and describe weather associated with the seasons and how day length varies.

...can work scientifically

- ✓ Ask simple questions and recognise that they can be answered in different ways
- ✓ Observe closely, using simple equipment
- ✓ Perform simple tests
- ✓ Identify and classify

As a LKS2 scientist I...

...have knowledge about plants.

- ✓ Functions of parts of plant
- ✓ Requirements for life
- ✓ Water transport
- ✓ Flowers - pollination, seeds, dispersal

...have knowledge about Living things and their Habitats

- ✓ Grouping living things (animal/plant) Vertebrate/invertebrate
- ✓ Classification keys
- ✓ Changing environments / dangers

...have knowledge about animals including humans

- ✓ Learn about different body systems: digestive and respiratory.
- ✓ Skeletons and muscles
- ✓ Teeth
- ✓ Food chains, producers, predators and prey

...have knowledge about materials

- ✓ Study different types of rocks and soils
- ✓ Learn about how fossils are formed

...have knowledge about states of matter

- ✓ Solids, liquids and gases
- ✓ Particles
- ✓ Changes of state
- ✓ Water cycle – evaporation and condensation

...have knowledge about forces and their magnets

- ✓ How forces work - push and pull
- ✓ Explore magnetic attraction and repulsion

...have knowledge about electricity

- ✓ Appliances
- ✓ Simple circuits and components; switches
- ✓ Conductors/insulators

As a UKS2 scientist I...

...have knowledge about living things and their habitats

- ✓ Life cycles
- ✓ Life processes of reproduction -plants/animals
- ✓ Classifying living things into broad groups

...have knowledge of animals including humans

- ✓ Study the heart, blood vessels and importance of healthy lifestyles
- ✓ Changes as humans develop to old age (life cycle)

...have knowledge about evolution and inheritance

- ✓ Living things change over time
- ✓ Evidence of fossils
- ✓ Adaptation leading to evolution

...have knowledge about materials

- ✓ Explore how materials change state: melting, freezing, dissolving
- ✓ Testing materials
- ✓ Reversible and non-reversible changes

...have knowledge about forces

- ✓ Gravity
- ✓ Air/water resistance and friction
- ✓ Levers, Pulleys, Gears (force multipliers)

...have knowledge about electricity

- ✓ Brightness of bulbs vs cells/voltage
- ✓ Explain brightness, loudness of buzzers
- ✓ Use circuit symbols
- ✓ Application of knowledge - traffic lights/burglar alarm

...have knowledge about light

- ✓ Light travels in straight lines
- ✓ How we see
- ✓ Reflecting light



<ul style="list-style-type: none"> ✓ <i>Use own observations and ideas to suggest answers to questions</i> ✓ <i>Gather and record data to help in answering questions</i> 	<p>...have knowledge about light</p> <ul style="list-style-type: none"> ✓ <i>Light is reflected</i> ✓ <i>Dangers of sun (eye protection)</i> ✓ <i>Shadow formation and changing shadow size</i> <p>...have knowledge of sound.</p> <ul style="list-style-type: none"> ✓ <i>Making sounds (vibrations)</i> ✓ <i>Sounds travelling in medium</i> ✓ <i>Patterns in pitch and volume</i> ✓ <p>...can work scientifically</p> <ul style="list-style-type: none"> ✓ <i>Ask relevant questions and use different types of scientific enquiries to answer them</i> ✓ <i>set up simple practical enquiries, comparative and fair tests</i> ✓ <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> ✓ <i>gather, record, classify and present data in a variety of ways to help in answering questions</i> ✓ <i>record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</i> ✓ <i>report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</i> ✓ <i>use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</i> ✓ <i>identify differences, similarities or changes related to simple scientific ideas and processes</i> ✓ <i>use straightforward scientific evidence to answer questions or to support their findings</i> 	<ul style="list-style-type: none"> ✓ <i>Explain shadows</i> <p>...have knowledge about earth and space</p> <ul style="list-style-type: none"> ✓ <i>Learn about the solar system, movement of plants, phases of the moon</i> <p>...can work scientifically</p> <ul style="list-style-type: none"> ✓ <i>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</i> ✓ <i>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</i> ✓ <i>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</i> ✓ <i>Use test results to make predictions to set up further comparative and fair tests</i> ✓ <i>Report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</i> ✓ <i>Identify scientific evidence that has been used to support or refute ideas or arguments</i>
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<p>What makes this subject special here?</p>		<ul style="list-style-type: none"> • Science teaching at WVPS is delivered through high-quality teaching to develop understanding of the world through biology, chemistry and physics. • Science teaching incorporates knowledge, methods, processes and uses. The vision for science at WVPS is based upon hands on, practical experiences where children can apply their learning. • We heavily focus upon oracy and vocabulary to further deepen their understanding. • We foster high levels of participation, curiosity and excitement! • Science is delivered using the Talking, Thinking, Doing Science pedagogical approach. • Children access school trips to bring learning to life – for example: <i>zoo trips, we the curious, aerospace museum.</i> • Workshops to further broaden the children’s scientific experiences – for example: <i>space dome, wild science, brainbox.</i> • We celebrate Science Week and study famous scientists. • Children often engage in STEM workshops; we have also worked closely with companies within the local area such as Bristol Airport. • Science is linked closely to other areas of the curriculum where appropriate. For example: artwork, writing instructions, posters.
<p>Accessibility for All pedagogy scaffolding, resources, enrichment, challenge, equity of access</p>		<ul style="list-style-type: none"> • Science is a practical area of our curriculum, where you will only see focused recording to demonstrate understanding or knowledge. • We place high emphasis on oracy and children are supported using STEM sentences to organise their ideas. • Practical prompts are used to provide a concrete link to learning and visuals are used throughout lessons to aid understanding. • Science displays are visible in each classroom – displaying key learning and vocabulary. • We develop confidence in Science using ‘Odd One Out’, ‘Big Ideas’ and ‘Positives and Negatives’ where the children use their knowledge to make connections with no definitive answer. • We facilitate open-ended practical investigations, and challenge is provided using higher-order questioning. • Support is provided through scaffolding, modelling, subject-based supports such as word banks, concrete resources and differentiated questioning.
<p>Assessment</p>		<ul style="list-style-type: none"> • Assessment in science is fulfilled using a combination of summative and formative assessment. • Teachers make assessments weekly using questioning. • At the beginning of each unit, a diagnostic test takes place to draw out information retained or known. At the end of each unit, we complete a quiz to assess the learning from that Science unit. These quizzes use a variety of questioning – multiple choice, true or false, matching, diagrams etc. • Science is assessed on FFT 3x per year but lots of teachers choose to update FFT at the end of each unit. Gaps are addressed through retrieval practice and teachers plan carefully for misconceptions.