Our Science Curriculum



Intent

Our Science curriculum aims to develop a sense of excitement and curiosity about natural phenomena and an understanding of how the scientific community contributes to the past, present and future.
Our aim is for pupils to develop a complex knowledge of biology, chemistry and physics but also adopt a broad range of skills in working scientifically and beyond.
Our science curriculum is inclusive and meaningful so all pupils may experience the joy of science and make associations between their science learning and their lives outside the classroom. Studying science allows pupils to appreciate how new knowledge and skills can be fundamental to solving arising global challenges.
Through our curriculum, we aim to encourage critical thinking and empower pupils to question the hows and whys of the world around them.

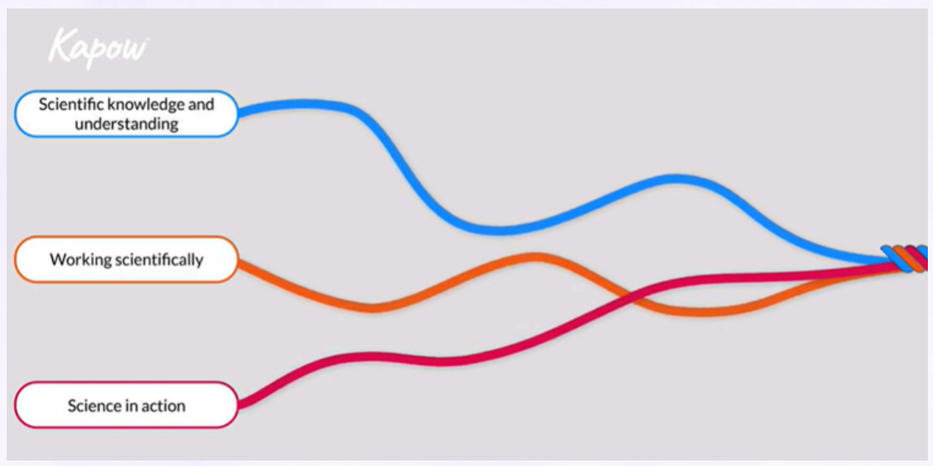
Our science curriculum encourages:

- A strong focus on developing knowledge alongside scientific skills across biology, chemistry and physics.
- Curiosity and excitement about familiar and unknown observations.
- Challenging misconceptions and demystifying truths.
- Continuous progression by building on practical and investigative skills across all units.
- Critical thinking, with the ability to ask perceptive questions and explain and analyse evidence.
- Development of scientific literacy using wide-ranging, specialist vocabulary.

Our Science curriculum enables pupils to meet the end of key stage attainment targets in the National curriculum. For EYFS, the activities allow pupils to work towards the 'Understanding the world' Development matters statements and Early learning goals, while also covering foundational knowledge that will support them in their further geography learning in Key stage 1.

Implementation

Our Science curriculum is planned with these strands running through each and every unit:



Pupils explore knowledge and conceptual understanding through engaging activities and an introduction to relevant, specialist vocabulary. Working scientifically skills are integrated with conceptual understanding rather than taught discretely to provide frequent but relevant opportunities for developing scientific enquiry skills. Our curriculum utilises practical activities that aid in the progression of individual skills and provide opportunities for full investigations.

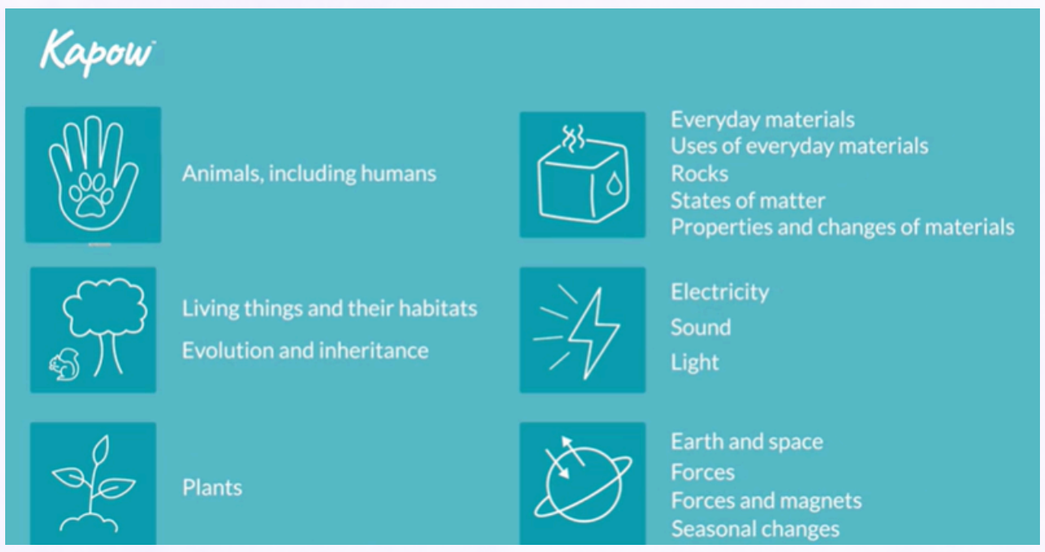
We develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.

Through following our units of work pupils will build their substantive knowledge base by:

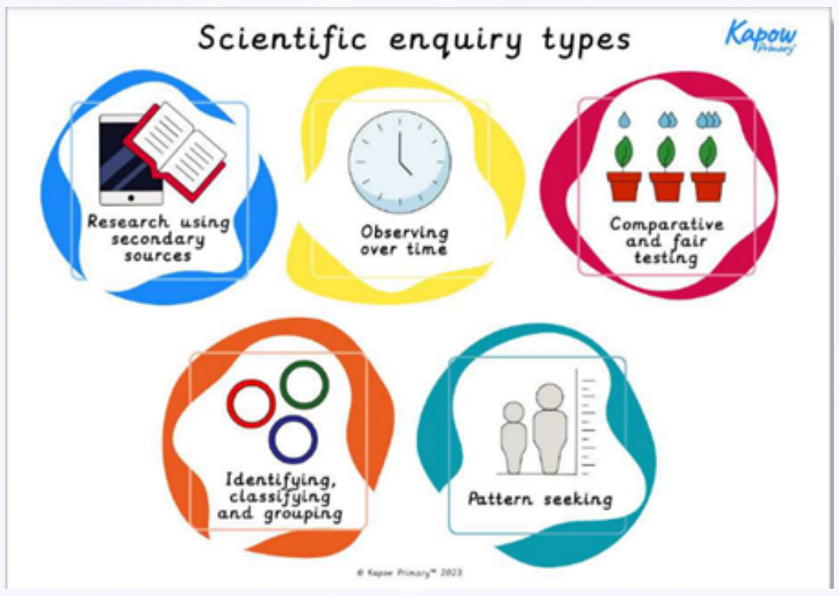
- Knowing more facts.
- Giving further examples of the same concept.
- Understanding and using a wider range of vocabulary.
- Using models or concepts that cannot be seen to explain ideas.
- Making and explaining links across areas of science.

Over time, that knowledge will become increasingly organised and connected. The Recap and recall section of the lesson helps pupils to activate their prior knowledge and encourages them to make connections between units.

Pupils develop their scientific knowledge and understanding through six key areas:



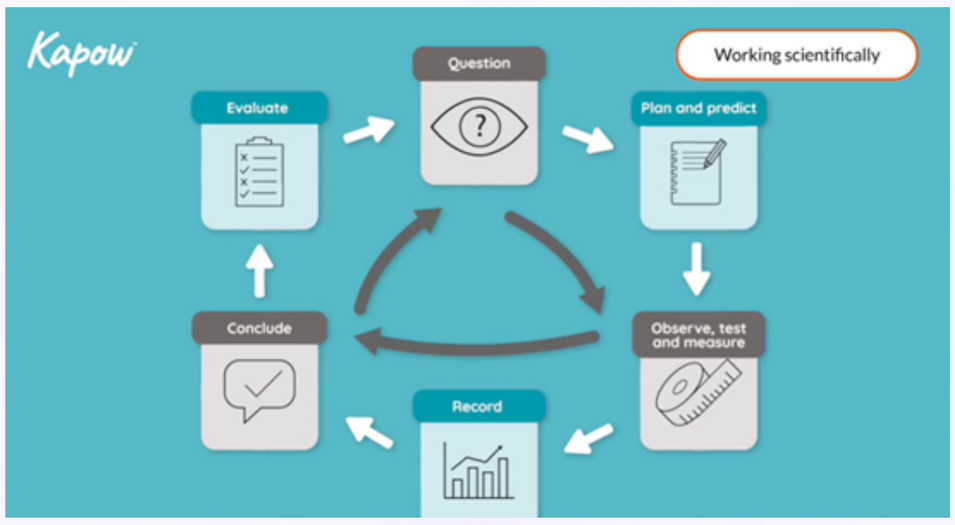
Working scientifically enables pupils to develop their disciplinary knowledge alongside their conceptual knowledge. Our Science curriculum aims to familiarise pupils with 5 types of enquiry so that by the end of Key stage 2 they are able to choose the most suitable enquiry type to answer questions. In Key stage 1, pupils are introduced to enquiry types as 'Super science skills' and are encouraged to reflect on which skills they have used to answer questions.



In EYFS (Reception), pupils build a solid foundation for science before transitioning to Key stage 1. Through hands-on exploration and focused observations, lessons spark curiosity and foster an early appreciation for the natural environment, paving the way for more structured scientific learning in Key stage 1.

In Key Stage 1 and 2 there are exploratory units called 'making connections' that delve beyond the statutory curriculum. These units are designed around the principle that deep learning occurs when pupils can link new information with existing knowledge. They are the culminating unit in each cycle and allow pupils an opportunity to revisit, revise and apply their learning in a new context. The units integrate and connect scientific concepts and working scientifically skills studied in recent units, as pupils engage in full enquiries and apply the enquiry cycle in new contexts. The emphasis on practical, hands-on lessons and guided enquiries supports the development of independent learning skills and scientific thinking.

We use the following enquiry cycle when working scientifically and encourage pupils to become familiar with the stages of the enquiry process.



Throughout all units within our science curriculum pupils get to experience science in action. This enables pupils to understand the uses and implications of science in the past, present and for the future. References to real-world examples are incorporated into all units, providing the rationale and motivation for why we learn Science. Science in action includes: famous scientists of the past and the methods and equipment they used, how scientific knowledge and understanding have changed over time, and jobs and careers related to science.

Our Science curriculum is a spiral curriculum, with essential knowledge and skills revisited with increasing complexity, allowing pupils to revise and build on their previous learning.

Impact

The impact of our Science curriculum is constantly monitored through both formative and summative assessment opportunities. Each unit has a skill catcher and knowledge assessment quiz which forms our summative assessment judgements. Opportunities for pupils to communicate using scientific vocabulary will also form part of the assessment process in each unit.
Children leave our schools equipped with the requisite skills and knowledge to succeed in science at Key stage 3. They will have the necessary tools to confidently and meaningfully question and explore the world around them and critically and analytically experience and observe phenomena. Pupils will understand the significance and impact of science on society.

The expected impact of our Science curriculum is that children will:

- Develop early scientific thinking skills through hands-on exploration and sensory experiences in EYFS (Reception).
- Develop a body of foundational knowledge for the biology topics in the National curriculum: Plants; Animals, including humans; Living things and their habitats; and Evolution and inheritance.
- Develop a body of foundational knowledge for the chemistry topics in the National curriculum: Everyday materials; Uses of everyday materials; Properties and changes of materials; States of matter; and Rocks.
- Develop a body of foundational knowledge for the physics topics in the National curriculum: Seasonal changes; Forces and magnets; Sound; Light; Electricity; and Earth and space.
- Evaluate and identify the methods that 'real world' scientists use to develop and answer scientific questions.
- Identify and use equipment effectively to accurately gather, measure and record data.
- Be able to display and convey data in a variety of ways, including graphs.
- Analyse data to identify, classify, group and find patterns.
- Use evidence to formulate explanations and conclusions.
- Demonstrate scientific literacy through presenting concepts and communicating ideas using scientific vocabulary.
- Understand the importance of resilience and a growth mindset, particularly in reference to scientific enquiry.
- Meet the 'Understanding the World' Early Learning Goals at the end of EYFS, and the end of key stage expectations outlined in the National curriculum for Science by the end of Year 2 and Year 6.