



Subject Discipline: Science

Intent

At Ranvilles Junior School we focus and aim to develop a sense of excitement and curiosity about natural phenomena and an understanding of the science in the real world. The school's motto 'Be You...Explore...Excel!' is integral to enable children to reach their potential to develop their scientific skills to explore, understand and apply their knowledge in a range of contexts. The school values provide the structure to enable all children to flourish in science through its low threshold, high ceiling learning activities and opportunities.

Science lessons evoke curiosity and excitement about familiar and unknown observations in the world of science in the fields: biology, chemistry, and physics. A practical approach helps children to develop their knowledge alongside higher order scientific thinking skills. Sequenced lessons break down misconceptions and challenge children to think critically to evaluate and conclude ideas and experimental results.

Talking scientifically and broadening their vocabulary is key and enables children to become deeper thinkers to access the world of science. We develop problem solving skills through the school's EPIC learning values building resilience to persevere and become more independent. Children challenge themselves and work both collaboratively and independently to explore, develop creativity and evaluate as learners

Implementation

The Science curriculum is aspirational. It is biased and shaped to meet the individual, contextual and holistic needs of all pupils. Formative assessment is used constructively to secure ambitious objectives, supporting learners to maximise their abilities.

The National Curriculum for Science knowledge and understanding is taught through the following key strands:

- Biology - living organisms and vital processes
- Chemistry - matter and its properties
- Physics - how the world we live in works '
- Working scientifically - processes and methods of science to answer questions about the world
- Science in Action - uses and implications of science in the past, present and for the future

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

engaging recall activities promote frequent pupil reflection on prior learning, ensuring new learning is approached with confidence. The Science in Action strand is interwoven throughout the scheme to ensure the concepts and skills are relevant to pupils and inspiring for future application. Cross-curricular links are included throughout each unit, allowing children to make connections and apply their science skills to other areas of learning.

Each unit is based on one of the key Science disciplines: **Biology**, **Chemistry** and **Physics**. To show progression throughout the school, the National Curriculum content is grouped into six key areas of Science:

- Plants
- Animals, including Humans
- Living Things and Habitats
- Materials
- Energy
- Forces, Earth, and Space

Pupils explore knowledge and conceptual understanding through engaging activities and relevant specialist vocabulary.

'Working Scientifically' skills are integrated with conceptual understanding rather than taught discretely. This provides frequent, and relevant, opportunities for developing scientific enquiry skills. The Science practical activities aid in the progression of individual skills and build up concepts incrementally before children undertake full investigations. Science also has a 'Making Connections' unit that delves beyond the essential curriculum, assimilating prior knowledge and skills to evoke excitement and to provide an additional method of assessing scientific attainment.

Lessons incorporate various teaching strategies from independent tasks to paired and group work, including practical, creative, computer-based, and collaborative tasks. This variety means that lessons are engaging and appeal to those with different learning styles. Lessons are adapted to ensure that all pupils can access learning, and opportunities are included to stretch pupils' learning. Knowledge organisers for each unit help to identify prior and future curriculum links to make learning as meaningful as possible and reinforce key technical terms.

Each unit of lessons includes multiple videos and resources to develop subject knowledge, target fundamental misconceptions effectively and support learning. The full Science curriculum maximises pupil progression through deep thinking questions, exciting learning, and real-life application.

Impact

Knowledge, built in the discipline of Science, is utilised in the Ranvilles SMSC 'Big Debate' at the end of a half term. The Big Debate connects key subject disciplines. Learners draw on the knowledge and skills explored in Science to: **Sequence** ideas, **Think** critically, **Articulate** precisely,

Respond respectfully and Synthesise collaboratively. This process enables learners to positively push new boundaries in exploring the world. Pupils will understand the significance and impact of science on society. They also understand and appreciate the developmental knowledge and skills required to be a life-long scientist. Summative assessment is used carefully to evaluate success and plan to meet future needs.

Children will gain knowledge:

- in Biology topics in the National Curriculum: Plants; Animals, including Humans; Living Things and Their Habitats; Evolution and Inheritance
- in Chemistry topics in the National curriculum: Everyday Materials; Uses of Everyday Materials; Properties and Changes of Materials; States of Matter; Rocks
- in Physics topics in the National curriculum: Seasonal Changes; Forces and Magnets; Sound; Light; Electricity; Earth and Space

Children will develop Scientific skills:

- to 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 in discussion and through written work
- understand the importance of resilience, school values and a growth mindset, particularly in reference to scientific enquiry
- meet the end of key stage expectations outlined in the National curriculum for science