# Science rationale

*Growing together, guided by love…*

**Subject Lead: Richard Giles**

**Science, a core subject within our broad and balanced curriculum, plays an essential role in nurturing enquiry skills, creative and critical thinking and problem solving. Through Oracy-based activities, pupils are effective participators that foster compassion within their discussion and a sense of community. This enables them to articulate and communicate ideas effectively and respect diverse perspectives. These experiences enhance their understanding of scientific concepts as well as empowering them to explore and address real-world challenges with empathy and confidence.**

**Intent:**

The federation 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. The curriculum aims 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. The scheme of work 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. The curriculum aims to encourage critical thinking and empower pupils to question the hows and whys of the world around them.

**● 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**

**Implement:**

To meet the aims of the National curriculum for science and in response to the Ofsted research review:
science, we have identified the following key strands:

● Scientific knowledge and understanding of:
- 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
around us.
● Science in action: uses and implications of science in the past, present and for the future.

This is 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 promotes frequent pupil reflection on prior learning, ensuring new learning is approached with confidence. The Science in action strand is interwoven throughout the scheme to make the concepts and skills relevant to pupils and inspiring for

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| **analyse evidence.**<br>**● Development of scientific literacy using wide-ranging, specialist vocabulary.**<br><br>The scheme of work supports pupils in meeting the Early Learning Goals for Understanding the world (The Natural world) and the end of key stage attainment targets set out in the National curriculum. | future application. Cross-curricular links are included throughout each unit, allowing pupils to make connections and apply their science skills to other areas of learning.<br><br>Each unit is based on one of the key science disciplines: biology, chemistry and physics. The National curriculum content has been grouped into six key areas of science to show progression throughout the school:<br><br>• **Plants.**<br>• **Animals, including humans.**<br>• **Living things and habitats.**<br>• **Materials.**<br>• **Energy.**<br>• **Forces, Earth and space.**<br><br>Pupils explore knowledge and conceptual understanding through engaging activities and an introduction to relevant, specialist vocabulary. As suggested in Ofsted research review: science (April 2021), the Working scientifically skills are integrated with conceptual understanding rather than taught discretely to provide frequent but relevant opportunities for developing scientific enquiry skills. The scheme utilises practical activities that aid in the progression of individual skills and provide opportunities for full investigations.<br><br>We are skills…creative thinkers, self-managers, independent enquirers, reflective learners, team workers and effective participators |
| **Impact**<br><br>The impact of Kapow Primary's Science scheme can be constantly monitored through both formative and summative assessment | Oracy in Science<br><br>The science curriculum places a strong emphasis on developing pupils' oracy skills, in alignment with the National Curriculum for Science in |

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| opportunities. Each lesson includes guidance to support teachers in assessing pupils against the learning objectives and any relevant scientific enquiry skills. Furthermore, each unit has a unit quiz and a knowledge and skills catcher, which can be used at the beginning or end of the unit to provide a summative assessment. Opportunities for pupils to communicate using scientific vocabulary will also form part of the assessment process in each unit. After implementing Kapow Primary Science, pupils should leave school 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 following the Kapow Primary Science scheme of work is that pupils will:<br><br>● Develop early scientific thinking skills through hands-on exploration and sensory experiences in EYFS (Reception).<br>● 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.<br>● 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.<br>● 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.<br>● Evaluate and identify the methods that 'real world' scientists use to develop and answer scientific | England, which states that pupils should "articulate scientific concepts clearly and precisely" and "talk about and explain their ideas."<br><br>Opportunities for purposeful talk are embedded throughout each unit, enabling children to discuss predictions, explain results, ask scientific questions, and engage in collaborative problem-solving.<br><br>Pupils regularly participate in paired, group, and whole-class discussions to deepen their understanding of key scientific concepts. They are encouraged to use subject-specific vocabulary when reasoning, to listen actively, and to express their thoughts with increasing clarity and confidence. Activities such as debates, oral presentations of investigations, and reflective discussions promote the development of both scientific thinking and effective communication.<br><br>This approach supports the development of essential speaking and listening skills, preparing pupils not only to be scientifically literate but also to be confident communicators across all areas of the curriculum. |