



Edward Feild Primary School SCIENCE in a Nutshell



RESEARCH	<p><i>'Children should be provided with a science education that enables them to appreciate what science is, how it works, the social nature of its practices, and its relevance to the lives of individuals and society,'</i> (Education Endowment Foundation, November 2021).</p> <p>According to the Ofsted Subject Science Review (April 2021), principles that can contribute to high quality science education include:</p> <ul style="list-style-type: none">• planning the science curriculum so that pupils build knowledge of key concepts and the relationships between them over many years• pupils remember long-term content that has been taught• explicitly teaching pupils the concepts and procedures needed to work scientifically• ensuring pupils are learning a wide range of vocabulary• clear explanations are given that build on pupils' prior knowledge• ensuring practical work has a clear focus• opportunities for high quality continuous professional development
VISION	<p>'When the curriculum lacks coherence, it is both harder to teach and harder for the children to locate and place their knowledge' - Vivian Robinson</p> <p>At EFPS, we ensure that our science lessons cover the skills required to meet the aims of the National Curriculum. The content, following the 'PZAZ' scheme, allows for a broader, deeper understanding of the programmes of study, with scientific enquiry embedded securely within teaching units. Our lessons aim to teach science through practical sessions and investigation, which encourages children to think both scientifically and creatively, and allows them to feel emotions such as curiosity, wonder, humour and even disgust to engage them in science. We do this through contextual teaching which takes advantage of the many opportunities the outdoor environment offers to learn.</p>
CURRICULUM	<p>The lessons are intended to improve children's scientific vocabulary, questioning skills and contextual understanding of science in the past and in our modern world, whilst also providing opportunities for consolidation, challenge and variety to ensure interest and progress in the subject. Using the 'PZAZ' scheme as a base, KS1 and KS2 teachers plan a unit using a PowerPoint planning template which includes: a <i>Big Question</i>, a written or oracy outcome, ideas for teaching the unit within a context (including hooks, trips and links to other curricular areas), key concepts, vocabulary and common misconceptions. An initial assessment is completed by the pupils from the 'PZAZ' scheme and the same assessment is completed at the end of the unit to ensure pupils have achieved the National Curriculum objectives. When using the template, teachers refer to the <i>'Science Curriculum Roadmap'</i> to guide their choice of <i>'Big Question'</i>, the <i>CIEC Working Scientifically</i> document to plan the scientific skills to teach and the whole-school science Progression Document to see where their teaching of each unit 'fits' within the science curriculum.</p>

<p style="text-align: center;">IMPLEMENTATION</p>	<ul style="list-style-type: none"> • In Reception, you will see science taught through topic work within ‘Understanding the World’ and through continuous provision – for example, if the topic is ‘Living and Non-Living Things’, children will explore life cycles and minibeasts. Science is also explored outdoors within the school Forest School area, where the children are encouraged to explore and question their natural environment. Within our continuous provision, we also encourage scientific thinking by discussing how and why basic scientific processes occur. • In KS1, science is taught by following the ‘PZAZ’ scheme, which meets the aims of the National Curriculum through four or five themed units in addition to one year-long unit based on the environment, where scientific processes are observed changing over time. In mixed year groups, units from both Year 1 and Year 2 have been mapped out to ensure coverage and progression as best as possible, and activities are differentiated to provide challenge where appropriate. Teachers are encouraged to follow the ‘PZAZ’ scheme as closely as possible, which includes suggestions of scientific enquiry of varying types and lists resources needed. • In KS2, science continues to be taught by following and adapting the ‘PZAZ’ scheme. In both LKS2 and UKS2, units are carefully mapped out across dual year groups (Years 3 and 4, and Years 5 and 6) to ensure coverage and progression as best as possible, again guaranteeing coverage of the National Curriculum aims for science. In KS2, teachers begin to raise the profile of the terms ‘biology’, ‘chemistry’ and ‘physics’ when teaching individual science units. Scientific enquiry is progressive across the key stages, as shown by the CIEC Working Scientifically document. • Through revisiting and consolidating science skills, our teaching helps children to build on and celebrate prior knowledge alongside introducing new skills and challenge. All children expand on their skills in scientific enquiry as well as scientific knowledge. • Key vocabulary is explicitly taught, repeated and questioned in each lesson before being displayed and used in cross-curricular contexts. Children are expected to be able to use the vocabulary orally in order to demonstrate a deepening of scientific knowledge and an ability to explain ideas scientifically. In addition, pupils are encouraged to use and apply this scientific vocabulary in one formal written task per science unit, which can also be used as a science assessment piece as well as evidence for writing assessment. • Where possible, English and topic units are interwoven with science planning across the school, allowing key vocabulary to be used orally and in written form throughout the unit in different contexts, such as department-planned Whole Class Reading, writing in English and maths. This gives disadvantaged pupils and children with SEN the time and contextual understanding to fully comprehend and use the vocabulary effectively, therefore allowing them to make progress. • Across the whole school, children have a range of opportunities to experience science through practical and engaging tasks beyond the classroom e.g. in our Forest School, in an after-school science club, on class trips (such as trips to the Oxford museums) and in general school life – observing and discussing shadows on the playground and evaluating the healthiness of school meals at lunch, for example. • Teaching staff are expected to maintain high-quality of science teaching. Staff are involved in science CPD (for example, Twilight meetings based on scientific enquiry led by STEM) and are observed teaching science regularly by the SLT and science subject leader. In addition, books are often monitored and, when planning a unit, teachers are offered support by the science subject leader.
<p style="text-align: center;">LEARNING ENVIRONMENT & RESOURCES</p>	<p>The learning environment across the school is consistent, with scientific vocabulary displayed, spoken and used by all learners. In classrooms, a science ‘working wall’ is recommended, which displays the unit’s ‘Big Question’ along with evidence of children’s prior and current knowledge e.g. post-it notes, scientific investigation write-ups, posters, mind maps, research findings, relevant photographs of pupils working scientifically and relevant facts. Scientific resources are available for use across the whole school, and are organised in boxes according to the science unit they cover. Staff are encouraged to contact the science subject leader to suggest new resource ideas or request additional resources. Chromebooks, laptops and iPads are used within some lessons for pupils to enquire in scientific research.</p>

<p style="text-align: center;">ASSESSMENT</p>	<p><i>Consistency in science assessment across the school is a work in progress. * indicates an assessment method in progress.</i></p> <ul style="list-style-type: none"> • Key questions are built into lessons to identify misconceptions and next steps in learning. • Unit assessment grids outlining unit scientific knowledge are stuck into books at the start of each unit for teacher assessment. • Teacher-assessed and child-friendly CIEC Working Scientifically posters are used to accurately assess a child’s scientific enquiry skills – these posters show progression across KS1, LKS2 and UKS2. • Working scientifically skills are also assessed formatively following the TAPS pyramid tool: https://pstt.org.uk/application/files/6314/5761/9877/taps-pyramid-final.pdf * • Elicitation tasks - specifically mind map (or retrieval mat if appropriate) tasks (<i>Plenty Think</i>) - are used by teachers to understand children’s prior knowledge at the start of a unit. Teachers also pose the unit’s ‘<i>Big Question</i>’ and record pupil’s responses. • Revision grids are used at the start of 3 lessons within each unit – these grids target prior teaching e.g. knowledge from the previous year, term and week. They also highlight science-specific vocabulary taught previously. • Odd one out tasks (<i>Plenty Think</i>) are used at teacher’s discretion throughout the unit, to challenge children’s scientific thinking and encourage use of vocabulary in discussion. • Retrieval mats are used as a summative assessment by teachers with the aim of targeting next steps in learning and to provide an overall judgement of progression across the unit. • All children in the school will be able to speak confidently about their science learning, skills and knowledge using appropriate scientific vocabulary. They should also be able to apply and use vocabulary appropriately within writing tasks across a range of contexts.
<p style="text-align: center;">FEEDBACK</p>	<ul style="list-style-type: none"> • Verbal feedback by teachers with a focus on use of scientific vocabulary and oracy, talking in full sentences. • Verbal feedback by pupils (peer assessment) - children use success criteria to help their peers identify next steps in their learning, justifying their reasons clearly. • Self-assessment using success criteria. • Mid-lesson feedback by teachers and pupils using scientific discussion/debate, ‘AirServer’ or examples of children’s work/ scientific enquiry as a base: teachers address misconceptions, correct learning or plan learning for next lessons. • End of lessons/units - reflections on learning through written or spoken comments. • Children’s opportunity to look at their CIEC working scientifically poster throughout units/ school year/ Key Stage.
<p style="text-align: center;">IMPACT</p>	<ul style="list-style-type: none"> • Having a knowledge-rich curriculum ensures pupils develop as scientists and learn how to work like scientists • Children acquire the appropriate age-related knowledge and skills linked to the science curriculum, which enables them to make good progress from their starting points. • Children develop a rich vocabulary which promotes their understanding of the world around them and will enable them to articulate their understanding of taught concepts. • Teaching scientific methods to students is teaching them how to think, learn, solve problems and make informed decisions. • Engaging young students with exciting material and experiences motivates them to learn to pursue the sciences throughout the school. • Science education teaches young learners problem-solving skills that will help them throughout their schooling, it also engages them in sciences from the start.