

Science at The Federation of Priddy and St. Lawrence's C of E Primary School

Rationale

Our science curriculum aims to prepare children for the wider world. We strive to ensure that the lessons we deliver achieve the three aims of the science national curriculum so that pupils understand the science and have the skills to engage with the knowledge and recognise where it fits in the wider world. We believe in the curious child and encourage our children to ponder, ask questions and find out answers to big questions for themselves, reflecting on that which they have discovered. The knowledge they acquire is deepened through the use of essential scientific enquiry skills. We believe that through working scientifically our children will have a greater depth of understanding of the knowledge and will be the scientifically literate adults of the future.

It is our aim that children will:

- ❖ develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- ❖ develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- ❖ develop their scientific language

Knowledge Choice

Substantive knowledge is organised into the 3 subject disciplines: biology, chemistry and physics.

Disciplinary Knowledge: this is referred to in the national curriculum as 'working scientifically' and it includes knowing how to carry out practical procedures. By learning substantive and disciplinary knowledge, our children not only know 'the science'; they also know the evidence for it and how this evidence is gained.

New knowledge is built up on what has been previously taught while working towards clearly defined end points. When units are repeated throughout the school, vocabulary and knowledge is revisited and it progresses to challenge the children's thinking further as well as introducing new ideas and material.

Progression in Science involves developing substantive and disciplinary knowledge through:

The Kent Science Scheme of Work develops children's ability to work scientifically and have a hands-on, enquiry-based approach to their Science learning. Teachers are given ownership to use the scheme to create fun and engaging lessons to excite and enthuse the children to meet the needs of all.

Within the scheme the use of precise, technical scientific language is consistent across all year groups as the vocabulary used in each unit is specified. This enables children to develop the appropriate vocabulary to discuss, reason and explain their scientific understanding more clearly and precisely. Our skills and progression map support the children's development of vocabulary through clearly outlined expectations for all previous and future year groups. This allows teachers the opportunity to revisit what the children have learnt and also have an understanding on what they will be progressing onto.

End Points

By the end of each key stage, children are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Intent

At Priddy at St. Lawrence's Federation, we want our children to be naturally curious about the world around them. We want to embrace their sense of wonder about natural phenomena and to guide them into becoming enquiry-based learners. The science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live. We want our children to develop an understanding of the uses and implications of Science, how it has changed and shaped our lives and how vital it is to the world's future prosperity.

Scientific enquiry skills are embedded in each topic the children study and these topics are revisited and developed throughout their time at school. Topics, such as Plants, are taught in Key Stage One and studied again in further detail throughout Key Stage Two. Thus, allowing the children to grow in their understanding, building upon their prior knowledge and increasing their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory.

We believe that every child can succeed in Science to become a self-assured and skilled Scientist equipped with the knowledge of the world around them and the ability to investigate scientifically. We teach Science in all classes using the Kent Science Scheme of Work (KSSW) which covers the National Curriculum (2014) mixed year group expectations. We teach our Early Years children through a play-based curriculum in which they can explore and learn the natural world. Opportunities for developing their scientific understanding are readily available through continuous and enhanced provision.

We ensure that all children are provided with rich learning experiences that aim to:

- ❖ Prepare our children for life in an increasingly scientific and technological world today and in the future.
- ❖ Help our children acquire a growing understanding of the nature, processes and methods of scientific ideas.
- ❖ Help develop and extend our children's scientific concept of their world.
- ❖ Build on our children's natural curiosity and developing a scientific approach to problems.
- ❖ Encouraging open-mindedness, self-assessment, perseverance and developing the skills of investigation – including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- ❖ Develop the use of scientific language, recording and techniques.

Implementation

At Priddy at St. Lawrence's Federation, teachers create a positive attitude to Science learning within their classrooms and reinforce an expectation that all children are capable of working scientifically through a hands-on, enquiry-based approach to learning. Our whole school approach to the teaching and learning of Science involves the following:

- ❖ Science is taught consistently, once a week for an hour, but is discretely taught in many different contexts throughout all areas of the curriculum. Teachers take opportunities to use high quality texts to support their Science teaching.
- ❖ In EYFS, Science is developed through purposeful play-based experiences which are represented in a variety of indoor and outdoor environments. Photographic evidence, observations and discussions with the children are a main aspect of Science learning in EYFS.
- ❖ Using the Kent Science Scheme of Work, teachers create fun and engaging lessons that excite and enthuse the children to meet the needs of all.

- ❖ Vocabulary is taught explicitly and reviewed every lesson.
- ❖ Existing knowledge, vocabulary and understanding is reviewed at the beginning of each topic to ensure that the children's starting points inform teaching and that it takes account of pupil voice, incorporating children's interests and needs.
- ❖ Throughout each area of Science, the children will be working scientifically, ensuring that the emphasis is on the children learning by doing. Teachers will plan and provide activities that will enable the children to test their previously held ideas.
- ❖ We build upon the knowledge and skill development of the previous years by referring to our whole school skills and knowledge progression map. As the children's knowledge and understanding increases, they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- ❖ We follow an enquiry-based approach, which involves problem-solving opportunities that allow children to apply their knowledge, and find out answers to their questions themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom.
- ❖ Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning. Tasks are selected and designed to provide appropriate challenge to all learners, in line with the school's commitment to inclusion.
- ❖ Teachers demonstrate how to use scientific equipment/ resources, and various skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.
- ❖ Teachers will assess children against their knowledge, understanding of key vocabulary and also their ability to work scientifically. A variety of formative assessment strategies will be carried out such as: questioning, mind-mapping, concept cartoons, KWL grids, drawings, annotated diagrams, quizzes/ word games and children's communication of science ideas – oral, posters, 'if the answer is... what was the question'.
- ❖ Regular events, such as Science Week will inspire, motive and enthuse children to celebrate all sciences and their importance in our everyday lives. These events often involve families and the wider community.

Impact

At Priddy at St. Lawrence's Federation, we ensure children not only acquire the appropriate age-related knowledge, but also skills which will provide the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Teachers will assess children at the end of each unit and this will be passed up with the cohort so future teachers are aware of the strengths and areas for development for the year group. This gives teachers a strong understanding of whether certain objectives may need revising before knowledge is built on.

All children will have:

- ❖ A wider variety of skills linked to scientific knowledge and understanding, and scientific enquiry/investigative skills.
- ❖ Children will be able to refer to prior knowledge to support their learning in each year group and as a result, they will apply this to scientific enquiry/investigation.
- ❖ A richer vocabulary which will enable to articulate their understanding of taught concepts.
- ❖ High aspirations, which will see them through to further study, work and a successful adult life.

As a Scientist leaving The Federation of Priddy and St. Lawrence's, every child will:

- ❖ Have a sense of awe, wonder and curiosity in the science in the world around them and have the skills to investigate, experiment and discover for themselves
- ❖ Be confident to ask their own questions and use their scientific skills to try to discover the answers

- ❖ Understand, and be inspired by the fact, that science is ever-changing and science changes our lives
- ❖ Have experienced a wide range of inspiring engagement and enrichment activities including educational visits and expert visitors
- ❖ Have a firm grounding in the disciplines of biology, chemistry and physics and a secure bank of knowledge and scientific skills which they can build on in the next stage of their science education.