

SCIENCE CURRICULUM DESIGN

"SCIENCE IS A WAY OF THINKING MUCH MORE THAN IT IS A BODY OF KNOWLEDGE"

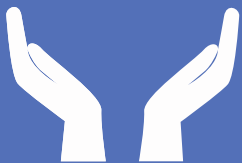
- CARL SAGAN



KNOWING



BECOMING



FEELING



Our science curriculum encourages children to ask questions and build on their natural curiosity about the universe. Throughout their time with us, children will acquire and develop the key knowledge set out by the national curriculum. To deliver this, we have chosen to use the Developing Experts (DE) scheme of learning. This actually goes beyond the basic content of the national curriculum - many of our pupils have parents associated with STEM, and thus thrive on the aspirational aspects of the DE curriculum. We also want to help pupils understand the application of what they learn in the wider world - and to build the necessary 'Science Capital' to retain and integrate the new concepts they discover.

Children are introduced to the key concepts of science (substantive knowledge) across the national curriculum areas which broadly span biology, chemistry and physics. DE breaks down these big concepts into smaller components which build, year on year. Some aspects are revisited in every year group (e.g. Animals including Humans), whilst others are introduced earlier or later according to the complexity of subject matter (e.g. Electricity in KS2). The acquisition of a comprehensive scientific vocabulary is vital - pupils begin this journey in EYFS learning the language of knowledge and understanding of the world, and go on to build their bank of scientific terminology progressively through the years.

Alongside these substantive aspects, we also introduce children to the knowledge of working scientifically - the methods scientists use to establish facts and, indeed, to see our understanding of the universe change over time in the light of new evidence. These 'practices of science' (the disciplinary knowledge of the subject) include learning about different types of enquiry - research, pattern seeking, comparative testing, grouping, observation over time etc. We also know children can't just 'do' practical experiments - they need to be taught the knowledge underpinning such enquiries. DE introduces this gradually, breaking this process down into learning about how to: ask questions & develop enquiries; predict & compare; observe & classify; gather & present data; and evaluate findings. This knowledge is revisited and deepened in every phase of school, thus ensuring pupils don't develop misconceptions or utilise overly simplistic approaches.

This disciplinary knowledge taught must be put into practice, and it is through doing so that children get to 'become' scientists. Again, this is not an experience confined to Year 5 and 6 "doing an experiment". Rather, children of all ages are provided with rich experiences which will prompt questioning about the world around them. In EYFS, through play and exploration, children will be encouraged to observe and draw conclusions. This hands-on learning continues through school - science is all around us - cooking, playtimes, weather - opportunities for investigation are endless. As they head into KS1, pupils take more ownership of this process, using simple equipment, measuring, recording and sharing their discoveries as they develop curiosity. By KS2, pupils are becoming confident and independent young scientists. They are encouraged to raise questions, develop hypotheses and undertake their own more formal enquiries. In addition, we want to set children up to become the scientists of the future and tackle the gender and ethnicity gaps within the field. To do so, we regularly introduce pupils to real-life scientists, not only the 'greats' of history like Einstein, but ordinary women and men that children relate to, thus building their science capital and belief that they too can shape our understanding of the world in years to come.

Science is full of emotion: the thrill of discovery, the curiosity of questions, the anticipation of a long awaited result, the frustration of an unfulfilled prediction or the struggle of wrestling through a complex set of data. We seek to embrace and unpack this aspect of children's scientific learning - helping them to overcome challenges and harness their enthusiasm.

Teachers use what they know about their pupils to relate science to students' own lives, making the subject more meaningful and accessible. We capitalise on our context to inspire children - working with RAF STEM ambassadors and university researchers. As children get older, we even introduce some discussion of the ethics of science, and the impact of our actions on the world. Ultimately, we want children to have their emotions stirred by discovery and the excitement that they can shape our world as the scientists of the future.