

Science at Rivenhall C of E Primary School

Intent:

At Rivenhall, we recognise the vital importance of learning Science. Science impacts every aspect of daily life, and without science humankind would not have made progress throughout history. Learning science is concerned with increasing pupils' knowledge of our world, as well as with developing the skills associated with science as a process of enquiry.

One of our key curriculum drivers is '*enabling learning*'. At Rivenhall, children will demonstrate a love of science work and an interest in further study and work in this field. They will build up their substantive knowledge and skills as they progress through the school. They will feel confident to question ideas and reflect on their knowledge. They will gain an understanding of how scientific knowledge becomes established and gets revised, and to learn about the different types of scientific enquiry. They will be empowered to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to science.

Our science curriculum also reflects our key curriculum driver of '*encouraging responsibility*': developing the natural curiosity of each child no matter their demographic, encouraging them to have respect for living organisms, and instilling in pupils the importance of caring for the natural environment.

Additionally, we seek to inspire aspiration in our pupils by developing a fun, practical and engaging high-quality curriculum that inspires the next generation to succeed and excel in science.

Implementation:

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children can achieve high standards in science. In order to support this the school has identified a Science scheme of work to follow, which has been in place from September 2021.

Using the requirements of the Science National Curriculum as our guide, our Science lessons enable learning by offering opportunities for children to:

- Develop substantive knowledge – scientific knowledge and conceptual understanding of the disciplines of Physics, Chemistry and Biology.
- Develop disciplinary knowledge – knowledge of the practices of science, enabling them to understand how scientific knowledge becomes established and gets revised, and to learn about the different types of scientific enquiry.
- Formulate and practically investigate their own questions using various methods of enquiry
- Confidently make predictions and postulate their own theories; revising and evaluating these in light of their findings.
- Gain competence in the science skills of planning scientific investigations, gathering and analysing data and critical evaluation of investigations across the disciplines.
- Use a range of methods to gather data from investigations and secondary sources including I.C.T., drawings, diagrams, videos and photographs.
- Present data in a variety of methods including tables, bar charts, line graphs, pictograms and pie charts as appropriate to their age.
- Produce increasingly comprehensive science reports that demonstrate their proficiency in the scientific method.
- Have care for the safety of all individuals in lessons by developing knowledge of the hazards of the materials and equipment they handle, along with mitigating these hazards.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

We deliver these opportunities using the following structure:

- All children in KS1 and KS2 will have a weekly Science lesson. In Early Years, there will be some direct teaching of science supplemented by opportunities presented as part of their continuous provision.

- Science teaching will be based on the Pzaz (Primary Science Advisory Service) scheme of work. As our classes are mixed age classes, the units of work identified in the scheme have been mapped out in a two year cycle, which ensures that each child will be taught all the required elements of the National Curriculum.
- The curriculum map enables the accumulation of knowledge and allows progress in repeated topics through the years. It identifies key vocabulary for each unit.
- Pupils in key stage two will concentrate on one key area of science skills per term. Term 1 will focus on planning investigations, Term 2 on results gathering and analysis, and Term 3 on evaluating practical work. Although each skill is related and there are links between them, this will ensure each of these three aspects is focused upon and will become firmly embedded.
- Pupils in key stage one will follow a rolling programme of science skills across each term.
- Through our planning, we include problem solving opportunities, allowing children to find out for themselves how to answer questions in a variety of practical means. Children are encouraged to ask their own questions and be given appropriate equipment to use their scientific skills to discover the answers.
- Engaging lessons are created which include a balance of practical and knowledge elements. Teachers use precise questioning in class to test conceptual knowledge and skills and children are regularly assessed to identify those children with gaps in learning, so that all children keep up.
- We build upon the learning and skill development of previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting and using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are explicit in lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the theme of the lesson.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding.
- The Pzaz scheme gives each teacher access to CPD videos for each block of learning, which ensure they are able to continually improve their knowledge and practical competence. These videos ensure they have access to accurate scientific knowledge and understanding of key vocabulary for each unit. They also provide a visual demonstration of how to teach the lessons outlined in the planning.
- Staff meetings were delivered during the first year the scheme was used in school to introduce the new scheme and support its implementation across the school. The subject leader and school leadership team monitor its implementation and effectiveness.

Impact:

The Pzaz scheme of work breaks the units down into blocks which provide lesson plans for approximately 2 weeks of work. At the end of each block there are questions provided to use for formative assessment of the pupils' understanding. These can be used to identify any areas which need further input and to identify children who may need further support, as well as those who demonstrate they are working at greater depth. Children's disciplinary knowledge will be informally assessed from observations in class and from their written work.

At the end of each unit there is a summative assessment test for the children to complete. This information will be again used to identify how well the children have understood the substantive knowledge covered and identify any misconceptions or gaps in their learning, and teaching adjusted accordingly.

The subject leader and SLT will undertake book scrutinies, learning environment walks and lesson observations to monitor the effectiveness of our science provision.

Pupil voice will be used to gather information about pupil views and attitudes to Science. This information will be used to help ensure our science curriculum is promoting positive attitudes and enjoyment of science for all groups of learners.