Roecliffe CE Primary School

Science Rationale

Intent and Implementation

Science Intent

"A high-quality science education provides the foundations for understanding the world. Science has changed our lives and is vital to the world's future prosperity. Pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena." National Curriculum 2014

At Roecliffe CE Primary we aim to develop pupils' knowledge and understanding of our world and beyond, through a range of scientific enquiries. We recognise children's innate desire to understand their world and aim to focus on developing the skills required to investigate a question as a process of enquiry.

Extending and developing the pupils conceptual understanding in all areas of science is the aim. We know it is important to provide pupils with opportunities to ask meaningful and exciting questions so they can build their knowledge and develop their skills for working scientifically.

Science Intent

Key Stages One and Two

At Roecliffe CE Primary School, in conjunction with the aims of the National Curriculum, our Science teaching offers opportunities for children to:

- 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;
- be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- develop the essential scientific enquiry skills to deepen their scientific knowledge.
- use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, which includes producing diagrams, graphs and charts.
- develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- develop an enthusiasm and enjoyment of scientific learning and discovery, working independently or positively together.
- We develop children's sense of **faith** in themselves by providing them with opportunities to challenge themselves and by having consistently high expectations. Children have the **courage** to have a go and learn from their mistakes and we encourage them to take risks with their questions, ideas and discussions. We foster a **love** of reading and offer children opportunities to read a range of materials around a wide variety of scientific topics.

Science Intent

EYFS

In the Early Years, children develop their science skills and knowledge through play and enquiry in all areas of provision. Open ended questions are displayed in different areas so that children can begin to understand how science is all around us. Children find out about objects, materials and living things looking at similarities, differences, patterns and change.

A carefully planned and enhanced environment facilitates curiosity and exploratory play, children are motivated to ask questions about why things happen and how things work and then apply their learning in creative, imaginative and challenging ways.

Science Implementation

The acquisition of key scientific knowledge is an integral part of our science lessons. Knowledge organisers can assist children when learning and help them retain key vocabulary and conceptual knowledge associated within each unit.
Skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons.
At Roecliffe, teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to learning science involves the following;

- Science lessons are planned using White Rose Science units as a springboard and linked to a theme where possible.
- Children are encouraged to formulate their own questions and are given opportunities to use their scientific enquiry skills to make discoveries and connections.
- Our curriculum is progressive. We build upon the learning and skill development of the previous years. Short 'pre-topic quizzes' are designed to identify misconceptions and provide an opportunity for the teacher to plan meaningful lessons that build knowledge and skills.

Science Implementation

Skills for investigating are progressively introduced and there is a progression of vocabulary for each unit.

In each classroom Science Enquiry symbols are displayed; children use these symbols to identify the enquiry skill they are using or could use for a particular investigation or to answer a line of enquiry. The symbols help the children understand the range of skills used when working scientifically.

Teachers find opportunities for children to explore their ideas, investigate their questions and work scientifically both in and out of the classroom. Enrichment days, such are planned and aim to promote the importance of Science in our lives.

Science Implementation
How we make Science accessible to all children at Roecliffe:
Adapted from National Association for Special Educational Needs (NASEN)

Planning Inclusive Lessons

When planning Science lessons at Roecliffe, teachers carefully consider the objective, and how information is presented in a way that all learners can access it and enjoy the learning experience. Learners may observe and explore a stimulus to hook them into the new learning, they can discuss the stimulus in small groups, talking about what they already know and begin to generate further questions for investigation. These opportunities for 'talk' with visuals support all learners, and enable everyone to build on and extend vocabulary and scientific thinking. Teaching Assistants roles and responsibilities are shared with them with them prior to the lesson so that they can support those children effectively.

Creating an inclusive environment

Our curriculum creates an inclusive environment by making sure that key concepts and procedures are systematically developed over time. The curriculum plans try to pre-empt misconceptions by making sure content is taught in a logical order. Teachers at Roecliffe carefully consider the class environment so that all learners feel safe and comfortable to learn. Children in all classrooms can access a range of resources to meet any sensory needs. Teachers begin each lesson with a review of the previous learning and a short discussion. Pre - teaching or trigger warnings are provided for children who may be sensitive to any part of an activity or lesson enabling them to participate fully.

Curriculum Considerations

Working scientifically is an important goal of science education. It improves a learner's cognitive, social and linguistic development whilst becoming more inquisitive and interested in the world around them. Skills that are underpinned by scientific knowledge range from making predictions and asking scientific questions, to drawing conclusions and interpreting data or information collected. As learners progress through each key stage, their knowledge of the methods, processes and nature of science is developed and deepened. At Roecliffe teachers encourage pupils to discuss which disciplinary skills may be required to investigate particular questions and symbols are displayed and used to support this discussion.

Strategies to Scaffold Learning

- Work banks and pictures
- Teaching assistants will collate word/picture banks on a mini whiteboard/paper with the learner during the teaching input to support their independent learning activity.
- Learning is made accessible for all learners e.g a learner with writing difficulties could verbally explain understanding or be filmed explaining their answers or use pictogram for presenting data, manipulatives and visuals may be used in Science
- Vocabulary is reviewed with the whole class at the beginning of a lesson
- Science does not always follow the same lesson format and structure so, when appropriate, we prepare learners in advance by explaining how the lesson will run.