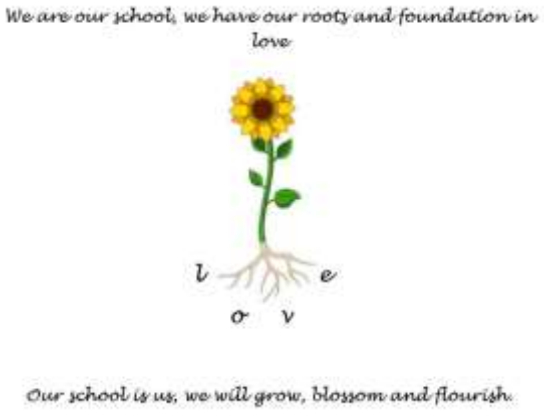
Rooted and Grounded in Love

'Let your roots grow down into him, and let your lives be built on him.'
Colossians 2:7



Science Rationale

National Curriculum Aims For Science

- Develop scientific knowledge and conceptual understanding through 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.
- Are equipped with the scientific knowledge requires to understand that uses and implications of science, today and for the future.

National Curriculum Purpose For Science

A high quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and its vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave and analyse causes.

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Scientifically Literate (Having knowledge and skill in a specified subject)

At North Stainley C.E. Primary School the journey to becoming scientifically literate begins in the Early Years. Our youngest pupils learn about history within the ETFS area of learning known as 'Understanding of the World'. The objectives re set out in the Early Learning Goals which underpin the curriculum planning. Activities that encourage children to explore, problem solve. Observe, predict, think and make decisions about the world they live in.

By the time the children reach the end of Year 6 they will be securely scientifically literate and working in line with age related expectations. They will be able to plan their own

scientific enquiries to answer questions, identifying and controlling variables where necessary. During their enquiries, they will demonstrate the ability to take measurements, using a range of scientific equipment. Children will understand the importance of accuracy and precision, taking repeat readings when appropriate. Children are able to clearly record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. They use test results to make predictions to set up further comparative and fair tests. They are able to report and present findings from enquiries, including conclusions, causal relationships and explanations of degree of trust in results, in oral and written forms such as displays and other presentations. Children are able to identify scientific evidence that has been used to support or refute ideas or arguments.

Science Rationale

Science is a body of knowledge built up through experimental testing of ideas. Science is also a methodology, a practical way of finding reliable answers to questions we may ask about the world around us.

Science is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying process skills. We believe that a broad and balanced science education is the entitlement of all children, regardless of ethnic origin, gender, class, aptitude or disability.

Our aims for teaching science include the following:

- Preparing children for life in an increasingly scientific and technical world.
- Fostering concern about, and active care for our environment.
- Helping children acquire a growing understanding of scientific ideas.
- Helping develop and extend children's scientific concept of the world.
- Developing an understanding of the international and collaborative nature of science.

Attitudes

- Encouraging the development of positive attitudes to science.
- Building on our children's natural curiosity and developing a scientific approach to problems.
- Encouraging open-mindedness, self-assessment, resilience and responsibility.
- Building children's self-confidence to enable them to work independently.
- Developing children's social skills to work cooperatively with others.
- Providing children with an enjoyable experience of science, so that they develop a deep and lasting interest and may be motivated to study science further.

Skills

- Give children an understanding of scientific processes.
- To acquire practical scientific skills
- Develop the skills of investigation- including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Developing the use of scientific language, recording and techniques.
- Developing the use of ICT in investigating and recording
- Enabling children to become effective communicators of scientific ideas, facts and data.

Primary Science helps children to;

- Build knowledge of the world around them and key scientific concepts.
- Have an understanding of scientific enquiry.

Intent	Implementation	**Impact:** to be reviewed at the end of each academic year
Science teaching aims to give children a strong understanding of the world whilst acquiring skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and the uses and implications of science today and in the future. Scientific enquiry skills are embedded in each topic area and are revisited and developed over time. Children build upon their prior knowledge and embeds it into their long term memory. All children develop and use a range of skills including observations, planning and investigations, and are encouraged to question the world around them and become independent learners. Specialist vocabulary is taught and built up, and effective questioning to communicate ideas is encouraged.	As part of the planning process, teachers plan the following: • A knowledge organiser which outlines key knowledge (including vocabulary) • A cycle of lessons for each topic, which carefully plans progression and depth. • Challenge questions for pupils to apply their learning in a philosophical/ open manner. • Where appropriate organise trips and visits from experts who will enhance the learning experience.	

Knowledge and Enquiry In Science Substantive knowledge concerns the key facts, concepts, principles and explanatory frameworks in a subject. Knowledge needed in order to think, process and understand with the subject.

Knowledge refers to the theories and concepts making up science, the method of posing questions and carrying out investigations. All investigations have common processes such as observation, classification, hypothesising, data collection, interpretation of data and evaluation. Children will progressively build up knowledge as they move up through school.

Scientific knowledge should:

- Be based on children's existing concepts of science.
- Arouse curiosity about natural phenomena, which stimulates the posing of questions about the phenomena.

- Be a systematic means enabling the children to ask and attempt to answer questions arising from observations.
- Provide models of scientists who have contributed to the field of science.
- Recognise that different students experience science differently.

In Science, knowledge is needed to collect, understand and evaluate scientific evidence. It is the ability to develop cognitive skills related to science such as acquiring scientific language, making observations, taking measurements, gathering, analysing and interpreting data, making generalisations, creating models, communicating ideas and carrying out investigations.

Enquiry In Science

As children build their knowledge within their studies they will have ongoing opportunities for scientific enquiry. Children must understand the methods in of scientific enquiry including how evidence is gathered and used to make scientific claims and how to ask perceptive questions. Skills that underpin scientific enquiry such as thinking critically, evaluating and examining results from investigations, allows for further opportunity for children to apply their knowledge meaningfully.

Creativity in Science.

Creativity and knowledge work closely as creativity can involve making connections using prior knowledge to create new. Curriculum planning encourages and supports achieving of natural links between Science and other subject disciplines such as English, Art and Design and Technology. These links are deliberate and purposeful. They are created naturally and never forced.

Assessment in Science

Tracking children's progress throughout their school life is vital in order to establish their acquisition of knowledge and skills. At North Stainley C.E. Primary school, learning always starts with the children's prior knowledge. Units of work are then personalised to the children.

Misconceptions that arise throughout the unit are identified and addressed appropriately by the teacher. From September 21 the staff will introduce the blocking of Science (and other foundation subjects) and a programme of recall to ensure knowledge is embedded and mastered.