



Redesdale Primary School

Science Policy

Policy reviewed	December 2021
Policy review date:	December 2024



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INTENT

Introduction

Redesdale Primary School is a happy, vibrant school where a love of learning is encouraged and celebrated. We are passionate about providing our children with enriching real-life experiences in all aspects of school life. We nurture and inspire children to develop lifelong communication skills in a safe and comforting environment. We believe that children will flourish if given the skills to encourage emotional intelligence that can be utilised in all areas of life.

The purpose of this document is to provide teachers, parents and governors with a clear summary of the role of Science within the broad and balanced curriculum offered at Redesdale Primary School.

As part of providing a broad and balanced Science curriculum, our Curriculum Drivers are strongly supported through, and embedded in, the delivery of our whole school approach to the curriculum.

Science stimulates and excites children's curiosity about phenomena and events that are happening in the world around them. It links direct practical knowledge with ideas and can engage learners at many levels. Through Science, children gain a range of transferable critical thinking skills and come to understand how major scientific ideas contribute to technological change, and how this can have an impact on industry, business and medicine. Children learn to ask scientific questions and begin to appreciate the way in which Science will affect the future on a personal, national and global level. Our Science Curriculum has been carefully developed with this in mind.

Aims

At Redesdale Primary School, children are given appropriate learning opportunities so that they develop the skills needed to be active citizens within an increasingly scientific world. Science is a powerful and useful tool through which children's understanding of the world around them is carefully developed. It is our aim to create a challenging environment that raises standards of achievement in Science through high quality teaching and learning. Children build up their scientific skills and knowledge, developing the necessary ability to investigate, question and understand scientific concepts. Our aim is to provide a high quality Science curriculum which:

- Develops lively, enquiring minds and the ability to question in order to further children's learning and check their understanding.

- Motivates children to learn scientific skills and acquire new knowledge or to build on existing skills or knowledge.
- Builds on children's natural curiosity and enables them to understand and care for the world in which they live.
- Provides an environment where children can work in an investigative way and can confidently articulate their ideas, views and opinions.
- Supports children to use equipment safely and sensibly.
- Develops the potential scientific links with all other areas of the curriculum.
- Develops an understanding of the nature, processes and methods of Science through different types of Science enquiries: observation, testing, research, classifying and identifying and pattern, that help them to answer scientific questions about the world around them.
- Equips children with the scientific knowledge required to understand the uses and implications of Science, today and for the future.

IMPLEMENTATION

Objectives of the Science Curriculum

Children will be taught to develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics across the Key Stages. 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.

Foundation Stage

The Science curriculum is known as; Understanding the World and is organised on a topic basis. Understanding the World is one of the specific areas within the Early Years Foundation Stage (EYFS). Each specific area is divided into early learning goals. For Understanding the World these are:

- Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.
- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
- Playing and exploring - children investigate and experience things, and 'have a go'.

Children should be taught to:

Key Stage One

- Experience and observe phenomena, looking more closely at the natural and humanly constructed world around them.
- Be curious and ask questions about what they notice.
- Develop understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.

- Use simple scientific language to talk about their findings and communicate ideas to an audience in a variety of ways.

Lower Key Stage Two

- Broaden their scientific view of the world around them.
- Explore, talk about, test and develop ideas about everyday phenomena and the relationship between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions.
- Develop own questions about their observations and make decisions about which types of scientific enquiry would be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.
- Draw simple conclusions using scientific language, first, to talk about and, later to write about what they have found out.

Upper Key Stage Two

- Develop a deeper understanding of a wide range of scientific ideas.
- To explore and talk about their ideas, asking own questions about scientific phenomena and analysing relationships and interactions more systematically.
- Encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates.
- Select the most appropriate ways to answer science questions, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.
- Draw conclusions based on their data and observations, use evidence to justify their ideas, and use scientific knowledge and understanding to explain their findings.
- Recognise that scientific ideas change and develop over time.

Teaching and Learning Style

At Redesdale Primary School we make Science an enjoyable learning experience. Children learn by doing, using their senses and first-hand and concrete experiences.

We use a variety of teaching and learning styles in Science lessons. Our principal aim is to develop children's knowledge, skills, and understanding. Sometimes we do this through whole-class teaching, while at other times we engage the children in an enquiry-based research activity. We encourage the children to ask, as well as answer, scientific questions. Children have the opportunity to use a variety of data, such as statistics, graphs, pictures, and photographs. They use Computing in Science lessons because it enhances their learning. They take part in role-play and discussions, and they present reports to the rest of the class. They engage in a wide variety of problem-solving activities.

Wherever possible, we involve the children in real scientific activities, for example, investigating a local environmental problem, or carrying out a practical experiment and analysing the results. The children are actively engaged with things and ideas that promote mental activity as this helps them retain new learning and integrate it with what they already know.

We recognise that in all classes' children have a wide range of scientific abilities, and we ensure that we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this in a variety of ways:

- Setting tasks which are open-ended and can have a variety of responses.
- Devising tasks of increasing difficulty (we do not expect all children to complete all tasks).
- Varying the grouping of children, e.g. by ability or mixed ability.
- Providing resources of different complexity, matched to the ability of the child.
- Encouraging a sense of challenge and feeling supported by others in their efforts to learn. Active listening to others in their group.
- Using classroom assistants to support the work of individuals or groups of children.

Science Curriculum Planning

At Redesdale Primary School Science is taught as a discrete lesson and as part of cross-curricular themes, when appropriate. Science has links with other areas of the curriculum including Geography, English, Mathematics, Art and Design, RSHE & PSHE, Computing and Design Technology. Planning should support wherever possible, the opportunity to learn from first-hand and concrete experiences which promote mental activity and support retention of previous learning by integrating it with what children already know.

We carry out the Curriculum planning of Science in three phases (long-term, medium term and short-term). The long-term plan maps the Science coverage studied in each term during the Key Stage. Key Stage groups devise these plans in conjunction with the Science Subject Leader. Through this programme of study, we teach the knowledge, skills and understanding set out in the National Curriculum.

The medium-term plans give details of each unit of work for each term. The Science Subject Leader is responsible for keeping up to date with the curriculum coverage and reviewing these plans.

The Class Teacher plans the individual lessons, which list the specific learning objectives and a brief outline of the tasks for each lesson. The Class Teacher is responsible for keeping these individual plans, and the Science Subject Leader will discuss the plans with them to support, provide further training and ensure specific knowledge and skills are evidenced.

The programmes of study describe a sequence of knowledge and concepts. While it is important that children make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Children should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of Science, including collecting, presenting and analysing data.

An overview of the units we cover:

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Early Years Foundation Stage	Understanding the World					

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Seasonal changes. Animals including humans Animal classification and characteristics. Parts of the human body.		Seasonal changes Materials Objects and materials Properties of materials		Seasonal changes Plants Plant structure Plant types	
Year 2	Animals including humans Basic needs of animals. Animal reproduction and offspring.		Materials Comparing materials, Function of materials.	Plants Basic needs of plants, Plant growth	Living things and their habitat Comparing living things, Classifying objects.	
Year 3	Plants Function of parts of plants.	Animals including humans Skeletons, Nutrition.	Materials Comparing and classifying rocks, Fossils.	Light Light, dark and shadows.	Forces and Magnets Forces, magnetic/non-magnetic, poles.	
Year 4	Living things and their habitats Animal and plant classification. Changes to habitats.	Electricity Circuits	Sound Sources, travelling, pitch, absorbing.	States of matter States of matter and processes.	Animals including humans The digestive system, Food chains	
Year 5	Living things and their habitats Life cycles and processes of animals.	Earth and space Sun, Earth, Moon, planets, night and day.	Animals including humans The human life cycle.	Forces Gravity, air and water resistance, friction	Properties and changes of materials Classification of materials. Irreversible changes.	
Year 6	Living things and their habitats Animals and plant classification.	Evolution and inheritance Adaptation, evolution and variation.	Animals including humans The human circulation system.		Light & Electricity Light process	

The contribution of Science to teaching in other curriculum areas:

Wherever possible, the Science curriculum will provide opportunities to establish links with other curriculum areas. Whole school STEAM projects are organised across the year in order to celebrate national and international events (e.g. British Science Week, World Science Day). The aim of these projects is to provide practical activities that will give the children an understanding of the real-life implications of STEAM subjects so that they begin to relate their learning to their future.

English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in English are of a scientific nature. The children develop oral skills in Science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments. They learn to develop the ability to confidently articulate their ideas, views and opinions on a range of matters. They develop their writing skills through writing reports and projects and by recording information.

Mathematics

Science contributes to the teaching of mathematics in a number of ways. When the children use weights and measures, they are learning to use and apply number. Through working on investigations, they learn to estimate and predict. They develop accuracy in their observation and recording of events. Many of their answers and conclusions include numbers.

Personal, Social, Health and Economic Education (PSHE) and Relationships, Sex and Health Education (RSHE)

Science makes a significant contribution to the teaching of PSHE and RSHE, which is mainly in two areas. Firstly, the subject matter lends itself to raising matters of citizenship and social welfare, for example, children study the way people recycle material and how environments are changed for better or worse. Secondly, the subject gives children

numerous opportunities to debate and discuss. The children develop greater self-awareness, develop empathy and the ability to relate to others by organising campaigns on matters of concern to them, such as helping the poor or homeless. Science thus promotes the concept of positive citizenship.

Science contributes to the teaching of PSHE and RSHE by promoting the benefits of physical exercise, simple self-care techniques and what constitutes a healthy diet, including an understanding of calories and other nutritional content. The principles of planning and preparing a range of healthy meals, the characteristics of a poor diet and risks associated with unhealthy eating, including obesity, and other behaviours, e.g., the impact of alcohol on health are included in the Science Curriculum. Children also learn about the main external parts of the body and changes to the body as it grows from birth to old age, including puberty.

Spiritual, Moral, Social and Cultural Development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking, and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet, and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

Science and Computing

Computing enhances the teaching of Science in our school significantly, because there are some tasks for which Computing is particularly useful. It also offers ways of impacting on learning which are not possible with conventional methods. Software is used to animate and model scientific concepts, and to allow children to investigate processes which it would be impracticable to do directly in the classroom. Software is used to assist in the collection of data and in producing tables and graphs. Children use Computing to record, present and interpret data, to review, modify and evaluate their work, and to improve its presentation. Children learn how to find, select, and analyse information on the Internet and on other media. Many of our school activities are also recorded on Seesaw and our school website.

Science and Inclusion

At Redesdale Primary School we teach Science to all children, whatever their ability and individual needs. Science forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our Science teaching we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those children with special educational needs, those with disabilities, those who are more able, and those learning English as an additional language, and we take all reasonable steps to achieve this. All children's contributions ensure they feel valued, involved and appreciated.

IMPACT

Assessment

Assessment in Science is based upon scientific knowledge and understanding, rather than achievement in English or Mathematics. In the Early Years Foundation Stage, we assess children's knowledge and understanding according to the EYFS Learning and Development Stages in 'Understanding the World' using Target Tracker.

In Key Stage One and Key Stage Two we use a range of assessment materials, including Target Tracker and Seesaw, to ensure that children are making appropriate progress. Children in Key Stage One and Two will use Seesaw to save Science work digitally and the Subject Leader monitors and reviews progression throughout these key stages. The evidence gathered on Seesaw should indicate the learning objective for the lesson. Children are expected to know, apply and understand the skills and processes specified in the relevant programme of study.

Monitoring and Evaluation

The Science Subject Leader monitors samples of children's work including videos of children working; photographs and written compositions as well as those completed using Computing, to demonstrate the Science experiences in our school.

It is the responsibility of the Subject Leader to monitor the standards of children's work and the quality of teaching in Science. The Subject Leader is also responsible for supporting colleagues in their teaching, for being informed about current developments in the subject, and for providing a strategic lead and direction for Science in school. The Subject Leader is responsible for informing the Headteacher of the strengths and weaknesses in the subject and indicates areas for further improvement. The Subject Leader has allocated time for monitoring Science including reviewing samples of children's work, and visiting classes to observe science teaching, in addition to speaking to children about Science lessons and their involvement in them.

This policy will be reviewed every three years by the Subject Leader, in conjunction with the Headteacher and Governing Body. Any changes made to this policy will be communicated to all members of staff.