Oughterside Foundation School Science Policy

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(Draft copy pending approval of updates)

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Introduction

Science is a core subject within the National Curriculum. This policy outlines the purpose, nature and management of Science taught at Oughterside Foundation School. It reflects the school's science principles and vision, developed by pupils, parents and staff. This policy should be read in conjunction with the National Curriculum 2014 documentation and Oughterside school's skills and knowledge progression documents which set out in detail what pupils will be taught in different year groups. These are available on the school website.

Science is the study of the physical world, involving a continuing build-up of knowledge and through specific teaching and scientific enquiry. Through science, pupils at Oughterside Foundation School will continue to deepen their respect, care and appreciation of the natural world.

As well as this, scientific study helps to stimulate a child's curiosity in finding out why things happen in the way that they do. It teaches methods of enquiry and investigation to stimulate creative thought. 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.

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 in teaching science include the following:

- To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.

- To develop understanding of the nature, processes and methods of science through different types of science enquires, detailed in the National Curriculum, that help pupils answer scientific questions about the world around them.

- To develop questions and enquiring minds through a range of enjoyable and interesting investigations and experiments.

- To foster a positive attitude to science and increase pupils' understanding of how science is used in the wider world.

- To prepare children for life in an increasingly scientific and technological world today and in the future.

- To provide a range of relevant experiences allowing pupils to acquire knowledge, skills and understanding in all areas of science through a variety of teaching and learning strategies.

- To develop the accurate use of scientific vocabulary.

- To build on children's natural curiosity and developing a scientific approach to problems.

- To engender a sense of 'awe and wonder' and develop the skills required to investigate questions they have.

- Children test their thoughts and questions using practical experiences inside and outside the classroom.

- To enable children to develop their knowledge and skills to understand the natural and scientific world, and to link concepts that are taught within the classroom to the world around them.

Inclusion of All Children

We teach science to all children, whatever their ability and additional needs. We enable all children to make progress. We do this by setting suitable learning challenges; use of adaptive teaching strategies; using must, should and could differentiation in lesson planning and using peer and adult support. Pre-assessment, either as a whole class, in groups or individually, enables teachers to identify gaps within pupil knowledge, as well as misconceptions. These can then be address during class teacher and through recap activities.

Teaching and Learning Style

Science is taught through discrete lessons and in Science Week. It is linked to class topics and high quality texts, where possible, to create links and make learning more meaningful.

At Oughterside Foundation School, we use the National Curriculum and the EYFS Framework to plan science units. This teaching is supported through the use of the CUSP Curriculum Science Scheme and websites such as Exploify, Inspire Science, STEM and PSTT to help meet the needs of all children. Children are taught working scientifically skills and scientific knowledge alongside each other, with a focus for each within most lessons. Teacher's follow the whole school science overview to ensure coverage.

Wherever possible real life opportunities will be provided for the children to help them to increase their science capital and to maintain their enthusiasm for science. We want our pupils to value the role that science plays in their daily life and how they can use science to help them make decisions about their own lifestyle both now and in the future. We have a large outdoor area which teachers utilise to enhance their teaching.

There is also a wealth of science which can be observed and studied within our locality, such as wind farms, Mines such as Honister slate mine, nuclear energy sites such as Sellafield and factories such as Innovia (film) and Iggesund (paper mill). We also live in a rural location with the opportunity to visit farms to teach children first hand about where their food comes from, the nutritional value of food and the importance of a balanced diet. We are currently in the process of establishing these links to give more context to children and to increase their science capital.

The class teacher is responsible for weekly timetabling and lesson planning to ensure that the relevant science units are covered throughout the year. Topics are planned using long the Science Long Term Overview with a two year cycle. Teachers also refer to medium term plans which link the objectives of the topic which is being taught. This ensures coverage of the full science curriculum within the mixed year classes.

Teachers will use a balance of:

- Teacher-prepared materials
- Website such as Explorify and STEM
- Inspiring Science and Science Guru documents
- Published resources
- A balance of scientific enquiries (observations over time, sorting and classifying, pattern seeking, research and fair testing).
- Visitors, e.g. parents, experts etc.
- Educational visits
- Relevant homework tasks

The outdoor environment will be used as much as possible throughout the year.

Investigations

Exploring and investigating is an integral part of the science curriculum. Children have the opportunity to carry out a variety investigations throughout the year. By the end of KS2, children should be more independent in planning and carrying out their own investigations, dependent on ability.

Children will be taught the skills of:

- Raising questions
- Planning investigations
- Predicting
- Formulating hypotheses
- Problem solving
- Evaluating
- Estimating
- Measuring accurately
- Communicating scientific ideas in a range of ways
- Collecting data
- Fair or comparative testing
- Drawing conclusions

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Early Years Foundation Stage

Children in the EYFS (Reception) will be taught Science through the specific area 'Understanding the World: The World' and 'Characteristics of Effective Learning' from the EYFS Framework.

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Throughout the year, children will work towards achieving the Early Learning Goal (the world). Science is taught through a combination of general daily activities, exploration and planned activities. The EYFS framework is used to plan activities.

Understanding the World ELG Children at the expected level of development will:

• 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.

These documents are taken from Development Matters EYFS Guidence, September 2023 (Understanding of the world). A link to the full document is on the school website.

3 and 4-year-olds will be learning to:	Examples of how to support this:
Show interest in different occupations.	Invite different people to visit from a range of occupations, such as a plumber, a farmer, a vet, a member of the emergency services or an author. Plan and introduce new vocabulary related to the occupation and encourage children to use it in their speech and play. Consider opportunities to challenge gender and other stereotypes.
Explore how things work.	Provide mechanical equipment for children to play with and investigate. Suggestions: wind-up toys, pulleys, sets of cogs with pegs and boards.
Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things.	Show and explain the concepts of growth, change and decay with natural materials. Suggestions: • plant seeds and bulbs so children observe growth and decay over time • observe an apple core going brown and mouldy over time • help children to care for animals and take part in first-hand scientific explorations of an-imal life cycles, such as caterpillars or chick eggs. Plan and introduce new vocabulary related to the exploration. Encourage children to use it in their dis-cussions, as they care for living things. Encourage children to refer to books, wall displays and online resources. This will support their investigations and extend their knowledge and ways of thinking.

3 and 4-year-olds will be learning to:	Examples of how to support this:
Explore and talk about different forces they can feel.	Draw children's attention to forces. Suggestions: • how the water pushes up when they try to push a plastic boat under it • how they can stretch elastic, snap a twig, but cannot bend a metal rod • magnetic attraction and repulsion Plan and introduce new vocabulary related to the exploration and encourage children to use it.
Talk about the differences between materials and changes they notice.	Provide children with opportunities to change materials from one state to another. Suggestions: • cooking – combining different ingredients, and then cooling or heating (cooking) them • melting – leave ice cubes out in the sun, see what happens when you shake salt onto them (children should not touch to avoid danger of frostbite) Explore how different materials sink and float. Explore how you can shine light through some materials, but not others. Investigate shadows. Plan and introduce new vocabulary related to the exploration and encourage children to use it.

Children in reception will be learning to:	Examples of how to support this:
Understand the effect of changing seasons on the natural world around them.	Guide children's understanding by draw children's attention to the weather and seasonal features. Provide opportunities for children to note and record the weather. Select texts to share with the children about the changing seasons. Throughout the year, take children outside to observe the natural world and encourage children to observe how animals behave differently as the seasons change. Look for children incorporating their understanding of the seasons and weather in their play.

Key Stage One (Winderemere Class)

In Windermere Class, children build upon knowledge and skills from the EYFS. Children will become familiar with the different types of scientific enquiry.

Working scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

These skills will be taught alongside the KS1 Science Programs of study which are:

- **Plants (Y1/Y2)**
- **Animals including Humans (Y1/Y2)**
- **Everyday Materials (Y1)**
- **Seasonal Changes (Y1)**
- **Living things and their habitats (Y2)**

Key Stage Two

In Key Stage 2, children will again build on previous learning and will be introduce to some new learning: light, rocks, electricity, forces and magnets, sound and Earth and space.

Children will be becoming more independent planning their own lines of enquiry and selecting their own equipment. Teaching will provide children with a safe environment to explore scientific questions that they may have.

Wherever possible real life opportunities will be provided for the children to help them to increase their science capital and to maintain their enthusiasm for science.

Lower KS2 (Crummock Class)

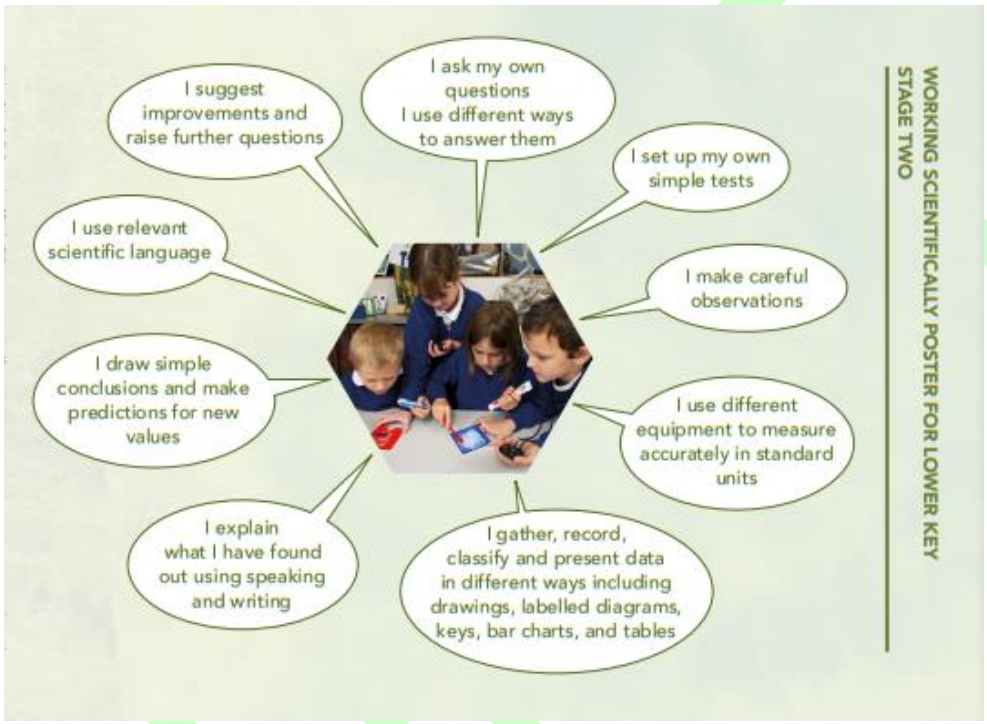
Working scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

These skills will be taught alongside the KS1 Science Programs of study which are:

- Plants (Y3)
- Animals including Humans (Y3)
- Rocks (Y3)
- Forces and Magnets (Y3)
- Light (Y3)
- Living Things and their habitats (Y4)
- States of Matter (Y4)
- Sound (Y4)
- Electricity (Y4)



Upper KS2 (Derwent Water Class)

Working scientifically

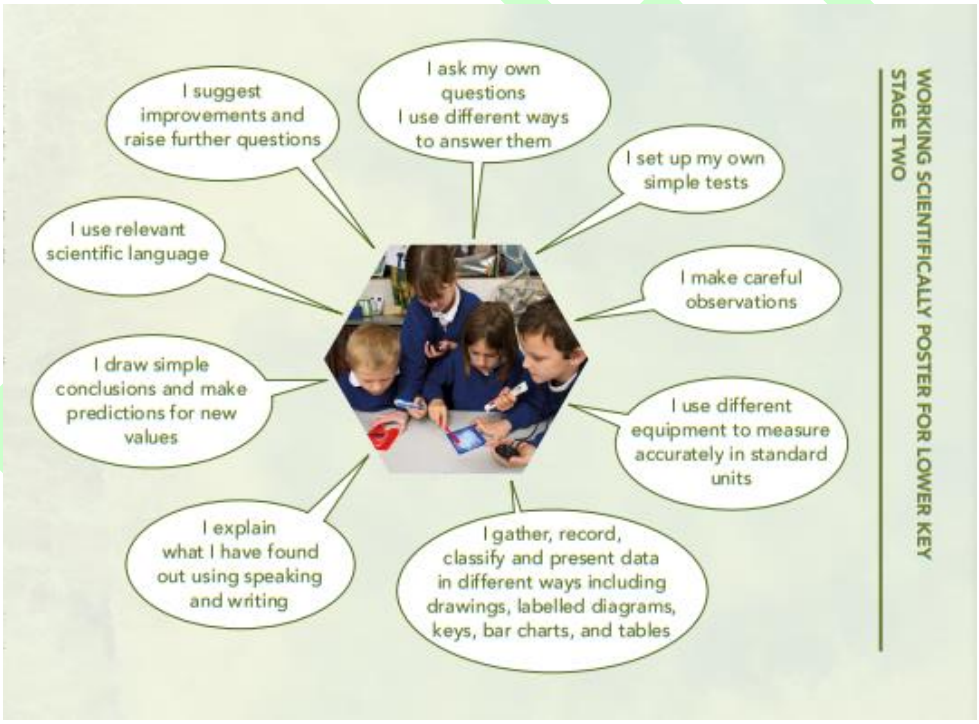
During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

<u>These skills will be taught alongside the KS1 Science Programs of study which are:</u>

- Living Things and their habitats (Y5 and Y6)
- Animals including humans (Y5 and Y6)
- Properties and changes in materials (Y5)
- Earth and Space (Y5)
- Forces (Y5)
- Evolution and Inheritance (Y6)
- Light (Y6)
- Electricity (Y6)



<u>Forest School</u>

Our forest school sessions are also used as a means to review the teaching within science through questioning during activities. The children are encouraged to use and apply their scientific knowledge to understand what they observe in the world around them. For example when making fires children will discuss why a fire can be extinguished, use their knowledge of habitats to create bug hotels and their knowledge of materials when building dens.

CDEC – Place Project

Oughterside Foundation School is a member of CDEC (Cumbria Development Education Center). CDEC helps to support science by looking at how science is helping to shape and create a sustainable future. This links with experiments within KS2 where children will use starch from potatoes to create a plastic like material. Our work with CDEC helps to give the children a purpose for this and also helps pupils to identify the role science has with formulating change for a better future.

Health and Safety

Teachers will carry out risk assessments when required for science lessons – hazards, risk and control. Risk assessments will be shared with Mrs Kirkbride and will be annotated on planning.

All teachers will:

- use the 'Be Safe' document from The Association for Science Education to risk assess (copies emailed out, the document is also placed on the inside of the science store door).
- Letters or messages will be sent to parents/guardians when children may come into contact with living things, substances or materials that may cause irritation – flowers, salt, vinegar, lemon juice.
- be aware of any allergies the children may have – eggs, pollen, animals. Pupils will be taught to use scientific equipment safely.
- discuss health and safety with children.
- check equipment regularly and report any damage, taking defective equipment out of action.

Assessment, Recording and Reporting

EYFS

Assessment of children's understanding and knowledge is achieved through observations and discussions. Evidence towards children meeting their Early Learning Goal for Understanding of the World is collected via the child's Tapestry profile using photographs and observational notes. Progress towards their ELG is regularly reviewed and next steps are identified. Statutory assessments are made at the end of EYFS.

The Natural World ELG Children at the expected level of development will:

• 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.

KS1 and KS2

Before each unit is taught, children answer a series of questions based on the unit. This will show the knowledge children have prior to the unit being taught and any misconceptions they have. The teachers use this knowledge to plan and adapt lessons to meet the needs of the pupils. These are put into pupil files and completed again as the unit is being taught or at the end of the unit. Children can then identify their progress.

These assessments, alongside teacher observations within practical lessons, are used to inform data which teachers input to scholar pack**.** Children are assessed against their scientific key learning each half term (National Curriculum Programmes of Study) and against the working scientifically objectives**.** These documents are used to identify any knowledge and working scientifically objectives that needs further teaching.

Data is reviewed by the Science lead, who monitors and tracks progress throughout school. Parents are informed of progress during meetings and end of year reports.

Resources

Resources for science are kept in a central store which is accessible for teachers at all times.

Visits and workshops within school will also be organised throughout the year to support the teaching of science, many of these are supported through Sellafield. Pupils in Y4/5/6 attend the annual science show in Autumn term lead by the National Science Museum in London.

Monitoring, Evaluation and Review

The school will continually assess the implementation and effectiveness of this policy. The science lead continually monitors teaching through pupil conversations, learning walks, book observations and conversations with staff, as well as analysing data providing on Scholarpack.

Staff skills are continually updated and improved through internal and external training.