

Oak Tree Federation



‘Inspiring learning for life’

Science Policy

Policy date 4th September 2022 – Reviewed 19th January 2023

Next review in 2024

Aims and objectives - linked to the National Curriculum 2014

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 is 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.

Aims

The national curriculum for science aims to ensure that all pupils:

- 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
- Are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.

Whole School Science Overview

Intent: We intend to build on children's understanding of the world at the end of Reception by extending their knowledge of biology, physics and chemistry through key stages one and 2 to enable pupils to be ready for science at secondary school. Pupils will be taught essential aspects of the knowledge, methods, processes and uses of science and key scientists from the past. Through building up a body of key foundational knowledge and concepts, pupils will be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. They will develop understanding through different types of science enquiries that help them to answer scientific questions about the world around them.

The programmes of study describe a sequence of knowledge and concepts. It is important that pupils make progress but the focus is also important to develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Pupils will be familiar with, and use, technical terminology accurately and precisely.

Investigations

It is essential that children experience and understand the full cycle of experimental science. Specific skill elements of investigations are to be covered discretely across the curriculum however all children should have the opportunity to work through the full process at least once a term this could be as part of the lessons mapped out or as a distinct separate block. The investigation should link closely with the lesson plans.

Working scientifically

We recognise that it is important our pupils are taught a variety of approaches to answer relevant scientific questions. Over the course of seven years, pupils will develop greater understanding of how to working scientifically. These types of scientific enquiry should include:

- observing over time
- pattern seeking
- identifying, classifying and grouping
- comparative and fair testing (controlled investigations)
- Researching using secondary sources. (Pupils should seek answers to questions through collecting, analysing and presenting data.)

Inclusion

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;
- setting tasks of increasing difficulty (we do not expect all children to complete all tasks);
- grouping children as mixed ability, and setting the same task for all to access using different resources and levels of support;
- providing resources of different complexity, matched to the ability of the child;
- where possible using classroom assistants to support the work of individual children or groups of children.

At our schools, 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 pupils with special educational needs, those with disabilities, those with special gifts and talents, and those learning English as an additional language, and we take all reasonable steps to achieve this.

Foundation Stage

Science in EYFS is taught through the strand of, 'Understanding the World' from the 'Development Matters' 2021, and follows the guidance from The Statutory Framework for the EYFS, 2021. In Reception, pupils explore science through continuous and structured provision. They use their senses, observe the world around them and are exposed to a rich scientific vocabulary by staff.

Teachers and teaching assistants support pupils to develop a solid understanding of things occurring around them in their day-to-day lives. Children are encouraged to be creative and inquisitive as they participate in activities both indoors and outdoors. Pupils are encouraged to use their natural curiosity, while taking part in exploratory play in specific scientific areas as well as areas that link across the EYFS framework. Reception children also will develop Communication and Language skills via observations, explanations, predictions and questions.

Science curriculum planning

Children have weekly lessons in Science throughout KS1 and KS2, using programmes of study written by Andrew Berry (Science Adviser) and a variety of hands on resources. In Early Years, Science is taught through the children learning about the world around them in their learning through play.

Our principal aim is to develop children's knowledge and understanding of the methods and implications of science. We encourage the children to ask, as well as answer, scientific questions. We use whole class teaching and group or individual tasks, in which children have the opportunity to engage in practical activities to develop their understanding of the nature and processes of science through a range of different types of scientific enquiries. The children are provided with opportunities to work scientifically using approaches to answer scientific questions.

We want our children to develop excitement and curiosity about how science can explain the world around them and could be used in the future. We want our children to build up and use technical terminology/ specialist vocabulary. We want our children to apply their mathematical knowledge such as the opportunity to use a variety of data. 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 pupils in real scientific activities. Discussion is used to gauge and address any misconceptions the children may have.

Science is a core subject in the National Curriculum. The programmes of study for science are set out year-by-year for key stages 1 and 2. Schools are, however, only required to teach the relevant programme of study by the end of the key stage. All schools are also required to set out their school curriculum for science on a year-by-year basis and make this information available online (See appendix 1 for our school's year-by-year curriculum).

Planning in our school. Teachers work in teams across the federation; EYFS and key stage 1 (Rec/Y1/2), lower key stage 2 (Y3/4) and an upper key stage two (Y5/6) department.

These teams work together to ensure coverage and follow a long-term plan. As we have mixed-age classes, we organise and teach our medium-term planning on a two-year rotation cycle. In this way, we ensure coverage of the National Curriculum, without repeating topics. The focus is to cover the key objectives for their upper or lower key stage and link the science to our federation's four year cycle of themes and, where appropriate, attribute.

The contribution of science to teaching in other curriculum areas:

- Children are expected to use their English skills; reading, writing and speaking and listening during science lessons. Children record their work in topic books and activities such as writing hold the same expectations across the curriculum.
- Maths skills should be applied in science lessons wherever possible. This can take place in a number of ways such as: When the children use measures; using and applying number; through working on investigations they learn to estimate and predict, record and analyse results.
- Personal, social and health education (PSHE) and citizenship. Science makes a contribution to the teaching of PSHE. For example, teaching the children about keeping healthy and staying safe.
- The schools values, Resilience, Collaboration, Imagination, Curiosity and Discipline at Laughton and Aspiration, Perseverance, Working together, Respect, Forgiveness and Kindness at Firle, can be fulfilled through teaching science in a way that creates curious and excited children who can apply their knowledge when answering scientific questions.
- Where possible links to science should be made in other areas of the curriculum not mentioned above.

Assessment

Will be carried out in accordance with the school's assessment policy.

Teachers assess children's initial knowledge when starting the unit (pre-assessment grid) and then go back and complete the same assessment at the end of the unit in their respective school's editing pens. This shows a clear assessment of what objectives a child has embedded and the progress made. Teachers formatively assess the children's conceptual knowledge via weekly lessons by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it using the 'triangle' system, and uses this assessment to plan for future learning. Written or verbal feedback is given to the child to help guide their progress. Scientific skills are woven through certain lessons, and teachers narrow down the specific skills that they will be focusing on and assessing in those lessons. This allows for more accurate formative assessment of scientific skills, especially in practical work. Along with teacher judgement, the children's STEM books are used to inform staff of the children's achievements within the subject.

Each unit of learning ends with a class 'Year * Vs Year *' quiz which assesses the children's retention of the conceptual knowledge. This is used as an opportunity to address any misconceptions or gaps in learning before ending the unit. At the end of each unit, teachers will use these assessments to inform and complete class assessments for that unit. These are stored in the Science Staff Drive where the science lead, SLT and governors can access data.

In EYFS, science is assessed and evidenced using the children's Learning Journeys, which include a range of evidence, such as post-it note observations, longer observational notes and photographs.

The science subject leader may keep samples of children's work in a portfolio, and then use these to demonstrate the expected level of achievement in science.

Monitoring of the subject may be carried out by the senior leadership team or the science co-ordinator.

The Science co-ordinator for EYFS, KSI&2 is E. Everest, the co-ordinator folder is located in the Y3/4 High Peaks classroom at Laughton CP School.

Resources

At Laughton the science resources are kept in the resource room in the yellow trays and the library contains a supply of science topic books. At Firle, they are kept in the long cupboard in the main corridor. As the new curriculum is covered, new resources will be purchased in order to aid the teaching of the subjects. Resources are also shared across the schools.

This policy will be reviewed at least every two years.

Signed:

Date:

Science Long Term Plan Cycle A

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|--|---|--|--|---|---------------------------|
| EYFS | <p>Ourselves/All about Me- senses and our bodies, looking after our bodies, <i>ELG: Make observations of animals and plants, explain why some things occur, and talk about.</i></p> <p>How our world changes during the seasons, animals and plants/trees. <i>*Explore the natural world around them. *Understand the effect of changing seasons on the natural world around them.</i></p> | | <p>Our World: Animals/plants that live in different habitats around the world and making comparisons between locations. <i>*Experiments- waterproof materials, keeping warm, melting and heating etc. ELG: Pupils know about similarities and differences in relation to places, objects, materials and living things.</i></p> <p><i>*Observe change and patterns in seasons and weather. *Understand the effect of changing seasons on the natural world around them.</i></p> | | <p>Growth and Change: Observing the growth of plants and animals (caterpillars/tadpoles). <i>*Planting. *Looking after our local area. *Living things, growing plants. *Life cycles of animals. *Looking after our planet- recycling.</i></p> <p><i>*Explore the natural world around them. *Understand the effect of changing seasons on the natural world around them. *Describe what they see, hear and feel whilst outside.</i></p> | |
| <p>Seasons – 2/3 lessons per term – link into Welly Walks <i>ELG: Pupils talk about the features of their own immediate environment and how environments might vary from one another.</i></p> | | | | | | |
| Years 1 and 2 | <u>Seasonal Changes – Year 1</u> | <u>Animals, including Humans – Year 1</u> | <u>Uses of Everyday Materials – Year 2</u> | <u>Plants – Year 1</u> | <u>Plants – Year 2</u> | <u>Scientific Enquiry</u> |
| Sorting and Classifying | <p>Seasonal Changes – Year 1 -Observe changes across the four seasons – Welly Walks →</p> | | | | | |
| Years 3 and 4 | <u>States of Matter – Year 4</u> | <u>Rocks and soils – Year 3</u> | <u>Rocks and soils – Year 3</u> | <u>Living things and their habitats – Y4</u> | <u>Electricity – Year 4</u> | <u>Scientific Enquiry</u> |
| Fair Tests | | | | | | |
| Years 5 and 6 | <u>Properties and changes of materials – Year 5</u> | <u>Electricity – Year 6</u> | <u>Forces – Year 5</u> | <u>Living things and their Habitats – Year 5</u> | <u>Animals inc Humans – Year 6</u> | <u>Scientific enquiry</u> |
| Variables | | | | | | |

Science Long Term Plan Cycle B

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|--|--|---|--|--|------------------------------------|
| EYFS | <p>Ourselves/All about Me- senses and our bodies, looking after our bodies, <i>ELG: Make observations of animals and plants, explain why some things occur, and talk about.</i></p> <p><i>How our world changes during the seasons, animals and plants/trees.</i> <i>*Explore the natural world around them.</i> <i>*Understand the effect of changing seasons on the natural world around them.</i></p> | | <p>Our World: Animals/plants that live in different habitats around the world and making comparisons between locations. <i>*Experiments- waterproof materials, keeping warm, melting and heating etc.</i> <i>ELG: Pupils know about similarities and differences in relation to places, objects, materials and living things.</i></p> <p><i>*Observe change and patterns in seasons and weather. *Understand the effect of changing seasons on the natural world around them.</i></p> | | <p>Growth and Change: Observing the growth of plants and animals (caterpillars/tadpoles). <i>*Planting. *Looking after our local area.</i> <i>*Living things, growing plants. *Life cycles of animals. *Looking after our planet- recycling.</i></p> <p><i>*Explore the natural world around them.</i> <i>*Understand the effect of changing seasons on the natural world around them.</i> <i>*Describe what they see, hear and feel whilst outside.</i></p> | |
| | <p>Seasons – 2/3 lessons per term – link into Welly Walks <i>ELG: Pupils talk about the features of their own immediate environment and how environments might vary from one another.</i></p> | | | | | |
| Years 1 and 2 Asking questions and making simple tests to answer them | <u>Animals including Humans (human body focus)– Year 2</u> | <u>Living things and their habitats – Year 2</u> | <u>Everyday Materials – Year 1</u> | <u>Living things and their habitats – Year 2</u> | <u>Animals including Humans (animal focus, comparing to humans) – Year 1</u> | Scientific Enquiry - |
| | <p>Seasonal Changes – Observe changes across 4 seasons – Welly Walks – Y1 Plants – Year 2 (continued)</p> | | | | | |
| Years 3 and 4 Predict, Test and Measure | <u>Animals inc Humans – Year 3</u> | <u>Light – Year 3</u> | <u>Sound – Year 4</u> | <u>Forces and Magnets – Year 3</u> | <u>Plants – Year 3</u> | <u>Animals inc Humans – Year 4</u> |
| Years 5 and 6 Identifying, controlling and testing variables | <u>Animals inc Humans – Year 5</u> | <u>Light – Year 6</u> | <u>Earth and Space – Y5</u> | <u>Evolution and Inheritance – Year 6</u> | <u>Living things and their habitats – Year 6</u> | Scientific enquiry |