



Science at Oxenhope C of E Primary School

We provide the rich soil allowing children to flourish and develop deep roots. We nurture **growth**, enabling children and adults to thrive as our Christian values blossom in their lives. We cultivate a sense of pride in our rural **community** where children and adults are **loved** and valued.

May our children flourish in their youth like well-nurtured plants. Psalm 144 v 12.

Throughout our curriculum and school life, along with our school vision, these three golden strands permeate through everything we do.

Community

Jesus often spoke of unity in our communities and encouraging one another on our journey. He spoke of bearing each other's burdens in love and helping those in need.

'Live in harmony with one another.' Romans 12 v 16



Love

It says in the Bible that God is Love and encompasses all that is loving and good. Jesus showed the ultimate unconditional love when he laid down his life for us on the cross. Therefore, this love should lead to a desire to love other people.

'Live a life filled with love, following the example of Christ. He loved us and offered himself as a sacrifice for us.' Ephesians 5 v 2



Growth

Just like a plant, we must endure the difficult times along with the good; but God has sent us his Holy Spirit to help and strengthen us so we can bear fruit and grow in the likeness of Christ.

'Grown in the grace and knowledge of our Lord and Saviour Jesus Christ.' 2 Peter 3 v 18



Science at Oxenhope

Intent:

We recognise the importance of science in every aspect of daily life. As one of the core subjects, we give the teaching of science the prominence it requires. We aim to equip pupils with knowledge, skills and understanding and to encourage children to be inquisitive throughout their time at Oxenhope. We will provide opportunity for the children to engage in scientific enquiry so that they can apply their knowledge of science when using equipment, building arguments and explaining concepts confidently. We will encourage them to explore, question and to be curious and excited about the world around them.

What is a scientist?

A scientist tries to understand the physical and natural processes of our world and beyond, through making observations, asking questions and proving or disproving theories.

Implementation:

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils can achieve high standards in science. Our whole school approach to the teaching and learning of science involves the following:

- Science is taught in planned and arranged in topic blocks to have a project-based approach. This is a strategy to enable the achievement of a greater depth of knowledge.
- We introduce our children to a variety of scientists over their time at Oxenhope.
- Each new unit of work begins with a recap of the previous related knowledge from previous years. This helps children to retrieve what they have learnt in the earlier sequence of the programme of study and ensures that new knowledge is taught in the context of previous learning to promote a shift in long term memory.
- Key vocabulary for the new topic is also introduced and teachers provide definitions and accompanying visuals for each word to ensure accessibility to all. This approach also means that children can understand the new vocabulary when it is used in teaching and learning activities and apply it themselves when they approach their work.
- We are further developing a phase of progressive questioning which extends to and promotes the higher order thinking of all learners. Questions initially focus on the recall or retrieval of knowledge. Questions then extend to promote application of the knowledge in a new situation and are designed to promote analytical thinking, such as examining something specific.
- Through our planning, we involve problem solving opportunities that allow children to apply their knowledge and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up. Tasks are selected and designed to provide appropriate challenge to all learners, in line with the school's commitment to inclusion.
- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure that skills are systematically developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in keeping with the topics.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.
- We are developing our school offer of visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.

- At the end of each topic, key knowledge is reviewed by the children and rigorously checked by the teacher and consolidated as necessary.
- We are developing giving our science lessons placement in the wider world allow children to feel their learning has a purpose.

Impact

The successful approach at Oxenhope results in a fun, engaging, high-quality science education that provides children with the foundations, knowledge and skills for understanding the world. Our engagement with the local environment ensures that children learn through varied and first-hand experiences of the world around them.

All children will have:

- A wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills.
- A richer vocabulary which will enable to articulate their understanding of taught concepts.
- High aspirations, which will see them through to further study, work and a successful adult life.

Science Long Term Plan

	Term 1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
Rec	<ul style="list-style-type: none"> • Know basic care for plants e.g. watering • Understand the need for care and respect towards animals • Identify a healthy snack • Know that brushing teeth is important • Talks in detail about features of own and immediate environment • Make observations about the environment in Autumn and Winter • Know the weather associated with Autumn and Winter • Understand the process of freezing and melting • Make observations of different materials and identify their properties 		<ul style="list-style-type: none"> • Understand the basics of what a plant needs to grow: water, soil and sunlight • Understand simple life cycles – plant • Understand how animals are adapted to live in different places e.g. polar bear • Understand simple life cycles – animal • Know that exercise is healthy • Know that it is important to have good health and a healthy diet • Know how to keep teeth healthy and why it is important • Identify the habitat of some animals • Know about similarities and differences in relation to living things • Make observations about the environment in Spring and Summer • Know the weather associated with Spring and Summer • Identify which materials float • Know that materials have certain uses depending on their properties 		<ul style="list-style-type: none"> • Make observations of plants • Identify different parts of a plant including roots, stem, leaves and flower • Make observations of animals and explain why somethings occur • Understand how we can maintain a healthy lifestyle; exercise, healthy eating and dental care • Begin to understand the effect of exercise on the human • Talks about features of own and immediate environment and how environments vary from one another • Know that the environment and living things are influenced by human activity • Identify and compare the 4 seasons and weather associated with seasons • Know about similarities and differences in relation to materials • Understand why some materials float and sink with support • Caterpillars 	

Yr 1	Animals including humans	Everyday materials / seasonal changes.	Animals, including humans	PAUL HUDSON Seasonal changes	Plants	Seasonal changes
Yr 2	Living things and their habitats	Living Things and their habitat	Use of everyday materials	William Gericke Plants	Uses of everyday materials	Animals including humans
Yr 3	Archimedes Forces and magnets	Plants	Thomas Edison Light	Mary Leakey Rocks	Animals including humans	Plants
Yr 4	Sir Alexander Graham Bell Sound	Marie Currie States of Matter	Animals including humans	Animals including humans	Carl Linnaeus Rachel Carson Living things and their habitats	Ada Lovelace Alan Turing Electricity
Yr 5	Pesticides - David Bellamy Living things and their habitats	Helen Sharman Stephen Hawking Earth and Space	Animals including humans	Sir Isaac Newton Forces	Daniel Fahrenheit Properties and changes of material	David Attenborough Living things and their habitats
Yr 6	Dr Daniel Hale Williams Marie Maynard Daly Animals including humans	Charles Darwin Jane Goodall Evolution and inheritance	Alexander Fleming - micro-organisms Living things and their habitats	Einstein Light		Shirley Ann Jackson Gladys West (GPS) Electricity

Progression of skills

Comparative / fair testing

Changing one variable to see its effect on another, whilst keeping all others the same.



Research

Using secondary sources of information to answer scientific questions.



Observation over time

Observing changes that occur over a period of time ranging from minutes to months.



Pattern-seeking

Identifying patterns and looking for relationships in enquiries where variables are difficult to control.



Identifying, grouping and classifying

Making observations to name, sort and organise items.



Problem-solving

Applying prior scientific knowledge to find answers to problems.



Year 1

Year 2

Year 3

Year 4

Year 5

Year 6



Taken from Primary Science Teaching Trust
©Primary Science Teaching Trust 2019

Comparative/Fair Testing

<p>Perform simple tests</p> <p>Use simple equipment</p> <p>Ask science questions</p> <p>Test out ideas with help</p> <p>Talk about what might happen and what they found out</p>	<p>Perform simple comparative and fair tests</p> <p>Measure using non-standard, then standard units</p> <p>Plan a simple fair test, with help</p> <p>Test out their own/someone else's ideas</p> <p>Explain why (in a simple way)</p> <p>Talk about what might happen and compare it to what did happen</p>	<p>Set up simple practical enquiries, comparative and fair tests</p> <p>Ask scientific questions and use information/collect data to answer them</p> <p>Predict what might happen and begin to explain why using everyday ideas</p> <p>Test out their own/someone else's ideas</p> <p>Plan a fair test with help</p>	<p>Set up simple practical enquiries, comparative and fair tests</p> <p>Collect evidence/find information to test out an idea/prediction or answer a question</p> <p>Predict what might happen and begin to explain why using everyday ideas and scientific facts/ideas</p> <p>Select equipment, with help</p> <p>Plan ways to test out their own/someone else's ideas</p> <p>Set up a fair test and explain why it is important to do so</p>	<p>Set up simple practical enquiries, comparative and fair tests</p> <p>Set up an investigation when it is appropriate - set up an enquiry based Investigation</p> <p>Know what variables are in a given enquiry</p> <p>Make predictions and explain why</p> <p>Plan how to collect evidence/information/data to test out an idea/prediction or answer a question</p> <p>Select the most suitable equipment for the task</p> <p>Plan ways to test out their own/someone else's ideas</p> <p>Explain what the evidence shows and whether it supports any predictions</p> <p>Begin to identify scientific evidence that has been used to support or refute ideas or arguments</p>	<p>Know which type of investigation is needed to suit a particular scientific enquiry</p> <p>Set up a fair test when needed</p> <p>Know how to set up an enquiry based investigation</p> <p>Know what variables are in a given enquiry</p> <p>Make predictions based on scientific facts and ideas</p> <p>Select the most suitable equipment for the task</p> <p>Plan ways to test out their own/someone else's ideas</p> <p>Independently set up and carry out fair tests</p> <p>Explain what the evidence shows and whether it supports any predictions</p> <p>Identify scientific evidence that has been used to support or refute ideas or arguments</p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6



Research

Ask simple questions and recognise that they can be answered in different ways

Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum

Ask relevant questions and use different types of scientific enquiries to answer them

Use research to find out a range of things

Ask relevant questions and use different types of scientific enquiries to answer them

Collect evidence/find information to test out an idea/prediction or answer a question

Find things out using a wide range of secondary sources of information

Plan how to collect evidence/information/data to test out an idea/prediction or answer a question

Find things out using a wide range of secondary sources of information

Collect evidence/information/data to test out an idea/prediction or answer a question from a wide range of sources



Taken from Primary Science Teaching Trust
©Primary Science Teaching Trust 2019

Observation over time

Observe, describe, and compare using simple science words

Use their own senses to describe

Talk about what they have found out and how they found out

Observe closely with support and scaffolding, using simple equipment.

Observe, describe, and compare using science words

Sort and order observations

Observe closely, using simple equipment.

Observe, describe, and compare using Key Stage 2 scientific vocabulary

Group and order observations giving scientific reasons

Form decisions about what observations to make and how long to make them for

Write about what has been found out

Observe, describe, and compare using Key Stage 2 scientific vocabulary

Group and order observations giving scientific reasons

Form decisions about what observations to make and how long to make them for

Write about what has been found out

Help to make decisions about the type of simple equipment that might be used.

Observe, describe, and compare in careful detail

Write about what has been found out

Help to make decisions about the type of simple equipment that might be used.

Make decisions about what observations to make, what measurements to use, and how long make them for

Observe, describe, and compare in careful detail using the correct language

Write about what has been found out

Help to make decisions about the type of simple equipment that might be used.

Make decisions about what observations to make, what measurements to use, and how long make them for

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6



Taken from Primary Science Teaching Trust
©Primary Science Teaching Trust 2019

Pattern Seeking

With help, record in a range of ways and begin to use simple scientific language.

Write and draw about science

Observe, describe, and compare using science words
Explain why (in a simple way)

Talk, write and draw about science

Explain observations/results using cause and effect and scientific facts and ideas

Explain what the evidence shows and whether it supports any predictions

Identify and explain simple trends and patterns in results

Explain observations/results using cause and effect and scientific facts and ideas

Explain what the evidence shows and whether it supports any predictions

Identify and explain simple trends and patterns in results

Explain observations/results using cause and effects and scientific facts and ideas

Explain what the evidence shows and whether it supports any predictions

Begin to identify scientific evidence that has been used to support or refute ideas or arguments

Interpret and predict from bar charts and line graphs

Explain observations/results using cause and effects and scientific facts and ideas

Explain what the evidence shows and whether it supports any predictions

Identify trends and patterns in data that do not fit and explain using scientific facts and ideas

Identify scientific evidence that has been used to support or refute ideas or arguments

Year 1

Year 2

Year 3

Year 4

Year 5

Year 6

Identifying, grouping, and classifying



Taken from Primary Science Teaching Trust
©Primary Science Teaching Trust 2019

Observe, describe, and compare using simple science words

Sort things

Observe, describe, and compare using science words

Sort and order observations

Identify, group, and classify according to a given criteria

Observe, describe, and compare using Key Stage 2 scientific vocabulary

Group and order observations giving scientific reasons

Group information according to common factors e.g., using Venn Diagrams/carol diagrams

Observe, describe, and compare using Key Stage 2 scientific vocabulary

Group and order observations giving scientific reasons

Group information according to common factors e.g., using Venn Diagrams/carol diagrams

Use and design simple keys

Observe, describe, and compare using Key Stage 2 scientific vocabulary

Group and order observations giving scientific reasons

Group information according to common factors e.g., using Venn Diagrams/carol diagrams

Use simple models to describe scientific ideas

Observe, describe, and compare using Key Stage 2 scientific vocabulary

Group and order observations giving scientific reasons

Group information according to common factors e.g., using Venn Diagrams/carol diagrams

Use and design classification keys

Problem solving and measuring



Taken from Primary Science Teaching Trust
©Primary Science Teaching Trust 2019

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>Use simple equipment</p> <p>Measure using non-standard units</p> <p>Write and draw about science</p> <p>Record on a simple table</p> <p>Make a simple written explanation about what has been learned from an investigation or what conclusions have been found.</p>	<p>Use simple equipment such as thermometers and rain gauges to observe closely changes over time</p> <p>Measure using non-standard, then standard units</p> <p>Record information on tables and bar charts</p> <p>Talk, write and draw about science</p> <p>Communicate ideas In a variety of ways e.g., simple written reports or write ups.</p>	<p>Measure in standard units</p> <p>Draw simple tables and bar charts to record their own observations/data</p> <p>Communicate findings in a variety of ways</p> <p>Talk about how to improve their own work</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p>	<p>Measure in standard units</p> <p>Select equipment, with help</p> <p>Draw tables and bar charts to record observations/data</p> <p>Communicate findings in a variety of ways</p> <p>Talk about how to improve their own work</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p>	<p>Measure precisely in standard units</p> <p>Select the most suitable equipment for the task</p> <p>Repeat observations and measurements</p> <p>Draw tables, bar charts and simple line graphs to record observations/data</p> <p>Select the most appropriate way to communicate findings, evaluating the evidence as well as describing it</p> <p>Talk about how to improve their own work giving reasons</p> <p>Report and present findings including conclusions/ causal relationships and explanations of degree of trust in results</p>	<p>Measure precisely in standard units</p> <p>Select the most suitable equipment for the task</p> <p>Decide when to repeat observations and measurements</p> <p>Choose the most appropriate way to record and present results</p> <p>Select the most appropriate way to communicate findings, evaluating the evidence as well as describing it.</p> <p>Report and present findings including conclusions/ causal relationships and explanations of degree of trust in results</p>