



Stukeley Meadows Primary School

Getting our best even better, every single day
Be Kind – Work Hard – Aim High



Science at Stukeley Meadows Primary School

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INTENT

At Stukeley Meadows Primary School we believe in learning to remember things worth remembering. We strive to engage our children in science that can help them to better understand the world around them and develop critical thinking and problem-solving skills. Children at Stukeley are supported with science through quality first teaching, a wide variety of resources, carefully planned activities, encouragement and the support needed for them to engage, understand and make progress with their learning. The curriculum has been designed to ensure the children leave year six with the knowledge and understanding of biology, physics and chemistry necessary to move successfully onto the key stage three science curriculum and beyond.

We encourage every child to use and see Science in real life contexts and make links between what has been taught and what can be applied in meaningful contexts to everyday life. The children are introduced to famous scientists of the past and those working today to make changes to all our lives for the better. The lessons are designed to provide inspiration and a sense of awe in an increasingly scientific and technological world. In addition to the weekly science lessons, opportunities are provided to develop the children's scientific capital as part of; British Science Week, Black History Month, online lessons, extra-curricular projects and reading material that supports the units of work as well as show-casing inclusive STEM role models. To make science meaningful and aid long-term memory, teachers find opportunities to apply Scientific skills across the curriculum, for example, using and collecting data, drawing graphs, considering health and the body in PE and PSHE, applying scientific knowledge to geographical learning, including scientific knowledge in writing, when appropriate, and even using art to develop critical thinking and observational skills with the aid of Explorify's 'Start with Art'.

At Stukeley, we are passionate about using regular retrieval practice to embed and master our knowledge across the curriculum. Therefore, children at Stukeley engage in regular retrieval of previously taught skills to ensure that common misconceptions and gaps in learning are addressed to aid the progression, not only in that year but also in the years that follow. A carefully planned learning journey of small steps is taken to ensure that all children can master concepts before moving on. There is coherent progression seen in planning within each unit to ensure learning is sequential and builds on previous knowledge, skills and vocabulary

Our Curriculum

White Rose Science

At Stukeley we follow a scheme of Science learning produced by *White Rose Education*. This is taught in every year group from Year 1 to Year 6. Learning with White Rose Science gives all children the opportunity to learn alongside the national curriculum guidelines in a fun, inclusive and age-appropriate way. White Rose Science materials are designed to support primary children as they have fun with science, exploring everything from the human body (biology), plants (biology) animals and habitats (biology), materials (chemistry), rocks (chemistry), forces (physics) states of matter (physics), electricity (physics) sound (physics), space (physics) reversible and irreversible changes (chemistry) and sustainability (biology).

White Rose Science resources are designed to instil a deeper understanding of scientific concepts using a full range of fun, inspiring classroom activities. Across the year, Science is taught in unit blocks, which are then divided up into a series of small learning steps. These steps are designed and scaffolded to support children with enhancing their knowledge and deepening their understanding and will cover all necessary curriculum content. Activities are suggested within the scheme of learning to extend those children who are working above age related expectations to develop a greater depth and breadth of understanding by applying their knowledge in other contexts to make connections. Another advantage of using the White Rose schemes for both maths and science is that the units are taught in line with the White Rose maths scheme, which ensures the mathematic skills support the scientific learning.

White Rose Science supports teaching for mastery.

“The science curriculum in bite-size pieces.

The key to the success of White Rose Science is our small steps approach. We break down the essential aspects of key stage science into easily digestible chunks.

Through experiment, practice and discussion, children gain core knowledge around:

- *Scientific vocabulary*
- *‘Working scientifically’ skills including systematic and careful observations and following practical scientific methods*
- *The gathering and interpretation of straightforward scientific evidence*
- *The use of everyday materials and scientific equipment to solve science problems*
- *Articulating scientific concepts and using five types of science enquiries*

We believe that children should be taught science in a way that helps nurture an understanding of the value of scientific skills. We think science should be engaging and inspiring. We’ve developed White Rose Science with those goals in mind.

Scientific Vocabulary (substantive knowledge)

Scientific vocabulary is a key focus in the teaching of Science at Stukeley. Teachers are provided with the tools they need to teach scientific vocabulary at each stage. The scheme of learning for each science unit ensures teachers have secure subject knowledge and use age-appropriate vocabulary. The vocabulary progression map gives teachers shows prior learning and next steps to avoid unnecessarily repeating teaching steps and ensuring enough time is devoted to the vocabulary for each specific year group and unit.

Scientific Skills (disciplinary knowledge)

This document details the techniques and skills that children will practice when learning the various science units. The assessment document is used alongside teacher assessment of written work, diagrams, retrieval quizzes and end of unit tests to determine an overall grade of Below, Working Toward, At ARE or Depth, for the science units taught each term. It also provides a whole school overview to guide science planning that ensures children leave primary school with the skills required for the secondary science curriculum.

What do Science lessons look like at Stukeley?

Most science lessons at Stukeley start with retrieval. Children will have 'Do Now' time at the start of each lesson, dedicated to retrieving knowledge and skills previously developed in order to foster fluency and efficiency. Retrieval is a crucial part of the lesson, as it is accessible and achievable for all children, which ensuring that common misconceptions and gaps in learning are addressed to the aid the progression of science mastery. It also provides some time for teachers to pick up on any children who missed the previous learning, either through absence or misconception. Occasionally, teachers may choose to begin a lesson with an Explorify activity which supports the children to think scientifically, by making links and explaining their reasoning. If this is the case a retrieval task will be planned in at some other point in the lesson.

The children are provided with a knowledge organiser at the start of each unit. Dual coding is used to reduce cognitive load and reduce difficult concepts into manageable chunks. The children look at the knowledge organiser, where they can see the previous small steps and they are provided with a learning focus for the lesson. These steps are added one at a time when each lesson is taught and displayed on the science board, alongside cloze procedure sentences as a helpful review tool.

The small step for the unit is then directly and explicitly taught to the children (I do). An opportunity is then given for the class to work alongside the teacher (we do). Then the children are given an independent task (you do). Depending on the unit and/or the step this may be written, practical, individual, paired or group work. The lesson is then completed by revisiting what has been learnt. An assessment opportunity (again this varies greatly depending on the task they have been set) will be completed by the teacher in collaboration with additional adults (if available). This model allows misconceptions and gaps to be picked up in the moment, or if they require more time, planned for the following session.

A planning format has been provided to all staff as guidance for what should be included. There is no expectation for them to complete the planning document but rather they should use it to ensure their planning (a combination of PowerPoint presentations and the scheme of learning) has taken into account all aspects of what makes a good science lesson.

Throughout the lesson children are given over the shoulder, instant feedback on their learning during the lesson to ensure that any errors or misconceptions are addressed as quickly as possible and supported where necessary. Teachers and additional adults will support all children to make progress, whether there be gaps in knowledge or opportunities for challenge and stretch.

The Long Term Overview

At Stukeley, we plan our science lessons using *White Rose Science* resources in years one to six. These are in line with the National Curriculum and DfE guidance. EYFS framework is organised across seven areas of learning. The most relevant statements for science are taken from the Communication and Language, Personal, Social and Emotional Development and Understanding the World. EYFS use play, outdoor learning, observation, questions and stories to develop the prerequisite skills required for the national curriculum science topics. Teachers are encouraged to use additional resources to supplement teaching and learning. This includes the Explorify website, STEM Learning website (which has resources from Hamilton, ESA, Teachers TV and many more), the Primary Science Teaching Trust, as well as reading about the life and work of influential scientists that link to each year group's science units. A carefully planned learning journey of small steps is taken to ensure that all children can master concepts before moving on. There is coherent progression seen in planning within each unit to ensure learning is sequential and builds on previous knowledge, skills and vocabulary.

EYFS

Children are exposed to scientific concepts and vocabulary through a range of materials, toys, play (free and structured), as well as through guided activities.

Stories are chosen that will help develop their understanding of the world around them and support their learning in science when they progress into year one.

A range of resources are strategically made available to support focused learning. Speaking and listening opportunities are designed to support all learners in the moment and ensure progression.



EYFS

Communication and language		<ul style="list-style-type: none"> • Learn new vocabulary • Ask questions to find out more and to check what <u>has been said</u> to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities and explain how things work and they <u>they</u> might happen. • Use <u>new</u> vocabulary in different contexts.
Personal, Social and Emotional Development		<ul style="list-style-type: none"> • Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - <u>toothbrushing</u> - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian
Understanding the World		<ul style="list-style-type: none"> • Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.
Communication and language	Listening, Attention and Understanding	<ul style="list-style-type: none"> • Make comments about what they have heard and ask questions to clarify their understanding.
Personal, Social and Emotional Development	Managing Self	<ul style="list-style-type: none"> • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
Understanding the World	The Natural World	<ul style="list-style-type: none"> • 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 <u>has been read</u> in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Year 1

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	<p>Biology</p> <h2>The human body</h2> <p>FREE TRIAL</p> <p>VIEW</p>					<p>Biology</p> <h3>Seasonal changes</h3> <p>VIEW</p>	<p>Chemistry</p> <h2>Materials</h2> <p>VIEW</p>					<p>Biology</p> <h3>Seasonal changes</h3> <p>VIEW</p>
Spring term	<p>Biology</p> <h3>Planting A</h3> <p>VIEW</p>	<p>Biology</p> <h2>Animals</h2> <p>VIEW</p>					<p>Sustainability</p> <h2>Caring for the planet</h2> <p>VIEW</p>	<p>Biology</p> <h3>Seasonal changes</h3> <p>VIEW</p>	<p>Biology</p> <h3>Planting B</h3> <p>VIEW</p>	<p>Consolidation</p>		
Summer term	<p>Biology</p> <h2>Plants</h2> <p>VIEW</p>					<p>Biology</p> <h3>Planting C</h3> <p>VIEW</p>	<p>Sustainability</p> <h2>Growing and cooking</h2> <p>VIEW</p>	<p>Biology</p> <h3>Seasonal changes</h3> <p>VIEW</p>	<p>Consolidation</p>			

Year 2

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	Biology Animals' needs for survival VIEW			Biology Humans VIEW		Chemistry Materials VIEW				Sustainability Plastic VIEW			
Spring term	Biology Plants (light and dark) FREE TRIAL VIEW			Biology Living things and their habitats VIEW						Biology Plants (Light and dark) VIEW		Consolidation	
Summer term	Biology Plants (bulbs and seeds) VIEW		Biology Growing up VIEW			Biology Bulbs and seeds VIEW	Biology Growing up VIEW	Sustainability Wildlife VIEW		Consolidation			



Year 3

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	
Autumn term	Biology Skeletons VIEW		Biology Movement VIEW		Biology Nutrition and diet VIEW		Sustainability Food waste VIEW		Chemistry Rocks VIEW		Consolidation		
Spring term	Chemistry Fossils FREE TRIAL VIEW		Chemistry Soils VIEW			Physics Light VIEW						Consolidation	
Summer term	Biology Plants A VIEW					Physics Forces VIEW		Physics Magnets VIEW		Biology Plants B VIEW	Sustainability Biodiversity VIEW		

Year 4

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	Biology Group and classify living things VIEW			Biology Data collection A VIEW	Chemistry States of matter VIEW							Consolidation
Spring term	Physics Sound FREE TRIAL VIEW				Biology Data collection B VIEW	Physics Electricity VIEW				Sustainability Energy VIEW	Consolidation	
Summer term	Biology Data collection C VIEW	Biology Habitats VIEW		Sustainability Deforestation VIEW	Biology The digestive system VIEW					Biology Food chains VIEW		

Year 5

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	<p>Physics</p> <hr/> <h2>Forces</h2> <p>VIEW</p>					<p>Physics</p> <hr/> <h2>Space</h2> <p>VIEW</p>					<p> Sustainability Global warming</p> <p>VIEW</p>	Consolidation
Spring term	<p>Chemistry</p> <hr/> <h2>Properties of materials</h2> <p>FREE TRIAL</p> <p>VIEW</p>			<p>Biology</p> <hr/> <h2>Animals including humans</h2> <p>VIEW</p>				<p>Biology</p> <hr/> <h2>Life cycles</h2> <p>VIEW</p>				
Summer term	<p>Biology</p> <hr/> <h2>Reproduction A</h2> <p>VIEW</p>		<p>Chemistry</p> <hr/> <h2>Reversible and irreversible changes</h2> <p>VIEW</p>			<p> Sustainability Plastic pollution</p> <p>VIEW</p>	<p>Biology</p> <hr/> <h2>Reproduction B</h2> <p>VIEW</p>		Consolidation			

Year 6

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn term	<p>Biology</p> <h2>Living things and their habitats</h2> <p>VIEW</p>					<p>Physics</p> <h2>Electricity</h2> <p>VIEW</p>					<p>Sustainability</p> <h2>Renewable energy</h2> <p>VIEW</p>	
Spring term	<p>Physics</p> <h2>Light</h2> <p>FREE TRIAL</p> <p>VIEW</p>				<p>Sustainability</p> <h2>Light pollution</h2> <p>VIEW</p>	<p>Biology</p> <h2>The circulatory system</h2> <p>VIEW</p>			<p>Biology</p> <h2>Diet, drugs and lifestyle</h2> <p>VIEW</p>			
Summer term	<p>Biology</p> <h2>Variation</h2> <p>VIEW</p>		<p>Biology</p> <h2>Adaptations</h2> <p>VIEW</p>			<p>Biology</p> <h2>Fossils</h2> <p>VIEW</p>		<p>Consolidation</p>	<h2>Themed projects</h2> <p>(Year 7 ready)</p> <p>VIEW</p>			

Helpful links and resources:

Curriculum:

Primary Science National Curriculum: [Science programmes of study](#)

DfE Guidance: [Statutory framework for the early years foundation stage for group and school providers \(publishing.service.gov.uk\)](#)

EYFS science curriculum guidance: [Play Observe & Ask - Primary Science Teaching Trust \(pstt.org.uk\)](#)

Apps and games to support learning:

[Science Fun at Home - Primary Science Teaching Trust \(pstt.org.uk\)](#)

[Home | WowScience - Science games and activities for kids](#)

[Fun online science games for kids - BBC Bitesize](#)

[Games and apps | Science Museum](#)

[Activities - Explorify](#)

[Science for kids | National Geographic Kids \(natgeokids.com\)](#)

[The Best FREE Science Apps for Kids \(science-sparks.com\)](#)