

Lanesfield Primary School



Science Policy 2023 - 2024

Reviewed date: September 2023

This policy was updated and reviewed by Teri-leann Roberts September 2023

Intent

At Lanesfield, we aim to give all children a strong understanding of the world around them whilst

acquiring specific skills and knowledge to help them think scientifically, gain understanding of scientific processes and the use of and implications of Science, today and for the future. We want our pupils to develop a love of learning that promotes enjoyment, challenge, creativity and purpose! Most importantly, we want every child to be instilled with the belief that anything is possible!

At Lanesfield, we understand that it is important for lessons to have a skills-based focus; therefore, scientific enquiry skills are embedded in each topic and developed throughout their time at school. This means, they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings. Another key aspect of our Science curriculum at Lanesfield is the implementation of the Cornerstone's approach to learning (Thinking Actively in Social Context) because we believe science encompasses the acquisition of knowledge, concepts and skills through communication. This model allows children to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory and develop their independence skills.

Aims

In accordance with the 2014 national curriculum for science, at Lanesfield we aim 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 skills required to understand the uses and implications of science, today and for the future.

Therefore, at Lanesfield, our Science curriculum is designed to allow each pupil to:

- Achieve the best possible standards and achievements, whatever their starting point.
- Have high levels of engagement, enjoyment and personal development in Science.
- Access a rich, broad and wondrous science curriculum that allows high levels of personalisation that plays to their strengths.
- Connect and build on prior knowledge leading to progression and depth.
- Utilise technology to support in scientific studies.

Our Children's Charter



Our Children's Charter

- ✓ To feel confident and successful in their Science learning.
- ✓ Have the attitude that learning is 'hard' and mistakes are necessary for learning to happen.
- ✓ Have a voice and be able to choose how they wish to learn and think like a scientist, the resources and maths they feel are most appropriate.
- ✓ Understand that Science is relevant to everyday living and a lifelong skill, by solving problems that are set in a real life context.
- ✓ To develop critical thinking and the confidence to question ideas in order to deepen their understanding.
- ✓ To become interdependent as well as independent learners.
- ✓ To become metacognitive learners, understanding their own abilities, what they need to do that will enable them to develop their abilities and the skill to review their learning accurately.

Implementation

Science is taught each week throughout the school by class teachers. As we want teachers to feel inspired in their planning, at Lanesfield we do not follow a specific scheme of work. However, we do incorporate Cornerstone TASCs within our planning to inspire our pupils, and ourselves, and encourage independent learning in social context. Careful consideration of specific TASCs, which cover units of study linked to the NC, have been implemented within the Medium term plan and supports teachers with their lesson planning. Our whole school approach to the teaching and learning of science involves the following:

- Science is taught, planned and arranged in topic blocks by the class teacher, to have an investigation-based approach. This is a strategy to enable the achievement of a greater depth of knowledge.
- Through teacher 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 within peer groups.
- Promoting enjoyment and enthusiasm for learning through real, first-hand and rich science experiences so that all children explore, question, predict, plan, carry out and make observations and conclusion about their scientific tests.
- Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify and address learning gaps.
- Our teachers have sound guidance and understanding of a progressive science curriculum and plan accordingly.
- As the children's knowledge and understanding increases, and 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.
- TASCs are incorporated into our science curriculum to support independent learning in social contexts. Children are encouraged to use their taught knowledge to: plan, conduct, complete and evaluate a scientific experiment within their group independently.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career.
- New, progressive vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the investigations.
- Developing an understanding of the importance of Science in everyday life.
- An active learning environment, showcasing the Lanesfield Science principles.
- Children making mistakes and applying their taught knowledge to re-plan investigations.

Inclusion

At Lanesfield, we believe that differentiation is ensuring all children make progress regardless of their starting points. We understand the importance of making mistakes across every subject and developing the intrinsic satisfaction of solving problems. Therefore, our dedicated staff work 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.

- We value 'Thinking Actively in Social Context (TASC), meaning we value using prior knowledge and working together to solve problems.
- When planning, we plan lessons into fragmented activities to encourage all children move through their learning together.
- Having a sound understanding of our curriculum in order to adapt the lessons in real time to either further support or challenge specific pupils/groups.
- Be clear and specific in modelling more difficult concepts where appropriate
- Utilizing Apple Classroom and navigating pupils to appropriate resources where needed to support or challenge them.
- Using a range of questions to target specific individuals. For example, if Jack is really understanding the process of the organs involved in the digestive system whilst Jill is struggling with the names of each bodily part then having a glossary bank will be more beneficial for Jill for now. Ultimately, both Jack and Jill will need to answer the same questions in the end they may just take slightly different journeys to get there.

Impact

The successful approach at Lanesfield results in a fun, engaging, high-quality science education, that

provides children with the foundations and knowledge for understanding the world. Our early year curriculum encourage engagement with their local environment and ensures that children learn through varied and first-hand experiences of the world around them. Additionally, frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Most importantly, children at Lanesfield thoroughly enjoy science and this results in motivated learners with sound scientific understanding, who can make clear links to previous learning.

Teaching and learning

In the foundation stage, children will work from the Knowledge and Understanding of the world planning from the Early Years scheme of work. This planning aims to develop in pupils the crucial knowledge, skills and understanding that help them make sense of the world. It provides opportunities for pupils to carry out activities based on first hand experiences that encourage exploration, observation, problem solving, prediction, critical thinking, decision making and discussion. It provides the foundations for the science KS1 and then the KS2 curriculum.

- 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.

The principal focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena looking more closely at the natural and humanly-constructed world around them. 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 will be taught through the following topics:

- Plants
- Animals including humans
- Seasonal changes
- Living things and their habitats
- Uses of everyday materials.

The principal focus of science teaching in years 3 and 4 is to enable pupils to broaden their scientific view of the world around them. They should do this through:

- 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 will be taught through the following topics:

- Plants
- Animals including humans
- Everyday materials
- Rocks
- Light
- Forces and magnets
- Living things and their habitats
- Electricity
- Sound
- States of matter.

Upper Key Stage 2

The principal focus of science teaching in upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through:

- 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 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.

These will be taught through the following topics:

- Living things and their habitats
- Animals including humans
- Earth and Space
- Properties and changes of materials
- Forces
- Evolution and Inheritance
- Light
- Electricity.

For a clear vision of our scientific progressive curriculum, please view our: [progression of skills and](#)

knowledge and progression of scientific skills document on the website.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils 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’s starting points are identified at the beginning of each science topic through KWLH grids, key vocabulary grids for children to convey and record what they know already. At the end of the block, children’s knowledge is checked in line with the key knowledge identified prior to the teaching block. Pupils 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 and teachers ensure that this is developed within each lesson and throughout each science topic. Children also complete a TASC wheel at the beginning of all their “prove it” investigations. They begin by applying their taught knowledge to plan a scientific investigation with their group. After carrying out the investigation, they record and use their TASC wheel to evaluate their results. Our Lanesfield science curriculum ensures that children are provided with regular opportunities to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

TASC wheel

At Lanesfield, we encourage children to complete ‘Prove it’ investigations throughout their topics to apply and demonstrate their taught skills scientifically. To do this, children work collaboratively in small groups to plan, carry out, record, evaluate and repeat (where necessary) investigations with little adult input. Their TASC wheel supports their learning during these lessons. Children complete one TASC per half term.

KS1 TASC wheel example



What's on my wellies?

What did you actually do in the investigation? What did you find out from the investigation?	What do we know about this task? What do we have to do?
What do you want to do to carry this investigation out? How did the investigation go?	How many ways can we think to prove this? Which of these ideas is the best and why?

KS2 TASC wheel example

Why do birds have different beaks?

What were your findings from this investigation? Were your predictions accurate or inaccurate? Why do you think this?	What do we know about this already?
Explain what you ACTUALLY did. Did you plan to change your investigation at all? Why was this?	What have you been asked to do?
How do you think this investigation went? Explain why	How many different ideas can you think of to investigate this?
What do you plan on doing to carry out this investigation?	Which of the ideas above is the best one and why?

The nature, processes and methods of science

‘Working scientifically’ specifies the understanding of the nature, processes and methods of science for each year group and this is embedded within lessons and focuses on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing; and researching using secondary sources. Pupils are given opportunity to seek answers to questions through collecting, analysing and presenting data.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. At Lanesfield, science lessons provide a quality and variety of subject specific language to enable the development of children's confident and accurate use of scientific vocabulary and their ability to articulate scientific concepts clearly and precisely. They are encouraged and assisted in making their thinking clear, both to themselves and others, and teachers ensure that pupils build secure foundations by using discussion and remedying their misconceptions.

The contribution of science to teaching in other curriculum areas

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 the Literacy Hour 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 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. The children use weights and measures and learn to use and apply number. Through working on investigations they learn to estimate and predict. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions.

Computing

Children use computing in science lessons where appropriate. They use it to support their work in science by learning how to find, select, and analyse information on the Internet. Children use ICT to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of personal, social and health education. This 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, children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. Science promotes the concept of positive citizenship.

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.

Assessment

Children's progress is continually monitored throughout their time at Lanesfield Primary School and is used to inform future teaching and learning. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as set out in the National Curriculum. These are set out as statutory requirements. We also draw on the non-statutory requirements to extend our children and provide an appropriate level of challenge. Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the success criteria. Children are guided towards achievement of the main objective through the use of process based 'success criteria', provided by and explained by the teacher. Children will have these to refer to in the lesson, where they will be evident in their books and used to identify areas of difficulty by children and teachers when reviewing and assessing work. Assessment for learning is continuous throughout the planning, teaching and learning cycle. However, children are more formally assessed half termly in KS1 and KS2 using a variety of methods:

- Observing children at work, individually, in pairs, in a group, and in classes
- Questioning, talking and listening to children
- Considering work/materials/investigations produced by children together with discussion about this with them.
- Summative and formative assessment
- Using early learning goal assessment guidelines for understanding the world around us.
- Using the DfE assessment framework for KS1 and KS2.

Planning and Resources

Planning is a process in which all teachers are involved. Planning should be done with parallel teachers, including mixed year groups, using the MTP to support them and ensure NC coverage and progression. Additionally, teachers embed the Cornerstone Science scheme of work within their planning to assist our children's 'Prove it' investigations.

Roles and responsibilities

It is the role of the Science co-ordinator, under the guidance of the Head teacher:

- To organise Science coverage within the curriculum and to ensure progression and development.
- To assist with and monitor planning and quality of delivery within the curriculum.
- To review standards of work within the school by reviewing samples of work from learning journals, display work, showbie and pupil interviews
- To ensure resources and equipment is available to staff
- To advise staff in their planning and teaching where needed

Review: This policy will be reviewed in September 2024.