

Science Policy 2023- 2025

Reviewed November 2023

Next review November 2025



1. Purpose of Policy

Science is a core subject in the National Curriculum. This policy will form the basis upon which we map out the statutory orders for science across the primary phase. It will outline the purpose, nature and management of how science is taught and learnt in our school and will inform new teachers of expectations.

All staff are fully aware of their role in its implementation. Staff have access to the Policy via the school's server via the Staff Drive and it is also published on the school website

1. Curriculum Statement

Intent:

The intent of our Science curriculum is a curriculum which is accessible to all and which will develop pupil's scientific knowledge and conceptual understanding as well as develop scientific enquiry skills. We intend to prepare our pupils with the knowledge and skills required for transition into secondary school and for their future lives.

We intend to teach lessons which are creative and engaging and which develop children's curiosity, interest and love of Science. Our intent is that pupils are equipped with the scientific knowledge and key vocabulary required to understand the uses and implications of Science, today and for the future, and that they understand and have an appreciation of the role of Science in history and its impact on their lives today.

We want to develop pupils' understanding of the nature, processes and methods of Science through different types of scientific enquiry that help pupils to answer scientific questions about the world around them. We aim to enable pupils to effectively communicate scientific ideas by using scientific vocabulary that they can use and understand.

Implementation:

Pupils are taught the processes and concepts, as well as the skills required in the National Curriculum. Science is taught regularly for at least 10 hours per term by the class teachers, who plan collaboratively in year groups, following outlined plans provided by the subject leader. Science is taught with an emphasis on the pupils' engagement in practical enquiry to support and develop their understanding of scientific concepts and skills.

Existing knowledge is reinforced and remembered through regular retrieval tasks built into all lessons. Teachers use a range of strategies when assessing the children within each unit: exploration, investigative enquiry and illustrative enquiry. Cross-curricular links are made with other subjects where relevant, especially Maths (through the collecting and analysis of data), Computing (through research and data logging) and PSHE (keeping safe, growing up and life cycles)

Progress is monitored using ongoing Teacher Assessment as well as an end of topic assessment. Assessment spreadsheets are updated 3 times a year to indicate each child's progress.

Children are provided with feedback (as per the Feedback Policy), which enables them to, not only recognise what they have done well, but also address any misconceptions or highlight areas that may challenge them further. Thus, each child is supported at the appropriate level to enable them to make the best progress possible. Children are given opportunities to work independently or collaboratively in pairs or small groups. They are encouraged to develop their speaking and listening skills as well as collaborative working skills through talk partners and groups experiments.

Pupils are encouraged to use appropriate scientific vocabulary which is shared with them on class displays or working walls and is modelled by the class teacher. As well as this, children can access key scientific vocabulary on their knowledge organisers with definitions, which is currently being implemented across each year group unit.

Impact:

The impact of our science curriculum is that children understand the science behind life, as well as real life problems and concepts. Our children develop a curiosity for science and life itself. They feel confident to ask and explore questions with adults and their peers. Science books show a wide range of learning covered in all aspects of Science as indicated in the National Curriculum. Books have been moderated by Science subject leaders at other Aquila schools. Books, plans and assessment are monitored by the subject leader regularly and feedback is provided to all staff in order to maintain high standards and/or develop the subject.

Progress and understanding is evident through books, Teacher Assessment and assessment data. Children understand and use a range of scientific vocabulary which can be seen in books and is evident in pupil consultations. Our children are well-prepared for secondary school Science.

3. Teaching and Learning

The science curriculum is mapped to ensure alignment with the National Curriculum content and programme of study. Key knowledge relates directly and builds towards the achievement of end of year 'end points' of 'sticky knowledge', informed by the National Curriculum statements. Key skills are also mapped so that these are developed systematically and align directly to the specified working scientifically statements as outlined in the National Curriculum for each phase.

A working wall is used to support and celebrate learning throughout each unit of work. This will also be used to support the acquisition of key knowledge and will support the accurate use of an extended specialist vocabulary.

Science is good when:

- Children are given the responsibility and independence to lead their own investigations
- Children ask questions and work together to discover the answers
- Children accumulate scientific knowledge and develop their conceptual understanding through a range of scientific enquiries
- Children are involved in creating and carrying out investigations and can share and explain their ideas and conclusions
- Children apply their 'working scientifically' skills to solve problems, explore and investigate
- Children are able to link their learning to the real world and are provided with a sense of purpose
- Children build on their prior learning, enabling them to progress and develop their scientific knowledge further
- Children's learning is enhanced through the outdoors, forest school, specialist visitors and access to high-quality resources

To ensure excellence across the school in the teaching and learning of science:

- Children are encouraged to ask their own questions and are given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom.
- Teachers ask a range of questions which enable all children to take part, listening carefully to answers and taking learning forward, using open and closed questions and allowing children time to think.
- Short-term plans strive for 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 make good progress. Gap analysis is undertaken to fill any gaps in learning
- New vocabulary and challenging concepts are introduced through pre-teaching and direct teaching. This is developed through the years, in-keeping with the topics.
- Working scientifically skills are embedded into lessons and these focus 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 (controlled investigations); and researching using secondary sources. Pupils are given opportunity to seek answers to questions through collecting, analysing and presenting data.
- The use of Explorify provides a range of engaging activities designed to develop curiosity, discussion and reasoning skills in order to support 'thinking scientifically'.
- The key knowledge or 'end points' of 'sticky knowledge' for each topic and across each year group is mapped across the school and checked at the end of each science topic.
- 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 through learning outside the classroom.
- 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. Children 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 to probe and address their misconceptions.

4. **Assessment**

As part of the introduction to each new science topic, teachers review what the children know already through carefully planned retrieval tasks. This informs the programme of study so that it takes account of children's starting points

Lessons are planned to ensure that key knowledge is developed over time, over the course of each science block and in a progressive sequence. Key knowledge is reviewed by the children and rigorously checked and consolidated by the teacher at the end of each unit of work through retrieval tasks. Lessons within each unit are also planned to ensure the systematic development of the key identified skills across the school.

By the end of the 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.

Teachers provide children with effective feedback, both orally and written, in relation to the aim of the lesson. Work in books is marked weekly with a comment. Marking is developmental and addresses misconceptions. Accurate spelling of topical vocabulary is also identified in books.

Ongoing assessment also includes:

- 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
- Retrieval quizzing
- A science assessment spreadsheet is used to record children's progress.

5. **Planning and Resources**

Teachers plan science lessons – where there are two classes in a year group science will be planned by one of the teachers and shared. Teachers also have access to a range of schemes of work to inform planning and lesson design; these schemes are adapted to the needs of the children and to provide best quality teaching.

Key knowledge and skills, in line with the National Curriculum are mapped on the whole school 'Science Knowledge and Skills Progression Map' and this shows the key knowledge and skills of each unit and how they build through the school. The school's own context is also considered and opportunities for learning outside the classroom, including the use of specific school resources (such as the peace garden, forest school and OPAL outdoor learning areas), are included on plans. Cross curricular links are also mapped to further support the contextual relevance of the science curriculum.

High-quality science resources to support the teaching of all units and topics from Year 3 to Year 6, are used consistently and maintained by the subject leader. These are kept in the science cupboard and are labelled and easily accessible to all staff. The library contains a rich and varied supply of science topic books to support children's individual research and all classes have access to these during their weekly allocated library slot.

6. **Organisation**

Within the academic year, children study science in blocks, as outlined in the overall curriculum framework overview. Children enhance their scientific knowledge and develop

working scientifically skills through focused lessons (1.5 hours weekly) throughout the duration of each block.

Lower Key Stage Two:

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. Children are encouraged and supported to ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Upper Key Stage Two:

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. At St. Laurence CE Junior Academy, children do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. Children are also supported to begin to recognise that scientific ideas change and develop over time. The school curriculum provides opportunities for children to select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Children learn to draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

‘Working and thinking scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Opportunities are provided for the children to read, spell and pronounce scientific vocabulary correctly.

7. Equal Opportunities

At St. Laurence CE Junior Academy, we are committed to providing a teaching environment which ensures all children are provided with the same learning opportunities regardless of

social class, gender, culture, race, special educational need or disability. Teachers use a range of strategies to ensure inclusion and also to maintain a positive ethos where children demonstrate positive attitudes towards others.

8. Inclusion

Science teaching considers the needs of different individuals and groups for learners and tasks are designed and adapted as appropriate to ensure an appropriate level of challenge and support. Supporting adults are also deployed effectively to ensure focussed support where this is necessary.

Teachers use a range of inclusion strategies, including paired work, open questions and direct, differentiated questioning and the activation of prior knowledge and contextual learning. This supports the inclusion and motivation of all learners ensuring that optimum progress is made throughout each part of the lesson.

9. Role of the Subject Leader

The subject leader's responsibilities are:

- To ensure the high profile of the subject and provide a strategic lead and direction for science in the school.
- To maintain and ensure use of the central supply of science resources, in accordance with those specific to each year group and topic
- To support colleagues in their teaching of science and support the CPD of others
- To ensure progression of the key knowledge and skills identified within each unit and that these are integral to the programme of study and secure at the end of each age phase.
- To monitor books and ensure that key knowledge is evidenced in outcomes.
- To monitor planning and oversee the teaching of science
- To lead further improvement in and development of the subject as informed by effective subject overview
- To ensure that the science curriculum enables the progress and raises the attainment of all pupils, including those who are disadvantaged or have low attainment
- To ensure that approaches are informed by and in line with current identified good practice and pedagogy; to attend regular opportunities for CPD, including borough forums.
- To establish and maintain existing links with external agencies and individuals with specialist expertise to enrich teaching and learning in science.
- To organise a whole-school science week, in accordance with the national theme, ensuring a focus on practical and investigative activities.

10. Health and Safety

Teachers should be following the St. Laurence CE Junior Academy's health and safety policy in lessons that require children to handle items such as:

- batteries
- wires
- glass
- lights/torches
- sharp objects
- magnets
- liquids and food-based items that include but are not limited to – oil, vinegar, rice, bicarbonate soda and ice

Teachers need to ensure that children are aware and prepared for any potential risks.

Date Reviewed: November 2023

Next review date: November 2025

Subject leader : Ashten Campbell

Headteacher: Sarah Graham

Appendix 1:

Science Curriculum Map

