



“Christ’s ministry, as recounted in the Gospels, and the values he promoted through his teachings are fundamental to the life of our school in fulfilling its purpose as a Catholic institution.” (Mission Statement)

St Aidan’s Catholic Primary School

Science Policy

A Policy for the Teaching and Learning of Science

Science Policy

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 and it is also published on the school website

2. Curriculum Statement

Intent

At St Aidan’s we follow the National Curriculum for Science aims to ensure that all children:

- 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. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this

At St Aidan’s, we encourage children to be inquisitive throughout their time at the school and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes.

Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that 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.

Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

- Science will be taught in planned and arranged topic blocks by the class teacher, following the Twinkl plan it scheme, extending when necessary.
- Through our planning, we involve problem solving opportunities that allow children to find out 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, adapting the units to suit the needs of their class.
- Teachers use precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in learning, so that all children keep up.
- We build upon the learning and skill development of the previous year groups using our progression maps and previous years data to ensure progress and the closing of gaps where necessary.
- 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.
- Working Scientifically skills are embedded into lessons to ensure these skills are being 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.
- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
- Regular events, such as Science Week or project days, allow all pupils to come off-timetable, to provide broader provision and the acquisition and application

of knowledge and skills. These events often involve families and the wider community.

Impact

The successful approach at St Aidan's results in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge 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. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Through various workshops, trips and interactions with STEM professionals (careers day, visits), children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn the possibilities for careers in science. From exposure to a range of different scientists from various backgrounds, all children feel they are scientists and capable of achieving. Children at St Aidan's enjoy science and this results in motivated learners with sound scientific understanding. We enter science teams into the national Big Bang science show annually and facilitate the achievement of Crest science awards in upper key stage 2.

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 phase (KS1, Lower KS2 and Upper KS2) 'end points', 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.

Science is good when:

- We are given the responsibility and independence to lead our own investigations
- We ask questions and work together to discover the answers
- We accumulate scientific knowledge and develop our conceptual understanding through a range of scientific enquiries
- We are involved in creating and carrying out investigations and can share and explain our ideas and conclusions
- We apply our 'working scientifically' skills to solve problems, explore and investigate
- We are able to link our learning to the real world and are provided with a sense of purpose

- We build on our prior learning, enabling us to progress and develop our scientific knowledge further
- Our learning is enhanced through the outdoors, 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.
- Teachers strive for engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Schemes such as Twinkl are drawn upon and adapted to ensure learning is accessible for all pupils.
- 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 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 key 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**

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As part of the introduction to each new science topic, teachers review what the children know already. 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.

Lessons within each unit are also planned to ensure the systematic development of the key identified skills across the school.

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.

Teachers provide children with effective verbal feedback in relation to the aim of the lesson. Work in books is marked weekly. Marking indicates whether the child has met the lesson objective. Where misconceptions arise, these are addressed by the teacher.

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
- Assessment objective sheet is filled in by the class teacher. Statements are updated on a termly basis, both in relation to the knowledge and skills pupils have acquired in lessons; pupil steps are updated termly to document pupil progress.

In EYFS, we assess the children's Understanding of the World according to the Development Matters statements.

5. Planning and Resources

Teachers have access to twinkl schemes of work to inform planning and coverage of the national curriculum. The Science Lead will support teachers with planning.

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.

High-quality science resources to support the teaching of all units and topics from EYFS to Year 6, are used consistently and maintained by the subject leader. As well as these, the EYFS classes have a range of resources for easy access to children during exploration. 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.

6. EYFS

The teaching of science in EYFS is in accordance with the EYFS national framework. Children are guided to make sense of their physical world and community through opportunities to explore, observe and find out about people, places, technology and the environment.

7. KS1 and KS2

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Key Stage One:

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. At St. Aidan's, children are encouraged to be curious and ask questions about what they notice. Their understanding of scientific ideas is supported through the use of different types of scientific enquiry so that children can answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. Children are supported to begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways, including wider school forums such as science week. Most of

the learning about science is done through first-hand practical experiences, and children are also to begin to use appropriate secondary sources, such as books, photographs and videos.

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. Aidan's, 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.

At St Aidan's children are encouraged to think scientifically. '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.

8.Equal Opportunities

At St. Aidan's Primary School, 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.

9.Inclusion

Science teaching considers the needs of different individuals and groups for learners and tasks are designed and differentiated as appropriate to ensure an appropriate level of challenge. 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 support the inclusion and motivation of all learners ensuring that optimum progress is made throughout each part of the lesson.

10.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 an annual whole-school science week, in accordance with the national theme, ensuring a focus on practical and investigative activities.

11. Health and Safety

Teachers should be following the School'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. Additionally, a copy of 'Health and Safety in School Science and Technology for Teachers of 3-12 Year Olds' by The Association for Science Education will be available to teachers to consult throughout of the school year.