



Stanley St Andrew's Church of England Primary School

Curriculum Policy for Science

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1. Curriculum Statement

Intent

The 2014 national curriculum for science aims 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.
- 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 Stanley St Andrews, 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 pupils 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, to have a project-based approach. This is a strategy to enable the achievement of a greater depth of knowledge.
- 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.
- We build upon the knowledge and skill development of the previous years. 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, such as Nature Day, 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 Stanley St Andrews 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 experts and local charities, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity.

2. Teaching and Learning

Science is a core subject of the National Curriculum and pupils at both KS1 and KS2 must undertake **science activity every week**. During these two key stages, science is taught as a **discrete subject**. Science Bug has been designed around the new curriculum. It is full of exciting lessons with a focus on easily manageable hands-on science. It has a straightforward structure with six units for each year group and six lessons in each. Planning takes into account that the school places a high emphasis on the development of pupil's skills of:

Scientific Enquiry (Sc1) in the substantial majority of lessons the skills for sc1 are taught alongside the knowledge and understanding in life processes and living things (Sc2) materials and their properties, (Sc3) and physical processes (Sc4). In this way there is an equivalent emphasis on Sc1 as there is on Sc2, Sc3 and Sc4 together.

For KS1 and 2, overall learning objectives are recorded in teacher's planning books each week. We recognise that complete coverage of each QCA unit is not always possible or desirable and that an emphasis on Sc1 should always inform any planning decision.

All lessons have a clear learning objective which are shared and reviewed with the pupils effectively. A variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress. The information is used to identify what is taught next.

Activities are challenging, motivating and extend pupils learning. Lessons make effective links with other curriculum areas, especially literacy, numeracy and ICT. We use ICT widely in science; children are given the opportunity to practice science skills and enhance their presentation using carefully-chosen software. We can access ICT for enquiry work through including microscopes with digital cameras, video capture of images and activates, and data logging. Other resources include selected video and wall chart resources; short video sequences and other teaching resources have been networked for the interactive whiteboard use. Activities inspire the pupils to experiment and investigate the world around them and to participate in a range of activities. These include:

- Asking questions
- Locating sources of information
- Observations
- Selecting appropriate equipment and using it safely
- Discussions
- Planning investigative work
- Investigation
- Raising ideas and prediction
- Testing
- Collecting evidence, measuring and checking results
- Handling evidence
- Making comparisons
- Describing patterns
- Communicating results and findings

3. Assessment

In early years foundation stage assessment is on-going, observations inform next steps planning. Progress over the year is recorded in books and on Tapestry - using the communicating matters statements and early learning goals (early years foundation stage).

Evidence is collected throughout the foundation stage. This may include photographs, observation or a work sample.

At KS1 and KS2, pupils' knowledge and understanding **are assessed before each unit** of work by questioning, discussion, observation, completion of a concept maps, brainstorming etc. the school recognises the importance of assessment for learning strategies, so staff and pupils are aware of next steps and ways to improve.

During assessment week, once each half-term, teachers from year 1 to year 6 assess pupils' attainment in science using summative tests set by the Pearson. In year 6 pupils attainment in Sc1 and KS2 curriculum is assessed regularly using SATs material from testbase software and teacher assessment throughout the year. In addition to teacher assessment, in year 2 and 6, STA material is used to make informed and professional judgements – books scrutinises and staff moderations help with the assessment process.

	Knowledge	Working Scientifically	At the end of each unit (half-termly) this (activelearn) attainment sheet is stuck in each child's book and highlighted accordingly and next step written. This enables children understand their attainment and what they need to do to improve their science knowledge and skills.
Exceeding ARE	Able to identify increasingly unusual or unfamiliar scents, textures, tastes and sounds. Use species-specific vocabulary with increasing accuracy and able to confidently name and draw the sense organs.	Able to classify and identify by linking observable features to already known objects or things. Able to explain which of these features have led them to classify in a particular way.	
On track for ARE	Able to name, draw and locate parts of their bodies, including the sense organs. Able to understand the functions of the sense organs, identifying familiar scents, textures, tastes and sounds.	Use observable features of objects using all of their senses to identify them and be able to recognise similarities and differences between smells.	
Working towards ARE	Recognise that they use their eyes to see, ears to hear, nose to smell and mouth to taste. May recognise that they can feel objects with their hands rather than skin.	Able to match objects by observable features and can recognise similarities and differences between phenomena, e.g. can match a smell or texture, can recognise when a smell is different from one with which they are familiar.	

Annual Teacher Assessment

At the end of each academic year, each class teacher uses the progress data accumulated during the year to assign accurate assessments for each child in the class and completes the science section on the annual report to parents. It is responsibility of the subject leader to monitor the progress of science across the school with reference to specific action points outlined in the science action plan.

4. Planning and Resources

Science is a core subject of the National Curriculum and pupils at both KS1 and KS2 must undertake **science activity every week**. During these two key stages, science is taught as a **discrete subject**. Science Bug has been designed around the new curriculum. It is full of exciting lessons with a focus on easily manageable hands-on science. It has a straightforward structure with six units for each year group and six lessons in each. Planning takes into account that the school places a high emphasis on the development of pupil's skills of:

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Learning Resources

Some science resources and equipment are located in each classroom; however. The majority are organised and found in Kingfisher Class. Pupils are trained in safe and considerate use of animals, plant and equipment and safety rules are explained when we use the outdoor areas and ECO garden. They are taught not to be careless and to use consumables efficiently. Teachers make sensible decisions based on the age and stage of pupil's relation to whether the teacher, the pupils under guidance of an adult or the pupil independently should collect and replace the resources. Many useful resources and ideas for each science topic, including key words which can be printed, concept maps etc can be found on safe, secure teaching resource websites.

The Learning Environment

Every classroom has work undertaken in science displays. This includes working displays which will play a part in promoting science activities in the classroom. Its profile should reflect its place as a core subject. Resources for the current topic should be easily accessible. All classrooms display prominently the relevant scientific vocabulary being introduced in current units of work.

Homework

At early years foundation stage and KS1 there are no compulsory requirements for science homework but encouraged so children can understand science is happening all around them. During KS2 science homework should be given where appropriate.

5. Organisation

Science will be taught in planned and arranged into topic blocks by the class teacher, to have a project-based approach.

These we need to be on a cycle due to mixed age classes.

Year 1 – parts of animals, changing seasons, plants, comparing materials, types of animals, identifying materials.

Year 2 – uses of materials, living things, growing plants, changing shapes, habitats, feeding and exercise.

Year 3 – movement and feeding, light and shadows, what plants need, rocks and soils, parts of plants, magnets and forces.

Year 4 - electricity, dangers to living things, human nutrition, sound, grouping living things, changes of state.

Year 5 – life cycles, earth and space, separating mixtures, types of change, materials, forces.

Year 6 – light and sight, our bodies, classifying living things, changing circuits, evolution, review and celebration.

6. EYFS

The Foundation Stage delivery of the science content involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. They are assessed according to the Development Matters attainment targets. Science activities are available daily with additional experiences provided through a specific topic focus. Observation of children's interests and activities also informs planning and provision for this area of learning.

7. KS1 and KS2

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. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to 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. They should 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. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos. 'Working scientifically' is described separately in the programme of study but must always be taught through and clearly related to the teaching of 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. Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

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 should 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. They should 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 should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out. 'Working 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. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

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. They should 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 should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should 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. Pupils should 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. Pupils should read, spell and pronounce scientific vocabulary correctly.

8. Equal Opportunities (eg Gender, race)

At Stanley St Andrew's Church of England Primary School we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

9. Inclusion (eg EAL/SEN/PPG/Provision for HA)

In school we aim to meet the needs of all our children by differentiation in our science planning and in providing a variety of approaches and tasks appropriate to ability levels. This involves providing opportunities for SEND children to complete their own projects, with support, to develop speech and language skills, as well as scientific skills and knowledge. This will enable children with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations and to achieve the goals they have been set. Some children will require closer supervision and more adult support to allow them to progress whilst more able children will be extended through differentiated activities. By being given enhancing and enriching activities, more able children will be able to progress to a higher level of knowledge and understanding appropriate to their abilities. Teachers will use the school's inclusion planning key to ensure that a range of strategies are used which include and motivate all learners, ensuring that optimum progress is made throughout each part of the lesson.

Equal Opportunities Inclusion

- Science is taught within the guidelines of the school's equal opportunities policy.
- We ensure that all our children have the opportunity to gain science knowledge and understanding regardless of gender, race and class, physical or intellectual ability.
- Our expectations do not limit pupil achievement and assessment does not involve cultural, social, and linguistic or gender bias.
- We aim to teach science in a broad global and historical context, using the widest possible perspective and including the contributions of people of many different backgrounds.
- Our resources both human and physical, and a range of teaching methods are deployed to promote inclusion for those children with EBD, physical and sensory disabilities, language and communication difficulties or learning and cognitive difficulties.
- We value science as a vehicle for the development of language skills and we encourage our children to talk constructively about their science experiences.
- In our teaching, science is closely linked with literacy and mathematics.
- We recognise the particular importance of first-hand experience for motivating children with learning difficulties.
- We recognise that science may strongly engage our gifted and talented children, we aim to challenge and extend them.
- We exploit science's special contribution to children's developing creativity, we develop this by asking and encouraging challenging questions and encouraging original thinking.

We understand children's learning potential in science will be enhanced significantly when greater attention is given to language skills, speaking, listening, reading and writing. Key vocabulary is displayed for all pupils and where possible provides a symbol or diagram to show what each word means. Science is of great benefit to pupils in the early stages of learning English. As with other practical subjects, pupils can handle the things being talked about, enhancing teaching of language. Many activities can be carried out with a minimum language demand, especially those involving making, observing and exploration. Many activities result in a product that allows you to understand the child's thinking even when you do not share a language (drawing, painting, model making, sequencing or ordering physical objects) others allow the learning of a practical skill that can be communicated by showing.

10. Safeguarding and Health and Safety

Safe practice must be promoted at all times. The ASE publication, 'Be safe!' has been adopted by the governing body as the schools safety policy in science. A copy is available in the staff room. Teachers must take into account any health and safety and child protection issues; particular attention must be given to avoiding the use of anything which aggravates individual pupil's allergies. Risk assessments are carried out to ensure safety issues have been identified and that specific attention is made when activities are unusual and beyond the scope of normal safety practice. We have safety goggles and lab-coats to promote safety and these are used within lessons when necessary.

11. Spiritual Development

Spiritual development is encouraged through reminding pupils of the wonder of science and the effect of science discoveries on the modern world. Topical scientific issues are also discussed as appropriate.

12. Cross Curricular Links

Literacy: in particular, at KS1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. All KS1 and KS2 children have a yellow science book, and some written evidence is expected in every session taught. At KS2 the pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they find out. In science they should be applying their literacy skills at levels similar to those which they are using their English work.

Numeracy: at both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should apply their numeracy skills similar to those which they are using in their maths work. Maths vocabulary will be promoted within the science curriculum (in line with school priority)

Information and Communication Technology: at both key stages pupils' ICT skills are used to locate and research information (CD ROM, internet); record finding (using text, data and tables); log changes to the environment over time (sensing equipment – when available); gain confidence in the use of calculators, digital camera and tape recorder as well as computer. Where available,

children and staff may access a variety of activities and resources using the IWB (interactive white board)

13. Trips and Visitors

The school recognizes the importance of curriculum enrichment which can be provided by visitors to the school e.g. theatre groups with scientific themes; as well as trips outside of school e.g. the science museum.

Review

This policy was compiled by OUR Subject Lead for Science Miss Price in July 2021.

This policy will be reviewed in July 2023.