

Science Policy

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St. Andrew's CE School

Introduction

This policy aims to outline the teaching and learning of Science at St Andrew's CE Primary School. It reflects the consensus of opinions of the whole staff and children and Governing Body. St Andrew's aims to foster an exciting learning environment in which Science is taught in an exciting, fun and stimulating way, with a focus on practical investigations and independent learning. It is taught both within the creative curriculum and as an independent discrete subject. We aim to enthuse and engage children and hopefully promote a life-long interest in Science.

Why is Science Important?

Science stimulates and excites children's curiosity about phenomena and events in the world around them. Because science links direct practical experience with ideas, it can engage learners at many levels. It teaches methods of enquiry and investigation to stimulate creative thought. Children learn to ask scientific questions and begin to appreciate the way in which science will affect the future in a personal, national and global level.

Through scientific enquiry children should be able to explore, observe and ask questions about living things, materials, themselves and their environment and observed scientific phenomena. They should begin to work together to plan investigations to answer their questions; and consider whether their comparisons are fair. Children should be provided with opportunities to carry out practical investigations and have hands on experiences to make their own discoveries about the world. Children should use a range of resources to find out more about scientific ideas. They should have opportunities to share their discoveries verbally and practically, and record them through pictures, tables, charts and writing.

Science lessons at St Andrew's School include children:

- Doing practical investigations.
- Gaining scientific knowledge.
- Working together in planning, predicting, decision-making, investigating and communicating results.
- Developing the skills of observing, classifying, recording, making and testing hypotheses, designing experiments and drawing from evidence.
- Reflecting on outcomes and the strategies which have led to them, leading to prediction and further planning.
- Discussing results, explaining outcomes, querying surprising findings and talking about possible improvements to their methods.
- Relating their work to everyday experience.
- Learning about their bodies, from senses in Year 1 to the heart and circulation in year 6, with the aim of better understanding of how to make informed choices about choosing a healthy lifestyle and caring for their physical and mental health.
- Learning about the world around them including the natural world, seasons, forces, materials and Earth in Space.
- Enjoying themselves and showing curiosity, self-discipline and interest.

Aims and Objectives

Aims

- To enable children to have the ability to acquire appropriate scientific knowledge, skills and attitudes.
- To foster a sense of 'awe and wonder' in children to discover and explore the world around them and to begin to understand the human body in all its complexity.
- To help children to develop a questioning approach that will stimulate curiosity about the natural and man-made world.
- To develop in children an understanding of, and ability to use, scientific methods.
- To enable children to hypothesize about their investigations and to develop the concept of a fair test.
- To encourage children to derive enjoyment and satisfaction from scientific activities and thereby develop a positive attitude towards Science within the curriculum and within the wider world.

Objectives

- Developing knowledge and understanding of important scientific ideas, processes and skills, relating these to everyday experiences.
- Learning about ways of observing, exploring and asking questions about living things, materials and phenomena.
- Children being involved in generating ideas for an investigation and making their own decisions as to how they are going to carry out the investigation and which resources they may need.
- Beginning in Reception, children will grow accustomed to the scientific processes of observing, measuring, describing, investigating, predicting, experimenting and explaining.
- At the same time, children's understanding of some of the central concepts of science should progressively deepen. The school needs to ensure that the teaching of Science is progressive and that topics build on previous learning.
- Ensuring Science within the Creative Curriculum is planned carefully to ensure that topics are age-appropriate and that there is no repetition of topics or areas of scientific learning.
- Primary science should include study of living things and their interactions with their environment; of materials and their characteristics; of energy and materials of forces and their effects.
- Wherever possible the content should be related to the experience of the children.
- Using the school grounds – the wildlife garden, pond area and field - to enhance the children's knowledge and experience of the natural world.
- Sharing ideas and communicating them using general scientific language and focused scientific vocabulary relevant to the topic being studied, in addition to scientific drawings, labelled diagrams, tables, graphs, mind maps and written explanations.
- Making Science part of the wider school learning environment, with whole school or year group experiences - such as specialist Science weeks or Science days - Science-focused school trips, including the beach, an allotment, a farm, Science Centres and Museums - and visits from Science specialists and Science shows.

Equal Opportunities

This is in line with our whole school policy on Equal Opportunities. Children are provided with a variety of opportunities to develop and extend their scientific skills throughout their time at St Andrew's School. All children have a right to develop and achieve their potential and equality of opportunity underpins the whole school curriculum. Children are treated as individuals with their own abilities, difficulties, attitudes, backgrounds and experiences.

Teaching and Learning

Science lessons are organised in a variety of ways according to the topic and individual lesson. These can include the use of talk partners, whole class carpet sessions during whole class teaching or plenaries, mixed ability/mixed sex or equal ability/same sex groups, pairs or independent learning. Teaching assistants are deployed by the class teacher to assist with small groups of individual children, or to assist with practical tasks, depending on the nature of the lesson.

Foundation Stage

The Foundation Stage Curriculum is based around the seven areas of learning, where Science is included as an aspect of 'Understanding the world'. Children are provided with a broad range of learning opportunities and experiences in Science enabling them to work towards the Early Learning Goals and extending them once the goals have been achieved.

Key Stage 1

Children further develop their understanding of the world around them which they have gained in the Foundation Stage. Throughout Year One and Two teachers plan from the National Curriculum and include Science within the St Andrew's Creative Curriculum. We aim to give children a fun, practical experience of Science.

Key Stage 2

Children build on their scientific learning in Key Stage 1 and further enhance and develop their scientific knowledge and skills. They have more opportunities to plan practical investigations using their own ideas and hypotheses, predicting results and evaluating what they find out. They also learn about Science in a broad sense in some of the Creative Curriculum topics, which use a cross-curricular approach to learning, leading to a fulfilling and rich experience, in which Science is taught in a broader way through topics such as 'Ice Worlds' and 'The Big Bang'.

Planning

As Reception forms part of the Foundation Stage we relate the scientific aspects of the children's learning to the Early Learning Goals. In KS1 and KS2 teachers use the National Curriculum and mostly plan in year groups. There are medium term plans and also Creative Curriculum planning available in the school 'Planning' folder. Teachers can decide whether to block science or to teach it as individual sessions, this will vary due to the nature of the topic and plans and also the individual needs of the children. Science is taught both in discrete topics and as part of the creative curriculum. Prior to teaching a new topic, teachers should review prior learning and pinpoint skills that their class and or individual children need to develop further and plan future opportunities for this. Teaching assistants are used to help with practical activities, assessment of individual children and small groups and supporting children of every ability, with a focus on SEN children.

Differentiation

We recognise the fact that there are children of widely different scientific abilities in all classes and we aim to provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this by:

- Setting common tasks which are open-ended and can have a variety of responses.
- Setting tasks of increasing difficulty, some children not completing all tasks.
- Providing resources of different complexity according to the ability of the child.
- Using teaching assistants to support the work of individual children or groups of children.
- Providing a range of ways for children to record their work.

Recording of Work

At St Andrew's we encourage children to explore scientific concepts in practical and experiential ways to deepen their understanding. From Reception the children's knowledge and understanding is recorded by photographs and quotes from the children together with adult observations of the children's learning. As the children progress through Key Stage One they are provided with a range of opportunities to share and record their scientific learning, including oral, visual, pictorial and written responses. Examples of these are discussion and debate, practical investigations, asking and answering questions, collecting and analysing data, tables, graphs and pictures.

Health and Safety

- During planning teachers need to consider and minimise risks for all activities and systematically teach pupils to take responsibility for determining the risks to themselves and others.
- All equipment should be regularly checked and updated to ensure that it is safe and well-maintained. This includes circuit building components and any resources that use batteries. All containers used by the children should be made of plastic and not glass.
- Occasionally equipment such as microwaves and kettles are used in Science lessons such as 'Heating Materials', 'Dissolving' or 'Reversible and Irreversible Changes'. These need to be used solely by the teacher and kept away from children. Used carefully and sensibly these can enhance the children's practical experience of different materials and how they can change. Children need to be advised of any Health and Safety issues at the start of the lesson by the teacher.
- Risk assessments must be used in any situation where children are taken off-site for a Science-based school trip, or it is felt there is any risk to the children that may arise within a lesson.
- Any lessons involving food or cooking (eg Heating materials/Reversible and Irreversible changes) need to take into account that some children in the school have severe allergies and this must be considered carefully when planning lessons to avoid any risk to children.
- Any external visitors to the school who are doing Science shows, workshops or demonstrations must have their own risk assessments in place if the school deems this necessary.

Resources

Science resources are stored in topic boxes and trays in the Resources room. These contain appropriate resources and artefacts that support the teaching of the topic. Science books and resources related to discrete year group topics are kept in individual classrooms. Within the school we are lucky to have access to a wildlife garden, pond area and field which are used regularly for the children to learn about habitats, plants and animals. As a school, we also encourage the use of our local museums and places of scientific interest to enhance our teaching. This includes visits to local places of scientific interest and visits from individuals providing hands on workshops for the children to engage in.

All out of school activities will comply with the guidelines in the school's Health and Safety Policy and a full Risk Assessment will have been undertaken prior to any out-of-school visit.

Assessment and Monitoring

The assessment of Science is an integral part of teaching. Formative assessment should form part of the learning and teaching process in Science and include a range of strategies:

- Mind-mapping at the beginning and end of a topic
- Specific questioning
- Observations of actions
- Listening to discussion, comments and quotes from children
- Analysing verbal and written outcomes
- Photographic evidence, video evidence and practical work
- Discussing work with children
- Use of Target Tracker to assess each child throughout the year.
- Monitoring by the Subject Leader to ensure there is adequate progression and continuity throughout the teaching of Science in the school.

The use of the school's marking policy should be evident to comment upon completed recorded work. This aims to show clear progression throughout the key stage and will be used to provide children's individual progress and their attainment.

The Early Years Foundation Stage profile which is updated termly and is informed by ongoing observations, photographs, drawings and informal observations from teachers and support staff.

On-going assessments of the learning and teaching within classes and year groups is an integral part of short-term, lesson-to-lesson planning and informs teachers of next steps.

Role of the Subject Leader

The role of the subject leader is to ensure that the Science curriculum is being delivered in a way that meets the learning objectives and both inspires and motivates the children. The subject leader aims to continually improve the science provision within the school. Within their role they need to:

- Be a role model and demonstrate good practice.
- Provide support for all staff through observations, monitoring, feedback and assistance with planning.
- Ensure progression and consistency across year groups.
- Manage and organise resources ensuring that they are readily available and well maintained.
- Ensure that the policy is working in practice and that it is reviewed every few years.
- Monitor standards in Science across the school and identify future targets.
- Be aware of national and local developments in Science by reading relevant materials, attending training where appropriate and disseminating information to staff.
- Organise a review of the Science teaching across the school every few years at the request of the headteacher, including lesson observations, pupil and staff questionnaires, monitoring of children's work and producing a report on the status of Science within the school, feeding the findings back to staff and governors.

Agreed by Staff on:.....

Agreed by Governors on:.....