



Sir Alexander Fleming Primary School and Nursery Science Policy

Reviewed: September 2024

Next Review: January 2025

Science Co-ordinator: Emily Brown

What is Science?

Science makes people reach unselfishly for truth and objectivity; it teaches people to accept reality, with wonder and admiration, not to mention the deep awe and delight that the natural order of things brings to the true scientist."

LISE MEITNER: PHYSICIST 1953

At Sir Alexander Fleming Primary School and Nursery, we want our children to be **naturally curious** about the world around them. Our curriculum has been developed to ensure full coverage of the National Curriculum and to foster a sense of **wonder about natural phenomena**. We are committed to providing a stimulating, engaging and challenging learning environment. We teach our children to explore scientific concepts **safely**. We endeavour for our children to show **pride** in their knowledge and investigations. Our lessons encourage children to be **brave** in their scientific thinking, linking concepts, ideas, and previous learning as building blocks throughout their school life. Our working walls and science weeks are designed to show our children the opportunities science provides in the real world and the chance at **success** in the industry of STEM. Throughout our school, children are encouraged to develop and use a range of working scientifically knowledge including questioning, researching and observing. We promote and celebrate these skills. Our children are taught to listen to other scientific predictions and treat our equipment with **respect**. We want our children to have a broad vocabulary. Scientific language is to be taught and built upon as topics are revisited in different year groups and across key stages. We intend to provide all children regardless of ethnic origin, gender, class, aptitude or disability with a broad and balanced science curriculum.

Intent

We aim to provide a broad, scientific curriculum that develops vocabulary and empowers children to ask scientific questions – this will enable children to make careful observations and decisions based on justifiable reasons. We ensure various, memorable experiences (including experiments, trips, science weeks and STEM days) take place to broaden children's knowledge. All learning is accessible for all children regardless of their ability or background and we encourage cross curricular learning to embed deeper thinking. Wider cross curricular links include:

- reading in science lessons through research and books for children to make links across the curriculum. (research)
- Maths and computing links are made through science by improving data handling skills as well as being able to develop the recording of scientific experiments. (record and present data)
- Design and technology lessons are planned to utilise children's scientific knowledge enabling them to apply their learning to their designs to. (substantiative knowledge)
- Physical education links are made through animals including humans when discussing the human body.

Ultimately, we want children to enjoy learning all areas of science and many topics will be covered on more than one occasion throughout children's schooling in order to embed knowledge. There are a number of key skills and attributes we will develop; children are taught to work scientifically, which involves:

- Developing an understanding of science through enquiry and investigation;
- Making predictions
- Observing, measuring and undertaking a variety of tests;
- Recording and evaluating results
- Developing curiosity and asking scientific questions;
- Reading and using scientific vocabulary;
- Testing and developing ideas;

- Making decisions;
- An enjoyment and fascination of science.



Teaching and Learning

Delivery of science places an emphasis on scientific investigations and practical activities.

EYFS

In the Early Years we pride ourselves on developing curious thinkers who notice features of the world around them. Curriculum topics are chosen by staff based on children's interests, cultural capital and the knowledge we believe is fundamental to later learning. Children are taught pre-requisite knowledge for the **4 key threads** in the National Curriculum of Animals including Humans, Plants, Working scientifically and Materials.

We provide active, memorable learning experiences and children have ample opportunities to be immersed in the natural world. Through weekly forest school sessions and daily outdoor learning children are given holistic opportunities to develop their scientific enquiry skills including observation, prediction and generating questions.

We value natural resources and our environment is filled with intriguing and stimulating objects which are used in a range of ways. For example, pinecones, conkers and stones are used to explore texture in the malleable area. Children have daily access to sensory play in the sand, water and mud as well as the junk modelling area which provides knowledge about materials. The small world and story areas include animals children will know by the end of the Foundation Stage. Books are a high priority in our setting and both non-fiction and fiction texts are selected and shared with children regularly to develop their knowledge of key themes. Our class libraries are regularly stocked with high quality literature. Nursery rhymes, songs and poems are taught and learnt which develop children's scientific conceptual knowledge and vocabulary.

We anticipate children's interest in the seasons and teach knowledge regarding this throughout the year. The home corner is an example of provision which is enhanced to reflect seasonal changes. Each classroom has a yearly timetable with visuals to support children's understanding and memory of the seasons.

Practitioners undertake formative observational assessment on a daily basis in order to ensure gaps in knowledge are addressed quickly.

KS1

Science is taught in weekly lessons and is also delivered during Forest School in KS1 and Outdoor Learning in KS2; children in nursery and reception develop their understanding of the world during Forest School and outdoor learning sessions where learning is guided by children's inquisitiveness.

Science lessons are differentiated to ensure all groups of learners can access the curriculum and make progress in each session.

KS2

Science is taught in weekly lessons and is also delivered and embedded through Outdoor Learning in KS2. Teachers follow the National Curriculum and long-term overview to ensure statutory content and knowledge are taught effectively.

Teachers use a range of resources to support their science planning including TAPS, their powerpoints follow the whole school pedagogy. KS2 also have external visitors and have taken part in 'STEMazing'. We have STEM days every term to encourage children's joy in STEM subjects and to ensure scientific knowledge is taught in a cross curricular way. Working scientifically skills are mapped out to support progression. Topics are revisited over the years from EYFS to year 6 so that knowledge and scientific skills can be added progressively.

Working Scientifically

Working scientifically at Sir Alexander Fleming is an integral part of all science teaching and is a part of every science lesson. In every lesson, children will be assessed against working scientifically skills as they will be explicitly taught and

modelled by teachers. At the end of the year, children will have the opportunity to showcase their 'Working scientifically' skills in the investigation focus unit, this will allow for exploration and child-led enquiry. Working scientifically specifies the understanding of the nature, processes and methods of science for each year group. For one half term per year, we have an 'investigations focus' in science to encourage children to be able to display their scientific knowledge in planning experiments in areas that interest them.

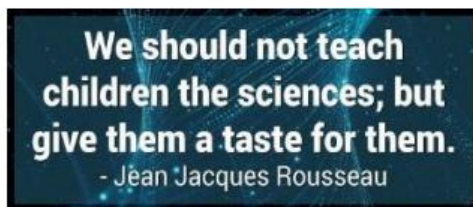
Children are taught to use all the **working scientifically skills**. These are on the children's learning objective, working walls and displayed and discussed as part of the lesson powerpoint:



Children are also given the opportunity to carry out five key areas of scientific enquiry:

- observing over time
- pattern seeking
- identifying, classifying and grouping
- comparative and fair testing (controlled investigations)
- researching using secondary sources

Pupils should also seek answers to questions through collecting, analysing and presenting data.



Curriculum Links

Science has many strong links with other subjects as well as constantly reinforcing children's basic skills; it develops many of the skills used in English such as reading, writing, speaking and listening. Children enhance their maths skills by developing their ability to problem solve, measure and represent and analyse information. Children use their computing skills whenever possible – including use of computers, tablets, cameras and movie creators. During the biology units, particularly animals including humans, children are encouraged throughout their PE lessons to link their learning and knowledge of the body. D & T links are made through the physics units such as light and electricity, as well as in Year 3, links to history through Stone age and rocks.

Planning

Planning is the responsibility of the class teachers who deliver the lessons across the school. Teachers should follow the long term overview and progression documents. Guidance and support will be provided by the Science co-ordinator.

Planning is used to:

- Set clear achievable goals;
- Identify possible gaps and misconceptions to close gaps and support progress
- Ensure work is matched to pupils' abilities, experiences and interests;
- Ensure progression, continuity and subject coverage throughout the school;
- Provide criteria for assessment and evaluation of teaching and learning.

Assessment and Record Keeping

Pupils are assessed formatively throughout each lesson. Teachers will complete assessment for learning of substantive knowledge before each topic, this will then inform future planning. Headstart topic tests will be used to at the end of each half term to assess substantive knowledge. These scores will be recorded by the class teacher to inform national assessment. Children's disciplinary knowledge (working scientifically) is assessed every lesson using the learning objective and child-led enquiries such as the TAPS assessments. Teachers will also use scientific discussions to assess progress. Progress is recorded in accordance with our progression of knowledge document for science. Progress is assessed and recorded through O Track at the end of each half term.

Other methods of formative assessment are used throughout the year through the use of marking, questioning, recap quizzes, peer and self-assessment.

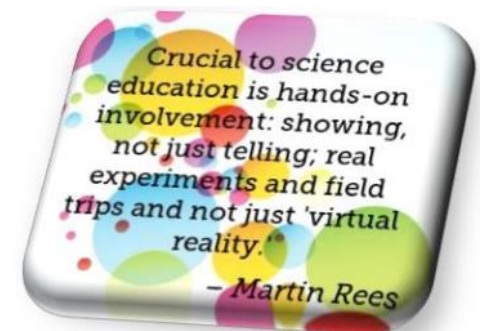
Monitoring and Reviewing

The Science co-ordinator is responsible for monitoring the standards of children's work and the quality and breadth of teaching. The coordinator supports colleagues in the teaching of Science by informing them of current developments in the subject and by providing a strategic lead and direction for the subject in school.

The co-ordinator is also responsible for evaluating strengths and weaknesses in the subject and identifying areas for improvement and development. This is established during learning walks, professional conversations and pupil voice.

Resources

A wide range of science resources are stored in a central location in school. The subject coordinator is responsible for purchasing, organising and replenishing resources and teachers are encouraged to request necessary resources before a new topic begins.



Health and safety

The document 'National Curriculum in England' recognises that Health and Safety issues are an important feature of the science curriculum.

Teachers should be alert to safety issues and potential hazards and should teach children how to approach hazards in a safe way. Children should be encouraged to make risk assessments and take reasonable precautions for themselves.

The publication 'Be Safe!' (Published by the Association for Science Education - ASE) contains information and advice about aspects of safety in science, and is available through the ASE website. CLEAPSS website also contains information and advice about aspects of science safety.

General Guidelines

In science, pupils will need to acquire a range of skills, and work with a variety of materials, substances, tools and apparatus. Whilst planning for science activities, teachers will consider and comply with the following:-

- Train children, through demonstrations and positive guidance in safe ways to use tools and equipment, and in aspects of personal hygiene (washing hands after practical work and before working with food).
- Familiarise themselves and with safe practice, trying out tools, apparatus, techniques or procedures to ensure safety.
- Ensure that adults other than teachers involved in activities are familiar with safe practices.
- Ensure that, during activities that require close supervision, only a manageable number of children are involved at one time; this is suggested to be a maximum of 4 children.
- Ensure that, if an emergency occurs which requires a teacher to leave the class unattended, all children stop work until the teacher returns. Electrical equipment will be switched off and hazardous apparatus removed.
- Involve the children in good working practices including looking after and replacing equipment and materials after use.
- Know the location of the First Aid Box and be aware of the school's Accident and Emergency procedures.