

Wellsprings School

Science Policy

November 2021



Wellsprings School Vision Statement

To develop creativity, high achievement and enjoyment.



Intent

The aims of science and how these contribute to the school's vision

Creativity	High achievement	Enjoyment
<ul style="list-style-type: none"> • Developing resilience - encourage open-mindedness, self-assessment, perseverance and responsibility. • We make cross-curricular links where relevant to show how science skills and knowledge can be used in many different contexts. • An enquiring mind - develop understanding of science through different types of scientific enquiries that help our children answer scientific questions about the world around them. • Being creative - build on our children's natural curiosity and help them to develop a scientific 	<ul style="list-style-type: none"> • Working together - we encourage pupils to work independently and with others and in many different ways to use a range of skills - practical, verbal and written. Verbal responses are no less valuable as written ones. • We use cross-curriculum links to show the relevance of what they are learning and how science is linked to everything. • Independence - we aim to prepare our children for life in an increasingly scientific and technological world. 	<ul style="list-style-type: none"> • Being active learners - We provide practical, hands-on activities/ investigations and real-life experiences (where possible) to engage the children. • We develop a positive attitude to science. We provide our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to

approach to problems and questions.

study science further.

There are four main purposes to this policy:

- To establish an entitlement for all pupils;
- To establish expectations for teachers of this subject;
- To promote continuity and coherence across the school;
- To state the school's approaches to this subject in order to promote public, and particularly parents' and carers', understanding of the curriculum.

Introduction

We aim to give all children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and also an understanding of the uses and implications of Science, today and for the future. Science at Wellsprings is focussed around talk - we want every child to be able to engage actively in lessons and give great value to verbal responses whether it be during play, whole class lessons or paired and group work.

The importance of science to the curriculum

Science is a body of knowledge built up through experimental testing of ideas. Science is also methodology, a practical way of finding reliable answers to questions we may ask about the world around us. Science at Wellsprings provides opportunities for children to develop their knowledge and understanding of the world in which they live both through practical experience and from other sources of information. It is based on the following principles:

- Developing children's sense of curiosity in their world.
- Encouraging children to observe and ask questions about what they learn and have the desire to find the answers for themselves, through application of learnt concepts.
- Ensuring children have a deep-rooted knowledge of the world around them, including how they, as humans, fit into this world.
- Develop children's thinking to ensure that they question results collected or ideas they learn - reflecting on why they have found the answers they have.
- Children are immersed in age -appropriate scientific vocabulary in all year groups to ensure that they have the subject specific language skills required to communicate their understanding.
- The science curriculum provides real-life opportunities to apply and deepen their skills and knowledge in the core curriculum subjects ensuring that they can understand the rationale behind learning in these areas.

The 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

- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Entitlement and curriculum provision

Expectations

All children are encouraged to develop and use a range of skills including observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific based questions. Specialist vocabulary for topics is taught and built up, and effective questioning to communicate ideas is encouraged. Concepts taught should be reinforced by focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions.

Within the seven areas of the Early Years Foundation Stage curriculum, science is mainly covered through 'Knowledge and Understanding of the World'. As a school we endeavour to provide a range of practical and physical activities and play experiences to ensure that children can achieve to the best of their abilities.

As the children move into Year 1 and on throughout Key Stage 1 and Key Stage 2, we strive for the children to achieve the age related expectation at the end of their key phase. This covers a range of areas, including:

Skills

- Give our children an understanding of scientific processes.
- Help our children to acquire practical scientific skills.
- Help our children understand risks and hazards and the steps needed to be safe.
- Develop the skills of investigation - including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Develop the use of scientific language, recording and techniques.
- Develop the use of computing in investigating and recording.
- Enable our children to become effective communicators of scientific ideas, facts and data.

Subject Specific-Skills

Science in EYFS

Science at Foundation Stage is covered in the 'Understanding the World' area of the EYFS curriculum.

It is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think and make decisions and talk about the world around them.

During their first years at school, our children will explore creatures, plants, people and objects in their natural environments. They will observe and manipulate objects and materials to identify similarities and differences.

Year Group	Understanding the World			Expressive Arts and design
Early Years	People and Communities	The World	Technology	Exploring Media and Materials

Working Scientifically objectives in EYFS at Wellsprings

Comment on similarities and differences e.g. between natural environments at school, materials, seasons or living things.

Ask questions about what they have seen or experienced

Children use the senses to comment on what they have seen or experienced.

With support, use simple equipment to make observations.

Children to record their observations and findings.

Begin to use what they have observed and experienced to answer questions

How we will support EYFS pupils to achieve these at Wellsprings:

- Give children the opportunity to use equipment such as magnifying glasses.
- Use the natural environment throughout the year and discuss and explore how it changes during different seasons and weather.
- Encourage the use of the senses to talk about what is the same or different. Could be done as a group using a floor book, through drawing/art, photographs or scribed verbal responses.
- Provide spaces to continue learning independently during free time based on current topics e.g. vets role play corner.

Implementation

For our mixed age classes, we have a rolling programme to ensure that all the curriculum areas below are covered by the end of their key phase.

Year Group	Biology	Chemistry	Physics
1	Plants Animals (including Humans)	Everyday Materials	Seasonal Changes
2	Living Things in their habitats Plants Animals, including Humans	Uses of Everyday Materials	
3	Plants Animals, including Humans	Rocks and Soils	Light Forces and Magnets
4	Living Things and their Habitats Animals, including Humans	States of Matter	Sound Electricity
5	Living Things and their Habitats Animals, including Humans	Reversible and Irreversible Changes	Earth and Space Forces
6	Living Things and their Habitats Animals, including Humans		Light Electricity

Evolution and Inheritance

Running throughout our science lessons we develop the key scientific enquiry skills detailed in the national curriculum:

			KS1		Lower KS2		Upper KS2	
			Y1	Y2	Y3	Y4	Y5	Y6
WORKING SCIENTIFICALLY	PLAN	Planning	<ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways 		<ul style="list-style-type: none"> asking relevant questions and using different types of scientific enquiries to answer them setting up simple practical enquiries, comparative and fair tests 		<ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary 	
		Observing / obtaining evidence	<ul style="list-style-type: none"> observing closely, using simple equipment performing simple tests identifying and classifying 		<ul style="list-style-type: none"> making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers 		<ul style="list-style-type: none"> taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate 	
	DO	Recording	<ul style="list-style-type: none"> gathering and recording data to help in answering questions 		<ul style="list-style-type: none"> gathering, recording, classifying and presenting data in a variety of ways to help in answering questions recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 		<ul style="list-style-type: none"> recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs 	
		Concluding	<ul style="list-style-type: none"> using their observations and ideas to suggest answers to questions 		<ul style="list-style-type: none"> reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings 		<ul style="list-style-type: none"> reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. 	
	REVIEW	Evaluating			<ul style="list-style-type: none"> using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 		<ul style="list-style-type: none"> using test results to make predictions to set up further comparative and fair tests. 	



					<ul style="list-style-type: none">identifying scientific evidence that has been used to support or refute ideas or arguments
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From Year 1, all pupils have dedicated science lessons but these can be taught in a weekly timetabled session or as a block. This is dependent on how the teacher feels it fits into the topic for each term, enabling cross-curricular links to coincide with the school's vision. On average, the minimum time dedicated to science each week is 1 hour.



Teaching and Learning



The national curriculum for science now reflects the importance of spoken language in pupils' development across the whole curriculum - cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to address their misconceptions.



All children are encouraged to develop and use a range of skills including observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific based questions. Specialist vocabulary for topics is taught and built up, and effective questioning to communicate ideas is encouraged. Concepts taught should be reinforced by focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions.



Teaching styles and lesson structure provide opportunities for pupils to consolidate their previous learning, use and apply their knowledge, understanding and skills, pose and ask questions, investigate ideas, reflect on their own learning and make links with other work.



Our approach to teaching science can include the following:



- dedicated science lessons
- direct teaching and interactive verbal work
- written work completed in English sessions linked to the science topic being covered
- practical investigations and demonstrations including both comparative and fair tests
- trips and visits from experts who will enhance the learning experience
- using the outside space at school provide real experiences of the natural world
- challenge questions for pupils to apply their learning in a philosophical/open manner
- activities differentiated in a manageable way so that all pupils are engaged in science
- developing scientific enquiry skills using a whole class, shared investigation / floor book



Enrichment Activities

Wherever possible, the teaching and learning of science is enhanced by educational visits using the local area as a resource or visitors to the school. Science theme weeks help to raise the profile of science in school and allows the children to experience a range of exciting activities and mini projects.

Teachers are responsible for planning and teaching all elements of the science curriculum to their pupils. The science subject leader provides support and guidance to all teachers, where appropriate.

Special Educational needs and Stretch

Teachers will aim to include all children in the science lesson. All children will benefit from aspects of the lesson, such as discussion, and other children communicating and sharing ideas. However, a pupil who has additional difficulties or needs may be supported by a teaching assistant in addition to appropriately differentiated tasks given by the teacher.

Children will be challenged and motivated by using high level questioning techniques, which allow the child to maintain their involvement in the lesson and demonstrate their knowledge and abilities. Also differentiated work may be given by the teacher appropriate to his or her needs.

Learning resources

Science equipment is stored in labelled trays in Adders' class cupboard. It is important that children are taught the rule of safety in science from a young age so that it becomes integral to their experiments and investigations. Materials and equipment need to be treated with respect and care and we endeavor to make sure all children do this.

Assessment and tracking of progress

We measure the impact of our curriculum through the following methods:

Short term

Teachers keep their own informal records, as appropriate, of those pupils whose progress is markedly different from that which is expected. These informal records are notes of anything which surprises them, either in terms of a lack of understanding or exceptionally good progress.

In line with the marking policy, staff use a three tick system in pupil books when marking, recorded next to the title or learning objective; three ticks - the child has achieved the learning objective, two ticks - the child needs to practise to achieve the learning objective, one tick - the child is struggling and needs more help to achieve the learning objective. Short and medium-term assessments are designed to be largely formative.

Medium term

At the end of each topic, children may undertake a low stakes quiz which helps identify any further consolidation needed or how each child is progressing against the curriculum objectives.

Long-term

At the end of each year, teachers will complete a class assessment indicating whether each pupil is in line, below or above age-related expectations against the 'working scientifically' objectives. Teachers use this working scientifically record alongside their informal records (from short-term assessment), to support them in writing their annual report to parents.

Foundation Stage tracking

The progress of pupils in the Foundation Stage is recorded through adult observations, the use of photographs and written work. This contributes to the child's learning journal on Tapestry.

The contribution of science to other subjects in the curriculum

Maths

- data handling: explore, describe and explain number patterns in results from investigations
- Use results to produce graphs and interpret what they tell us
- shape, space and measure: read scales and take measures of length or distance, angle, temperature and time and interpret them

English and topic work

- teaching scientific vocabulary and technical terms
- asking pupils to read and interpret texts relevant to the science topic
- expecting pupils to explain, argue and present their conclusions to others, both orally and in writing
- find out about scientists throughout history and the effect that their work had.

English supports science. English and topic sessions can be used to read non-fiction texts in which scientific vocabulary, graphs, charts and tables have to be interpreted.

Computing

Computers are used in science lessons, where appropriate, in order to encourage pupils to:

- explore and explain patterns in data (by using data-handling applications e.g. excel to produce different type of graphs)
- research a topic and present information they have found using an appropriate programme such as word or powerpoint
- consolidate their knowledge using games and online quizzes
- collect data for investigations which could include using data loggers, microscopes with digital cameras, video capture of images and activities

Personal, social and health education

The ability to work collaboratively as well as individually is an essential quality in good science learning. Group work and activities are a regular feature of lessons so that pupils develop qualities such as tolerance and the ability to see other points of view. These activities encourage pupils to develop their own strengths when working as a member of a team.

Pupils are encouraged, where appropriate, to reflect on the moral and social implications of scientific advancements and developments through time

Implementation

Leadership and management

Staff development and training opportunities

As a result of monitoring and evaluation procedures and the whole-school staff development policy, individual teachers and whole-school needs are identified. Opportunities are given for training, to enable teachers to observe colleagues' lessons and to enable the subject co-ordinator to develop science learning within the school.

Leadership and management roles

The science subject leader is responsible for supporting the development of effective teaching across the school.

The main roles are to:

- ensure that teachers are familiar with the National Curriculum and help them plan lessons, where appropriate
- lead by example in the way they teach
- prepare, organise and lead training, with the support of the Headteacher
- carry out monitoring and observe colleagues from time to time, with a view to identifying the support they need
- attend any relevant training to broaden their knowledge of science and science teaching;

The role of the Headteacher is very important in ensuring that the school is successful in raising levels of attainment in mathematics. The Headteacher's role is to:

- lead, manage and monitor the implementation of National Curriculum, including monitoring teachers' planning and the quality of teaching in classrooms
- to support the science co-ordinator to carry out observations and reviews of science across the school
- agree and set the action plan for achieving the school's targets with the whole staff and governing body
- support the subject leader, SEN co-ordinator and staff in implementing the science National Curriculum

- manage the school's allocation of funds for training, including the release time for staff

How the subject is monitored and evaluated

The monitoring of Science takes place as directed by the Head teacher and Governing body.

- Monitoring may take the form of lesson observations, book monitoring and pupil/staff consultations.
- Standards in Science across the school are monitored regularly through review of enrichment/practical evidence (usually in the form of annotated photos), work sampling and evaluation of planning.

Evaluation of this information informs strategic planning. To do this, the following monitoring activities may take place across the school year in line with the school's policy:

- work scrutiny
- talking with a sample group of pupils
- observing lessons and carrying out learning walks, looking at teachers' planning
- analysing questionnaires to pupils and staff, where appropriate
- analysing data and records (e.g. end of year assessments)

Review

This policy will be reviewed annually in line with the school's policy review programme. The subject leader is responsible for reporting to the governors' curriculum committee about the quality of its implementation and its impact on standards. In the light of this, policy amendments may be made.