

Science Policy Statement

Introduction

Science is a core subject in the National Curriculum. It is essentially about enabling pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them.

All children should be encouraged and have the opportunity 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.

Through the development of scientific skills, children will learn to work as scientists; planning and undertaking investigations. It is through investigating that children develop their knowledge and understanding.

Aims

To provide opportunities for appropriate practical experiences through which finding out occurs and science is taught.

To develop a child's:

- enjoyment of science and foster a positive attitude to it;
- natural curiosity;
- sense of enquiry;
- ability to ask questions which can then be made suitable for investigation;
- awareness that all science investigations must be carried out fairly;
- ability to observe closely using all appropriate senses;
- ability to use prior experiences and knowledge to make predictions;
- skills of drawing together their evidence and making appropriate conclusions from it;
- in light of the above, to know that findings may vary and that science does not always provide us with 'right answers'; awareness of the relationship between science and everyday life including personal health and the environment;
- ability to read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge.

For the children to be able to work like scientists:

- to develop investigative skills; observing, collecting information, recording, interpreting, performing simple tests, identifying and classifying, which enables them to find out more;
- to select and use appropriate equipment for use in their investigations;
- to develop their recording skills and become aware of the different methods which can be used. To select that which is appropriate for their task;
- to present findings scientifically through a variety of means;
- to develop an understanding of the need for a fair test;
- to use their observations and ideas to suggest answers to questions;
- to recognise the need to work safely.

Teaching and Learning

Science is a core subject which, where possible, is not taught in isolation but will draw from, compliment and contribute to all other areas of the curriculum.

The teaching of science encompasses a range of methods including whole class, experimental learning, discovery learning, problem solving and open-ended investigations. All teachers have positive attitudes towards their pupil's scientific interests and abilities and promote quality in their scientific development.

Pupil Activities and Experiences

Science is taught through cross-curricular topics where appropriate. In the Foundation Stage, children experience science through practical and play activities linked to 'Understanding the World' from the Early Learning Goals.

Resources

A range of Science resources are located in the science cupboard. The Team Leaders are responsible for the ordering and organisation of resources specific to topic-based science. The school grounds are also used as an educational resource. In addition to the computer suite, there are netbooks and each classroom is equipped with interactive boards, allowing for access to the Internet which allows for research. Each class is also equipped with a class camera and video recorders are available in each year group to enable children to carry out further investigations and an alternative method of recording their work.

Equal Opportunities

All children are entitled to a science curriculum which caters for their individual needs, offers equal access and opportunity and enables them to participate fully in all areas of the science curriculum. Further reference should be made to the schools equal opportunities policy.

Monitoring & Evaluation

The science curriculum is monitored by the Science Subject Leaders. It is also monitored by the Governors through curriculum visits.

Health & Safety

All staff are familiar with the contents of the schools' Health & Safety Policy. Children are taught to handle resources carefully. Close adult supervision is given to children using special equipment when appropriate.

SCIENCE POLICY

Planning and Organisation

The National Curriculum for science is set out under the programme of study for each year group

Working Scientifically outlines the ways in which children should be learning to work when undertaking an investigation. The skills of working as a scientist which include, asking simple questions and recognising that they can be answered in different ways, observing closely, using simple equipment, performing simple tests, identifying and classifying, using their observations and ideas to suggest answers to questions, gathering and recording data to help in answering questions, are skills which have to be developed. At KS1, Working Scientifically is specifically taught through the programme of study for each year group.

The school has a statutory obligation to cover all the programmes of study (POS) at KS1. The programmes of study are organised into half termly planning by each Team Leader. The areas covered in Year 1 and year 2 are set out in Appendix 1. Where appropriate, the units link to the topic. Meeting the objectives outlined in the programme of study will ensure the requirements of the National Curriculum are met, however, should you wish, other aspects might also be covered to enhance the topic under study.

The Early Years Foundation Stage Profile encompasses the requirements of the specific area of Understanding the World, (Early Learning Goals).

Progression and Differentiation

The Reception year will primarily focus on the Foundation Stage, however it will also cover Year 1 areas where this is appropriate. Reception classes will have a 'come and find out about' table for the children to explore. This may be used to extend or consolidate the topic under study or to revisit a concept previously taught.

For children both in the nursery unit and those under statutory school age in the Reception unit, the **Early Learning Goals** are pertinent to them. The outcomes for science are contained

in the specific area of learning 'Understanding the World'. The children are required to be able to talk about their environment and their observations and sometimes be able to record these. They should also be able to ask questions to help them come to a greater understanding of why and how things work. This aspect also focuses on learning about cause and effect and is developed through having conversations with adults and other children about the things they observe.

Assessment and Record Keeping

At Key Stage One, teachers will carry out a formative assessment prior to each unit of work to ascertain the children's current understanding of specific areas of science. This will also allow teachers to differentiate work, either by providing additional support or by providing challenges.

At the end of each term an assessment will be undertaken and the results of this will be recorded on class data sheets. Teachers will also assess the children through ongoing observations during the weekly science sessions. In the Foundation Stage, assessment is carried out primarily through ongoing observations.

Parents are informed about their child's scientific progress in the individual end of year reports.

Teaching

Science will be taught through cross-curricular topics where appropriate. Science will normally be taught by individual class teachers either within their own classroom area or the wider environment as appropriate. A variety of teaching methods will be employed which the teacher feels appropriate to the children and the content of the curriculum in question. These will include whole class and group activities.

Each teacher must make themselves aware of the relevance to health and safety when undertaking work in science. In turn s/he must enable children to become aware of safety aspects.

The school site has been developed as an educational resource, including a foundation stage outside learning area, quiet areas and activity areas for all pupils in the school. There is also a 'Magic Garden' to the front of the school which is a fenced off natural area that is used to enhance the science provision.

Visits will provide the opportunity to study the local environment as well as animal and plant life in different habitats. Visits are important tools which:

- link to an area of study
- develop a topic
- provide a stimulus
- consolidate previous work.

Training

Science is included in the annual review for the School Improvement Plan and staff audit, which monitors staff's perception of science teaching, learning and resources throughout the school. Following this, appropriate INSET is planned. This can take the form of staff meetings, professional days or team meetings. Individual training is available on an on-going basis through request or as and when a specific need is identified. Staff are provided with details of online CPD that they can access to support with Subject Knowledge.

Liaison

Liaison between classes is achieved through team meetings, informal discussion and SLT meetings.

Liaison with the junior school occurs at co-ordinator level with particular respect to the continuity of policy and practice and between Year 2 and Year 3 team leaders as part of the transfer process.

Liaison between parents and School occurs through a variety of means:

- school website
- parents notice board
- curriculum newsletter
- informal discussion
- parent consultations
- assemblies and open days enable parents to see on-going work
- social media
- Tapestry

The governors have a sub-committee with particular responsibility for the curriculum as a whole. Liaison is achieved through governor curriculum visits to the school.

Review

This policy is reviewed annually by the Science Subject Leaders.

Approved: January 2025

Next Review Due: January 2026

Appendix 1

Key stage 1

Areas covered in Year 1

Plants

Animals, including humans

Everyday materials

Seasonal changes

Areas covered in Year 2

Living things and their habitats

Plants

Animals, including humans

Use of everyday materials

Food and Farming - learning where our food comes from

Appendix 2

| Working Scientifically – Progression of Skills for Classification | | | | | | | | | | |
|---|---|---|----------------------|--|-----------------------------------|----------------------------|--|--|---|--|
| | To ask scientific questions | To plan an enquiry | To make a prediction | To observe closely | To measure precisely / accurately | To gather / record results | To present results | To interpret results | To draw conclusions | To evaluate an enquiry |
| Key Stage One <i>Developing close observation</i> | Be able to ask a yes/no questions to aid sorting | Identify the headings for the two groups (it is, it is not.....) | | Be able to compare objects based on obvious, observable features e.g. size, shape, colour, texture etc. | | | Sort objects and living things into two group using a basic Venn diagram or simple table | Talk about the number of objects in each group i.e. which has more or less | Children in KS1 are not expected to draw conclusions. They are expected to make observations which will help them to answer questions. They do not have the subject knowledge to give reasons for what they observe so they cannot draw scientific conclusions. | |
| Lower Key Stage Two <i>Developing a systematic approach</i> | Be able to ask a range of yes/no questions to aid sorting | Be able to put appropriate headings onto intersecting Venn and Carroll diagrams | | Be able to compare objects based on more sophisticated, observable features. Present observations in labelled diagrams | | | Sort objects and living things into groups using intersecting Venn and Carroll diagrams | Spot patterns in the data particularly two criteria with no examples e.g. there are no living things with wings and no legs | Draw simple conclusions when appropriate for patterns e.g. a flying insect with no legs might always crash land | Suggest improvement e.g. a wider range of objects – only looked a British trees. Suggest new questions arising from the investigation. |
| Upper Key Stage Two <i>Developing independence</i> | Be able to ask a range of yes/no questions to aid sorting and decide which ways of sorting will give useful information | Identify specific clear questions that will help to sort without ambiguity | | Be able to compare not only based on physical properties but also on knowledge gained through previous enquiry | | | Create branching databases (tree diagrams) and keys to enable others to name living things and objects | Be able to talk about the features that objects and living things share and do not share based on the information in the key etc | Be able to use data to show that livings things and materials that are grouped together have more things in common than with things in other groups | Be able to explain using evidence that the branching database or classification key will only work for the living things or materials it was created for |

| Working Scientifically – Progression of Skills for Research | | | | | | | | | | |
|---|--|---------------------------------------|----------------------|--------------------|-----------------------------------|--------------------------|---|--|---------------------|---|
| | To ask scientific questions | To plan an enquiry | To make a prediction | To observe closely | To measure precisely / accurately | To gather/record results | To present results | To interpret results | To draw conclusions | To evaluate an enquiry |
| Key Stage One <i>Developing close observation</i> | Ask one or two simple questions linked to a topic | | | | | | Present what they have learnt verbally or using pictures | Be able to answer their questions using in simple sentences | | |
| Lower Key Stage Two <i>Developing a systematic approach</i> | Ask a range of questions linked to a topic | Choose a source from a range provided | | | | | Present what they learnt verbally or using labelled diagrams | Be able to answer their questions using simple scientific language | | Suggest limitations e.g. only had one book. Suggest new questions arising from the investigation. |
| Upper Key Stage Two <i>Developing independence</i> | Ask a range of questions recognising that some can be answered through research and others may not | Choose suitable sources to use | | | | | Present what they learnt in a range of ways e.g. different graphic organisers | Be able to answer their questions using scientific evidence gained from a range of sources | | Be able to talk their degree of trust in the sources they used |

| Working Scientifically – Progression of Skills for Comparative / Fair Tests | | | | | | | | | | |
|--|--|---|---|--|--|---|---|--|---|---|
| | To ask scientific questions | To plan an enquiry | To make a prediction | To observe closely | To measure precisely / accurately | To gather/record results | To present results | To interpret results | To draw conclusions | To evaluate an enquiry |
| Key Stage One <i>Developing close observation</i> | Identify the question to investigate from a scenario or choose a question from a range provided | Choose equipment to use, decide what to do and what to observe or measure in order to answer the question | Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen but this will be based on experience or may simply be a guess. | Make observations linked to answering the question | When appropriate, measure using standard units where all the numbers are marked on the scale | Record data in simple prepared tables, pictorially or by taking photographs | Present what they learnt verbally, using pictures or block diagrams | Answer their question in simple sentences using their observations or measurements | | |
| Lower Key Stage Two <i>Developing a systematic approach</i> | Ask a range of relevant questions linked to a topic | Decide what to change and what to measure or observe | Use results from an investigation to make a prediction about a further result | As for KS1 | Measure using standard units where not all the numbers are marked on the scale, take repeat readings where necessary | Prepare own tables to record data | Present data in bar charts | Refer directly to their evidence when answering their question | Where appropriate provide oral or written explanations for their findings | Suggest improvements e.g. to method of taking measurements. Suggest new questions arising from the investigation. |
| Upper Key Stage Two <i>Developing independence</i> | Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results | Recognise and control variables where necessary. | Use test results to make predictions for further investigations | As for KS1 | Measure using standard units using equipment that has scales involving decimals | Prepare own tables to record data, including columns for taking repeat readings | Choose an appropriate form of presentation including line graphs | Be able to answer their question, describing causal relationships | Provide oral or written explanations for their findings | Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled and accuracy of results |

| Working Scientifically – Progression of Skills for Observation over time | | | | | | | | | | |
|---|--|---|---|--|--|---|--|--|---|---|
| | To ask scientific questions | To plan an enquiry | To make a prediction | To observe closely | To measure precisely / accurately | To gather/record results | To present results | To interpret results | To draw conclusions | To evaluate an enquiry |
| Key Stage One <i>Developing close observation</i> | Ask a question about what might happen in the future based on an observation | Choose equipment to use, decide what to do and what to observe or measure in order to answer the question | Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen but this will be based on experience or may simply be a guess. | Make observations linked to answering the question | When appropriate, measure using standard units where all the numbers are marked on the scale | Record data in simple prepared tables, pictorially or by taking photographs | Present what they learnt verbally or using pictures | Answer their question in simple sentences using their observations or measurements | | |
| Lower Key Stage Two <i>Developing a systematic approach</i> | Ask a range of relevant questions linked to a topic | Decide what to measure or observe. Decide how often to take a measurement | Use results from an investigation to make a prediction about a further result | Make a range of relevant observations linked to answering the question | Measure using standard units where not all the numbers are marked on the scale. Use dataloggers to measure over time | Prepare own tables to record data | Present data in time graphs | Refer directly to their evidence when answering their question | Where appropriate provide oral or written explanations for their findings | Suggest improvements e.g. need to make observations more regularly. Suggest new questions arising from the investigation. |
| Upper Key Stage Two <i>Developing independence</i> | Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results | Recognise and control variables where necessary | Use test results to make predictions for further investigations | Make a range of relevant observations linked to answering the question | Measure using standard units using equipment that has scales involving decimals | As for LKS2 | Choose an appropriate form of presentation including line graphs | Be able to answer their questions, describing the change over time | Provide oral or written explanations for their findings | Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled and accuracy of results |

| Working Scientifically – Progression of Skills for Pattern Seeking | | | | | | | | | | |
|---|--|---|---|--|--|---|---|--|---|---|
| | To ask scientific questions | To plan an enquiry | To make a prediction | To observe closely | To measure precisely / accurately | To gather/record results | To present results | To interpret results | To draw conclusions | To evaluate an enquiry |
| Key Stage One <i>Developing close observation</i> | Ask a question that is looking for a pattern based on observations | Choose equipment to use, decide what to do and what to observe or measure in order to answer the question | Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen but this will be based on experience or may simply be a guess. | Make observations linked to answering the question | When appropriate, measure using standard units where all the numbers are marked on the scale | Record data in simple, prepared tables and tally charts | Present what they learnt verbally | Answer their question in simple sentences using their observations or measurements | | |
| Lower Key Stage Two <i>Developing a systematic approach</i> | Ask a range of relevant questions linked to a topic | Decide what to measure or observe | Use results from an investigation to make a prediction about a further result | As for KS1 | Measure using standard units where not all the numbers are marked on the scale. | Prepare own tables to record data | Use ICT package to present data as a scattergram | Refer directly to their evidence when answering their question | Where appropriate provide oral or written explanations for their findings | Suggest improvements e.g. needed a bigger sample/wider range. Suggest new questions arising from the investigation. |
| Upper Key Stage Two <i>Developing independence</i> | Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results | Recognise and control variables where necessary | Use test results to make predictions for further investigations | As for KS1 | Measure using standard units using equipment that has scales involving decimals | As for LKS2 | Choose an appropriate form of presentation including scatter graphs | Be able to answer their questions identifying patterns | Provide oral or written explanations for their findings | Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled and accuracy of results |

| Working Scientifically – Progression of Vocabulary | | | |
|--|--|--|---|
| EYFS and Year 1 | Year 2 <i>(plus previous year group)</i> | Lower KS2 <i>(plus previous year groups)</i> | Upper KS2 <i>(plus previous year groups)</i> |
| Questions Answers Equipment Gather Measure Record Results Sort Group Test Explore Observe Compare Describe Similar/similarities Different/differences Egg timers Ruler Tape measure Metre stick Beaker Pipette syringe | Pictogram Tally chart Block diagram Venn diagram Table Chart Order Observe changes over time Notice patterns Link Secondary sources Hand lenses Stop watch | Variables Control variable Types of scientific enquiry Identify Classify Order/rank Comparative tests Fair tests Careful/systematic Accurate Observations Evidence Present Data/evidence/results Keys Bar charts Conclusions Prediction Support/not support/ refute Thermometers Data loggers Magnifying glass Microscope Increase Decrease Appearance | Independent variable Dependent variable Accuracy Precision Degree of trust Classification keys Scatter graphs Line graphs Causal relationship Opinion/fact |