Brunshaw Primary School

'Inspiring children to be resilient and aspirational learners, within a positive and considerate community.'

Science Policy

November 2024

Agreed by Governors: 10/10/2024

1. **Curriculum Statement**

Intent:

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.

In order to achieve this staff will ensure:

- Children are encouraged to be inquisitive.
- Children will acquire: knowledge, concepts, skills and positive attitudes towards the subject
- Children will acquire and develop key knowledge (as laid out in National Curriculum (NC)) and build on this throughout their primary education.
- Children will develop their 'Working Scientifically' skills and that these are continually built on (as per NC and Lancashire documents).
- Experiments are offered throughout topics to ensure practical experiences are being offered.

Implementation:

In order to achieve an effective Science curriculum, that allows children to achieve at their highest standard, teacher's must:

- Create a positive learning attitude towards Science at all times.
- Ensure all NC statements are taught and evidenced for each pupil (e.g. workbooks, photographs)
- Teach Science in the pre-arranged blocks.
- Ensure Science is taught for at least 1hr 30mins per week (or equivalent of if blocking subjects).
- Involve problem-solving opportunities (e.g. challenge questions, open-ended experiments) to build on pupils' knowledge and understanding of key concepts.
- Have up-to-date knowledge of the curriculum, and completing relevant CPD opportunities.
- Use open-ended questioning (linked to higher-order thinking).
- Adapt teaching based on children's current scientific knowledge.

- Ensure that working scientifically skills are embedded throughout all sequences of lessons.
- Provide opportunities for cross-curricular learning (e.g. constructed tables/graphs – Maths).
- Demonstrate how to correctly use scientific equipment.
- Ensure opportunities are given for outdoor scientific learning.

Impact:

Staff will measure the impact of the curriculum they have taught through a variety of assessment strategies (see section three).

Staff will continually use Assessment for Learning strategies throughout lesson time to build and develop children's understanding of key scientific concepts.

Children will be able to explain key scientific concepts and be able to explain them from their own experiences (e.g. through experiments). It is imperative that pupils understand the scientific skill being taught and not just the experiment they have taken part in.

Children to enjoy science lessons and to begin to develop a passion for STEM careers.

2. Teaching and Learning

- Children will be encouraged to ask their own questions and be given time to use their own scientific skills and research to discover the answer. These should be celebrated and encouraged.
- Teachers need to ask a range of questions (both open and closed); engaging all pupils and furthering understanding (e.g. through expanding on answers, asking further questions, etc.).
- Planning creates highly engaging lessons, alongside using high-quality resources (if required see Science lead/SLT).
- Precise questioning from teachers to check understanding, identify gaps in learning and address any misconceptions.
- New vocabulary to be directly taught and this is to be applied in pupils' work. Key vocabulary for each area of learning is on the Knowledge Organiser and displayed on the working walls in all classrooms.
- Outdoor learning used to develop pupils' knowledge and understanding, whilst providing engaging learning.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of Science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The national curriculum for science 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 probe and remedy their misconceptions.

3. Assessment

Class teachers will assess pupils each half term. This will include two areas of assessment, ensuring that we not only use summative assessment strategies, but also strategies to ensure progress in scientific concepts and key knowledge.

- When completed a Science Unit, teachers will assess children on the Insight tracker. Children will be reported 'On track to meet End of Key Stage Expectation' or 'Not on track to meet the End of Key Stage Expectation'.
- All pupils have to work in their year group, unlike maths and English where pupils could be working on a lower year's curriculum.

4. Planning and Resources

The order of topics will be listed in section five. These must be followed, as this will allow the Science Lead/SLT to check progression throughout school at any given time.

Staff are directed toward to ASE documents (on server) to assist with planning and to see how a series of lessons can effectively be delivered.

Further evidence of good science lessons will include (and should be planned for):

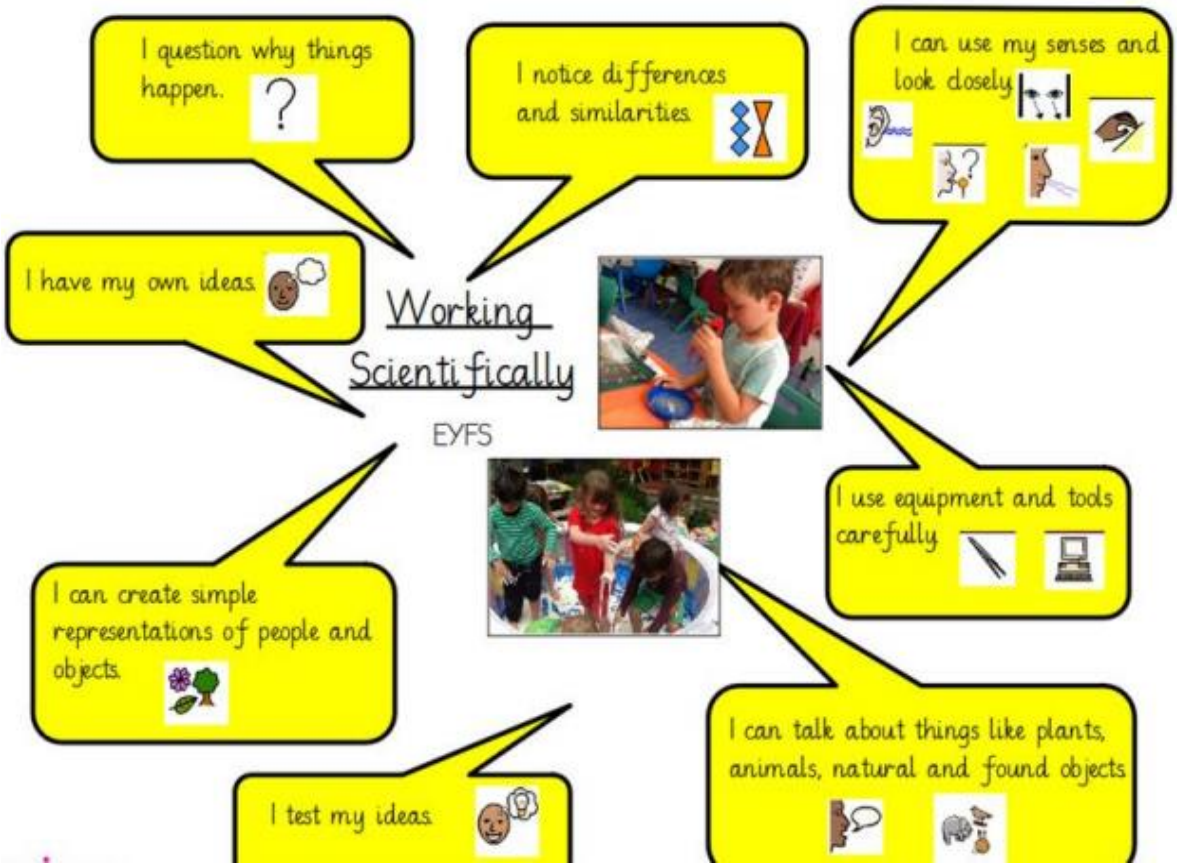
- An active and engaging learning environment
- Children being encouraged to ask and answer open-ended questions
- Children conducting and planning their own experiments (when relevant); using their scientific understanding to assist them
- Children recording their findings in a variety of ways (e.g. table, Carroll diagram, bar charts, line graphs, etc.)
- Children enjoying what they are learning and able to discuss with adults and other children
- A cross-curricular approach

5. Organisation

Science will be taught and planned in these topic blocks by each year group. This will allow Science Lead/SLT to check on progression. Year groups must consult the NC to ensure that each subject area's objectives are fully taught and evidenced.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 1	Animals including humans	Seasonal Changes	Plants	Seasonal Weather	Everyday Materials	Seasonal Weather
YEAR 2	Animals including humans	Use of everyday materials	Living things and their habitats	Scientists And Inventors Florence Nightingale	Plants (3 lessons – linking to the Amazon rainforest and local area)	Plants
YEAR 3	Animals including humans	Rocks	Forces and Magnets	Scientists And Inventors Marie Curie	Plants	Light
YEAR 4	Animals including humans	Living things and their habitats	States of matter	Scientists And Inventors Thomas Edison	Sound	Electricity
YEAR 5	Animals including humans	Earth and Space	Properties and changes of materials	Scientists And Inventors Isaac Newton	Forces	Living things and their habitats
YEAR 6	Animals including humans	Electricity	Evolution and Inheritance	SATS prep	Light	Living things and their habitats

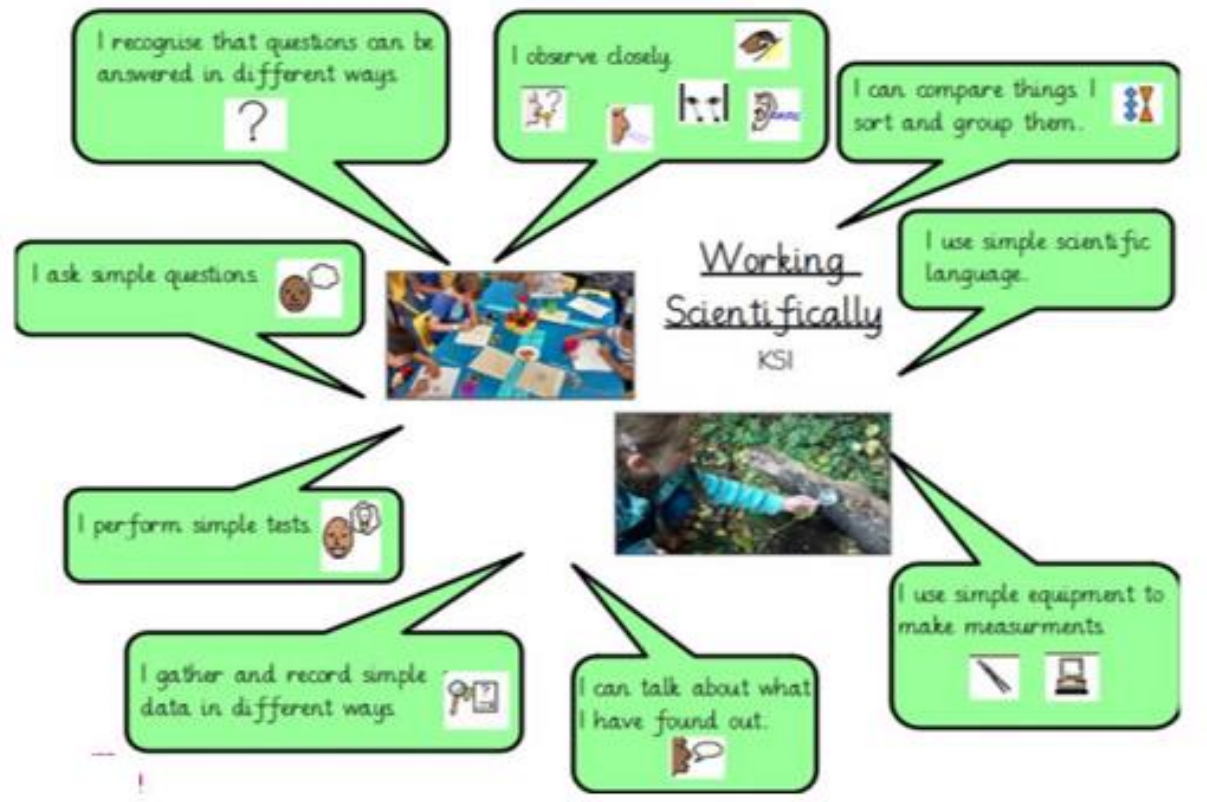
6. EYFS



The Foundation Stage delivers Science content through the 'Understanding of the World' strand of the EYFS curriculum. This 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.

7. KS1 & KS2

Key stage one:

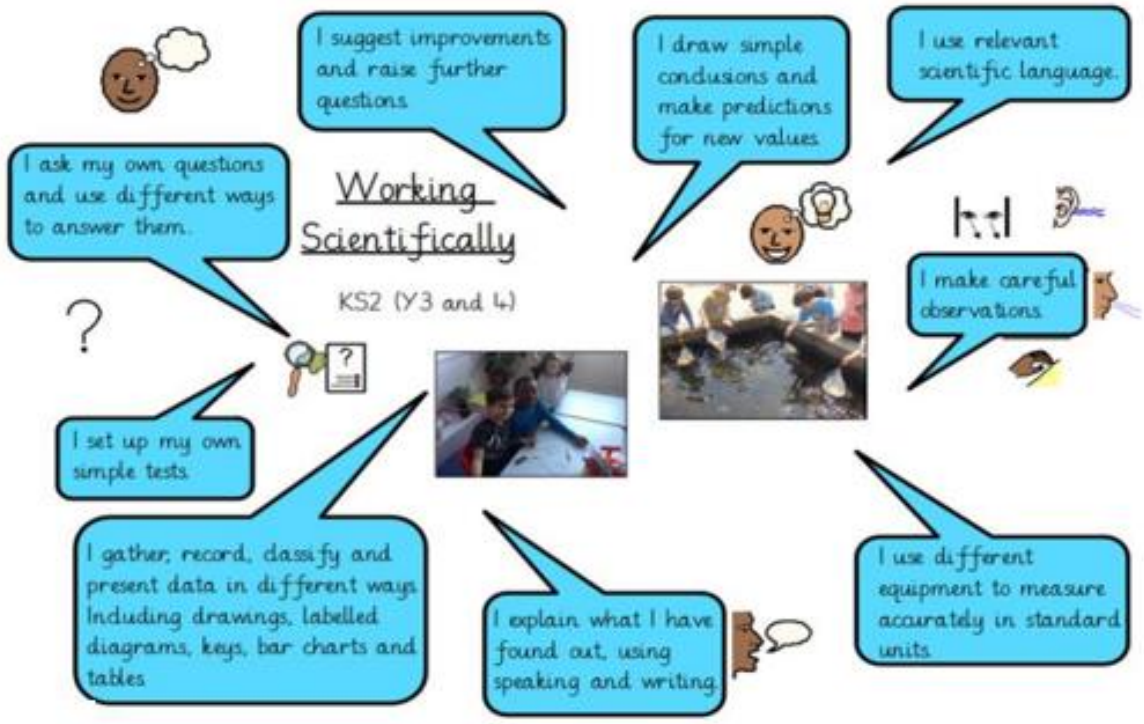


The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop 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:

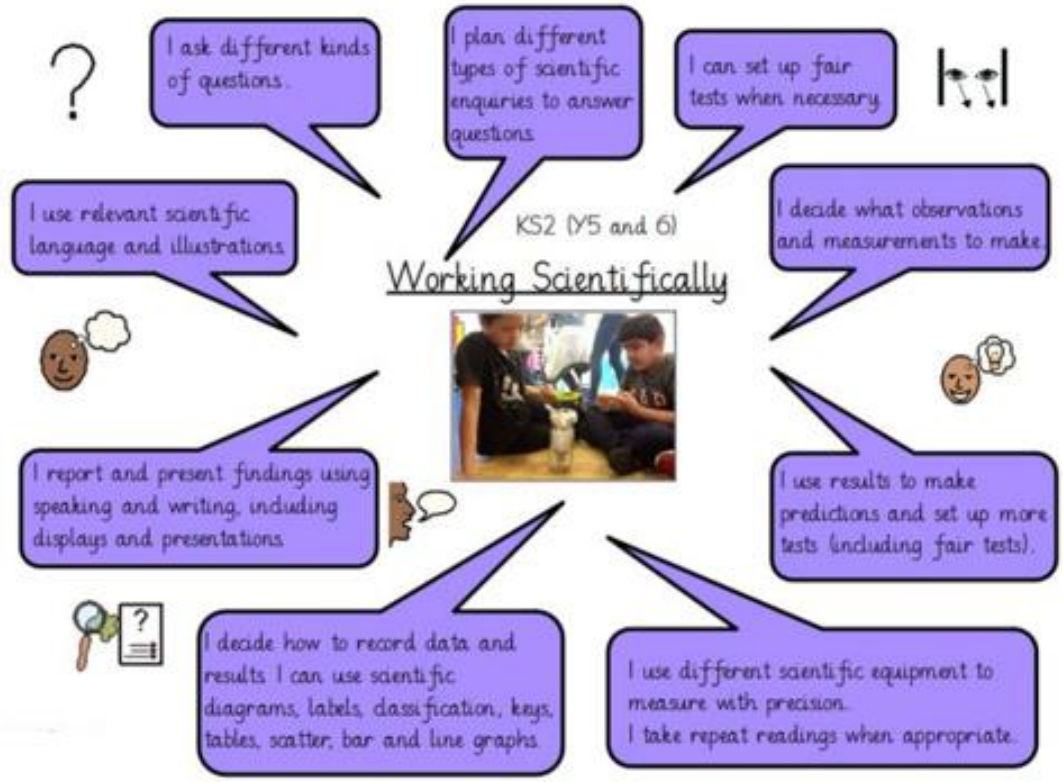


The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar 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. Scientific Vocabulary

EYFS:

- New vocabulary to be introduced and used in the correct context with the children.
- Vocabulary could be recapped throughout the year through vocabulary games.
- Not all vocabulary needs to be able to be spelt, it is more essential at this stage that pupils begin to have a knowledge of words they will encounter in KS1 (e.g. for plants – stem, trunk, leaves, etc.)

KS1 and KS2

- The Knowledge Organiser will show vocabulary that is to be taught and used in each unit. A front cover will be at the start of each new unit of work. This front cover will show what children will be learning and the scientific vocabulary to be taught.
- Evidence of pupils applying vocabulary in their work books and evidence when speaking to pupils that they understand the word meaning and can apply it to their scientific knowledge.
- New words to be taught however is felt appropriate (e.g. Word Aware, word games, etc.)
- New vocabulary to be displayed on the Science working wall and accessible for all children.

9. Inclusion

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 work, 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 a range of strategies to include and motivate all learners, ensuring that optimum progress is made throughout each part of the lesson.

Review date: November 2026