



Science Policy and Subject Guide

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Bewick Bridge Community Primary School

Purpose of this policy

- To establish an entitlement for all pupils in the subject of Science;
- To establish expectations for adults and children;
- To promote clarity, coherence and consistency in the teaching of Science across the school;
- To promote a shared understanding of Science, within the school;
- To explain how Science is taught at Bewick Bridge Community Primary School;
- To give further guidance about teaching methods and the resources available

Science Subject Statement

At Bewick Bridge, we believe that a high-quality education in Science is a vital part of children's learning. The process of 'working scientifically' has the ability to develop and merge creative and critical thinking skills, through children's engagement with a range of activities including: observation; pattern seeking; identifying, classifying and grouping; comparing; designing and carrying out controlled investigations; creating and answering questions; collecting, presenting and interpreting information. Scientific learning provides children with the opportunity to recognise the value of rational explanations as well as the chance to investigate their curiosities about the natural world. Scientific learning allows children to develop an understanding of the world around them and their role within in through the disciplines of biology, chemistry and physics. They do this through a combination of acquiring essential scientific knowledge, practising key scientific skills and developing a deep conceptual understanding about the world around them. Through a respectful and inquisitive learning environment, children are encouraged to show curiosity about the world around them and to use their critical thinking skills to develop lines of enquiry that explore questions about the world they inhabit.

Aims and objectives of scientific learning

The National Curriculum states that:

"A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and

concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes” (DfE, 2014).

The overarching aim for Science in the national curriculum is to promote high standards of knowledge, skills and understanding relating to scientific processes and the treatment of natural phenomena.

At Bewick Bridge we aim:

- To teach the key scientific topics as outlined in the Early Years Foundation Stage Statutory Framework and the National Curriculum;
- To use rigorous whole-school, long term planning to ensure curriculum coverage;
- To use termly assessment to ensure learning progression within and across year groups;
- To incorporate the principles of ‘working scientifically’ into all of our scientific learning;
- To encourage curiosity by providing opportunities for open ended investigations;
- To link our scientific learning to our locality, where possible, so as to make it relatable and relevant to children;
- To encourage children to ask and answer their own scientific questions;
- To promote rational thinking when explaining process and justifying interpretations;
- To model and scaffold oracy skills through in-depth, rational scientific discussions;
- To develop key scientific skills;
- To develop an understanding of why and how things occur in the natural world;
- To offer enrichment opportunities that link scientific learning to other curriculum subjects;
- To provide equal opportunities for all children to achieve through lessons and extra-curricular activities.

Science programmes of study

The [Early Years Foundation Stage Statutory Framework](#) and the [National Curriculum Science programme of study for Key Stage 1 and Key Stage 2](#) form the basis of teaching and learning in Science.

In the Early Years Foundation Stage, the prime area of 'Understanding the World' is explored through topic based learning and through the use of continuous and enhanced provision, both in the indoor and outdoor learning environment.

In Key Stage 1 and Key Stage 2, the National Curriculum programme of study is addressed through the school's use of the [International Primary Curriculum](#), which provides the children with topic-based learning opportunities that focus on one key subject area, but creates links with other subjects.

Additionally, over the course of the year there are termly whole-school learning enrichment days that provide children with the opportunity to utilise and extend their scientific learning.

Teaching and learning

Through the teaching of Science, children should develop scientific knowledge, such as the facts relating to animal life cycles, as well as scientific skills, such as the ability to construct a controlled investigation. By combining knowledge and skills, children will be able to develop rich understandings and address misconceptions related to scientific learning. Where possible, scientific learning should be linked to real life resources and experiences. Teaching and learning should build upon children's speaking and listening skills by providing children with ample opportunities to express their knowledge and understanding. As children progress through the school, this expression should incorporate an increasing number of technical terms. This will demonstrate children's increasing confidence in the subject as well as provide teachers with the opportunity to assess learning and address any misconceptions. Science is a high priority subject as it provides children with the opportunity to provide curious and critical thinking, enabling them to understand the world around them and to situate themselves within it.

Cross-curricular learning

Science Enrichment days

At least one every term, the school plans for a science enrichment day. Each day has a particular theme that aims to link specific areas of the science curriculum with other subjects. The subject lead develops a theme and provides class teachers with an overview of possible activities. Then class

teacher's tailor these proposals to ensure that their children are engaged in learning and that the learning meets their needs.

English

Science supports and enhances English learning by providing children with opportunities to utilise their reading, writing, speaking and listening skills. Moreover, our long and medium-term English planning provides opportunities for children to study non-fiction and fiction texts that directly link to children's topic-based scientific learning. Scientific learning children with provides opportunities to develop their oracy skills by encouraging the forming and answering of questions, by encouraging rational discussions and by providing opportunities to recount investigations. With regards to writing, children have the opportunity to write about their investigations, presenting reports and justifying the conclusions reached.

Maths

Science supports and enhances Maths learning by providing children with the opportunity to use different weights and measures. Additionally, through the use of scientific investigations, that generate quantitative data, children are able to use and apply their understanding of number. Such investigations also provide children with the chance to estimate and predict using numerical values.

History and geography

Through scientific observation and investigation, children are able to learn about the geographic features of local and distant environments. They are able to use their primary investigations with secondary sources to learn about historic changes within the natural world. Thus, scientific learning enhances history and geography learning. Additionally, in their history learning, children are able to develop an understanding of key individuals and events that have played an important role in the development of the field of science.

Spiritual, moral, social and cultural development

By learning about the world around them, children develop a sense of their place in the world and the impact humans have upon it. This might include an understanding of the use of physical resources, littering and recycling. Additionally, through learning about the life cycles and health of animals, children develop an understanding of their own physicality and what can affect their health and

wellbeing, for example exercise and diet. Scientific learning has the ability to impact upon children's life choices, affecting them, others and the world around them, both now and in the future

Coverage and planning

The teaching staff at Bewick Bridge construct a two-year learning cycle using topics from the International Primary Curriculum. These are selected in order to ensure coverage of the National Curriculum. The topics selected and the coverage of National Curriculum programmes of study are documented in the Whole School Curriculum Overview document. It is the role of the Science subject lead to cross reference this document against the areas of study in the National Curriculum (see the table below). Where potential gaps are identified in the one year teaching plan, these are discussed with year group teachers to ensure that coverage will be ensured via the two year teaching cycle.

Year A of two-year cycle

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year Group	Area of learning	Sep - Oct	Nov - Dec	Jan - Feb	Mar - Apr	Apr - May	Jun - Jul
Reception	Understanding the world: The World	Classroom pets - Autumn			Growing and spring		Summer - Life Cycles - Minibeasts - Ourselves
	Understanding the world: Technology	Addressed via continuous provision / learning environment					
Year 1	Plants						
	Animals, including humans	The Earth: Our Home (animals and habitats)				I'm Alive	
	Everyday materials		The Magic Toy Maker		The Circus is Coming to Town		From A - B
	Seasonal changes					I'm Alive	From A - B
Year 2	Living things and their habitats	The Earth: Our Home					

		(animals and habitats)					
	Plants						
	Animals, including humans	The Earth: Our Home (animals and habitats)				I'm Alive	
	Uses of everyday materials		The Magic Toy Maker		The Circus is Coming to Town		From A - B
Year 3	Plants					Saving the world	
	Animals, including humans					Saving the world	How Humans Work
	Rocks						
	Light						How Humans Work
	Forces and magnets		Bright Sparks				
Year 4	Living things and their habitats					Saving the world	
	Animals, including humans					Saving the world	How Humans Work
	States of matter						
	Sound		Bright Sparks				How Humans Work
	Electricity		Bright Sparks				
Year 5	Living things and their habitats			Out of Africa			Being Human: Growing Up
	Animals, including humans			Out of Africa			Being Human:

							Growing Up
	Properties and changes of materials						
	Earth and space						
	Forces						
Year 6	Living things and their habitats			Out of Africa			Being Human: Growing Up
	Animals, including humans			Out of Africa			Being Human: Growing Up
	Evolution and inheritance			Out of Africa			Being Human: Growing Up
	Light						
	Electricity						

Year B of two-year teaching cycle

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year Group	Area of learning	Sep - Oct	Nov - Dec	Jan - Feb	Mar - Apr	Apr - May	Jun - Jul
Reception	Understanding the world: The World						
	Understanding the world: Technology						
Year 1	Plants	Live and Let Live			Flowers and Insects		
	Animals, including humans	Live and Let Live			Flowers and Insects	Super Humans	
	Everyday materials		Time Detectives				

	Seasonal changes	Live and Let Live			Flowers and Insects		
Year 2	Living things and their habitats	Live and Let Live			Flowers and Insects		
	Plants	Live and Let Live			Flowers and Insects		
	Animals, including humans	Live and Let Live			Flowers and Insects	Super Humans	
	Uses of everyday materials		Time Detectives				
Year 3	Plants						
	Animals, including humans						
	Rocks			Material World			
	Light		Time and Place, Earth and Space				
	Forces and magnets				Active Planet	Feel the Force	
Year 4	Living things and their habitats						
	Animals, including humans						
	States of matter			Material World	Active Planet	Feel the Force	
	Sound						
	Electricity					Electricity	
Year 5	Living things and their habitats						
	Animals, including humans						
	Properties and changes of materials		Making new Materials				
	Earth and space				Mission to Mars / Space		

					Explorers		
	Forces	Fascinating Forces					
Year 6	Living things and their habitats						
	Animals, including humans						
	Evolution and inheritance						
	Light				Mission to Mars / Space Explorers		
	Electricity						

This form of long-term planning is then supported by medium and short term planning. Medium term planning is conducted by groups of teachers, namely Key Stage 1 teachers plan a half-termly topic together, as do lower key stage 2 and upper key stage 2. During this stage of planning, teachers look at the programme of study provided by the International Primary Curriculum and select activities that will provide children with stimulating and relatable learning experiences. These activities establish firm scientific foundations, while also stretching and challenging children to explain their understanding. To ensure that these activities provide rigorous coverage of the National Curriculum, teachers match the learning objectives of the International Primary Curriculum against those of the National Curriculum, using standardised cross-referencing documents provided by the International Primary Curriculum. Once a medium term plan has been completed for a new topic, teachers then construct weekly short-term plans that refer back to the planned learning, while also responding to the needs of the children so as to provide appropriate levels of support and challenge that ensure for learning progression. Short-term plans detail the learning to be covered, using the learning objectives from the National Curriculum, so as to ensure teaching and learning is focused on these areas. All planning documents are stored digitally on a central, shared platform allowing for effective monitoring by the subject lead.

Learning and assessment

Learning

Evidence of children's learning, achievement and progression should be visible, both to them and to adults. This can take the form of recorded learning in their topic or International Primary Curriculum books, when engaged in a topic that incorporates scientific learning. Additionally, learning can be evidenced as follows:

- By children contributing to their class working wall;
- By children's work being neatly and proudly displayed on corridor displays;
- By children or teachers taking photographs or videos of investigations and discussions;
- By children or teachers scribing discussions;
- By examples of children's learning being shared in the school newsletter or year group Bugle;

The subject lead for Science conducts termly learning environment walks, book scrutinies and data analysis to monitor progression in learning and security of judgements. Additionally, lesson observations are conducted in the Spring term to monitor the quality and consistency of teaching and learning, with examples of quality first teaching being shared with colleagues in professional development meetings.

Assessment

Children are assessed against the learning objectives as outlined in the Early Years Foundation Stage Statutory Framework and the National Curriculum. This assessment is based on a range of learning evidence, as detailed above. Frequent assessment, for example, observations in Reception or plenary discussions at the end of a lesson in Key Stage 1 and 2 will be formative in nature. Where possible, children should be aware of this assessment process, for example, by looking at previous observations on Tapestry in Reception or by talking with the teacher about their recorded learning during the lesson in Key Stage 1 and 2. This will enable the teacher and the child to understand the depth of learning acquired and the next step in the learning.

In the Early Years Foundation Stage, assessment takes the form of focused observations of children's play-based learning and discussions with friends, using Tapestry, to discern children's understanding of key concepts. Additionally, discussions and questions taught activities allow teachers to identify current learning, to address misconceptions, to bridge gaps and to provide opportunities to extend learning. Each half term, teachers in the Early Years assess children's attainment in the area of

Understanding the World by referring to Development Matters statements. This is then used to make a judgement as to which age band they are currently learning within and whether they are seen to be below, below plus, working towards, working towards plus, secure or secure plus in that age band.

In Key Stage 1 and 2, formative assessment during lessons takes the form of questioning and discussions. Teachers can then plan subsequent activities, discussions and questions to address misconceptions & gaps and provide opportunities for extension. Formative assessment will also involve teachers and children reflecting on the learning recorded in IPC books, in such forms as drawings, diagrams, posters and reports. This will involve teacher-modeled reflection, learning partner peer-review and self-assessment. All these strategies aim to identify 'next steps' in the child's learning. Children are given 'next steps' in their International Primary Curriculum books at least once a week. Children then address these 'next steps' using green pens either during early morning learning or at the start of the next topic lesson.

At the end of each science unit within an International Primary Curriculum topic, teachers should provide children with an activity or task that allows them to demonstrate their learning. This activity will allow teachers to assess learning thus far and to use the time assigned to completing the activity to address misconceptions and to extend learning. The learning output from this activity must be recorded in books. This will allow teachers to reflect on current attainment and the subject lead to review the accuracy of judgments. An 'A' should be clearly visible on this piece of learning so that class teachers and the subject lead can locate it quickly to support their assessment process. Having conducted an assessment activity at the end of a topic, teachers enter 'Statement' based data on Target Tracker that allows them to identify attainment related to a specific area of the science curriculum. Where there are gaps these are identified and inform future planning including how to ensure learning during Science Enrichment days are engaging and responsive to learning needs.

On a termly basis, teachers will conduct summative assessments of the child's learning to date. This will involve assessing the child's attainment against National Curriculum statements on Target Tracker. Children will then be assessed as currently attaining 'at', 'below' or 'above' age related expectations. The subject lead will monitor these judgements at the end of each term by analysing the percentage of children at, above or below age related expectations, identifying trends in the assessment data, paying attention to the attainment of vulnerable groups and ensuring the quality of

judgements by moderating them against work scrutiny evidence, also gathered on a termly basis. These summative assessments and the monitoring of them also perform a formative role as both the class teacher and subject lead can discuss current attainment levels for children and plan to support and stretch learning accordingly in subsequent units of learning.

Differentiation and support, including support for SEND

At Bewick Bridge we aim to ensure that all children have equal opportunities to participate in a broad and balanced Science curriculum regardless of age, race, gender, disability, religion, culture or attainment. Through a wide range of activities and resources all children are able to participate and their individual needs are met. This is made possible by the following steps:

- Tasks are set that are appropriately challenging, based on systematic, accurate assessment of children's prior skills, knowledge and understanding.
- Regular support throughout lessons in the form of modelling and scaffolding
- Timely intervention that is systematic and effectively monitored over the course of a topic
- Regular and constructive verbal and written feedback that enables pupils to understand how to improve their work
- Appropriate time within early morning learning or at the start of a new topic lesson for children to respond to feedback
- Providing a variety of resources depending on abilities
- Clearly defined roles and activities for all adults and children in planning

When a child's progression falls significantly behind that of the age related expectations for the subject, it is possible that there may be an additional learning need. Class teachers should discuss learning concerns with the subject lead and the SEN Coordinator to investigate appropriate ways to support the child's learning. SEN plans may be implemented for those children who need them and are reviewed termly.

Essential Classroom resources

When conducting Science sessions, classrooms should have:

- A stimulating range of non-fiction books
- Age-appropriate dictionaries

- Appropriate measuring utensils, such as timers, scales and graduated cylinders
- Appropriate safety apparatus, such as gloves, goggles and table covers
- A clean and accessible sink and drainage area

Home Learning

The provision of Science related home learning is set in line with the school's Home Learning policy. For Science, this will take the form of a choice of half-termly home learning projects, related to the current topic, to be completed at home with an adult or at the school's homework club.

Role of Subject Leader

- To be responsible for the coordination of the subject throughout the school
- To monitor the acquisition and maintenance of resources
- To promote the profile of Science across the school
- To review and update the Science policy
- To keep up to date with good practice in Science and any changes in the Science curriculum
- To assist in monitoring and evaluating of teaching and learning in Science across the school
- To monitor the curriculum coverage of the subject across the school
- To monitor the assessment and learning progression of the subject across the school
- To scrutinise samples of work related to the subject to assess learning progression