



**BREThERTON ENDOWED CE PRIMARY SCHOOL
Science Policy**

Walking in the footsteps of Jesus with our Christian family, we learn, grow, achieve and flourish together in God's love.

This policy is for Bretherton Endowed CE Primary School and The Hub, Bretherton Endowed Out of School Provision.

Intent

At Bretherton Endowed CE Primary School, we encourage children to be inquisitive and see science as the world around them, whilst acquiring specific skills and knowledge to help them think and reason scientifically. We want them to gain an understanding of scientific processes and have a rich range of scientific vocabulary which they can use progressively as they advance through school. At Bretherton Endowed CE Primary School we believe that STEM is an education for life. Through the Developing Experts scheme, we have a mission to enable children to access high-quality STEM education that is linked directly into the real-world career progression pathways.

We aim to ensure that all of the students that study through Developing Experts become exceptional critical thinkers and problem solvers; the essential skills that are needed in the world of work. They are never too young to start with STEM. We have addressed this by designing and implementing schemes of learning that offer breadth and depth, respect the National Curriculum and build progressively across the Key Stages; lesson-by-lesson, and unit by-unit.

Through well-structured and engaging science lessons, we enable children to:

- Be curious and explore their world building a wealth of scientific knowledge and skills.
- Become effective problem solvers using science to answer the challenges that the world is facing.
- Develop excellent skills in maths to enable data handling and analysis.
- Emerge as effective exponents of STEM through the disciplines of biology, chemistry and physics.
- Challenge themselves to address every question with investigation, prediction, observation, data collection, synthesis, analysis, and a thorough evaluation of their findings.
- Communicate their understanding and ideas with a wide technical vocabulary.

Implementation

At Bretherton Endowed CE Primary School, we use the Developing Experts scheme to plan lessons and ensure all children learn and retain knowledge throughout the programmes of study. In each lesson, pupils are given key facts and knowledge through a storytelling approach to learning. Further to this, each lesson offers Rocket Words, these are key words and meanings to learn; vocabulary which is then repeated throughout the lesson, quizzed on at the end and repeated at the beginning of the following lesson. All our lessons contain a balance of the different 'Working Scientifically Skills' and 'Scientific Enquiry' types, so that children practice a broad range of skills

throughout the curriculum. Each child has an individual science book and knowledge organiser. Wherever possible and suitable the children are taken outside for a first-hand experience of their learning.

At Bretherton, we understand that every child is individual and every child learns at their own speed. Through the use of Developing Experts resources, we aim to ensure that all children have the opportunity to learn science knowledge and vocabulary, revisit knowledge and science vocabulary, and to apply it in meaningful experiments across each year group. We use child friendly indicative assessment opportunities, through; Mission Assignments, quizzes, comprehensive handouts and a range of other activities that interweave with prior learning, as well as end of unit assessments. This blend of assessments grants teachers the necessary tools to ensure pupils make good or better progress in science.

The Developing Experts curriculum revisits and builds upon the national curriculum objectives with extra lessons to really strengthen and make links between science units.

We feel that it is important that the opportunity is offered to extend higher achieving pupils beyond the limits of a key stage of National Curriculum, as well as catering for those that need extra support. As such, our Developing Experts scheme has included additional lessons and resources that carry 'signpost' to extended learning capability, which is used at the discretion of the class teachers.

Key Stage 1

At Key Stage 1 pupils are exploring and making sense of the world around them; naming things and understanding how they fit in their environment. Developing Experts apply the National Curriculum programmes of study by helping children to identify what makes, animals and humans, materials and their uses, plants and seasonal change. There is a clear progression pathway from Year 1 to Year 2 and children are encouraged to work scientifically, investigating, observing, recording and sharing, using simple equipment increasing their curiosity for their surroundings. We believe that the acquisition of Developing Experts Ltd. knowledge, concepts, skills and positive attitudes builds strong foundations. Our emphasis on keywords reinforces the children's learning and understanding. In each lesson experts explain things and relate them to the world outside home and education, enabling children at a young age to begin to form the relationships of the working world within their own conceptual understanding.

Key Stage 2: Lower

Having established the foundational scientific concepts, we now add depth to their understanding of the areas from KS1 and broaden the range of topics and concepts studied; rocks, human impact on living things - conservation and pollution, and eventually, states of matter, sound, and electricity. Children are immersed and progressively build on their foundational scientific knowledge and vocabulary. Our indicative assessment provides clear guidance as to where each pupil is in their individual learning journey, enabling teachers to adjust the style of delivery or repeat a resource if required. Children become more conversant with the world of work through our expert dialogue that applies STEM knowledge to the professional context. We continue to encourage children to be inquisitive through real life experiences where possible such as: pond dipping or investigating dead trees for life, or testing material resistance to glass paper, or impact testing to list characteristics; then to chart and classify their data and form narratives from their findings developing their skills to work scientifically.

Key Stage 2: Upper

We ensure topics are visited at each key stage progressively, adhering to the National Curriculum, this is reinforced through revisiting each topic and strand. By Year 5 and Year 6, pupils are becoming confident and independent young scientists. Through their explorations, they raise questions, make simple hypotheses that they test, collect data for, then subject to analysis and report from. The breadth of study now includes the solar system, forces, light and evolution. They have developed their language and communication through their study of our key words and the dialogue of our experts in the field.

About Developing Experts

Developing Experts is an online platform used at Bretherton Endowed CE Primary School to enable the teachers to plan and deliver lessons that are pitched so that children with different starting points can access them. Children need to have a large amount of subject knowledge stored in their long-term memory in order to become competent at any subject, and this is especially true of science. For this reason, these lessons are designed to teach science in a clear and deliberate fashion, emphasising secure content knowledge before moving on to tasks. To build aspiration, a lesson expert often from industry or university enables everyone to learn and deepen their understanding about how the subject relates to the world of work. At Bretherton we have a rolling 2 year programme due to our mixed age classes.

Each unit comes with:

- Knowledge Organiser
- End of unit written test

Each lesson comes with:

- Formative quiz
- Word search designed to check each child's ability to spell key words
- Summative quiz
- Careers film
- The training pathway the individual who features in the career film took
- A link to their employer
- Handout
- An expert film
- A mission assignment film
- And sometimes a song

Year group curriculum maps can be found on the science page of the school website, detailing the summative questions linked to each lesson, the resources needed, the key words covered, the National Curriculum links made and the links to the statutory requirements for working scientifically made for each unit. Generic statements have been used for simplicity:

- Asking questions
- Performing tests
- Observing and measuring
- Gathering and recording data
- Identifying and classifying
- Using equipment
- Planning and setting up different types of enquiries

Our two-year curriculum cycle provides details of when each of these topics are taught as well as the lesson questions for each topic.

Impact

Through Developing Experts, our Science curriculum is high quality, well thought out and is planned to demonstrate progression in knowledge, working scientifically skills and enquiry types (different types of experiment) . The impact of our Science curriculum is that the majority of children, in our school, are able to;

- Demonstrate knowledge and scientific vocabulary in the core areas of science taught each year.
- Recall, make links to and build upon previously taught science vocabulary and knowledge.
- Use scientific vocabulary and skills to help them to work scientifically when planning, conducting, recording, reporting and understanding (evaluating) scientific enquiries (experiments).
- Know about science and scientists in real life.
- By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

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

- Summative assessment of pupil discussions about their learning.
- Formative assessments provided by the Developing Experts scheme.
- Images and videos of the children's practical learning.
- Interviewing the pupils about their learning (pupil voice).
- Moderation staff meetings where pupil's books are considered and discussed and there is the opportunity for a dialogue between teachers to understand their class's work.
- Annual reporting of standards across the curriculum.
- Marking of written work in books.

Staff are knowledgeable, well-prepared, confident and able to stretch the curriculum when needed. All Science teaching is a minimum of good. Children attain in Science to a level at least as good as that nationally, with no disparity between the genders. Pupil Premium and SEND children make good progress in Science, often seeing it as a subject they can excel in, with or without good reading and writing skills.

Children are curious, engaged and motivated to learn. They are used to being given time to think and share their ideas, safe in the knowledge that making mistakes is all part of the scientific process! They have an extensive mental bank of technical vocabulary which they can use to talk about challenging concepts. Their working scientifically skills progress well in small cumulative steps across the key stage. At the same time as being adventurous, they are safety-conscious. They know how science as a subject applies to their everyday lives, and, through their years at Hill View, develop extensive science capital.

Early Years

- Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

- Children know about similarities and differences between themselves and others.
- Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.
- Children use everyday language to talk about size, weight, capacity, position, distance and time to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them

SEND/PPG/Higher Attainers

We recognise the fact that we have children of differing abilities in all our classes, and so we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies which are differentiated by task, expected outcome and/or support from peers or adults. As much provision as possible is made for pupils with Special Educational Needs to aid their equal participation in art activities and development in all the skills and elements. This includes children who may be gifted, talented and able in science. Activities are matched to each individual's needs.

Science also provides excellent opportunities to enhance the learning of more able pupils through exploration, investigation, critical thinking and through application. Science ambassadors are identified as children who are enthusiastic and knowledgeable in science and who want to contribute to whole school development of science.

Spiritual, moral, social and cultural development and British Values

Social

- Group practical work
- Team working skills and to taking responsibility
- Taking responsibility for their own and other people's safety
- Understanding that science has a major effect on the quality of our lives
- Consider the benefits of scientific developments and the social responsibility involved

Moral

- Pupils to become increasingly curious
- Development of open mindedness to the suggestions of others
- Scientific developments may give rise to moral dilemmas
- Considering the environment.

Spiritual

- Looking for meaning and purpose in natural and physical phenomena
- Wonder about what is special about life
- An awareness of the scale of living things from the small micro-organism to the largest
- The interdependence of all living things and materials of the Earth.
- Emotional drive to know more and to wonder about the world
- Wonder at the vastness of space and the beauty of natural objects.

Cultural

- Scientific discoveries as a part of our culture
- Scientific discoveries of other cultures
- Scientific discoveries by a wide range of men and women in many different cultures
- Environmental issues are central to science.

British Values

Democracy

- Take the views and opinions of others into account
- Take turns and instructions from others

The rule of law

- Understand the importance of safety rules when working scientifically
- Know that there are consequences in rules are not followed

Individual liberty

- Make choices when planning an investigation
- Others may have different points of view as to where to start

Tolerance

- Scientific discoveries have come from other cultures
- Religious beliefs often compete with scientific understanding

Mutual respect

- Work as a team
- Discuss findings
- Offer support and advice to others

Equality Statement

At Bretherton Endowed CE Primary School, we actively seek to encourage equity and equality through our teaching.

As such, we seek to advance the equality of opportunity between people who share any of the following characteristic:

- gender;
- ethnicity;
- disability;
- religion or belief;
- sexual orientation;
- gender reassignment;
- pregnancy or maternity.

The use of stereotypes under any of the above headings will always be challenged.

This policy was adopted : October 2022

This policy will be reviewed before the end of 2024

Bretherton Endowed CE Primary School – Policy Document

All aspects of our policy intend to comply within the Data Protection (GDPR) legislation.



Headteacher : Mrs Alison Moxham

Chair of Governors : Mr T. G. Wilson

www.brethertonschool.org.uk