

Intent: To cover the **Early Learning goals** and **National Curriculum**. The 2014 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 skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this.
- Through science, pupils at Bolton Primary School will continue to deepen their respect, care and appreciation for the natural world and all its phenomena. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each key stage, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

Implementation: A **specialist science teacher** (and lead teacher for science) delivers our science curriculum throughout the school. This helps to ensure that children build on their knowledge and skills as they progress through the school. The science teacher also teaches Science at another primary school in the cluster which helps them compare a greater number of pupils when assessing. The science teacher creates a positive attitude to science learning within their classrooms and reinforces an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

- Science will be taught in planned and arranged topic blocks. The National curriculum objectives are grouped into topics and adapted and extended for Bolton Primary School. Each topic is taught in: Early Years, Class 1, Class 2 and Class 3 at the same time to: ensure progression, coverage, allow resources to be evaluated and to provide the opportunity for whole-school trips or topic days. Families with children in more than one class can also visit places out of school, get library books etc that appropriately support the science topic for all of their children.

- **Home-based activities** are available for the topic being taught on the school website. **Learning overviews** are sent home at the start of each term.
- Through our planning, we involve problem solving opportunities that allow children to apply their knowledge, and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.
- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient at; planning investigations (making predictions, selecting equipment, method-writing, controlling variables), recording results in tables and graphs, drawing conclusions, evaluating evidence and evaluating, conducting research and understanding key concepts.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics. The key knowledge and skills of each science topic is informed by the Associate of Science Education's 'Planning Matrices'. Teachers model how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics. The teacher has access to a developing central store of high-quality resources shared with another primary school in our cluster. Teachers ask a range of questions, which enable all children to take part, listening carefully to answers and taking learning forward, using open and closed questions and allowing children time to think. Teachers find opportunities to develop children's understanding by accessing outdoor learning.

We adapt and extend the curriculum to match the unique circumstances of our school.

- Events, such as **subject days** provide a broader provision encouraging the acquisition and application of knowledge and skills. These are purposeful, linking with the knowledge being taught in class and where appropriate involve the wider community.

Impact: The approach at Bolton Primary School results in a fun, engaging, high-quality science education that provides children with the foundations and knowledge for understanding the world. Our **engagement with the local environment** ensures that children learn through varied and first-hand experiences of the world around them. Through various **workshops, trips and interactions**, children have the understanding that science has changed our lives and that it is vital to the world's future. Children learn the possibilities for **careers** in science and about **scientists present and past** who have had a significant impact. They learn about scientists from different cultures and backgrounds, allowing all children to feel they can be a scientist.

Strengths:

1. Taught by a science lead teacher with 20 years experience of teaching science and who worked as a scientist before becoming a teacher.
2. Same specialist teacher from Reception to Year 6 facilitates good progression and knowledge of learning styles.
3. **Excellent results at the end of KS2.**
4. Good **resources** shared between two schools in the cluster.
5. **A strong emphasis on practical activities, working scientifically and group work – group DOJOS**
6. The specialist teacher works at another primary schools which helps with **moderation** of results.
7. Children **enjoy** the subject.
8. The same topics are taught to different classes at the same time to ensure progression.
9. **Topics are taught in KS1 to ensure secure foundations.**



Planning: The content of the National Curriculum has been put into topics that are taught to every class. PLAN

progression learning objectives are used. These topics are detailed on the Science Long Term Plan (science@doc). Some topics such as 'Electricity' are taught earlier than required by the NC to ensure pupils have a basic foundation on which to build. The same topic is taught to each class at the same time to help ensure progression and to utilise resources effectively etc. A plan for each topic is produced by the Science coordinator. **Annual science days.**

Subject: Science

Monitoring and Assessment:

- Head-Start Topic Tests
- End of topic tests written by co-Ordinator
- Plan-teach-assess cycle
- Green-box tracking
- End of year targets
- Core subject data
- Moderation with CR
- Observed by HT
- David Salmon and Deep Dives
- Governor Observation
- Pupil/parent surveys
- WT*, WT, E, GD
- Science certificates
- Tapestry – Early Years
- DOJos

SEND:

The Science teacher is also the **SENDCo** and has a good understanding of the children's needs.

Knowledge organisers help to remind children of scientific words and their meanings.

Key words are displayed during lessons. Help given to all pupils with reading and spelling key words.

Group work – allows children to work to their strengths.

Recording in different ways.

Double weighting of 'working scientifically' skills.

Lots of **recapping activities.**

Next Steps:

1. Through the Enthuse Partnership with Ullswater Community College:
 - Build a bank of 'wow' resources.
 - Use funds to provide magical and memorable experiences.
 - Attend CPD.
 - Collaborate with other schools.
 - Utilise STEM ambassadors.
2. Implement the new 'Mary Myatt' units as per the long-term plan for Science.
3. Make the curriculum even more fun and memorable through exciting experiments.
4. Develop the children's oracy skills with the use of concept cartoons.

EYFS

ELG 15

- Explore the natural world around them, making observations & drawing pictures of animals & plants.
- Know some similarities & differences between the natural world around them & contrasting environments, drawing on their experiences & what has been read in class.
- Understand some important processes & changes in the natural world around them, including the seasons & changing states of matter.