



## Shankhill C of E Primary School

*Our vision: Creative learning, personal achievement and happiness.  
Enabling everyone to flourish and 'to live life in all its fullness'. (John 10:10)*

### Science Policy

#### INTENT – Purpose and Structure

Our Science curriculum pays close attention to guidance provided by the National Curriculum sequence and content. It is infused with evidence-led practice and enriched with retrieval studies to ensure long-term retention of foundational knowledge. The foundations are cemented in the EYFS through learning within the Natural World, and People, Culture and Communities. Our ambitious interpretation of the National Curriculum places knowledge, vocabulary, working and thinking scientifically at the heart of our principles, structure and practice.

At Shankhill School, we will ensure our children become scientists by making sure they meet the National Curriculum expectations, to:

- 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

#### WHAT PUPILS WILL KNOW

Substantive knowledge - this is the subject knowledge and explicit vocabulary used to learn about the content. Common misconceptions are explicitly revealed as non-examples and positioned against known and accurate content. Misconceptions are challenged carefully and in the context of the substantive and disciplinary knowledge.

#### WHAT PUPILS WILL DO

Disciplinary knowledge – this is knowing how to collect, use, interpret, understand and evaluate the evidence from scientific processes. This is taught. It is not assumed that pupils will acquire these skills by luck or hope. Pupils construct understanding by applying substantive knowledge to questioning and planning, observing, performing a range of tests, accurately measuring, comparing through identifying and classifying, using observations and gathering data to help answer questions, explaining and reporting, predicting, concluding, improving, and seeking patterns. We call it 'Working Scientifically.'

Teaching and learning follows our *Six Phases of Learning* model to ensure that learning: connects to prior learning; is taught explicitly; children are given time and support to understand and deepen their learning, and are challenged appropriately. Our curriculum is rich in vocabulary, knowledge and skills that are progressive and transferable. Our Science key concepts, long term overview and EYFS Understanding the World documents show how knowledge progresses from Nursery through to Y6 and beyond.

*"This school continues to be good... maintains good quality education... pupils gain a sense of achievement from their lessons... they display excellent attitudes towards their learning... behaviour in lessons and around school is impeccable... Staff are welcoming and inclusive... strong Christian values are promoted well... (results) well above that of other schools nationally" Ofsted 2019*

*Staff "strive to ensure that pupils are happy, while making education fun and enjoyable." Parent View 2018*



## **IMPLEMENTATION**

All teachers provide inclusive, quality first teaching in Science by planning and delivering engaging and effective teaching and learning for their class. In Shankhill School, we follow the National Curriculum and primarily use the CUSP Scheme of Work as a guide to support teachers with their planning and assessment. As we have two mixed-age classes, children come across knowledge and vocabulary in a two or four year rolling program to ensure National Curriculum coverage, whereas skills are built upon each academic year.



Connect



Explain



Example



Attempt



Apply



Challenge

Our clear, cumulative curriculum is taught through our six phases of learning, so that every child has equal opportunity to learn the rich vocabulary, knowledge and skills in a clear progressive manner. Pupils are explicitly taught the vocabulary, knowledge and skills required then are supported and challenged to learn, use and deepen their understanding accordingly. This knowledge is included in a knowledge organiser and taught using knowledge notes.

Quality first teaching using a range of monitoring, feedback and assessment strategies provides opportunity to intervene and support learning in the moment. Support can also be from a variety of strategies such as personalised learning activities, resources and adult support; pre/post-teaching or interventions. Scientific analysis is developed through IPROF criteria. We call it 'Thinking Scientifically.' Challenge can vary depending on the area of study:

- identifying and classifying
- pattern seeking
- research
- observing over time
- fair and comparative testing

These will be mapped throughout CUSP Science against each knowledge note. The use of knowledge notes allows teachers to make reasonable adjustment for pupils with SEND / EHCP to help make sense of the content.

We have created our own long term sequence that is rich and progressive in knowledge and vocabulary to clearly outline what pupils should know, be able to do and remember at key points in their primary education (end of: EY, KS1, KS2).

Teaching in Early Years, pupils may learn about The Natural World through daily activities and exploring their locality and immediate environment. This is revisited and positioned so that new and potentially abstract content in Year 1, such as Animals, including humans, is related to what children already know. This makes it easier to cognitively process. This helps to accelerate new learning as children integrate prior understanding. Science makes a significant contribution to the objectives in the Early Learning Goals (ELG) of developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water. We teach science in our Nursery and Reception class as an integral part of the topic work covered during the year.

In key stage 1, pupils study the Seasons and develop an early conceptual understanding of how day becomes night. An understanding of change over time connects to the study of Plants, including trees. This focus enables children to associate trees as belonging to the plant kingdom and notice the changes

deciduous trees go through connected to the seasons. Contrasting that study, pupils learn about Animals, including humans. Non-examples of plants are used to contrast the features of an animal. Pupils are introduced to identifying and classifying materials. Scientific terms, such as transparent, translucent and opaque are taught explicitly through vocabulary instruction and pupils make further sense by applying it to what they know and then to working and thinking scientifically tasks. This substantive knowledge is enriched by pupils' use of disciplinary knowledge through scientific enquiry. To sophisticate their understanding, Year 1 pupils revisit the study Animals, including humans as a retrieval module and deepen their knowledge through revisiting and thinking hard through increasingly challenging tasks. As pupils progress through KS1, new knowledge is integrated with pre-existing understanding. For example, in Year 2, the study of Living things and their habitats and Uses of everyday materials, engages pupils to integrate and draw upon their knowledge of Animals, including humans as well as Plants, and the study of Materials. New substantive knowledge is constructed and made sense of through Working and Thinking scientifically tasks

Learning in key stage 2, substantive knowledge is always present and acts as a precursor for pupils' understanding. This will enable them to successfully apply disciplinary knowledge. In KS2 we introduced disciplinary scientific terms, including:

- variable
- independent variable
- dependent variable
- controlled variable

These give structure to working and thinking scientifically tasks in relation to the substantive knowledge taught in that specific study.

We have an abundance of learning resources; and active play-based learning equipment. This, paired with high quality in the moment teaching and creativity, allows our pupils to fully delve into working scientifically.

Teachers assess children's work in science by observing them work during lessons. Verbal feedback is offered throughout the lesson, and through generative tasks, the connection between the scientific content and the context needs to be made relevant to the everyday lives of children. Work is marked at the end of the unit of work in each child's workbook, teachers will assess the children's retention of the knowledge they have gained and how their working scientifically skills have developed. By comparing pre and post learning questions and using open ended questions that require children to connect and explain their learning, through the disciplinary and substantive concepts, which are the focus of that particular science unit.

In KS1 and KS2, during lessons, staff use in the moment feedback as all evidence points towards feedback being most impactful as near to the point of learning as possible and this is what the six phase lesson enables.

Our monitoring cycle is planned across the year and our 3 year school improvement cycle. When science is in focus, there is additional time and resources budgeted so that a deep audit, review and evaluation of impact can be carried out, and actions completed. When art is not a main focus, leaders will complete light touch monitoring as outlined within their action plans.

## **IMPACT**

Leaders and staff work collaboratively to monitor and evaluate the impact of the science curriculum using a variety strategies, including:

- Pupil Book Study
- Learning Walks
- Pupil Voice
- Seeking views of other stakeholders: parents, carers, staff, governors, community.

These will show that by the end of each key stage, children know, apply and understand the substantive knowledge and skills specified in the Science National Curriculum programme of study for KS1 and KS2 and the Understanding the World strand of the EYFS.

Ongoing assessments take place throughout the year. Teachers use this information to inform future lessons; ensuring children are supported and challenged appropriately. This data is analysed on a termly basis to inform and address any trends or gaps in attainment. Children in Foundation Stage are assessed within Understanding the World and their progress is tracked and age related expectation levels are reported to parents at the end of the reception year.

Our Science curriculum is high quality, well thought out and is planned to demonstrate progression. We focus on progression of knowledge and skills and vocabulary progression also forms part of the units of work. We use workbooks from Key Stage 1 to enable children to explore ideas and practise skills and keep a record of their learning.

This will culminate in pupils at Shankhill School being confident scientists, ready for the next stage in their learning.