



FENISCOWLES PRIMARY SCHOOL  
*'STRIVING FOR EXCELLENCE'*



SCIENCE POLICY

JULY 2021

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# Revisions

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Revision 1:

## Context

*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 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

The most recent Ofsted report<sup>1</sup> into science in primary schools in England outlined three factors which exemplify the best teaching:

- It is driven by determined subject leadership that puts **scientific enquiry at the heart of science teaching** and coupled with **substantial expertise** in how pupils learn science
- It sets out to sustain **pupils' natural curiosity**, so that they are eager to learn the **subject content** as well as develop **the necessary investigative skills**
- It is informed by **accurate and timely assessment** of how well pupils are developing their understanding of science concepts and their skills in analysis and interpretation so that **teaching can respond to and extend pupils' learning.**

We believe that our curriculum design and structure is well matched to these principles.

## Statement of Intent

Feniscowles Primary School has created a curriculum intent statement. This intent has been written to provide an overarching context for our school curriculum to allow **'A Feniscowles Child' to 'Live Life in its fullest'**. ***This document can be found on our website and should be read in conjunction with our subject specific intent statements.***

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<sup>1</sup> Ofsted 2013 Maintaining Curiosity

<sup>2</sup> Goldsworthy, A., Watson, R., Wood-Robinson, V. (2000) *Investigations: Developing Understanding* Hatfield: Association for Science Education

As a core subject, science is given the prominence it deserves at Feniscowles Primary School and following the National Curriculum ensures coverage of knowledge and skills, along with a significant contribution to our overall curriculum intent for our learners. At Feniscowles Primary we aim to give a high-quality science education, which provides the foundations for understanding the world through biology, chemistry and physics.

We want to teach our learners that science has changed our lives and is vital to the world's prosperity today and in the future, and are taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils are encouraged to recognise the power of rational explanation and develop a sense of enthusiasm and curiosity about natural phenomena.

We want to make sure our learners are supported to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. This will support our learners in becoming methodical decision makers as they grow up.

**Scientific enquiry skills are seen as the heartbeat of our science curriculum and essential to achieving our intent for 'A Feniscowles Child', as defined in our curriculum design document. All learners are encouraged to develop and use a range of skills including observation, planning, recording, investigation and presentation of findings. Additionally, they are encouraged to question the world around them and become independent learners in exploring possible answers for their scientific based questions.**

Specialist vocabulary for topics is taught and built on progressively, and effective questioning to communicate ideas is encouraged. Concepts taught are reinforced by application through scientific enquiry often in real life contexts, so that pupils learn to use a variety of approaches to answer relevant scientific questions. Specific units of work are delivered that promote enquiry so that pupils become proficient in selecting and using scientific equipment and are enthused about learning science.

Our Science curriculum will provide our learners with a strong framework to enable them to **'Live Life in its Fullest'** in a VUCA world (Volatile, Uncertain, Complex, Ambiguous) and to make the most of the wonderful opportunities life can offer. Many challenges that face our civilisation can be resolved with a pursuit of innovative, scientific solutions. In a borough rich in engineering and scientific industries, we want to make sure our learners are enthused about science and see this as a valuable and exciting career pathway. As a result we look to foster strong STEM links within our curriculum.

## **Implementation**

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all learners are capable of achieving high standards and becoming effective scientists.

## Curriculum Structure

When designing our curriculum, we placed the following principles at the heart of our decisions.

- 1 A science scheme of work must embody a clear progression.**
- 2 It is through working scientifically that learners develop an understanding of the nature and processes of science and the key scientific knowledge and concepts.**
- 3 Learners are curious to find answers to questions about the world around them.**
- 4 Learners need to be actively involved in their own learning, to be engaged and reflective.**
- 5 Every child should have the opportunity to achieve in every lesson.**
- 6 Assessment is an integral part of teaching that enables learners to understand the purpose of their activities and to improve the quality of their work.**

These principles have shaped the overall design of our curriculum, as well as the content and structure of each lesson.

1. Based on the year by year model of the Programmes of Study, our curriculum has a **clear progression framework of the 'big ideas in science'** which has been used to structure the content both within each topic, from year to year and within each year group and module, and to identify any conceptual gaps. This ensures learners are continually building on their prior learning as they systematically develop their understanding of key ideas and their scientific skills.
2. We recognise that **working scientifically**, asking questions and testing ideas against evidence, is the most effective way for learners to excel in science. Therefore each lesson **has a clear science enquiry focus**.
3. ***In the Foundation Stage***, learners are taught Science through the key areas of learning set out within the EYFS Statutory Framework. Through a broad range of teacher-led, child-initiated and continuous learning opportunities, learners will be taught to:
  - Use their senses to investigate a range of objects and materials
  - Find out about, identify and observe the different features of living things, objects and worldly events
  - Look closely at similarities, differences, patterns and change
  - Ask questions about why things happen and why things work
  - Develop their communication and co-operation skills
  - Talk about their findings, sometimes recording them
  - Identify and find out about features of the place they live and in the natural world around them

### ***In the National Curriculum Years:***

4. Every lesson is carefully planned around a **question for learners to answer**, either inside the classroom or outside. By ensuring that these questions spark learners' curiosity and that they want to

find out the answer, lessons are purposeful and result in learners gaining a new understanding of the world around them.

5. In each lesson the **learning objective** is designed so that learners have a powerful understanding of the skills and understanding they are developing in the lesson. **Success criteria** define the features of the learning objective in the context of the activity so that learners can identify what they are aiming for and how well they are doing.
6. Each lesson is designed to ensure that all learners in a class can access and master the lesson's learning with each lesson offering **three levels of differentiated task**. These are planned to challenge and extend the learning of all learners whilst ensuring that they all achieve the learning intention.
7. Every lesson includes **Assessment for Learning strategies** which enable teachers to find out what learners have learned and to use that information formatively.
8. In response to the wealth of evidence that exists about the benefits of learners experiencing the natural world first hand, **learners learning science outdoors** is a key feature of our science curriculum. For each year group there is a module called **Our Changing World** which is designed to be taught in every term, offering learners regular opportunities to explore all aspects of their outdoor environment and build up a rich understanding of how it changes over the year.

## SCIENCE ENQUIRY

Our curriculum has **science enquiry at its heart**, requiring learners to develop and use a variety of approaches to answer relevant scientific questions<sup>2</sup>. Each module is made up of a carefully planned series of lessons which will engage learners in **the different types of science enquiry identified in the National Curriculum**, where they will use and develop **the necessary investigative skills** and attributes identified for each Key Stage phase. All lessons are stimulated by a question for learners to answer, a scientific phenomenon to investigate or a problem to solve. Science Enquiry is the methodology learners will use to develop their conceptual knowledge, working in an authentically scientific and purposeful way to collect evidence to find answers to their questions.

## EXPLORE ACTIVITIES

Stimulating and maintaining **learners' natural curiosity** is fundamental to good science teaching and learning. Every lesson starts with an **Explore activity** to excite learners's curiosity about a scientific phenomenon and provide a focus for their questions and investigations. The Explore activity is also designed as a **rich formative assessment opportunity** for learners to reflect on what they already know, and identify what they need to learn next.

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<sup>2</sup> Goldsworthy, A., Watson, R., Wood-Robinson, V. (2000) *Investigations: Developing Understanding* Hatfield: Association for Science Education  
Turner, J., Keogh, B., Naylor, S., Lawrence, L., (2011) *It's Not Fair - Or Is It?* Sandbach: Millgate House Publishers and Association for Science Education

## ENQUIRE CHALLENGES

Genuine curiosity leads to **authentic, purposeful science investigation** so each Explore activity is followed by a **differentiated Enquire challenge** where learners will collect and analyse data to answer their questions and so develop their scientific understanding and knowledge. Mostly learners' science investigations will involve them in **first hand collection, recording and analysis of data**, although sometimes they will use secondary sources of evidence or information to answer questions. In the Enquire challenges learners will engage in a **wide range of practical activity** both indoors and outside, using a variety of observation and measuring equipment, everyday items and materials, natural and living things and electrical components. Comprehensive equipment lists are supplied for every module and lesson to help teachers with planning and ensure that **learners have as much independence as possible to decide what data to collect to answer their question and how**. Our lesson structure supports learners to work both in groups and alone as appropriate.

## SUMMARISE, SHARE, REFLECT

Good science teaching recognises that learners need opportunities to **summarise what they have found out, share their findings and reflect on what they have learned**. Each lesson has a final **Reflect and Review** activity when learners will communicate what they have learned in an appropriate and meaningful way. Being able to summarise understanding is key to developing conceptual knowledge as well as being the vital, final satisfying step in the science enquiry process. **Writing, drawing, speaking, using ICT and mathematical** formats are all important skills in communicating and presenting science and are all developed.

The Reflect and Review part of each lesson also provides an excellent opportunity for learners to **self and peer assess their achievements** in the lesson or module, using the success criteria to guide them. How well have I completed the challenge? What do I know now that I didn't know at the beginning of the lesson? What have I learned to do? What can I do better now than I could at the beginning of the lesson? What do I want to find out next? What do I need to do next to improve the skills I used today?

As learners reflect on their own learning, teachers can also assess the progress that they are making. Each lesson **includes opportunities for teacher assessment**, indicating where teachers will find evidence of achievement of the learning intention and what that achievement may look like, in the things that learners say, do, write or draw. Assessment will therefore be on-going and accurate – focusing firmly on progress in conceptual knowledge plus data collection and analysis skills. Assessment will also be formative, supporting teachers and learners to identify the next steps in learning, and to keep moving forward.

## LEARNING ORGANISERS

Learning organisers are used within each module as a point of reference to secure key knowledge, concepts and vocabulary. Learners use these organisers to help shape their learning within each lesson.

## **TIME ALLOCATION**

In EYFS , science is taught through a balance of whole class teaching and continuous provision, within the 'Understanding the World' specific area of the EYFS framework. This is carefully aligned to the work completed with National Curriculum year groups, providing effective starting points as learners build knowledge, skills and understanding over time.

In National Curriculum Year groups, Science is taught weekly. This may be for one or two hours depending on the context of the module. Additional time is also allocated to explore changes over time . E.g. Seasonal/ weather changes.

## **Impact**

The impact of our Science curriculum is measured through the monitoring cycle in school alongside our assessment procedures. This includes:

- Lesson observations
- Book monitoring
- Learning walks
- Discussions with class teachers
- Discussions with pupils
- Formative and summative assessment data , including regular analysis and evaluation by class teachers and subject leaders

Monitoring and assessment data is used to measure whether:

- Learners enjoy and are enthusiastic about science in our school.
- There is a clear progression of learners's work and teachers' expectations in our school.
- Learners's work shows a range of topics and evidence of the curriculum coverage for all science topics.
- Learners are becoming increasingly independent in science, selecting their own tools and materials, completing pupil lead investigations and choosing their own strategies for recording.
- Feedback from teachers has an impact on our pupils, often with next step questions to push learning on.
- All learners are making progress, including EAL and SEND learners.
- Learners are being asked to 'do more' with their knowledge as they move through school.



Monitoring is also used to identify gaps in the curriculum that may need to be addressed across the school, or within individual year groups. Monitoring is an ongoing cycle, which is used productively to provide the best possible Science curriculum for our learners.

## **Recording of work**

Throughout all year groups, we take a balanced approach to how learners demonstrate their understanding. Whilst it is important to record findings and promote cross-curricular writing skills, we recognise that this demand creates a barrier for some learners when trying to demonstrate their knowledge and understanding. As a result, we look to promote oracy throughout the curriculum. This may include learners verbally presenting their findings, recording their work or creating video blogs. Adult scribing where appropriate can further support this approach. We believe learners should flourish as scientists without over relying on written forms of evidence.

## **Assessment, Reporting and Tracking Progress**

Each lesson has key assessment opportunities planned. Due to the practical nature of our enquiry curriculum, formative assessment is the most significant method of assessment (questioning) This is further supported by assessment tasks that can be completed to support teachers accurate assessment and planning.

Staff use our Management Information System to make formative assessments against key statements at the end of each module of work. This enables further ' booster' sessions to be planned to close gaps in performance. In our curriculum there are 'additional sessions' that can be taught to further consolidate learning for those that need it.

Staff make summative judgments on an annual basis, once the complete programme of study has been completed. This data is analysed and reported on by the subject leader, who utilises the information to make strategic choices about development with the subject.

Performance is reported to parents on an annual bases as part of their school report. Work is showcased on displays and in books via parents' evenings.

## **SEND and Greater Depth**

Our scheme of work is written as a universal core curriculum provision for all learners. Inclusivity is part of its philosophy. Each lesson has three challenges that offer differing approaches to achieving the learning intention. This allows for SEND learners to be supported in their access to the lesson through activity type. It is important to note that these differing approaches still enable all learners to achieve the learning intention. SEND does not mean that a child is not capable of achieving in line or above their peers.

Teachers will need, as always, to tailor each lesson to meet the needs of the learners in their classes. Additional resourcing may be made available for learners with SEND to enable them to fully access the curriculum alongside their peers. This will be on a case by case basis.

## **Safeguarding**

Throughout our science curriculum, content provides the learners with the awareness and knowledge to keep themselves healthy and safe in many aspects of life. This is particularly prominent in the 'Animals including humans' aspect of the curriculum. During these lessons, which includes reproduction, staff promote a listening culture to allow learners appropriate opportunities to ask questions and share their thoughts. This may offer opportunities to discover unhealthy attitudes and experiences that could be of concern.

Our science curriculum works in tandem with our PHSE curriculum to provide a comprehensive curriculum that supports the safeguarding requirements of our school policy and aspirations for our learners to be healthy and safe.

## **The Learning Environment**

Throughout our school, Science is promoted via displays. This includes the important skills of 'working scientifically'. This is critical in supporting 'The Feniscowles' Child' becoming an agile learner.

In each classroom, where space allows, key learning is shared through a working wall approach. This supports the acquisition of new knowledge, understanding, scientific skills and vocabulary.

## **Involving Parents and Carers (Co-Curriculum)**

The school believes that it is important to have the support of parents, carers and the wider community for the science curriculum. Science content is routinely included in our enrichment homework activities. The school website also provides links for parents to support their child through a 'co-curriculum'.

## **Promoting the love of reading**

Appropriate learners's literature is planned carefully into our English curriculum to support Science. This allows us to enrich and promote our science curriculum through highly engaging texts. Examples include 'Until I met Dudley'. We also use our English curriculum to provide connected themes in learning. E.g. Rocks accompanying texts related to the stone age.

## **Training, support for staff and connected experts**

Regular CPD is provided in line with the school's overall curriculum development cycle. In addition, each module is accompanied by a teacher guide which outlines:

***Coverage of unit, prior learning that has occurred, future learning, key concepts and knowledge, key vocabulary and most importantly: common misconceptions.***

Where further support is required, the subject leader provides bespoke 1:1 support.

We also utilise materials from ASE.ORG , which exemplifies pupils' work at each stage of the curriculum. This supports teachers in maintaining high expectations.

Connections are in place with local secondary school science departments to provide high quality access to resources and subject knowledge.