Curriculum Overview St Andrew's Church of England Junior School Curriculum Area: Science

Subject Lead: Luke Higgins

Our curriculum approach to Science reflects our ethos statement:

'Shining light on a world of possibilities'.

Our 'curriculum drivers' are at the core of Science at St Andrew's:

•Curiosity, enquiry and creativity
•Community
•Possibilities

In particular, the promotion of curious, creative and enquiring minds. To inspire *all* children to explore the world of science and present the many possibilities, present and future.

Intent

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.

– National Curriculum, Science, Key Stage 1 & 2, Purpose of Study (2014)

At St Andrew's Junior School, we aim to encourage children to:

- Think like scientists in school and in the wider community.
- Deliver a science curriculum that fosters healthy curiosity.
- Give children confidence and promote enquiry about the world around them.
- Leave our school having gained both the conceptual knowledge and scientific skills to take them readily into their next stage of learning.

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 knowledge required to understand the uses and implications of science, today and for the future.

Implementation

At St Andrew's all staff create a positive attitude to science learning within their classrooms and create an environment where children feel safe to ask questions and share their ideas. Our whole school approach to the teaching and learning of science involves the subject being taught weekly in each year group. This allows children to be regularly immersed in science.

To fulfil our intent children need to work as successful scientists. This requires them to have the necessary skills for enquiry. These skills should build upon opportunities for them to play, explore, create and engage in active learning. By carefully examining the statutory requirements for *Working Scientifically*, it is possible to create a list of generic science enquiry skills common to all children across the primary age phase:

- Asking questions
- Planning and setting up different types of enquiries
- Performing tests
- Using equipment
- Observing and measuring
- Identifying and classifying
- Gathering and recording data
- Reporting, presenting and communicating data/findings

Planning

At St Andrew's school, we aim to deliver a science curriculum that embodies:

- High quality science teaching built upon learning objectives set out by the National Curriculum.
- Planning that facilitates high quality science lessons using the *Switched on Science* scheme.
- Lessons that include problem-solving opportunities that encourage children to pose questions and plan ways to find out for themselves.
- Planning tools such as *Explorify* and *STEM* that ensure children are able to gain a greater depth of knowledge. These provide deeper thinking questions that add structure as part of starters and plenaries.
- Learning and skill development of previous years that children become more proficient in selecting, including the use of scientific equipment and formation of conclusion from investigations.

Impact

Within each unit a short *pre and post assessment* is carried out such as a concept cartoon or odd one out from Explorify. Children all record this individually and it is either recorded in their learning journal or the class floor book. This supports teachers to make a judgement on the class's starting point and therefore aid future planning.

The *assessment* of science is carried out in a number of ways:

- Formatively, teachers are able to use their class floor book as a working document. They can use photos, children's work and quotes that they have said to help build a picture of where children are in their learning and the knowledge and skills that have been taught. Alongside this teachers record the children they feel have 'not met' or who are 'exceeding' that objective/skill on *Insight*. This supports them in adapting the next lesson and feeds into more summative data.

- St Andrew's school has recently been part of the TAPS trial created by Bath Spa University and as of 2020 a TAPS assessment lesson is carried out within each science unit. The aim of this is to inform teachers of children's conceptual knowledge of a specific objective and a working scientifically skill. This helps to build a picture of their knowledge and skills and to identify those children with gaps or misconceptions in their learning. The TAPS lessons ensure that across every year group each working scientifically skill is a focus of at least one assessment lesson.
- *Insight* is also used to track children's summative data. Half-termly, teachers make judgements for each pupil using the objectives for the units they have taught. This includes all of the National Curriculum (England) statutory requirements for working scientifically and science content for children in the relevant year groups. To make these judgements teachers are drawing upon the evidence from each child's work, the class floor book and objective data on *Insight.*
- With teachers making judgements and entering data in year 3, 4 and 5 it enables the year 6 teachers to ensure that the remaining statements are taught and assessed as well as gaps addressed. They then use Insight to assess against the objectives for the year 6 units and as it is the final year of the key stage assess against the full list of end of key stage 2 'pupil can' assessment statements from the statutory framework.

<u>Knowledge and skills progression throughout the school</u>

It is important that there is a progression of skills throughout school. This ensures that children are not simply repeating the same skills again and again. As children move through St Andrew's, they need to be able to use progressively more challenging skills to tackle the scientific problems they encounter.

At St Andrew's school, we ensure progression by:

- Using the *Progression of Skills Assessment Grid,* which enables teachers to see how the knowledge content is built upon and what the children should already know before the unit is taught. This enables pupils with SEND to have prior learning re-visited and misconceptions ideally addressed.
- Supporting children in gaining a love of science and aim to offer opportunities where they can apply and re-visit their science skills and knowledge and have memories to spark their inquisitive nature in the future.
- Taking more progressive pedagogical approaches, where by enquiry is valued and placing a stronger emphasis on the acquisition of skills. At the beginning of each lesson, the children are shown a working scientifically wheel. This offers an opportunity to discuss the focus skill of the lesson about to be taught and to reflect on their previous learning. Within each science unit a TAPS (Teacher Assessment in Primary Science) lesson is carried out, which also has a working scientifically skill focus.
- At St Andrew's we are aware that science relies heavily on pupils' ability to understand new terms and concepts. Therefore immersing them in the key vocabulary of each science topic supports their understanding and helps them to communicate their knowledge. Knowledge organisers aim to show the key vocabulary and progression for each unit and support children's learning at home.

Recording

We are currently in our third year using floor books and feel that this method aids the enquiry and investigative approach as it allows more time to be spent with the children 'doing'. The aim is for teachers to ensure that the focus skill for each lesson e.g. planning is recorded individually but other parts can be carried out more collectively. Where children are recording individually their science work is often recorded in their learning journal.

Reporting

On our annual reports, which are given to parents at the end of the year, reference will be made to our Science learning and how a child is developing their knowledge and working scientifically skills. This will be located in the *Science comment* section of the report.

Monitoring

The curriculum leader will collate evidence including analysing how planning matches the evidence in books, learning walks, speaking to pupils about their learning and discussing with colleagues what has gone well as well as any lessons learnt. The Curriculum Leader will produce a yearly report submitted to the Senior Leadership Team.

Review

Spring 2023