Science Policy April 2019

At Trefonen RESPECT is our core value. Mutual respect and good behaviour is the expectation of all adults and pupils at all times.

Intent

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.

During the Early Years, pupils develop science knowledge and understanding through 'Understanding the World' and they will have the opportunity to:

- Explore objects and look closely at similarities, differences, patterns and change
- Look at what is around them more closely
- Investigate materials and objects that they use in the natural and made world
- Ask questions about why things happen
- Talk about their observations and sometimes record them.

Through the Science National Curriculum and Early Year's documents, pupils will acquire and develop these skills throughout their time at Trefonen School.

Our curriculum is a knowledge-led progression model where we teach for long-term learning.

At Trefonen School, we understand that pupils are naturally curious and we encourage this inquisitive nature throughout the science curriculum. We ensure that we give the knowledge required for pupils to work scientifically in a range of contexts and to be able to develop a range of scientific skills. These skills are built-on and developed so that pupils can use equipment; carry out investigations; explain concepts confidently; develop **independence, resilience** and **creativity**; be **curious** and ask questions about their surroundings.
The successful approach at Trefonen School results in a fun, engaging, high-quality science education, that provides pupils with the foundations

for understanding the world. It also encourages the pupils to have high aspirations in the world of science – anything is possible.

Implementation

Science is a core subject in the National Curriculum.

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that **all** pupils are capable of achieving high standards in science – **the Mastery approach**. This includes making connections; becoming fluent in facts; making sense of patterns; moving from concrete to pictoral to abstract. We encourage pupils to become curious about the world around them and want to aspire to continue learning about science.

Our whole school approach to the teaching and learning of science involves the following:

Planning and Resources

- Science will be taught in half-termly topic blocks which are carefully arranged as a two-year rolling programme. Each unit covers 'high-dividend' objectives as set out in National Curriculum.This strategy enables the achievement of a greater depth of knowledge through concepts being revisited.
- Teachers use Hamilton Trust half-termly units of work as lesson plans. These have an engaging enquiry project-based approach. However, these lessons may be adapted to suit the needs of the class.
- Working scientifically and investigations are fully incorporated in each unit.
- The Foundation Stage access science content through the 'Understanding of the World' strand of the EYFS curriculum. This involves guiding pupils to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.

- We have sufficient, high-quality science resources to aid and support the teaching of all topics. We keep these in a central store, where they are be labelled and easily accessible to all staff.
- The School library has a good selection of science-based books to aid research.
- There is access to iPads and computing equipment to aid teaching and learning of science concepts.

Teaching and Learning

- Pupils study Science for the equivalent of 1-2 hour per week.
- Pupils carry out at least 3 investigations each term, at least 1 is an independent investigation
- Investigations taught include: observing over time, identifying and classifying, pattern seeking and comparative fair testing.
- Pupils have the opportunity to work creatively developing independence and resilience.

- Pupils use coloured investigation frames to work through fair tests.
- Through our planning, we include problem solving opportunities that allow pupils to find out for themselves. Pupils are encouraged to ask their own questions and are given opportunities to use their scientific knowledge, skills and research to discover the answers. This curiosity is celebrated within the classroom e.g. through Golden Awards.
- Pupils have opportunities to work independently, with a partner and with small groups. Learning is deepened through peer interaction and support.
- We build upon the learning and skill development of the previous years. As the pupils's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence- MASTERY.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to enhance pupils's understanding of their surroundings by accessing outdoor learning.
- Our engagement with the local environment ensures that pupils learn through first-hand experiences of the world around them.
- An annual Science week is held in March. The focus being the National theme. During this week, science workshops and guests work with all pupils. There is also a Science Fair at the end of the week where pupils and relatives demonstrate their science knowledge by showing a practical science presentations to other pupils and parents.
- Through Science Week, workshops, trips and interactions with local experts, pupils have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Pupils learn about the possibilities for careers in science e.g. Vets visits.
- Y5 and 6 pupils have access to STEM sessions annually at The Marches secondary school.
- Pupils have topic specific homework occasionally to increase their science subject knowledge.
- Teachers use 'stem sentences' to aid long-term learning of scientific facts.
- Science teaching provides pupils with a sense of awe and wonder.
- Science teaching enables pupils to think creatively , critically, solve problems and to develop a growth mindset.
- Science provides a natural link with maths, computing, DT and English.
- Precise appropriate vocabulary is used when teaching topics.
- At KS1, pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at KS1
- At KS2, pupils should be able to understand, read, spell and pronounce scientific vocabulary correctly.

Assessment

Pupil's progress and achievement is continually monitored formally and informally. It is used to inform future teaching and learning.

- Pupils receive effective feedback through science lessons, both orally and through written feedback. Throughout the lesson, pupils are reminded of the main lesson objective, WALT, which is evident in their book. Pupils self-assess against the WALT at the end of the lesson.
- Teachers use precise questioning in class to test conceptual knowledge and skills.
- Teachers assess pupils regularly to identify gaps in learning, so that all pupils keep up.
- Teachers use Classroom Monitor 'beehives' to record pupils achievements throughout the half-termly topic.
- Photographs are used as evidence of activities and achievements.

Assessment for learning is continuous throughout the planning, teaching and learning cycle. However, pupils are more formally assessed half - termly in KS1 and KS2 using a variety of methods:-

- Observing pupils at work, individually, in pairs, in a group, and in classes
- Questioning, talking and listening to pupils
- Considering work/materials / investigations produced by pupils together with discussion about this with them
- Teachers use Classroom Monitor termly to record pupils summative assessment in 'Working Scientifically'
- At the end of Y2 and Y6, pupils are expected to achieve the statutory requirements stated in the Science Interim Frameworks.
- In EYFS, we assess the pupils against Early Learning Goals.
- Rising Stars end of unit assessment tests.

We make good use of the value of assessment tasks in strengthening memory by providing children with opportunities to 'struggle' and make sustained effort in trying to retrieve information, the process of which strengthens their memory. We understand that it is the concerted effort within such tasks that strengthen memory recall and creates the strongest connections in their learning.

Impact

Pupils at Trefonen enjoy science and this results in motivated learners.

As a result of our science curriculum, most children who leave our school:

- have developed scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- have developed an 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
- have a strong web of science knowledge that is deep, durable and transferable from one context to another
- can use scientific equipment
- can carry out a range of investigations independently
- can explain scientific concepts confidently
- are curious and can ask questions about their surroundings
- have high aspirations in the world of science
- can apply their knowledge and use it to solve problems and generate creative solutions
- are creative, innovative and can think critically
- are able to make deeper connections in their learning as a result of their access to science experiences through our school that they would not otherwise have had.

Impact is measured through pupil and parent voice; end of Key Stage results; tracking progress and achievement with termly science data on Classroom Monitor; pupil participation in annual Science Fair and science based homework.

Equal Opportunities

At Trefonen Primary School, we are committed to providing all pupils with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

Inclusion

In Trefonen Primary School, we aim to meet the needs of all our pupils by differentiation in our science planning and in providing a variety of approaches and tasks appropriate to ability levels. This involves providing opportunities for SEND pupils to complete their own projects, with support, to develop speech and language skills, as well as scientific skills and knowledge. This will enable pupils with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations and to achieve the goals they have been set. Some pupils will require closer supervision and more adult support to allow them to progress.

Role of the Subject Leader

It is the responsibility of the subject leader to:

- create a culture of high expectation
- monitor the standards of pupil's work
- monitor the standard of science lessons
- listen to pupil and parent voice
- measure and evaluate the impact of science teaching and learning
- supporting colleagues in their teaching
- have knowledge of current developments in the science
- work closely with staff, pupils, parents and governors to promote science

- provide a strategic lead and direction for science in the school.
- monitor and order science resources
- books trips and workshops to support learning in science
- organise Science Week
- write risk assessments for science activities requiring one.

Parents

Parental input is highly valued. Parents are invited to become involved in the annual Science Fair and science activities pupils may receive based on their current topic.
Parents receive an oral termly progress and achievement tupdate as well as a written report at the end of the summer term.

Governors

A link Governor responsible for science carries out regular focus visits and reports to the Governing Body.

This policy will be reviewed every two years.

April 2019