St Dennis Primary Academy

Science *"The important thing is to never stop questioning." – Albert Einstein*

Intent

At St Dennis Primary Academy, we recognise the importance of science in every aspect of daily life. We have a shared understanding of the value of science, as a core subject and the need to make science fun, enjoyable and accessible to all children.

We endeavour to foster children's natural desire to be inquisitive, question why things happen and understand the way things work, developing and increasing children's knowledge and understanding of our world.

Children will acquire key scientific knowledge through practical experiences; wherever possible and we endeavour to develop children's understanding of the nature, processes and methods of science through different types of scientific enquiries. We will encourage children to respect their physical environment and the living organisms within them.

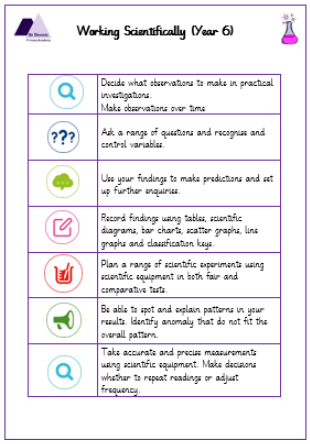
Our continuing aim is to ensure that children are equipped with the required knowledge and scientific enquiry skills to understand the uses and implications of science, today and for the future.

Implementation

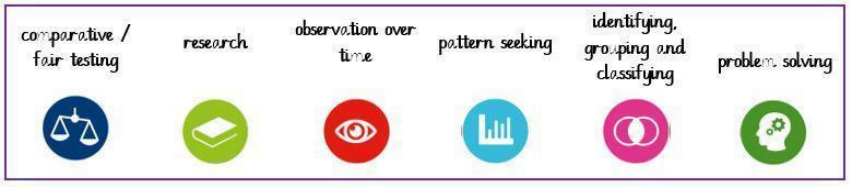
Throughout the year groups, science has been carefully planned following the National Curriculum. We have also identified the 'critical knowledge, understanding and skills' which children should achieve at the end of every unit of learning.

Science (biology, chemistry and physics) is taught in planned blocks by the class teacher, within the half-termly topic. Learning is recorded in science books and class floor books in Year 1. Children are encouraged to work as scientists, ask their own questions, plan their own investigations and be given opportunities to use their scientific skills and research to discover answers and come to their own conclusions. Children are also encouraged to critically evaluate their enquiries and findings.

Lessons have a 'working scientifically' skills-based focus and substantive knowledge is taught through this. We have a progression of these skills across the school. They are stuck in the front cover of children's books.



There are a range of different types of scientific enquiry throughout the year in each year group to ensure there is appropriate progression in skills through the school. These are identified on planning by symbols and on Learning Objectives in books to enable children to become familiar with the different types of enquiry.



To support learning, children also have a knowledge organiser in their book and on display, with key learning points and maps, diagrams, facts and vocabulary. They also take one home so they can share their learning at home.

Children with SEND are fully included in science and their needs are understood so that the right adjustments and provision are in place. Staff have high expectations which ensures children aspire to be successful in their learning and make good progress. This is because 'Everyone matters, everyone succeeds and every moment counts'. Adaptations in science can be viewed on our website: https://primarysite-prod-sorted.s3.amazonaws.com/st-dennis-primary-academy/UploadedDocument/9365e9be-5142-4304-abb7-039b20a7fa9b/science-send.pdf.

Impact

Science is taught by teachers with good subject knowledge and an understanding of the need to incorporate and develop the use of scientific skills.

Children are enthusiastic to find out more about the world around them and have a natural curiosity to find out even more. Children can talk about their learning in science and the skills they have used to gain this understanding. Regular monitoring and talking to children about their perception of science takes place.

Science is promoted and is evident throughout the school with science displays, regular visitors and awards for high quality science work.

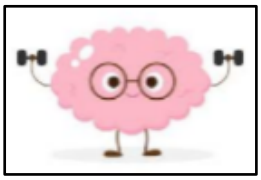
We measure the impact of our curriculum through the following methods:

- Whole class feedback and feedforward element of lessons.
- Formative assessing of on-going learning and children's understanding of scientific concepts and knowledge within each science topic.
- Assessing knowledge from previous year groups using 'Memory Master' to inform teaching within a unit.
- Quiz questions in every lesson that build to a cumulative quiz.
- 'Four from Before' weekly retrieval tasks.
- Images and videos of the children's practical learning.
- Conferencing the children about their learning (pupil voice) with their books.

Science Unit and Lesson Structure

Memory Masters

We plan for **Memory Masters** at the beginning of every unit of learning, as we recognise the value in pupils having the opportunity to **re**visit, **re**call, **re**vise, **re**member, **re**inforce, **re**learn and **re**flect upon previously taught content. This enables them to **re**tain key knowledge across the whole curriculum to know more and remember more.



Memory Masters sessions will be evident in books through a Learning Objective, showing the Memory Masters symbol. Alongside this, there will be an opportunity for pupils to record their achievements. Examples of this could be a score from a quiz, a scale of confidence or key information remembered. We use a range of retrieval techniques from Kate Jone's Retrieval Practice books.

Monday 11th September 2024 T TA I P G

MEMORY MASTER

Topic:
Retrieval Task:

Feedback and Feedforward

At the beginning of lesson, there is a **feedback and feedforward** element to review prior learning within the unit, in readiness to build connections. The **Knowledge Organiser** (stuck in book at beginning of the unit) may be used to support this.

In line with our **Marking and Feedback Policy**, this element may also include:

- Work to praise and share to address misconceptions

- Excellent examples of presentation
- Targeted support
- Time to edit basic skills errors

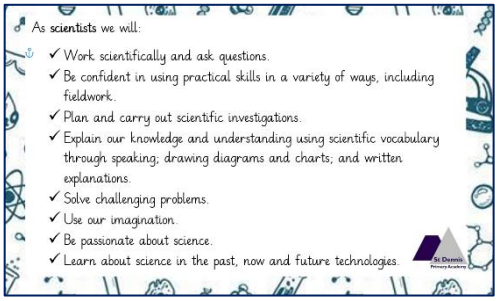
Pedagogy

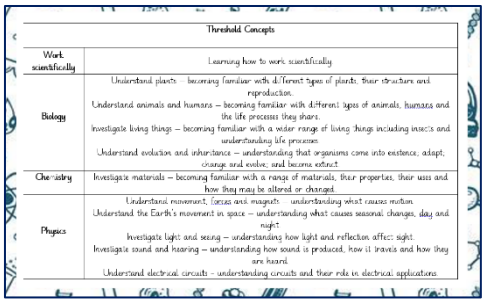
Following the Feedback and Feedforward element, we **remind ourselves what a scientist** is:

'Scientists are people who discover new things and research how things work. There are many different types of scientists. They observe, measure and communicate results.'

We also look at which **skills of a scientist** will be developed in today's lesson through sharing and highlighting these symbols.

We also highlight which subject we are learning about, so children learn what biology, chemistry and physics are.





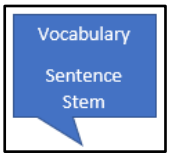
Learning Objective and Success Criteria with Key Vocabulary and Sentence Stems

The **Learning Objective with Success Criteria** are then shared *(format for books is in planning folder and includes vocabulary).*

Definitions of key vocabulary for this lesson and any relevant vocabulary from previous lessons.

Sentence Stems are also shared and repeated. These can be accessed here:

https://truropenwithacademytrust.sharepoint.com/:f:/s/stdennisallstaffteam/EnW8nTsrAnsTqtg6GT6k_ZABpAgj6H7jFGc3iLsMEEf_jw?e=6fFwPB



An Exciting Introduction!

You may present your class with an idea, thought, question, or object that will grab their attention.

Explorify or **Primary Science Trust** are useful resources for this.

https://explorify.uk/ https://pstt.org.uk/

New Learning *(Key Concept Introduction / Modelling / Questioning)*

Key knowledge and concepts are **introduced**, and it is explained that these will be learnt through key scientific skills.

These skills are then discussed, highlighted and **modelled** so they are developed and used accurately.

We have a progression of skills for working scientifically in each year group and share these at this point (they are also inside the front cover of children's books).

Questioning *(throughout lesson)*
Why do you think that?
What is your reason for that?
How do you know?
What is your evidence?
Do you have any other evidence for that?
Can you think of another reason for your idea?
Can you think of any reasons why your idea might not be right?
What reasons might someone else have?
Can you explain why you do not agree with me?
Why might that not be true?

Other questioning techniques are also considered e.g. pose, pause, pounce, bounce / think, pair, share / whiteboards / cold calling / lolly lotto etc.

Independent Practice/Practical

Following modelling, children have the opportunity to **develop skills of being a scientist** and they know which type of enquiry they are using.

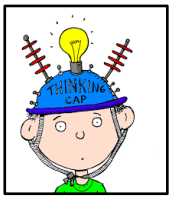
The **symbol** is also included on the Learning Objective in the children's book or Floor Book.

Think Deeper – An extra challenge!

What evidence is there...?

How could we prove it?

How is this used in everyday life?



Let's Reflect *(Formative Assessment)*

Learning Objective and Success Criteria are revisited to ensure children know what they have learnt. This also provides feedback that improves children's learning.

End of Unit *(Formative and Summative Assessment)*

At the end of a unit, assessment is carried out through a complete cumulative quiz and a 'Show what you know' activity. The objective for each lesson is shared to support the answering of the overarching question. Sentence stems are used to support this along with key vocabulary. There may also be diagrams to label. These could also include sections of the knowledge organiser with elements missing for children to complete.