St. Andrew's C of E (VA) Primary School

Science Curriculum Statement

"I have come that they may have life, and have it to the full. John 10:10"

Science Intent:

Through the teaching of Science, St Andrew's CE Primary School intends 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.
- Equip children with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- Recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.
- Understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.
- Share ideas and work in teams to help the more disadvantaged children enhance their vocabulary, discussion and collaborative skills. Give opinions, make predictions and carry out investigations.
- Open up an arena for children to discuss their wider knowledge though their interests outside school, helping improve their self-esteem.

Science brings people together through collaboration, investigation, and discussion.

Science Implementation:

The National Curriculum programmes of study will be taught as a sequence of knowledge, concepts and skills. Priority will be given to making sure children develop a secure understanding of each key block of knowledge and concepts in order to progress to the next stage.

Children will be asked to create a concept map at the beginning of each new unit, using all the associated topic vocabulary. This will also be repeated at the end of the unit to show the progression made. Relationships between the vocabulary should be shown. This vocabulary will be explained at frequent points during the unit and be on display for the children to observe and discuss.

Links are made to previous and future learning on teachers' flip charts. References to past topic vocabulary will be made.

Regular 'low stakes' testing takes place. This will ensure that children are able to describe associated processes and key characteristics in common language and be familiar with, and use, technical terminology accurately and precisely. At the start of each new lesson, the children will be asked to complete a few (typically 3) review questions from the previous lesson. An end of unit topic test is often used to assess overall understanding.

Pre-teach vocabulary sessions will be given to SEN children.
Target WTS children to have group support with TA or teacher to boost to ARE. Children working towards ARE at the end of each academic year will be targeted for intervention by the next teacher.

Children will apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

'Working Scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It **WILL NOT** be taught as a separate strand but together with key topic knowledge and concepts. At least 1 WS investigation will take place every half term.

These types of scientific enquiry will include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Each teacher will assess the key skills achieved during the course of the year by recording who is either below or exceeding expectations. Children not at the expected standard will be targetted the following term or by the next teacher.

The relevant WS vocabulary will be stuck on the back page of the children's books and referred to regularly throughout the year. (KS2 only.) All WS work will also be placed in the back of the books, with the general topic knowledge at the front of the books.

Spoken language /Oracy

The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. Pupils will be assisted in making their thinking clear, both to themselves and others, and teachers will ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.
Where possible teachers will be encouraged to include oracy opportunities to help embed scientific understanding. Sentence stems will be used to start scientific discussions.

CPD

Regular CPD opportunities to ensure that all teachers are kept up-to-date with new ideas, learning opportunities and the requirements of the science curriculum. Constructive feedback given from annual book scrutinies and informal drop-in observations by the subject leader.

Annual Science Week:

2021- School Grounds Improvement Project (continuation - Covid year 2)
2020 - School Grounds Improvement Project (continuation - Covid year 1)
2019 - School Grounds Improvement Project - all classes responsible for making an area of the school ground look brighter. Including: planting flowers and vegetables, science based wall murals, bird feeders, bug hotels, recycling projects etc.
2018 - Science Fair - lead by outside agencies, to encourage careers within the science industry. (For example: scientists from the MBA and Marine Laboritory, leaders from the Plymouth University with a focus on robotics, Shark Trust and Derriford Hospital).
2017 - Whole school Science Fair in the hall. Each class had a display table and demonstrated some of their Working Scientifically learning to the rest of the school.
2016 - Scientist Day - all children dressed as scientists and took part in a science experiments and investigations for the day.
2015 - Whole School Science Fair. Each class had a display table and demonstrated some of their Working Scientifically learning to the rest of the school. Parents invited to attend.

Curriculum Enrichment:

- Year 3 - 3 x 2 hour visits to the 'Inspire Me Fab Lab' on Union Street July 2021 to take part in a pilot project for Covid catch-up learning. The children were involved in a superb series of exciting and inspiring experiments and learning based on the Y3 - 'Light' unit that was only completed as part of homelearning during lockdown.
- Widening Horizons- 2020/21 - Year 5 were engaged in several Science based virtual visits in conjunction with the Millfields Inspired 'Widening Horizons' (15 things to do in Year 5) scheme. This included interactive visits via Zoom with students, trainee doctors, researchers and professional lecturers within the Peninsular Medical and Dental School, Marine Biology department linked to the

NMA, Ocean Conservation Trust as well as an exclusive 'Covid 19 Super bug' project, liaising directly Dr Tina Joshi of the School of Biomedical Sciences (Faculty of Health), at the University of Plymouth. The latter culminated in the design of a BEAT THE BUG board-game, based on Year 5's experiences, questioning and understanding of viruses and microbes, of which their contributions to a COVID 19 workbook would in turn feed directly into the department's research. This will continue each academic year, with the number of outdoor visits increasing.

- Year 5 visits to the MBA for their annual 'Biologist for a day' event. (5 x able scientists every March)
- STEM workshops for all Year 1-6 classes with Tina Brinkworth (Head of skills and post 16 at Plymouth City Council) - Sept 2019
- Visits from the Science Explorer Dome. 2017 and previous years.
- Whole school STEM visit to the National Marine Aquarium 2016

Links with other areas of learning:

Science will be linked to other curriculum areas wherever possible. Some examples are highlighted below.

Maths

- Data handling: tables, graphs, analysing data, taking accurate measurements.

English

- Practise of predicting, summarising/concluding and evaluating. Science texts used in guiding reading, with opportunities for cross curricular writing.

DT

- Building structures linked to materials, alternative energy sources (mini wind turbine), and a model of the solar system.

Art

- Parts of a plant, making accurate botanical illustrations to support topic knowledge, investigative diagrams.

Dance/Drama

- Acting out scientific mechanisms (seed dispersal) and scientific processes (liquids, solids, gases).

Science Impact:

This will be determined by the following:

Monitoring of:

Increased understanding and interest from all teachers.
Purposeful learning-walls, making vocabulary explicit.
Inspiring and interactive teaching. Use of effective flip charts/ resourcing.

Assessing of:

Children's knowledge of key facts through low-stakes testing and end of unit assessments.
Children's knowledge of common and technical vocabulary (and keys facts) through discussions.
Achievement of Working Scientifically objectives.
Pupils' interest through the pupil questionnaires.
Progression shown from the initial concept map to the final one at the end of the unit.

Positive impact should be evident through:

Improved presentation and quality of science learning shown in workbooks. (Annual book scrutiny).
Clear inter-disciplinary links in English books.
Excitement, discussions and purposeful work heard and seen through the school.
Engagement and enthusiasm of children during science lessons and science week activities. (Annual lesson observations and pupil interviews).