SCIENCE

Intentions, Implementation and Impact Statement in conjunction with The Church of England's "Golden Threads"

Educating for Wisdom, Knowledge and skills

Educating for hope and aspiration

Educating for community and living well

Educating for dignity and respect

At St Philip's our Science Curriculum is driven by our whole school vision and values.

Happiness, Love and Security Abound

Everyone is Special

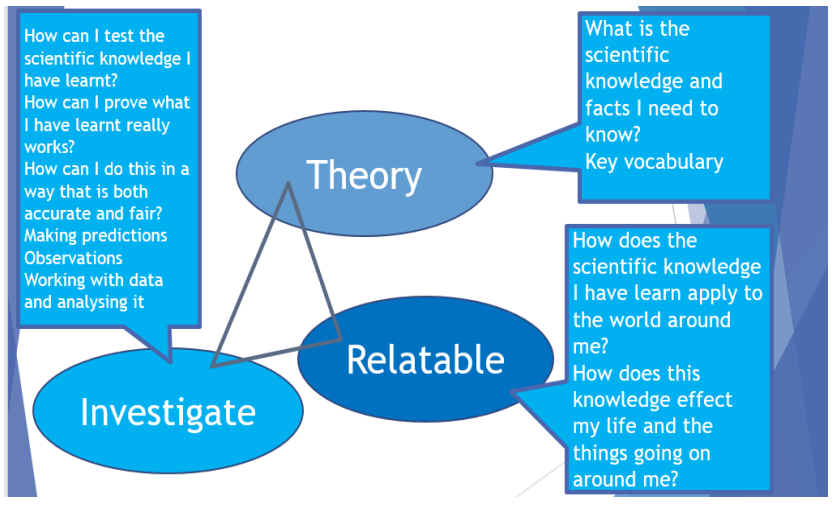
Every achievement is celebrated

Relationships and teamwork matter

A beacon of light in the community

Christ is in everything we do

Subject Leader: Luke Highton



SCIENCE Curriculum Intent:

Our golden threads run through our science provision - Educating for Wisdom, Knowledge and skills - Educating for hope and aspiration - Educating for community and living well - Educating for dignity and respect

At St Philips, we strive for excellence in all aspects of education by providing a safe, caring environment, where all are valued and respected as individuals, enabling them to reach their full potential, whilst growing in their love and understanding of the Christian Faith. This is encapsulated in the **vision and values** statement.

A high-quality Science education at the primary stage provides a strong foundation for understanding the wonderful world in which we live. Science makes an increasing contribution to all aspects of life, and is vital to the world's future prosperity.
As well as being an important subject in its own right, scientific knowledge and conceptual understanding is an important component in all areas of learning, and a good understanding of Science helps to support pupils' work across the curriculum.

Intentions

Science makes an increasing contribution to all aspects of life. Children are naturally fascinated by everything in the world around them and Science makes a valuable contribution to their understanding.
Our intention is to provide all our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further. We intend to do this through access to a broad and balanced science curriculum, regardless of ethnicity, gender, class or disability.
As well as learning scientific skills and knowledge, it is important for children to develop lively, enquiring minds and the ability to question. Science in our school is about building on children's natural curiosity and developing ideas and ways of working scientifically, that enable them to make sense of the world in which they live, through a process of enquiry and investigation.
By talking together, children are encouraged to explore and observe so that they can group objects and events and look for similarities and differences. They learn to measure and record the things they have found out in ways that make sense to them. They are encouraged to learn and use new scientific vocabulary, so that later they can talk to other people about what they have discovered. As they progress through the school, pupils develop a better understanding of how science can be used to explain what is occurring, predict how things will behave, and begin to analyse causes.

In teaching Science it is our intention to be developing in our children:

- a positive attitude towards science and an awareness of its fascination;
- an understanding of Science through a process of enquiry and investigation;
- confidence and competence in scientific knowledge, concepts and skills;
- an ability to reason, predict, think logically and to work systematically and accurately;
- the initiative to work both independently and in co-operation with others;
- the ability to use and apply science across the curriculum and in real life.

Oracy

- an ability to communicate scientifically; Oracy with the aim of expressing scientific ideas and reasoning
- We intend to develop pupils' ability to communicate scientific ideas clearly, using appropriate vocabulary and reasoning. Through discussion and questioning, pupils will learn to articulate their understanding, justify predictions, and explain conclusions — building both scientific thinking and oracy skills.

Implementation

At St Philip's, Science is taught as part of a planned programme, following the requirements of the National Curriculum 2014, which ensures continuity and progression by building on, consolidating and extending previous knowledge.
St Philip's ensures high standards of teaching and learning in science. Our teachers are skilled in teaching science in ways that are imaginative, purposeful, well managed and enjoyable, giving clear and accurate teacher explanations and offering skillful questioning.
Teachers are supported in a range of ways including:

- a subject leader who is a specialist in science and attends CPD
- following programmes of study that build on each other and ensure the implementation of a curriculum that is progressive across the school
- Scientific vocabulary for units in year groups 1-6 is on the school website, to help teachers in developing word banks to encourage understanding and use of scientific vocabulary
- Use of science tracking ladders which outline objectives and are linked to Target Tracker for assessment purposes
- Materials to support teacher assessment – Rising Stars tests purchased 2018

- Emerging knowledge organisers
- INSET which has supported teachers' understanding of the different types of scientific enquiry and 'how science works' - Ashley Sinclar 6.3.19

Science is taught consistently, once a week for up to 2 hours in KS1 and 2 hours in KS2. It is taught in discrete units to ensure coverage of the curriculum. However where possible, cross-curricular links will be made with other subjects, such as Mathematics, ICT, Geography and English.

EYFS: At the foundation stage, all the areas of learning are interconnected, and science is a means for enabling children to develop skills across the curriculum. Through engaging in science activities, children are developing key skills in all areas of learning while developing their knowledge of the world around them, preparing them well for the science curriculum in KS1

KS1 & 2 : Teachers follow the programmes for study set out each year for KS1 and 2.
The grid below outlines the units taught in each year group. The order in which units are taught is decided by the teacher, to enable cross-curricular links with topic planning, and will be shown on the curriculum map on the school's website in the current year.
Teachers are aware that it is important for pupils to have a secure understanding of each unit of knowledge and concepts, in order to progress to the next stage.

Working scientifically: teachers ensure opportunities for pupils to 'work scientifically', taught through the curriculum content in the programme of study for their year group. Children develop understanding of **different types of enquiry**, including **observing changes over time, grouping and classifying, noticing patterns**, **carrying out fair tests and finding things out using an increasing range of secondary sources of information**. Much of the learning in science should be through appropriate 'first hand' practical experience, but will also include the use of appropriate secondary sources.

Oracy

Oracy is explicitly developed through regular opportunities for talk in science lessons. Pupils engage in partner and group discussions, debates about scientific ideas, and presentations of their findings. Teachers model precise scientific language and encourage pupils to use sentence stems to explain, justify, and reason.

Strategies such as **Think–Pair–Share**, **Science talk frames**, and **'Because… so…' reasoning stems** are embedded to support scientific discussion and develop confidence in verbal expression.

Overview of units Y1-Y6

Year 1	Working scientifically				
		Seasonal changes	Animals including humans	Materials	Plants
Year 2	Working scientifically				
		Materials and their uses	Living things and habitats	Animals including humans	Plants
Year 3	Working scientifically				
	Rocks, soils and fossils	Light	Forces and magnets	Animals including humans	Plants
Year 4	Working scientifically				
	Animals including humans	Sound	States of matter	Electricity	Living things and their habitats
Year 5	Working scientifically				
	Space	Forces	Properties of materials	Living things and their habitats	Animals including humans
Year 6	Working scientifically				
	Animals including humans	Evolution and inheritance	Electricity	Light	Living things and their habitats

(Note: pupils will also learn about Scientists & inventors linked to their units of work, but this is non –statutory and delivery will depend on time constraints.They will also learn about equality in the Science profession – encouraging more female Scientists)

Impact

The impact of the teaching of Science will be demonstrated through children having:

- ✓ the appropriate scientific knowledge for their year group, as per the National Curriculum for Science
- ✓ more developed skills of enquiry and investigation, linked to scientific knowledge and understanding, that equip them to make sense of the world in which they live.
- ✓ a deep and lasting interest in science; some will be motivated to study science further, and go on to develop their appreciation of applications of science in the world around them.
- ✓ A richer vocabulary, to enable them to read and spell scientific vocabulary at a level consistent with their reading, and be able to articulate their subject knowledge and understanding of scientific concepts appropriate to their year group.

Measuring the impact:
Subject knowledge and understanding of working scientifically is measured in all year groups through on-going assessment, using tracking ladders, and Target Tracker. This is supported in KS1 and 2 by summative assessment using materials such as Rising Stars tests.

In YR (EYFS): In YR, children are encouraged to be curious and ask questions about the world around them. The impact of teaching in Science is measured through tracking progress in 'Knowledge & Understanding of the World' (EYFS steps attainment)

At Key Stage 1 (Year 1 and Year 2) children should:
The main focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about Science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.
Pupils should read and spell scientific vocabulary at a level consistent with their reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2 – Years 3 and 4 – children should:
The main focus of Science teaching in Lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, firstly to talk about and later to write about what they have found out.

Upper Key Stage 2 – Years 5-6
The main focus of Science teaching in Upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer Science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. Pupils should read, spell and pronounce scientific vocabulary correctly.
KS2 Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing reading and spelling knowledge.

Oracy
Pupils are confident to discuss scientific ideas using accurate vocabulary and can explain their reasoning clearly. They demonstrate developing oracy skills through their ability to ask questions, justify opinions, and present their scientific understanding both informally and formally.