“Together in faith, working as one”

Science Policy

Core Principles

At St. Paul’s, our science curriculum 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. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Intent

We develop responsible, resilient, respectful pupils who value themselves, others and their learning.

We aim for our children to be happy, inquisitive, reflective and ambitious individuals who can become lifelong learners ready for the next stage of their ‘journey’.

Our curriculum is **CLEAR**:-

- **C**hallenging – lessons are stimulating and provide opportunities for children to ‘grapple’ with concepts, utilising opportunities for regular lesson enhancements.
- **L**anguage rich– staff promote, develop and encourage high quality talk for learning so that all pupils can express themselves and communicate clearly and effectively in a wide range of situations.
- **E**ncouraging – staff promote resilience through the development of a growth mindset and ‘the power of yet’.
- **A**spirational – staff have high expectations and the children dare to take risks and dream.

- **R**eflective – children are encouraged to consider their role in making our world a better place. **'LIVE WISELY, THINK DEEPLY AND LOVE GENEROUSLY '–** (Pope Francis, *Laudato Si*)

Teaching & Learning

Science is a core subject within the National Curriculum.

Science will be delivered for a minimum of 1.5 hours per week in KS1and a minimum of 2 hours per week in KS2. Each unit of work provides opportunities for working scientifically, subject specific knowledge and developing skills across the key stage, as outlined in our 'Mapping of Skills and Knowledge' document. This can be tracked on the 'Science – Progression of Skills and Knowledge' document, where skills have been colour-coded to allow for easier tracking and monitoring.

Science will be taught in the Foundation stage as part of Understanding the World in line with the objectives set out in the Early Learning Goals. Units of work will incorporate opportunities to explore, observe and investigate the world.

Planning

St. Paul's Catholic Primary School currently delivers a two-year cycle to allow for our mixed-age classes. Progression has been planned as sequentially as possible, for pupils to be ready for the next stage in their learning.

The Science Subject Leader is responsible for mapping the topics, skills and knowledge for the whole school. Planning should be annotated as appropriate and evidenced in planning files. Work is evidenced in individual Science books.

Health and Safety

The school's Health & Safety Policy outlines the safe codes of practice for our school and provides the necessary guidance on the response and the reporting of all incidents.

Children are encouraged to assess hazards and discuss the appropriate precautions. Children are taught the appropriate safe practice when using equipment. This will include:

- how to use equipment correctly and in accordance with health and safety guidelines
- to behave in a considerate and responsible manner, showing respect for other people and the environment whilst on trips outside the classroom.

A copy of 'Be Safe' is located in the PPA room, this provides information about safety in science lessons along with generic topic risk assessments that should be adapted as required. The school also subscribes to CLEAPSS as part of the Local Authority H&S SLA (website in appendices).

Assessment

Teachers complete an assessment of the pupils at the end of each unit. See attached assessment document.

At the end of KS1 and KS2 a formal assessment is undertaken and reported to parents and the Standards and Testing Agency (STA) in line with national testing and reporting requirements.

STA arrangements are issued annually for reporting and assessment (including details of sample testing) of Science attainment. The latest version should be accessed and considered (website in appendices). Schools that are selected for sampling purposes have a statutory obligation to participate.

Resources

An audit of current resources is carried out at the start of the Summer term, allowing time for supplies for the following academic year to be ordered before the Summer holidays. Perishable resources will be ordered as required to avoid unnecessary waste. Materials are kept in the central location of the PPA room. It is expected that staff use and 'put back' what they require for their unit, so that it is available for other team members to deliver their topics.

Enrichment Opportunities

It is not a requirement that pupils go on a 'Science' related trip each year, but any opportunities for enrichment should be explored where appropriate. The Long-Term Plan suggests examples for this, which can be amended accordingly. Science can also provide a great opportunity for enrichment across the curriculum. For example, exploring mummification as part of the Egyptians topic is beneficial and memorable for our pupils, but it is an enrichment opportunity. This means it is delivered 'in addition' to the curriculum diet that we offer for Science, not 'in replacement' of such.

Cross-Curricular Links

As far as possible, the Science curriculum will provide opportunities to establish links with other curriculum areas:

English

In particular, at Key Stage 1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. At key stage 2 the pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they found out. The children develop their written skills by writing reports in science. Science based texts are sometimes used in English lessons and in guided reading sessions.

Maths

At both Key Stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their maths skills at levels similar to those, which they are using in their maths work. Mathematical skills such as weighing and measuring are an important part of a Science lesson. Where appropriate, children record their findings using charts, tables and graphs. Opportunities to explore reasoning skills are provided throughout the science curriculum.

Information and communications technology

At both Key Stages the pupils will use ICT to:

- Locate and research information (CD ROM, internet)
- Record findings (using text, data and tables)
- Gain confidence in using calculators, tape recorder, data logging equipment as well as the computer.

Spiritual development

Spiritual development is encouraged through reminding pupils of the wonder of science and the effect of scientific discoveries on the modern world. Topical scientific issues are also discussed as appropriate.

Personal, social and health education

Health education is taught as part of the units on ourselves, health and growing, teeth and eating, moving and growing, keeping healthy and life cycles. It is also linked to becoming a global citizen.

Sustainability

Sustainability forms an integral and vital part of the science curriculum. Within the scheme of work, individual units naturally lend themselves to developing the children's knowledge, understanding, concern and care for the environment. There are many resources within our school grounds which allow effective teaching of environmental science, including our wildlife area, outdoor classroom and pond area. Children are encouraged to use the wildlife area and outdoor classroom as part of their break and lunch times.

As a result of teaching about the environment, every encouragement is given to the children to apply the principles of energy efficiency, water conservation, waste reduction and recycling and litter control. Recycling is actively encouraged throughout the school and every classroom has notices encouraging this. Additionally, there are many opportunities within science and other areas for children to learn about the choices they have and the impact that they can make on their environment.

<u>Links to our Curriculum Intent:</u>

Challenging

Each lesson begins with a 'question hook' that can be explored and finally answered by the end of the session. Pupils are exposed to a range of units that cover Biology, Chemistry and Physics. Pupils are taught to develop their own questioning skills to enable them to extend their own knowledge. As skills and knowledge are mapped out to allow for progression, opportunities to develop skills are provided, but this is

extended each time to ‘upskill’ our pupils. Further opportunities for challenge can be found in investigative work when pupils should consider ways to extend their investigations to confirm new ideas or to establish links to other concepts (e.g. establishing a plant needs water to be able to grow healthily then questioning whether it is water that is required or if other liquids could be used and then extending to which liquid would allow the plant to grow more quickly/more healthily etc.)

Language rich

Language is explored and defined throughout the units and teachers each have a ‘Key Vocabulary’ document which provides definitions of certain techniques, styles and resources. Further vocabulary is highlighted in lesson plans and discussed accordingly with pupils during the appropriate lessons. Key Vocabulary is provided to pupils prior to the start of new topics via our home/school communication leaflet, so that both pupils and parents have made connections with the topics before we begin. Pupils are expected to use the correct vocabulary during sessions and teachers and teaching assistants correct errors and model accurate terminology as much as possible.

Encouraging

Resilience is a big issue for many of our children and so we make it a key pillar of learning in our curriculum intent for Science. Through step by step teaching and plenty of encouragement, pupils will learn to: ask questions; observe and measure; identify, classify, record and present data and to draw conclusions. It is important that pupils understand that the investigative process relies upon an element of trial and error to explore new concepts. Pupils should suggest improvements for future enquiry after evaluating their work. Attention should be paid to the scientists and inventors whose study and persistence has led to advancements in science and technology. All work is collected and celebrated through individual portfolios and class displays.

Aspirational

Our Science work is rooted in the styles chosen to steer the curriculum for our school. Each unit of work focuses on key areas to allow for the development and progression of skills. These skills include ‘asking questions and carrying out fair tests’, ‘observing and measuring changes’, ‘identifying, classifying, recording and presenting data’ and ‘drawing conclusions, noticing patterns and presenting findings'. The activities required as such, do challenge the pupils, particularly with the development of core skills relating to working scientifically.

Reflective

Science units provide opportunities for pupils to self-evaluate their progress, performance and learning. These skills are particularly nurtured through investigative work when pupils are asked to reflect on their findings. Pupils are encouraged to identify key learning points and suggest ways to improve their work.

Pupils are reminded to consider how their new learning can help to make their school, community and world a better place.

Impact

Pupils will be happy, inquisitive, reflective and ambitious learners during their Science sessions, proud to showcase their projects. Progression will be evident in their science books.

Monitoring will be ongoing throughout the school year, with a pure focus on the content and quality of the science books. This will be achieved through designated staff meetings, where teachers bring examples to share in a ‘Bring and Brag’ context. The Science Subject Leader will then use the outcomes of these meetings and the science book evidence provided, to decide the next steps for the Science action plan.

Links to KS1 from EYFS

Science links directly to the ‘The World’ and ‘Shape, Space and Measure’’ Early Learning Goals. ‘The World’ encourages the children to investigate similarities and differences and to question what they see. This is built upon in the ‘Asking Questions and Testing’ aspects of the KS1 curriculum. The ‘Observing and Measuring Changes’ aspect ties in directly to ‘The World’ where the children make observations of the natural world. In Foundation Stage the children are also encouraged to record what they have learnt and this continues in the aspects that include presenting data, drawing conclusions and recognising patterns. All of which link to the ‘Shape, Space and Measure’ Early Learning Goal.

Appendices

Appendix 1: Whole school long term plan

Appendix 2: Map of skills and knowledge (KS1 & KS2)

Appendix 3: Progression of skills and knowledge – Cycle A

Appendix 4: Progression of skills and knowledge – Cycle B

Appendix 5: Why this topic? Why here?

Appendix 6: Key Vocabulary

Appendix 7: Example of Planning

Appendix 8: Assessment record sheet

Appendix 9: Resources

Appendix 10: Portfolio presentation and expectations

Appendix 11: Useful Websites