



Blessed is the one who trusts in the Lord, whose confidence is in him.
They will be like a tree planted by the water that sends out its roots by the stream.
It does not fear when heat comes; its leaves are always green.
It has no worries in a year of drought and never fails to bear fruit.

Jeremiah 17: 7 - 8

Science Policy

"Don't let anyone rob you of your imagination, your creativity, or your curiosity. It's your place in the world; it's your life. Go on and do all you can with it, and make it the life you want to live."

— Mae Jemison, Engineer, Physician and Former NASA Astronaut

Introduction

A FEDMAS scientist ...

... is aspirational, curious and raises questions to develop their scientific knowledge. Their love of learning is rooted in confidence and resilience. They show competence in a full range of practical skills, for example, planning and carrying out scientific investigations. They have love to grow in their scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings. They have a passion for science and its application in past, present and future technologies.

At The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools, we acknowledge and celebrate that each child is unique and that they learn in different ways. We provide a rich and varied science learning experience that allows children to develop their knowledge, skills and abilities to their full potential. Our science curriculum is ambitious and designed to meet the diverse needs of the children who attend The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools. It aims to provide all pupils with the knowledge, skills and cultural capital they need to succeed in their lives.

The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools follows the national curriculum and Early Years Framework to ensure knowledge; skills and understanding are taught throughout all key stages. The school has created its own long and medium term planning which details the topics, objectives, knowledge, skills and vocabulary which should be covered. Through this planning, the national curriculum breath of study for science is fully covered.

Our core aims are to provide teaching and learning opportunities through the science curriculum that empowers the children to be:

**ASPIRATIONAL
RESPECTFUL
RESILIENT**

We believe that by having these three aims at the root, will equip our pupils to **LIVE FRUITFUL LIVES** and to **LEARN, LOVE and GROW**.

Curriculum Intent

Aims of the science curriculum

At The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools, we recognise how science impacts every aspect of daily life, and without science humankind would not have made progress throughout history. As one of the core subjects taught at primary level, we give the teaching and learning of science the prominence it deserves.

Learning science is concerned with increasing pupils' knowledge of our world, and with developing skills associated with science as a process of enquiry. Our science curriculum develops the natural curiosity of each child no matter their demographic, encourages them to have respect for living organisms, and instil in pupils the importance of caring for the natural environment.

By the time the children leave The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools, they will be competent and skilled scientists. Using the requirements of the Science National Curriculum as our guide, our Science lessons offer opportunities for children to:

- Develop scientific knowledge and conceptual understanding of the disciplines of Physics, Chemistry and Biology.
- Formulate their own questions about the natural world.
- Foster the confidence to 'be wrong' when it comes to making predictions and postulating their own theories.
- Promote an awareness of the importance of teamwork in scientific experimentation.
- Practically investigate their questions using various methods of enquiry.
- Gain competence in the science skills of planning scientific investigations, gathering and analysing data and critical evaluation of investigations across the disciplines.
- Use a range of methods to gather data from investigations and secondary sources including I.C.T., drawings, diagrams, videos and photographs.
- Present data in a variety of methods including tables, bar charts, line graphs, pictograms and pie charts.
- Produce comprehensive science reports that demonstrate their proficiency in the scientific method.
- Have care for the safety of all individuals in lessons by developing knowledge of the hazards of the materials and equipment they handle, along with mitigating these hazards.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

Teachers will ensure teaching of science has the federation's Christian ethos and values at its root.

Implementation

Effective learning

We acknowledge that children learn in many different ways and we recognise the need to develop strategies that allow all children to learn in ways that best suit them most effectively. We take into account the different ways that children learn when planning and teaching in order to ensure all children access a full and varied curriculum.

We aim to develop curiosity of the world and a love of science, both inside and outside the classroom. We provide children with hands on experience of their local area, allowing them to implement and continue to develop their scientific skills and knowledge.

Effective Teaching

We believe in whole-class teaching methods, and we combine these with enquiry-based research activities. Teachers use PZAZ and Hamilton Trust teaching schemes and resources to support their planning, delivery and to develop subject knowledge to provide high quality science lessons. We encourage children to ask as well as answer scientific questions. Our curriculum provides pupils with rich, deep, inter-connected curriculum contexts to develop their skills of resilience, independence and emotional intelligence. These key curriculum elements are woven into our coherently planned, sequenced, enquiry-led learning units. Pupils will concentrate on one science skill per term. Term 1 will be dedicated to planning investigations, Term 2 to results gathering and analysis, and Term 3 will be spent evaluating practical work. Although each skill is related and there are links between them, there is minimum crossover as they are taught, so each becomes firmly embedded.

Whilst developing key science knowledge, skills and vocabulary to allow pupils to develop as scientists, learning in science also supports pupils to debate, learn about influential scientists, engage in social action projects and have a positive impact the lives of others. Teaching promotes the development of pupils' resilience skills to become confident scientists.

Mental health and well-being is a right of way for all pupils at The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools; it is given high priority. Learning in science develops children's understanding of how to keep their body healthy, the positive effects of exercise and the impact this has on mental health and well-being.

Vocabulary

The children at The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools are encouraged to *think and talk like scientists* by being taught key vocabulary, modelled by the teacher. Vocabulary is displayed on the 'golden thread of language.'

Enrichment Opportunities

Trips or visitors are planned to complement topics studied and will be scheduled to have maximum impact on learning. Visits are planned to enhance learning and give hands on activity. People with an interest, or expertise, in a particular topic or area of science could be invited into school to work with the children. These might be parents, grandparents, other family members, neighbours or representatives of the local community.

Enrichment opportunities will:

- be fun and exciting
- challenge thinking
- help us to find out about the World
- help us to know about ourselves
- be practical – HANDS ON!
- inspire our futures
- help us to communicate, share our ideas and work together.

Teachers may plan enrichment days to provide an opportunity for pupil to study a topic in more details for the day, giving the opportunity to develop additional skills such as team work, and encouraging them to take part in activities and challenges that are different to their normal everyday lessons.

Children will also learn about and take part in science related events when appropriate, e.g. COP26, Earth Day.

Early Years Foundation Stage

Science makes a significant contribution to the development of each child's knowledge and understanding of the world.

Pupils explore the world around them through a combination of child initiated and adult directed activities. They have opportunities to learn to:

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Resources

Children will have opportunities to use a range of science equipment. They are given instructions in the safe and considerate use of these items. All equipment necessary will be accessible to children.

High Quality Texts

All classrooms have access to a range of high quality fiction and non-fiction books specific to the science topics being taught.

Digital Learning

The use of technology to support and enhance pupils' learning is a high priority in school. Information and Communication Technology enhances our teaching of science, wherever appropriate, in each key stage. Children use ICT to enhance their skills in data handling and in presenting written work. They can research information through the Internet. We also arrange for the children to communicate with pupils in other schools and we offer children the opportunity to use the digital camera.

Health and Safety

We must obviously be alert to any possible dangers when working in school. It is very important that children are aware of the safe handling and storage of any tools and equipment. Risk assessments are carried out prior to any visits or visitors attending the school.

Equal Opportunities and Special Education Needs and Inclusion

All children are given opportunities to access the National Curriculum requirement. All children regardless of ability, ethnicity, religion or gender, will be given equal opportunity to access all aspects of the science curriculum. Any child experiencing difficulty in accessing part, or all, of the curriculum, will be supported with the time, materials and equipment to access the activity at their own level where this is practically possible. Planning, resources and displays will reflect positive images of all communities represented in our society.

British Values and Science

Democracy

- Take the views and opinions of others into account
- Take turns and instructions from others

The rule of law

- Understand the importance of safety rules when working scientifically
- Know that there are consequences if rules are not followed

Individual liberty

- Make choices when planning an investigation
- Others may have different points of view as to where to start

Tolerance

- Scientific discoveries have come from other cultures
- Religious beliefs often compete with scientific understanding

Mutual respect

- Work as a team
- Discuss findings
- Offer support and advice to others

Impact

Assessment for Learning

At The Federation of Middleham (VA) & Spennithorne (VC) CE Primary Schools assessment is an integral part of the teaching process. The assessment of children's work is on-going to ensure that understanding is being achieved and that progress is being made, this is done in a range of ways including quizzes to check retention of knowledge over time, use of exhibitions or presentations to the school community to showcase the work they have done. Teachers take time to review pupil knowledge, and take the time to use these assessments to inform and adapt future planning. Opportunities for pupils to make connections to deepen understanding is central to learning and this is outlined in our curriculum maps for each subject.

Feedback is given to the children as soon as possible, and marking work will be guided by the school's Marking Policy.

Teachers update the assessment tracker following a science topic (at least termly) to record progress and objectives covered.

Subject Leaders monitoring

The subject leader reviews standards and monitors the impact of the curriculum provision whilst also ensuring training and resources are up to date.

Monitoring and review

We are aware of the need to review the school science policy regularly so that we can take account of new initiatives, pupil needs, changes in the curriculum, developments in technology or changes to the physical environment of the school.