St John Vianney Catholic Primary School, West Denton

Through following Jesus, we aim to be a caring, happy school, where everyone is valued and appreciated and can reach their true potential. We hope to act justly, love tenderly, and walk humbly with our God

Science Policy 2023-2025

Date reviewed: November 2023

Date of next review: November 2025

Our whole school curriculum vision

Vision

At St John Vianney Catholic Primary School, we endeavor to provide a broad and balanced curriculum which inspires and provides opportunities for success for all of our learners. Through our curriculum, we strive to create independent, curious, creative and critical thinkers, problem solvers and innovators. We aim to provide engaging learning opportunities that encourage our pupils to develop and fulfil their potential academically, socially, emotionally and spiritually. We strive to provide a range of activities and opportunities through a carefully sequenced and progressive curriculum in all subject disciplines, which fosters a passion for learning, stretching beyond the confines of primary school and creates lifelong learners. Our vision is that our curriculum will ignite passion, expand horizons and raise aspirations for all of our learners. We aim to equip our pupils with the knowledge and skills that will prepare them for the world of work in an ever-evolving landscape, and with the confidence, resilience and tolerance to live harmoniously with others.

Intent

Through our curriculum we aim to:

- be inclusive to all learners and provide opportunities for all learners to succeed, regardless of their individual starting points;
- foster a lifelong love of learning;
- develop a rich subject knowledge, including substantive and disciplinary knowledge, conceptual and procedural knowledge;
- make meaningful links between topics within a subject, between different disciplines and across year groups;
- make links to the world in which we live, which goes beyond the white western experience, thereby instilling a positive attitude of respect and tolerance of other societies, cultures and religions;
- raise the self-esteem of children as capable and resourceful learners;
- develop children's ability to think creatively, solve problems and innovate;
- develop children's capacity and confidence working independently and collaboratively;
- to understand the purpose and value of their learning and how it is placed on a timeline of the past, present and future.

We believe that all learners should experience success across the curriculum and be allowed to develop their own interests and passions within the curriculum. Therefore, our curriculum is delivered with the understanding that all of God's children are blessed with different talents and skills, and the knowledge that there is 'something for everyone' within both core and foundation subjects. For this reason, we ensure that the same value and high standards of learning and teaching are upheld in all subjects across the curriculum. In ensuring success for all children across the curriculum, we aim that this will create confident, resilient and impassioned children who have high self-esteem as learners.

Alongside academic success, the emotional, spiritual and physical wellbeing of children is of high priority, and as such, regular and meaningful opportunities for personal development are integrated throughout the curriculum. We believe that it is our duty to educate and develop the whole child. Our PSHE and RSE curriculum has been refined to ensure that pupils build positive relationships with others, feel valued and those who are most vulnerable are identified and supported. Our curriculum has the flexibility to respond to the needs and priorities of our children and of the local area.

It is our aim that all children develop a knowledge and understanding of and take pride in the British Values of our rich and diverse society and its history. Throughout the curriculum, we present children with the experiences of a diverse range of people, through texts, key figures in different disciplines and exploring the history through a lens that is not always that of the white western experience.

We believe that successful learners are aware of the key skills and strategies of that help them to 'know more and remember more' and make progress. We developed a toolkit of fundamental characteristics of effective learning – LEARNER. These principles are explored with children and modelled within lessons by teachers, creating an ethos of 'lifelong learning' within St John Vianney Catholic Primary School.

At St John Vianney Catholic Primary School we aim for all pupils to receive a broad experience in Science as part of the termly plans. Long term planning is covered in a yearly programme of units.
Medium term planning: This identifies within each unit of work; learning objectives, science activities, assessment opportunities, the vocabulary to be taught and used, safety issues, how information and communications technology and resources should be used.

Intent of the Science Curriculum

The intent of the Science curriculum is to develop a love of learning and give all children a curiosity about the world around them and a thirst for knowledge to understand how things work. We aim to build this science capital by giving and developing the children's vocabulary, language and experiences that they may not have had prior to entering our school. We seek to maintain and improve a rich, broad and balanced curriculum – giving opportunities for them to write and use scientific enquiry skills. We hope to provide them with worthwhile subject content that will inspire them to take an interest in Science as they move forward with their education and into adulthood.
We see the pupils as blank canvasses that need to be filled with scientific wonder, knowledge and through a number of avenues: exciting, investigative lessons; horizon-broadening trips and real-life visitors who can demonstrate how science is used in jobs/real-life situations. We also attempt to engage children by highlighting how science influences their daily lives at home and in school.

Finally, we use the science curriculum as an opportunity to help pupils stay safe, be that through exploring the dangers of using cigarettes or drugs on their bodies, to showing how children can use electrical equipment safely.

Our aims:

- Children are engaged and motivated to deepen their knowledge in specific areas linked to the National Curriculum.
- Develop cross curricular links and strengthen further links with the local and wider community and global world.
- Deepen children's knowledge and understanding by planning extracurricular visits.
- To progress the subject through steadily acquiring and building upon skills and knowledge, both substantive and disciplinary.
- To learn about the natural world and how to protect the environment, from an understanding of changes in the seasons in Year 1 to Evolution in Year 6.
- To learn to identify materials and understand how they can change state, as well as understanding about different forms of energy, light, sound and basic movement, and its effects.
- To develop scientific enquiry skills so that they understand what variables are and how they can affect the outcome of experiments.
- To undertake a range of scientific investigations and be able to interpret their results to draw conclusions.

Implementation

- Design and construct a varied and engaging long term plan that is ambitious and ensures the projects are linked to the National Curriculum but are also linked to the interests of the children in school.
- We aim to progress the subject through steadily acquiring and building upon skills and knowledge. We do this by ensuring teachers have a good subject knowledge and are aware of what is expected in each unit.
- For each unit to start with an initial assessment using a selection of, but not limited to KWL, quizzes, big questions.
- At least one science experiment/investigation and other ways of developing scientific enquiry skills per unit
- Evidence of developing 'sticky knowledge' by eliciting prior knowledge such as science blasts (1 per unit) and pink-think or challenge stickers.
- Evidence that misconceptions have been identified and addressed – cover pages and questioning.
- Evidence of some mathematical link i.e. bar charts or calculations.
- Evidence of factual learning i.e. How many days does it take the Earth to orbit the Sun? What are the chambers of the heart called?
- Choosing the appropriate skills from the National Curriculum for each unit.
- We aim to progress the subject through steadily acquiring and building upon skills and knowledge. We do this by ensuring teachers have a good subject knowledge and are aware of what is expected in each unit.

Science Content

Science has been referenced in 'Understanding the World' in the new Early Learning Goals as set out in the Early Years Foundation Stage Statutory Framework 2021. These goals are addressed through topic content throughout the whole year of Reception and are as follows;

Autumn Term:

- Amazing Me – The pupils explore a healthy diet and their body.
- Lights at Night – The Pupils observe seasonal changes by exploring the school grounds; hibernating animals; shiny and reflective materials; torches and sound around the school

Spring Term:

- Brilliant Books – Seasonal changes around the school ground; melting and freezing of snow and ice; change with baking and dissolving; our environment and global warming; smells; building bridges and looking after pets.
- It's Spring – seasonal change; planting seeds and flowers; the weather; observing new life and changes of state through baking bread.

Summer Term:

- Journeys – seasonal changes; weather; floating and sinking; comparing natural environments around the world.
- Out and About – minibeasts , recycling

Key Stage 1

The science content for KS1 follows the science National Curriculum and is taught as follows:

<table>
<tr><td></td><td colspan="2">Year 1</td><td>Year 2</td></tr>
<tr><td>Autumn 1</td><td rowspan="6">Seasonal changes</td><td>Animals, including humans</td><td rowspan="2">Living things and their habitats</td></tr>
<tr><td>Autumn 2</td><td>Seasonal changes</td></tr>
<tr><td>Spring 1</td><td>Everyday materials</td><td rowspan="2">Uses of everyday materials</td></tr>
<tr><td>Spring 2</td><td>Plants</td></tr>
<tr><td>Summer 1</td><td>Everyday materials</td><td>Plants</td></tr>
<tr><td>Summer 2</td><td>Seasonal changes</td><td>Animals, including humans</td></tr>
<tr><td></td><td colspan="2">Working scientifically</td><td>Working scientifically</td></tr>
<tr><td></td><td colspan="3">During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

• asking simple questions and recognising that they can be answered in different ways
• observing closely, using simple equipment
• performing simple tests
• identifying and classifying
• using their observations and ideas to suggest answers to questions
• gathering and recording data to help in answering questions</td></tr>
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Key Stage 2

The science content for KS2 follows the science National Curriculum and is taught as follows:

	Year 3	Year 4
Autumn 1	Rocks	Animals, including humans
Autumn 2	Animals, including humans	Electricity
Spring 1	Plants	States of Matter
Spring 2		
Summer 1	Forces and magnets	Sound
Summer 2	Light	Living things and their habitats
	Working scientifically	Working scientifically
	During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings	

	Year 5	Year 6
Autumn 1	Living things and their habitats	Living things and their habitats
Autumn 2	Properties and changes of materials	Animals, including humans
Spring 1	Earth and space	Light
Spring 2		Electricity
Summer 1	Forces	Evolution and inheritance
Summer 2	Animals, including humans	
	Working scientifically	Working scientifically
	During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations • identifying scientific evidence that has been used to support or refute ideas or arguments	

Key	Biology topic	Chemistry topic	Physics topic

Planning

We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each area of science. Planning ensures progression throughout the scheme of work so that the children are increasingly challenged as they move up through the school. Long term planning is compiled across a whole school basis, which is determined by the requirements of the 2014 National Curriculum and the EYFS Curriculum. Planning is monitored by the Senior Team and the Science Champion.

Impact

- Children are engaged and motivated to learn developing their understanding further.
- Cross curricular links are made and this, therefore, deepens the children's knowledge.
- Children understand that the presentation and quality of work is essential in all areas.
- Children develop a foundation for understanding of the world.
- Children develop a love of science and develop inquisitive, questioning minds.
- Children acquire practical enquiry skills and be introduced to the process of scientific enquiry.

Pupils with SEN

Teacher's make appropriate adaptions to the curriculum and their teaching style. This ensures that all pupils regardless of need, are able to access the curriculum and succeed across the curriculum.

Metacognition in Science

Within all subjects at St John Vianney, teachers employ metacognitive strategies in lessons, which are based upon EEF research and guidance. In Science, these strategies are evident within lessons, through:

- activating relevant prior knowledge from previous lessons within a Science topic, across previous Science topics and previous year group Science topics (vertical curriculum links);
- activating relevant prior knowledge from other curriculum areas within the current year group (horizontal curriculum links);
- activating relevant prior knowledge from other curriculum areas and year groups (diagonal curriculum links);
- explicit instruction of Science strategies, knowledge and skills;
- teacher modelling of Science strategies, knowledge and skills, and effective learning behaviours in Science;
- memorisation of Science strategies, knowledge and skills;
- guided practice of tasks in Science;
- independent practice of tasks in Science;
- structured reflection upon understanding and learning behaviours, which is seen in Science, namely through end of lesson discussion and feedback, verbal self-assessment and RAG rating of lessons.

Metacognition is also promoted across whole topics of work, such as through the use of Science Blasts or topic knowledge organisers, which encourage children's retention of knowledge by drawing prior learning back into the working memory, building upon it and creating schemas in the long-term memory – the principle behind this being to ensure that learning is not forgotten. 'Science Blasts' refer children back to learning of previous year groups, topics and lessons and are used twice per Science topic. Knowledge organisers allow children to keep track of their previous learning, current learning, where their learning is going next and any key vocabulary for the topic of work they are studying. This affords children an opportunity to monitor their own learning, which is important in fostering self-regulated learners.

Assessment

We assess children's work in Science by making informal judgements during each Science lesson. Learning is promptly evaluated after each lesson and this is then used to inform future planning. Pupils are assessed as WTS or EXP+ three times a year and reported to parents.

Monitoring

The Science subject champion is responsible for monitoring the standard of the children's work and the quality of teaching in Science. The Science subject champion is also responsible for supporting colleagues in the teaching of Science, for being informed about current developments in the subject, and for providing a strategic lead and direction for the subject in

the school. The Science subject champion gives the headteacher an annual audit in which they evaluate the strengths and weaknesses in the subject and indicates areas for further improvement. We allocate specific time for the vital task of reviewing samples of children's work, talking to the children about Science and for visiting classes to observe teaching in the subject. These tasks are carried out at least once a year, with staff being given dedicated time out of class to support this.

Equal Opportunities

We are committed to providing a teaching environment conducive to learning. Each child is valued, respected and challenged regardless of ability, race, gender, religion, social background, culture or disability, in line with the School Policy for Equal Opportunities.

Supporting Documents

This policy is to be read in conjunction with and used alongside the subject 3I statement and where appropriate the End of Year expectation document.

Headteacher's signature _____

Science Lead's signature _____

Chair of Governor's signature _____

Date: Governor approval 30th November 2023

Renewal time frame: Revisited every two years