



Intent

At St Monica's, our primary goal is to nurture children's fundamental scientific knowledge and understanding while engaging them in first-hand experiences that cultivate a deeper insight into the world around them. We firmly believe that STEAM subjects (Science, Technology, Engineering, Arts, and Maths) are integral to a comprehensive school education. Our curriculum is designed to be expansive and challenging, providing students with ample opportunities to develop their understanding of present-day realities and prospects.

From Nursery to Year 6, we emphasise teaching investigative skills, recognising them as vital components of scientific learning. This approach fosters critical thinking and problem-solving abilities, enabling students to approach challenges with confidence and curiosity.

By offering a diverse and stimulating curriculum, St. Monica's ensures students can explore their interests across various subjects. This approach equips them with a well-rounded education and prepares them to navigate the complexities of an ever-evolving world.

Implement

At St. Monica's Primary School, science is taught weekly. Teachers utilise 'Smart Connect' to assess children's existing knowledge, enabling them to establish connections to prior learning. This approach empowers students to build upon their prior knowledge and make connections between concepts. Additionally, students are offered the chance to revisit previous knowledge through 'Smart Flashbacks'. This revalidation encompasses factual and disciplinary knowledge, fostering a deeper understanding of how to think and act like scientists. Through activities such as 'Big Ideas' and 'Smart Secure' tasks, students can reflect on the primary lesson outcomes, further enhancing their understanding and retention of scientific concepts.

Impact

The successful approach to science education at St. Monica's Primary School incorporates hands-on activities, skills-based lessons, and outdoor learning experiences to enrich students' understanding and engagement.

Assessment practices at St. Monica's Primary School are comprehensive, blending formal and informal strategies. These include periodic year-group assessment tasks, quizzes, concept maps, verbal/written outcomes, and reflection tasks/presentations.

Formative assessment takes precedence at St. Monica's Primary School, enabling prompt identification and rectification of misconceptions and knowledge gaps, thereby fostering secure scientific foundations.



At St. Monica's Primary School, students are expected to:

- Cultivate a passion for scientific inquiry and demonstrate an interest in pursuing further study and careers.
- Retain scientific knowledge within real-life contexts.
- Develop the ability to question ideas critically and engage in reflective thinking.
- Articulate their understanding of scientific concepts and engage in scientific reasoning using language rich in scientific terminology.
- Exhibit proficiency in mathematical skills through the organisation, recording, and interpretation of results.
- Collaborate effectively and engage in practical investigations and experiments, including indoor and outdoor hands-on activities.

The curriculum at St. Monica's Primary School integrates outdoor learning experiences to allow students to explore science in natural environments, fostering a deeper connection with the world around them. These experiences enhance scientific understanding and promote environmental awareness and appreciation.

The impact of learning is assessed through various means, including pupil voice, deep dives, and evaluating whether students can articulate responses to questions about big ideas and establish connections to prior learning. Outdoor learning experiences and hands-on activities are also assessed for their effectiveness in facilitating student learning and engagement.

Key learning facts year 6:

Year 6 Science Animals Including Humans: Key Learning Facts

L1	L2	L3	L4	L5	National Curriculum
To classify living things into broad groups according to observable characteristics and based on similarities & differences. Skills:	To describe how living things have been classified. Skills:	To identify the difference between living things and non-living things Skills:	To understand the difference between vertebrate and invertebrate. Skills:	To identify the difference and similarities between animals, plants and micro-organisms. Skills:	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics
Key Vocabulary: mammals, reptiles, birds, classification, Animals, characteristics, classify, deciduous, differences	Key Vocabulary: Micro-organisms, plants, animals, reptiles, birds, classification, characteristics, deciduous, differences, groups, insects, keys, plants, similarities, systems	Key Vocabulary: Living things, non-living things, classification, differences, classify, difference	Key Vocabulary: Vertebrates, invertebrates, classification, characteristics.	Key Vocabulary: similarities, Micro-organisms, plants, insects, invertebrates	
Key Learning Facts	Key Learning Facts	Key Learning Facts	Key Learning Facts	Key Learning Facts	Asking questions Planning investigations and can be assessed using a variety of methods Using questions Using prior knowledge to suggest what will happen and why Setting up trials Recording and measuring equipment to make observations and recording Recording data Using tables, drawings and diagrams to make observations and measurements Interpreting and communicating results Using evidence to make conclusions and explaining how they are made Evaluating Thinking about the evidence and equipment to make conclusions and explaining how they are made
Self-Assessment	Self-Assessment	Self-Assessment	Self-Assessment	Self-Assessment	

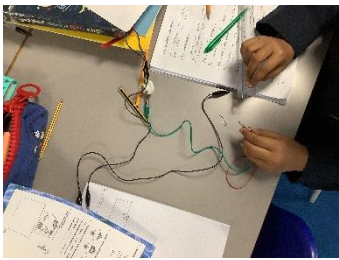


If you were to walk into a science lesson at St. Monica's, you would observe the following:

- Students can recap on previous and prior learning that links to the current lesson, establishing connections and building upon existing knowledge.
- Students engage in discussions and drawings of scientific skills, demonstrating their understanding of key concepts and their ability to interpret scientific icons.
- Opportunities for collaboration and sharing ideas are provided within small groups and with the whole class, fostering a supportive learning environment.
- Students are encouraged to recognise the relevance of scientific concepts to everyday life, enhancing their understanding of the subject matter.
- Hands-on activities tailored to the lesson's topic are incorporated, allowing students to apply theoretical knowledge in practical contexts.
- Each lesson concludes with an experiment or hands-on activity, preceded by a short knowledge-based lesson to prepare students.
- Students are provided Clear instructions on safely conducting experiments or hands-on activities, ensuring their well-being during practical work.
- At the end of the experiment, students can share observations and conclusions with the class, promoting critical thinking and scientific discourse.
- Students then recap what they have learned in the lesson, evaluating their understanding of critical concepts and reflecting on their overall learning experience.

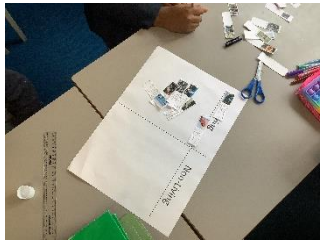
This holistic approach to science education at St. Monica's encourages active participation, critical thinking, and reflection, fostering a deeper understanding and appreciation of scientific concepts among students.

Example of outcomes and lesson structure:

Experiencing with circuits	Testing other combinations	Evaluating how it went
		

Outstanding examples of learning outcomes:



 Year 6 Living and Non-living. Year 6 pupil 1: "We were allowed to sort pictures to say if they are living or non-living according to specific criteria we learned during the lesson."	 Year 6 living and non-living. Year 6 Pupil 2: "We looked at living and non-living things and discussed with our partner to evaluate different pictures with living and non-living pictures on them. We were given the challenge to see if we could provide a reason why a tree would be living or non-living and explain why."	 Year 6 living and non-living things. The pupil had sorting activities based on their abilities to determine if the picture had a living or non-living animal or object on it. They had to describe why it is living or non-living based on specific criteria.
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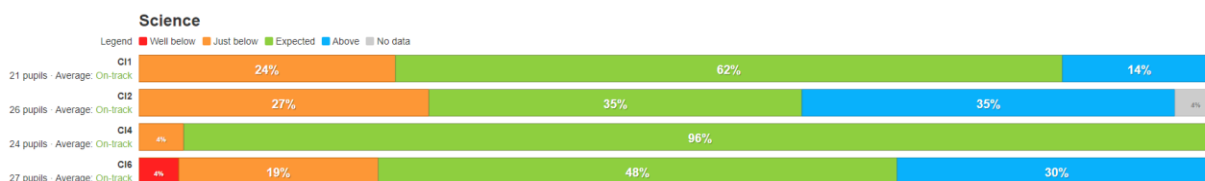
Pupil voice:

How do you learn science at St Monica's?

Year 5 pupil: "We learn science through experiments and science skills."

Why do you think Science is important?

Year 6 Pupil: "Science helps us explore the world around us. Experimenting helps us develop different skills that we do not learn in other subjects."





An example of the progression of skills and science curriculum for science

Animals Including Humans	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
National curriculum	- PD: Begin to show accuracy and care when drawing - UW: Explore the natural world around them, making observations and drawing pictures of animals and plants - UW: 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 - UW: 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 - ED: Make use of props and materials when role playing characters in narratives and stories - PSED: Show an ability to follow instructions involving several ideas or actions - PD: Use a range of small tools, including scissors, paint brushes and cutlery - ED: Share their creations, explaining the process they have used	- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - identify and name a variety of common animals that are carnivores, herbivores and omnivores - describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	- explore and compare the differences between things that are living, dead, and things that have never been alive - identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of animals and plants, and how they depend on each other - identify and name a variety of plants and animals in their habitats, including microhabitats - describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food, they get nutrition from what they eat - identify that humans and some other animals have skeletons and muscles for support, protection and movement	- recognise that living things can be grouped in a variety of ways - explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - describe the simple functions of the basic parts of the digestive system in humans - identify the different types of teeth in humans and their simple functions - construct and interpret a variety of food chains, identifying producers, predators and prey - recognise that environments can change and that this can sometimes pose dangers to living things	- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - describe the life process of reproduction in some plants and animals	- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals - give reasons for classifying plants and animals based on specific characteristics
Science Q1 progression	To identify that animals are living things. To discover where animals live and what they need to survive To explore where birds live and what they need to survive To explore farm Animals To learn about dinosaurs that lived on Earth	To identify a variety of animals, including fish, amphibians, reptile, birds and mammals. To classify and name animals by what they eat (carnivore, herbivore and omnivore). To organise animals into categories (including fish, amphibians, reptiles, birds and mammals). To classify and sort living and non-living things	To identify things that are living, dead and never lived. To describe how a specific habitat provides for the basic needs of things living there (plants and animals). To identify and classify plants and animals in a range of habitats. To investigate living things in their habitat. To describe how animals find their food. To identify some different sources of food for animals. To identify a simple food chain.	To explore the five key food groups To classify and identify the different nutrients we get from different foods To explain how nutrients, water and oxygen are transported within animals and humans. To classify and identify the skeletal system of a human and animal. To identify the role of the muscles. To describe the purpose of the skeleton in humans and animals	To explore different habitats To research different habitat To explore how animals can be classified To create a classification key To explore Adaptations and classification within species To explore and observe pond habits To identify the organs in the digestive system To describe the functions of the main organs in the digestive system To identify the types of human teeth and their functions To investigate the effects of different liquids on the teeth	To investigate the life process of a plant To explore the life cycles of mammals To compare the life cycles of insects and amphibians To develop a Understand of the life cycle of different animals To research and present the life cycle of a creature	To classify living organisms. To identify and understand the kingdoms of life To classify living things using the Linnaean system To explore the characteristics of different types of microorganisms To investigate asexual reproduction through spore dispersal To classify and describe a living organism

Pupil voice strengths 2023-2024

Strengths:

Student Comprehension:

- Students grasp the material and understand the purpose behind their learning, fostering a deeper connection to the subject.

Recall and Application:

- Pupils can recall previous learning and skilfully apply scientific knowledge to their everyday lives.
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Cross-curricular Integration:

- Integrating science across various subjects enhances the overall curriculum, emphasising the interconnected nature of knowledge.

Peer Collaboration:

- Participate in collaborative learning with peers.
- Contribute to group projects, engage in discussions, and collaborate on problem-solving activities.

Reflection and Discussion:



- Reflect on learning experiences regularly.
- Discuss observations and findings with peers, deepening understanding and improving the articulation of scientific concepts.

Areas for development:

Real-world Applications:

- Apply scientific skills to solve everyday problems or address challenges.
- Demonstrate an understanding of how scientific concepts are relevant in practical situations.

Problem-solving Scenarios:

- Engage in problem-solving scenarios that require the use of science inquiry skills.
- Demonstrate the ability to apply these skills across different situations.

Successes in Autumn 2023-2024

Strengths:

At St. Monica's School, our strengths in science education are evident through several key aspects:

Teacher Expertise:

- Our science teachers possess profound knowledge in their subject, ensuring a comprehensive understanding of scientific concepts.

Engaging Lesson Design:

- Teachers consistently create captivating lessons rich in information, effectively conveying critical aspects of science to students.

Clear Learning Progression:

- Educators adeptly comprehend students' progress, effectively building on their skills and knowledge.

Well-Documented Outcomes:

- The outcomes of our science education are meticulously presented in student records, showcasing a clear picture of individual achievements.

Recall and Application:

- Pupils can recall previous learning and skilfully apply scientific knowledge to their everyday lives.

Cross-curricular Integration:

- Integrating science across various subjects enhances the overall curriculum, emphasising the interconnected nature of knowledge.

These strengths collectively contribute to a dynamic and effective science education environment at St. Monica's School, where students excel in understanding scientific principles and develop a genuine appreciation for the subject and its broader applications.



Development areas for Autumn 2023-2024

Areas for development:

Teacher Support:

- Implement regular professional development sessions to equip teachers with effective science teaching strategies.
- Establish a collaborative platform for sharing best practices and mutual support in lesson planning and delivery.

Holistic Approach in KS1 and EYFS:

- Integrate science into other subjects to create a seamless and holistic learning experience.
- Prioritise hands-on, inquiry-based learning methods to foster curiosity and exploration.

Forest School Development:

- Create a dedicated Forest School space to enrich the learning environment.
- Provide training for teachers on Forest School principles and practices, emphasising motor skills development and a connection to seasonal changes.

Inclusive Planning for SEND Children:

- Develop training programs for teachers to adapt science lessons for students with special educational needs.
- Ensure that science resources and materials are accessible to all students, fostering an inclusive learning environment.

Development of Scientific Skills:

- Design a progressive curriculum focusing on the systematic development of scientific skills.
- Integrate practical activities and experiments to reinforce theoretical concepts and promote active student engagement.

Hands-on Approach:

- Encourage teachers to incorporate more hands-on activities into science lessons.
- Invest in science kits and materials for in-class experiments, fostering a culture of experiential learning.

Experiments Across the School:

- Develop a school-wide plan for integrating experiments into various subjects and grade levels.
- Establish guidelines for documenting and reflecting on experiments, promoting a culture of shared learning.

Continuous Assessment and Reflection:

- Implement regular assessments to gauge students' understanding of scientific concepts.
- Encourage teachers to reflect on their teaching practices, fostering continuous improvement.

Through these initiatives, St. Monica's School aims to create an engaging and inclusive science education environment where students develop a love for learning and a solid



foundation in scientific principles. Regular feedback and adjustments will ensure the ongoing success of our science education development plan.

Support and planning of SEND during Science lessons

At St. Monica's Primary School, we take a personalised and inclusive approach to supporting children with Special Educational Needs and Disabilities (SEND) during science lessons. Here's how we do it:

1. **Adapting Instruction:** Our teachers provide differentiated instruction tailored to the individual learning needs of SEND students. This may involve adapting teaching methods, materials, and assessments to accommodate diverse learning styles and abilities.
2. **Visual Aids:** We use a variety of visual aids such as diagrams, charts, and models to support understanding for SEND students. Visual representations help make scientific concepts more tangible and accessible to all learners.
3. **Multi-sensory Learning:** Our science lessons incorporate hands-on activities, experiments, and demonstrations to engage students through tactile, auditory, and visual experiences. Multi-sensory learning helps reinforce concepts and accommodate different learning preferences.
4. **Scaffolding:** We provide scaffolding and support to help SEND students access challenging scientific content. This includes breaking tasks into smaller steps, offering prompts or cues, and providing additional support to ensure success.
5. **Flexible Grouping:** We use flexible grouping strategies to allow SEND students to work collaboratively with peers who can provide support and encouragement. Pairing SEND students with classmates who excel in science fosters peer learning and social interaction.
6. **Individualized Learning Plans (ILPs):** We develop Individualized Learning Plans (ILPs) in collaboration with students, parents, and support staff. ILPs outline specific learning goals, accommodations, and strategies tailored to each student's unique needs and abilities.
7. **Assistive Technology:** We integrate assistive technology tools and resources to support communication, comprehension, and participation for SEND students. This may include screen readers, speech-to-text software, or specialised learning apps.
8. **Sensory Considerations:** We consider the sensory needs of SEND students when planning science lessons. Our classrooms are designed to minimise distractions and



accommodate sensory sensitivities, ensuring a supportive learning environment for all students.

9. Positive Reinforcement: We celebrate the achievements of SEND students to boost confidence and motivation. Positive reinforcement, such as praise, recognition, and rewards, acknowledges effort, progress, and participation in science activities.

10. Collaboration and Communication: We foster open communication and collaboration among teachers, support staff, parents, and other professionals supporting SEND students. Sharing insights, strategies, and feedback ensures a coordinated approach to meeting the diverse needs of all students.

St. Monica's Primary School is committed to providing an inclusive and supportive learning environment where every child can engage, learn, and succeed in science education.

Supporting the lower 20% in science at St-Monica's Primary school

At St. Monica's Primary School, we have developed a tailored approach to support the lower 20 per cent of students in science. Here's how we do it:

- **Adapted Instruction:** Our teachers provide personalised instruction to cater to the diverse learning needs within this group. By adapting teaching methods, materials, and assessments, we ensure that every student receives the support they need to succeed in science.
- **Hands-On Activities:** Science lessons at St. Monica's are designed to be interactive and hands-on. Through experiments and practical activities, we engage students and make abstract concepts more accessible, particularly for those in the lower 20 per cent.
- **Visual Aids and Graphic Organizers:** Visual aids such as diagrams, charts, and graphic organisers are integrated into our lessons to support understanding. These visual tools help simplify complex information and reinforce learning for all students.
- **Peer Tutoring and Collaborative Learning:** We encourage peer tutoring and collaborative learning opportunities where students can support each other in understanding scientific concepts. Peer interaction fosters a supportive learning environment and enhances comprehension.



- Targeted Intervention Programs: St. Monica's offers targeted intervention programs and support services for needy students. These may include after-school tutoring, remedial classes, or individualised learning plans to provide extra support and guidance in science.
- Assessment for Learning: Our teachers use formative assessment strategies regularly to assess student progress and understanding against objectives. This allows us to identify areas of difficulty and provide timely feedback and support to help students improve.
- Parent and Family Engagement: We actively involve parents and families in their child's science education by providing resources and opportunities for involvement. Collaborating with parents reinforces learning at home and strengthens support for student progress.
- Professional Development for Teachers: St. Monica's invests in ongoing professional development for teachers to enhance their skills in supporting students. Training in differentiated instruction, classroom management, and assessment techniques equips our teachers to effectively meet the diverse needs of all learners.

At St. Monica's, we are committed to providing a supportive and inclusive learning environment where every student, including those in the lower 20 percent, has the opportunity to thrive and succeed in science.

Professional development

As the Science Faculty Lead at St. Monica's School, I have taken the initiative to implement a new science curriculum that aligns with our school's vision for holistic education. Since joining St. Monica's, I have also undertaken Forest School training to deepen my understanding of how outdoor learning can nurture children's love for nature and enhance their development.

We are currently in the process of revitalizing our outdoor area to create a dedicated space for Forest School sessions. This outdoor learning environment will provide our students with the opportunity to engage in hands-on exploration, discovery, and skill-building activities in a natural setting. By integrating outdoor learning into our curriculum, we aim to inspire a sense of wonder and curiosity about the natural world while fostering students' physical, social, and emotional well-being.

The redesigned outdoor area will feature elements such as nature trails, sensory gardens, wildlife habitats, and outdoor classrooms to support a range of learning experiences. Through Forest School sessions, our students will have the chance to connect with nature,



develop practical skills, and deepen their understanding of scientific concepts through real-world exploration and observation.

By incorporating outdoor learning into our curriculum, we aim to provide our students with a well-rounded education that promotes creativity, resilience, and a lifelong appreciation for the environment. I am excited about the positive impact that our Forest School initiative will have on our students' learning experiences and overall development at St. Monica's School.

Looking to the future of science at St Monica's

As we look towards the future of science education at St. Monica's, we are committed to ongoing development and improvement to provide our students with the best possible learning experiences. Here's what we are currently working on and planning for the future:

- **Enhancing Outdoor Learning:** We are continuing to develop our outdoor area to create a vibrant and engaging space for students to explore nature and participate in hands-on learning activities. By utilizing the outdoor environment, we aim to foster a deeper connection with the natural world and provide opportunities for experiential learning.
- **Aligning with the National Curriculum:** Our science curriculum has been updated to align more closely with the national curriculum standards. This ensures that our students are covering essential scientific concepts and skills while preparing them for future learning and assessment.
- **Emphasizing Skills-Based and Hands-On Learning:** We have revised our curriculum to emphasize skills-based and hands-on learning experiences. This approach allows students to actively engage in scientific inquiry, experimentation, and problem-solving, fostering a deeper understanding of scientific concepts and principles.
- **Implementing Science Week:** We are planning a dedicated Science Week for our students, where they will have the opportunity to participate in a variety of workshops and activities led by guest presenters. This will expose students to exciting real-world applications of science and inspire curiosity and enthusiasm for the subject.
- **Teacher Professional Development:** Our teachers have received CPD (Continuing Professional Development) focused on planning and implementing hands-on experiments and activities in line with our revised curriculum. We will continue to provide support and resources to teachers to enhance their teaching practices and ensure the effective delivery of our science curriculum.



- **Continuous Curriculum Development:** I will work closely with teachers throughout the year to review and refine our curriculum resources and planning to ensure that they reflect best practices in science education. This includes sourcing and developing new resources, incorporating feedback from teachers and students, and aligning our planning with our focus on hands-on learning experiences and experiments.

By prioritizing outdoor learning, aligning with national curriculum standards, emphasizing hands-on learning, and providing ongoing support and professional development for teachers, we are dedicated to providing our students with a high-quality science education that prepares them for success in their future studies and careers.