Aston Rowant C†E Primary School

WHAT SCIENCE LOOKS LIKE AT ASTON ROWANT

Growing together, rooted in God, having fullness of life.
Colossians 2:1-7

Vision: Aston Rowant community will be courageous life-long learners, who are rooted in God, living our Christian values and enjoying life in all its fullness.

Mission: Growing together and inspiring one another through our Christian values and a broad enriched curriculum.

G	GRATITUDE
R	RESILIENCE
O	OUTREACH
W	WONDER
T	TRUST
H	HARMONY

Grateful Our attitude to learning shows that we appreciate the breadth of opportunities that we have to learn inside and outside of the classroom with our resources and surroundings.

Resilient We cultivate a growth mindset from the perspective of building courage, encourage failure by modelling it and showing how to reframe events in a positive light, so children are willing to try new things whilst embracing failure and the opportunities it brings. Let the children learn to have control over their own actions, including trying again if they don't succeed.

Outreach Children will leave Aston Rowant C†E Primary School with an enthusiasm and thirst for learning that continues for the next stage of education and enables the children to live life to its fullness.

Wonder We generate curiosity and wonder about what we teach and allow it to take hold into something that becomes a passion for lifelong learning for all of our children. We openly involve them in their learning by meeting them where they are and then showing them where they can go exploring their interests, expanding upon their ideas, and engaging them in meaningful dialogue which encourages them to fully engage with owning and developing their own learning.

Trust We will develop our children into independent learners to empower them to take control of their own learning – both inside the classroom. Teachers trust that our pedagogical approach cultivates independent habits of mind in the children we teach and the children themselves trust their foundation and values to explore the truths of the world for themselves.

Harmonious The whole school team will grow together, sharing our knowledge, understanding and experience. We will question, encourage and support one another on our learning journey.

INTENT, IMPLEMENTATION AND IMAPCT

Science at Aston Rowant School is structured to enable our children to demonstrate **wonder** in their approach to learning, to be **resilient** in their attitude to learning, to be empowered to work **harmoniously** with **gratitude** for all the opportunities we have, to understand and **trust** the impact their learning has had on them so far and be inspired to **reach out** and keep learning. We are hold the Primary Science Quality Mark – having achieved the gilt level.

Intent

At Aston Rowant Primary School, we believe that a high-quality science education provides the foundations for understanding the world through the specific strands of biology, chemistry and physics. We recognise and value the importance of science knowledge and scientific enquiry; we ensure that all pupils are taught essential aspects of the knowledge, methods, and uses of science through a concept-driven and progressive curriculum, which has been informed by the National Curriculum.

We endeavour to ensure that our children are immersed in science, both from the perspective of knowledge and working scientifically, and have experiences that they may not have outside of school. Ultimately, we want our children to develop a sense of wonder about natural phenomena through a build-up of key foundational knowledge and the opportunity to investigate their own questions with support from staff with strong subject knowledge.

Implementation

Our enquiry-based curriculum ensures that children are immersed in science and have the ability to organise their thoughts and build upon prior learning, which is then deepened through progressive and sequential teaching. Planning for science is a process in which all teachers are involved to ensure that the school gives full and progressive coverage of the National Curriculum. Science units are per half term. In addition, we explore science-specific concepts (Biology, Chemistry, Physics), during our Science Enrichment Week. During lessons children work scientifically by developing their enquiries at an appropriate level, are given frequent opportunities for review, small step lesson sequencing, deep questioning, well-structured scaffolding and guided into independent practice. We encourage 'sticky knowledge' for children hook to knowledge onto previous learning and build effectively upon their prior knowledge. We ensure that the working scientifically skills are built-on and developed throughout the children's journey from Year 1 to Year 6. The five main types of scientific enquiry alongside the skills of working scientifically are interwoven into the units with purpose and are used to ensure a broad and balanced coverage of the curriculum.

Impact

Our Science Curriculum is high quality, well-thought-out and is planned to demonstrate progression in both scientific knowledge and working scientifically. Children from Aston Rowant School leave with not only the appropriate age-related knowledge linked to the science curriculum, but also skills which equip them to progress further in education and within their everyday lives. Our adaptive teaching encourages children to know more, remember more and understand more about the curriculum and how it links and applies to modern day life.

Our regular pattern of monitoring and evaluation shows that our children have a rich vocabulary, which enables them to articulate their understanding of taught concepts and make connections between different subjects and new phenomena they come across. Our children often make links to prior learning and observations they've made at home, making science more relevant and meaningful. Children also have a clear understanding of why science is important in their lives and are excited about it as a subject.

We want to make sure our impact remains strong and positive. We do this through a combination of assessment, pupil voice, dedicated staff meetings, peer reviews and network meetings within Thame Partnership, sharing of work and pupil progress. This shared high expectation of success means that children from Aston Rowant School feel empowered to pursue Science and STEM subjects as potential career paths, regardless of gender, ethnicity or socio-economic background.

What Science Looks Like at Aston Rowant.

At Aston Rowant C of E Primary School, Science is practical, enquiry-rich and full of awe and wonder. It is a subject where children explore God's world with curiosity, confidence and joy — asking questions, testing ideas, solving problems and discovering how science shapes their lives and the wider world.

Our approach is rooted in our Christian vision of *Growing Together* and reflected through our GROWTH values: **Gratitude, Resilience, Outreach, Wonder, Trust and Harmony**. These values shape how pupils think, behave and learn as scientists.

Across the school, science learning is purposeful, hands-on and ambitious. The Kapow Mixed-Age Science Curriculum (Cycle A & B) provides clear progression in **substantive knowledge** (biology, chemistry and physics) and **disciplinary knowledge** (working scientifically). Children revisit concepts regularly, deepening their understanding over time.

Science in EYFS

Science in EYFS sits within *Understanding the World*. Children develop early scientific thinking through exploration and play:

- Investigating natural materials, weather, plants, animals and seasonal changes
- Observing how things change (melting, growth, decay, mixing)
- Asking simple questions and sharing ideas
- Using magnifiers, simple tools and first scientific vocabulary
- Exploring outdoors daily — noticing patterns, textures, movement and change

Children begin to see themselves as "little scientists", learning through curiosity, observation and discussion.

Science in Years 1–2 (KS1)

In Key Stage 1, children begin formal scientific enquiry while securing foundational knowledge about:

- Plants and seasonal change
- Animals, humans and habitats
- Everyday materials

They learn to:

- Ask and answer simple scientific questions
- Classify and sort objects
- Make careful observations
- Carry out simple tests
- Use practical equipment safely
- Record findings using drawings, tables and simple charts

Learning is highly practical, with outdoor science, real objects and hands-on investigation at the heart of teaching.

Science in Years 3–4 (Lower KS2)

Children begin to think with more independence and complexity. They study:

- Light and shadows
- Rocks and soils
- Movement, muscles and nutrition
- Electricity and circuits
- Digestion and teeth

They learn to:

- Set up simple enquiries and comparative tests
- Measure accurately using standard units
- Present data in tables and bar charts
- Identify patterns and make evidence-based conclusions
- Use a wider range of scientific vocabulary

Practical science, fair testing and repeated investigations become central to learning.

Science in Years 5–6 (Upper KS2)

Older pupils extend their scientific thinking further, studying:

- Properties and changes of materials
- Mixtures and separation
- Forces and mechanisms
- Light and reflection
- Circulation and health
- Earth, space, evolution and inheritance

They learn to:

- Plan and carry out full scientific enquiries
- Make predictions using prior knowledge
- Identify, control and measure variables
- Collect, analyse and evaluate data
- Consider reliability and sources of error
- Present findings using scientific language

By the end of Year 6, pupils are confident, articulate and reflective scientists who can explain and justify their ideas with precision.

Working Scientifically at Aston Rowant

Across all year groups, children regularly engage with the five enquiry types:

1. Observing over time
2. Identifying and classifying
3. Pattern seeking
4. Comparative and fair testing
5. Research using secondary sources

These enquiry types are woven throughout the curriculum so children know *how* scientific knowledge is created.

Practical Science and Outdoor Learning

Practical work is central to every unit. Children:

- Use measuring equipment and data loggers
- Examine specimens, materials and environmental samples
- Build circuits, mechanisms, models and prototypes
- Carry out investigations in our outdoor spaces
- Explore habitats, weather and seasonal change
- Test, refine and improve scientific ideas

Our natural environment helps pupils appreciate biodiversity, stewardship and sustainability.

Science Enrichment

Every year, pupils take part in exceptional whole-school enrichment such as:

- British Science Week
- Themed investigation days (Time, Change & Adapt, Curiosity & Space)
- Visiting scientists and STEM professionals
- Oxford University fossil workshops
- Parental expertise and community involvement

These experiences deepen knowledge, strengthen identity and celebrate science as fun, meaningful and life-enhancing.

Inclusion & Adaptive Teaching

All pupils, including those with SEND, access full scientific learning through:

- Vocabulary and concept scaffolds
- Visual models and diagrams
- Pre-teaching and structured enquiry frames
- Peer collaboration and adult support
- Alternative ways to record learning (photos, verbal explanations, diagrams)

Every child is supported to succeed - and expected to think.

What Our Children Say

Pupils talk about science with excitement and pride:

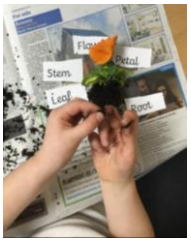
- "I feel like a real scientist when I test my ideas."
- "We learned that mistakes help you find better answers!"
- "Science helps us understand how everything works."
- "I like going outside to find out things for ourselves."
- "We used real equipment — it made me feel grown-up."

Their voices show the impact of our curriculum: confident, curious, resilient thinkers.

GRATITUDE







Science lessons provide a great opportunity to stimulate and explore gratitude. At Aston Rowant, gratitude shapes how children see and appreciate God's world. In Science, this means:

- Appreciating the natural world and its complexity
- Understanding how our bodies work and how to care for them
- Recognising the importance of food, materials and natural resources
- Being thankful for the opportunities to explore, experiment and learn

Scientific study helps pupils see the beauty, order and interconnectedness of creation - inspiring appreciation and stewardship.

The principles of gratitude can be interwoven into various subjects to promote positive well-being and enhance learning. For example,

Human Body: Our Biology units give us a chance to explore our incredible bodies and how we function

Healthy Habits: Gratitude is linked with healthy lifestyle choices, such as appreciating the food we eat and the importance of exercise, fostering a sense of responsibility for our well-being.

Ecology and Biodiversity: Our Science lessons explore ecosystems and biodiversity to highlight the interconnectedness of life and encourage children to appreciate the natural world.

The World, Universe and Beyond: Through learning about the world, the universe and beyond, our children develop gratitude for the wonder, complexity and vastness of creation, recognising how fortunate we are to live in a world filled with beauty, mystery and possibility.

Environmental Stewardship: As we discuss the importance of protecting our planet and resources, we foster a sense of gratitude for the environment and its role in our lives.

Nature Walks and Reflection: We integrate nature walks into science lessons, allowing children to observe and reflect on the beauty and complexity of the natural world, promoting a sense of awe and gratitude

"Science makes us see and understand things that we might not have thought to be grateful for otherwise." Oliver, Year 6

RESILIENCE

Science naturally develops resilience because enquiry often involves trial, error and improvement. Children learn to:

- Keep going when results don't match predictions
- Re-test and refine their ideas
- Embrace mistakes as learning opportunities
- Develop confidence with new equipment, methods and vocabulary

In Science lessons, resilience relates to a child's capacity to overcome challenges and setbacks in learning, maintaining a positive attitude and persistence when faced with difficulties. It is about not giving up easily, embracing trial and error, and seeing failure as a learning opportunity. Science often involves complex ideas and experiments that can be frustrating. Resilience helps children not give up when they encounter difficulties, encouraging them to try different approaches and learn from mistakes. Resilience is also about talking the time to observe and think and go back to previous work completed or revisit thinking and ideas. This persistence strengthens character as well as scientific understanding.

Science is inherently about problem-solving and thinking about questions and scenarios. Resilience helps children develop the persistence and adaptability needed to analyse problems, test solutions, and refine their understanding. When planning investigations, it takes repeated exposure and modelling before children start to be able to plan for controlling variables. When doing practical work, it can take a while for children to gain the skills and confidence to do practical activities independently. That is why we take the time to build and develop these skills.

When children successfully navigate challenges in Science, it boosts their confidence in their ability to learn and tackle new things. This confidence can extend to other subjects and life situations.

"You have to keep working at it on Science but then you suddenly see something that you hadn't seen before."
Tabitha, Year 4

OUTREACH





Science helps pupils connect learning to real people, real problems and real futures. Outreach includes:

- Visits, visitors and partnerships with experts
- Sharing learning with parents and the community
- Seeing how science addresses global issues (health, environment, technology)
- Inspiring pupils to consider future STEM roles

Outreach in Science refers to activities that connect scientific concepts and practices to the wider community, including schools, families, and the public. These activities aim to make Science more accessible, engaging, and relevant to people's lives. Outreach in Science can involve various approaches, such as hands-on workshops, interactive exhibits, public lectures and online resources or even inspire the children for how they could use science to reach out in the future. Children understand that science reaches beyond the classroom and empowers them to make a difference.

Connecting to Everyday Life: Science outreach activities often demonstrate how scientific principles apply to everyday situations, like the science behind cooking, cleaning, or even the evolution of our eyes.

Interactive Resources: We make our Science lessons as hands on and engaging as possible and demonstrate scientific concepts through games and hands-on activities, making learning engaging for all ages.

Relatable Stories: Where possible we try to share personal stories about how scientists became interested in their fields or how they apply their knowledge in different contexts can make science more approachable and relatable.

Hands-on Experiments: Activities like extracting DNA from plants, exploring the properties of non-Newtonian fluids, or investigating the effects of different fizzy drinks can make learning interactive and fun.

Career Connections: We try to showcase the diverse career paths available in STEM fields, inspiring children to pursue science-related education and careers.

"I want to be a scientist when I am older because it is fun and I am good at it."
Harry, Year 2

WONDER

Wonder sits at the heart of scientific discovery. We nurture it by:

- Encouraging children to ask bold, curious questions
- Providing hands-on experiences that spark excitement
- Giving time for noticing, exploring and investigating
- Sharing awe-inspiring scientific ideas and phenomena

Science lessons can cultivate a sense of wonder by encouraging exploration, sparking curiosity, and making connections to the real world. By engaging children in hands-on activities, asking thought-provoking questions, and fostering a deeper understanding of natural phenomena, science education can inspire a lifelong love of learning and discovery. This sense of wonder drives deeper engagement and lifelong interest in science.

Experiments: Allowing children to actively participate in experiments, like observing the effects of different liquids on plant growth, can spark excitement and curiosity as they uncover new knowledge.

Exploration: Providing opportunities for children to explore the natural world, whether it's through nature walks or examining specimens, can help them connect with the wonders of science in a tangible way.

Project-based learning: Engaging children in project-based learning, where they can design and conduct their own investigations, fosters a deeper understanding and appreciation for scientific process.

Asking Questions: Science encourages children to ask questions about the world around them, prompting them to investigate and explore further.

Encouraging Inquiry: Creating a classroom environment where children feel comfortable asking questions and seeking answers, even if they are unconventional, is crucial for fostering a sense of wonder.

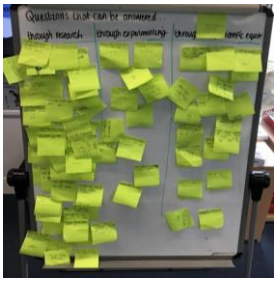
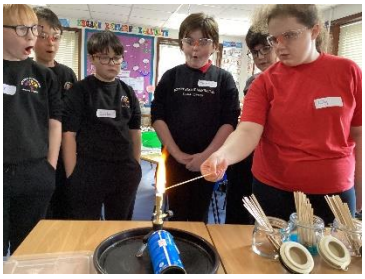
Notice and Wonder: Using activities like "Notice and Wonder" encourages children to observe carefully, identify patterns, and formulate questions about scientific phenomena, leading them to delve deeper into the subject matter.

Everyday Phenomena: Explaining natural phenomena, such as the changing seasons or the behaviour of animals, can help children understand the world around them and appreciate the science behind everyday occurrences.

Real-world Applications: Connecting scientific concepts to real-world applications, like the science behind a cell phone or a medical breakthrough, can make learning more relevant and exciting.

Awe-inspiring Examples: Showcasing examples of scientific discoveries and technological advancements that evoke a sense of awe and wonder can inspire children to pursue careers in STEM fields.

TRUST


Science develops trust in:

- Evidence
- Accurate measurement
- Clear explanation
- Collaboration and peer review
- The reliability of methods and repeatability

Science lessons teach trust by encouraging children to investigate, question, and build their own understanding of the world, rather than simply accepting information as fact. This process fosters critical thinking, questioning and the ability to evaluate evidence, all of which are crucial for building trust in scientific knowledge. Children learn to trust not only scientific processes, but also their own growing ability to reason, analyse and explain.

Hands-on investigation and experimentation: Engaging in practical activities allows children to directly observe, measure, and analyse scientific phenomena, building a personal connection to the knowledge gained.

Developing critical thinking skills: Science lessons encourage children to question assumptions, analyse data, and evaluate evidence, enabling them to form their own reasoned conclusions rather than blindly accepting information.

Constructing explanations: Children learn to explain scientific concepts in their own words, fostering a deeper understanding and ownership of the knowledge.

Exploring different perspectives: Science lessons can expose children to various viewpoints and interpretations, encouraging them to consider multiple possibilities and develop a nuanced understanding.

Learning from mistakes: Scientific inquiry often involves errors and unexpected results, providing opportunities for children to learn from their mistakes and refine their understanding.

Connecting science to real-world applications: Demonstrating the practical relevance of science in everyday life helps children see the value and trustworthiness of scientific knowledge.

Building a shared language of science: Through discussion and collaboration, children develop a shared understanding of scientific terminology and concepts, fostering trust in their ability to communicate and learn from each other.

Utilising diverse resources: Incorporating diverse resources like documentaries, podcasts, and guest speakers can provide different perspectives and highlight the human element of science, further strengthening trust.

Focusing on process as well as product: Emphasizing the methods of scientific inquiry, such as observation, data collection, and analysis, helps children understand how scientific knowledge is generated and validated.

Addressing misconceptions: Science lessons can address common misconceptions and provide evidence-based explanations, helping children differentiate between reliable information and misinformation.

HARMONY

Science promotes harmony through:

- Collaboration in investigations
- Respectful discussion and shared problem-solving
- Understanding ecological balance and interdependence
- Appreciating diversity - in living things, materials and ideas

Pupils recognise that science is a collaborative endeavour that reflects the harmony found in creation.

Enhanced Innovation: Working in teams allows for the cross-pollination of ideas, leading to novel approaches and solutions.

Greater Depth: Children can review each other's work, providing valuable feedback and improving the accuracy and reliability of their findings.

Broader Impact: Collaborations expose researchers to different perspectives and disciplines, increasing the visibility and reach of their work.

Improved Funding Opportunities: Teams are often more successful in securing grants due to their diverse expertise and ability to address complex research questions.

Growth: Teamwork in all subjects provides opportunities to learn from others and develop new skills.

Effective Problem Solving: Teams can share diverse knowledge and resources to overcome challenges and develop innovative solutions.

"I like learning with my friends and other people because they know things that I don't know." Phoebe Year 3