



Science Policy

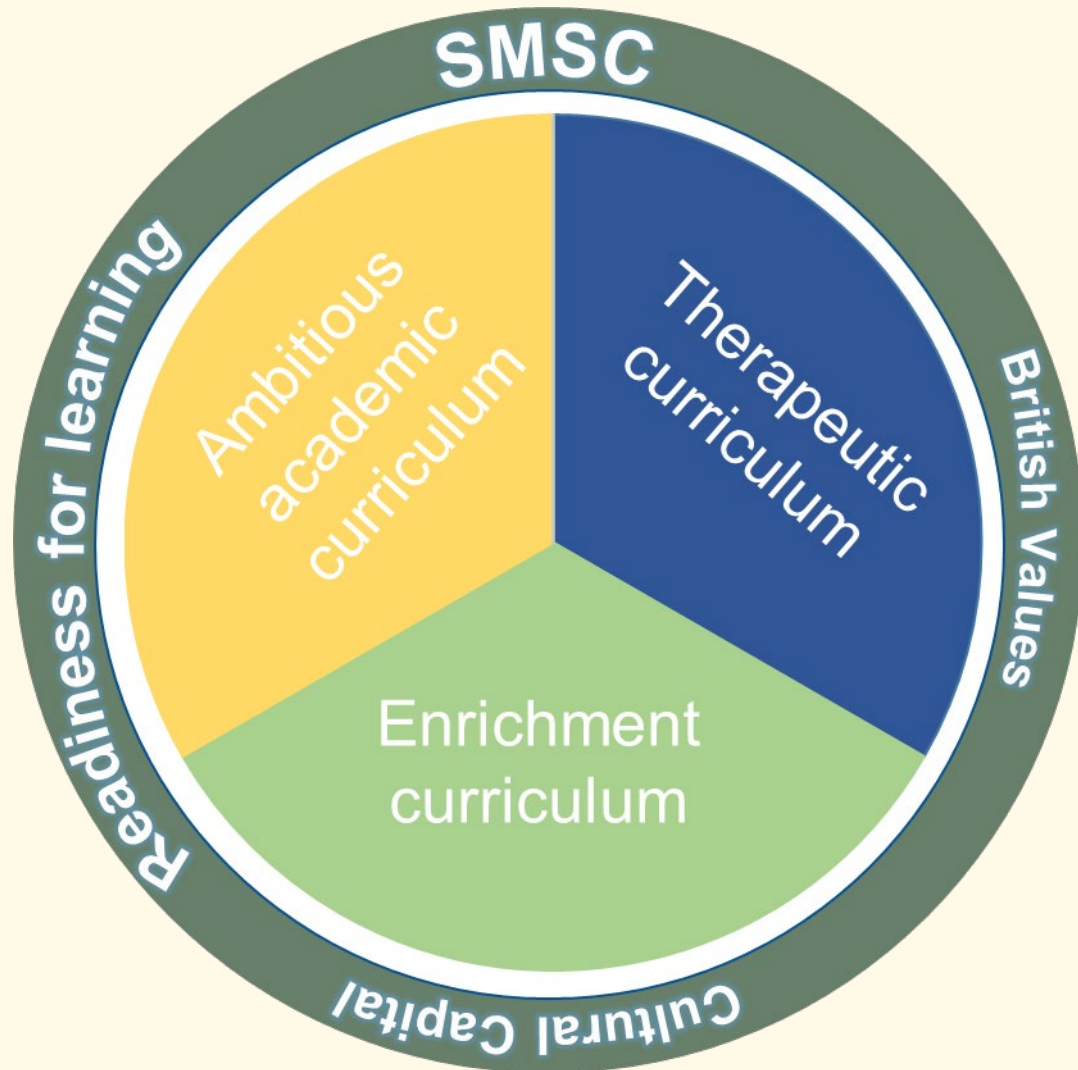
Belonging – Engaging – Compassion – Learning

ARBOUR ACADEMY MISSION STATEMENT

Caring for young people and their families, providing them with a safe and nurturing environment to learn.

Policy developed by:	Mr A Jones
Policy to be reviewed:	September 2025
Summary of changes:	Policy reviewed in line with new teaching staff in science and review of the curriculum.

Main aims of the Arbour curriculum



	Provide an ambitious academic curriculum so that students can access a wide range of qualifications and vocational options that can support and impact on their further education and their employability.
	To provide wide-ranging out of school opportunities to offer the our students the best understanding of how to be successful in 21st Century Britain. At Arbour Academy we explore and develop all opportunities that allow pupils to experience activities beyond the classroom in line with their more socially advantaged peers
	We offer a therapeutic curriculum to support our students' holistic development, fostering emotional well-being alongside academic progress. By integrating therapeutic approaches into our curriculum, we create a nurturing environment where students can thrive socially, emotionally, and academically.
	To ensure that our students are in the best position to be ready to access and participate in their acadmic lessons. To develop our students cultural capital , for us this is providing students with the opportunities to experience people, places and things that contribute towards the essential knowledge that pupils need in order to be educated citizens. To promote pupils physical health and personal development which includes the spiritual, moral, cultural, mental development of pupils at the school in order to prepare our students for the opportunities, responsibilities and experiences of later life

Rationale

The rationale of this Science policy is to:

- introduce the key aims and objectives of the Science department.
- to explain the curriculum design and coverage.
- to explain the effective Teaching and Learning strategies involved in Science.

Vision (Why)

Arbour's Science Policy Vision (Why)

To develop pupils' curiosity and excitement about the world around them.

To develop pupil's ability to work scientifically.

To explore how science is used in real world situations.

To provide opportunities to discuss ethical issues relating to scientific discoveries.

Curriculum intent

Science education at Arbour Academy focuses on providing learners with sequential opportunities to fill in knowledge gaps and consolidate their understanding. Our science curriculum is sequenced to build secure knowledge and understanding across biology, chemistry, and physics, reinforcing connections between topics to aid retention. Key scientific concepts are introduced gradually, reducing cognitive overload and allowing for deeper exploration at a manageable pace. Practical work is embedded throughout, with an emphasis on hands-on learning to promote engagement and confidence.

We recognise that learners join us with varying starting points, so our curriculum is designed to identify gaps in key stage 2 knowledge at key stage 3 and gaps in key stage 3 knowledge at key stage 4. Targeted support is provided to ensure that all learners can access and build upon prior learning effectively, allowing them to progress with confidence in science.

Curriculum Organisation

Spiralised Design: Our science curriculum follows a spiralised approach, ensuring that key scientific concepts are revisited and built upon throughout Key Stage 3. This structured repetition allows students to consolidate their understanding over time, reducing cognitive overload and improving long-term retention. By gradually increasing the complexity of topics across biology, chemistry, and physics, learners can develop a deeper, more connected understanding of science rather than viewing topics in isolation. This design also supports differentiation, enabling students to access content at an appropriate level while being challenged to progress further as their confidence and competence grow.

Prerequisite Knowledge: A well-structured Key Stage 3 science curriculum must address gaps in prior learning while preparing students for the increasing demands of Key Stage 4. We are able to effectively identify and build upon prerequisite knowledge from Key Stage 2, ensuring that foundational scientific principles are secure before introducing more advanced content. The curriculum explicitly makes links between prior knowledge and new learning, supporting students with different starting points. This approach prevents misconceptions from becoming embedded and allows for targeted intervention where needed, ensuring that all learners have the essential scientific literacy required for success at GCSE and beyond.

Awe and Wonder: Engaging students in science requires more than just knowledge delivery; it should inspire curiosity and excitement about the natural world. We foster a sense of awe and wonder by embedding real-world applications, contemporary scientific issues, and hands-on practical experiences into learning. By encouraging inquiry-based learning and critical thinking, students develop a genuine enthusiasm for science and an appreciation of its relevance to everyday life. This engagement not only enhances motivation but also cultivates scientific habits of mind, preparing learners for further study and careers in STEM fields.

The 'Big Ideas' identified in Science

	KS3 A	KS3 B	KS3 C	Years 10 and 11
How organisms work	Cells, Structure and function of body systems	Photosynthesis Respiration	Cells to systems Photosynthesis and respiration	Cell structure and transport, Organisation Photosynthesis and respiration Nervous and hormonal coordination
Growth, development, and reproduction	Reproduction in plants and animals		Reproduction	Cell division Reproduction
Health and disease		Health and lifestyle		Communicable and non-communicable diseases Preventing and treating disease
Ecosystems and environment		Ecosystems Adaptation		Ecosystem processes, Biodiversity Organising an ecosystem
Variation and evolution		Variation and natural selection	Variation and natural selection	Variation Evolution
Genetics and inheritance		Inheritance		Genetics and inheritance

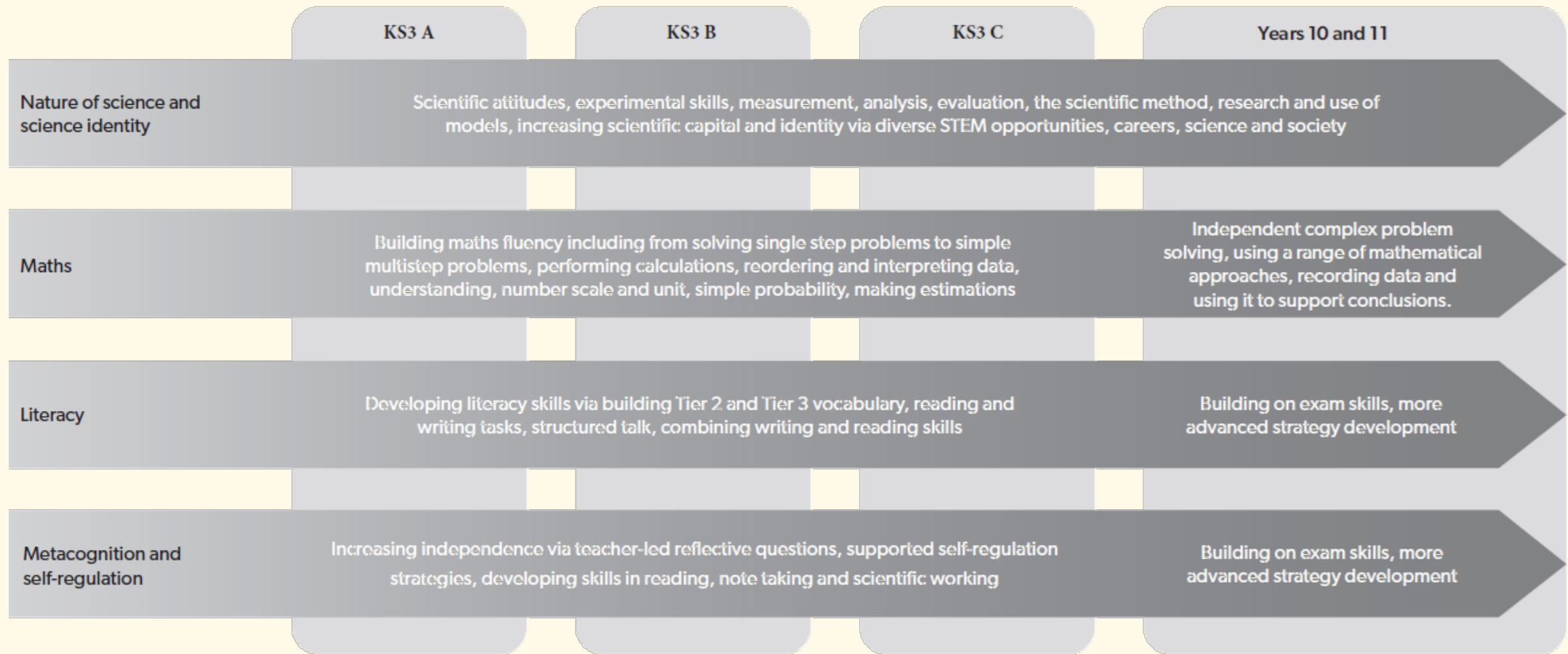
The 'Big Ideas' identified in Science

	KS3 A	KS3 B	KS3 C	Years 10 and 11
Substances, bonding, and structure	Particles and their behaviour		Particle model and changes of state	Structure and bonding Polymers
Elements, compounds, and organic chemistry	Elements, atoms, and compounds	The Periodic Table Elements and groups	Atoms and the Periodic Table	Atomic structure The Periodic Table Organic reactions
Chemical reactions	Reactions and energy transfer Acids, alkalis and pH	Metals and acids	Word and symbol equations Useful chemical reactions	Chemical changes, Electrolysis Energy changes, Rates and equilibrium
Chemical analysis		Separation techniques		Chemical analysis Chemical calculations
Chemistry of the Earth, and Earth's resources		Earth's atmosphere Climate change Cycles and recycling	Extracting metals and recycling	Crude oil and fuels, Earth's resources
Earth and environment		Structure of the Earth Rocks		Human impact on the world, Seismic waves, Changing atmosphere

The 'Big Ideas' identified in Science

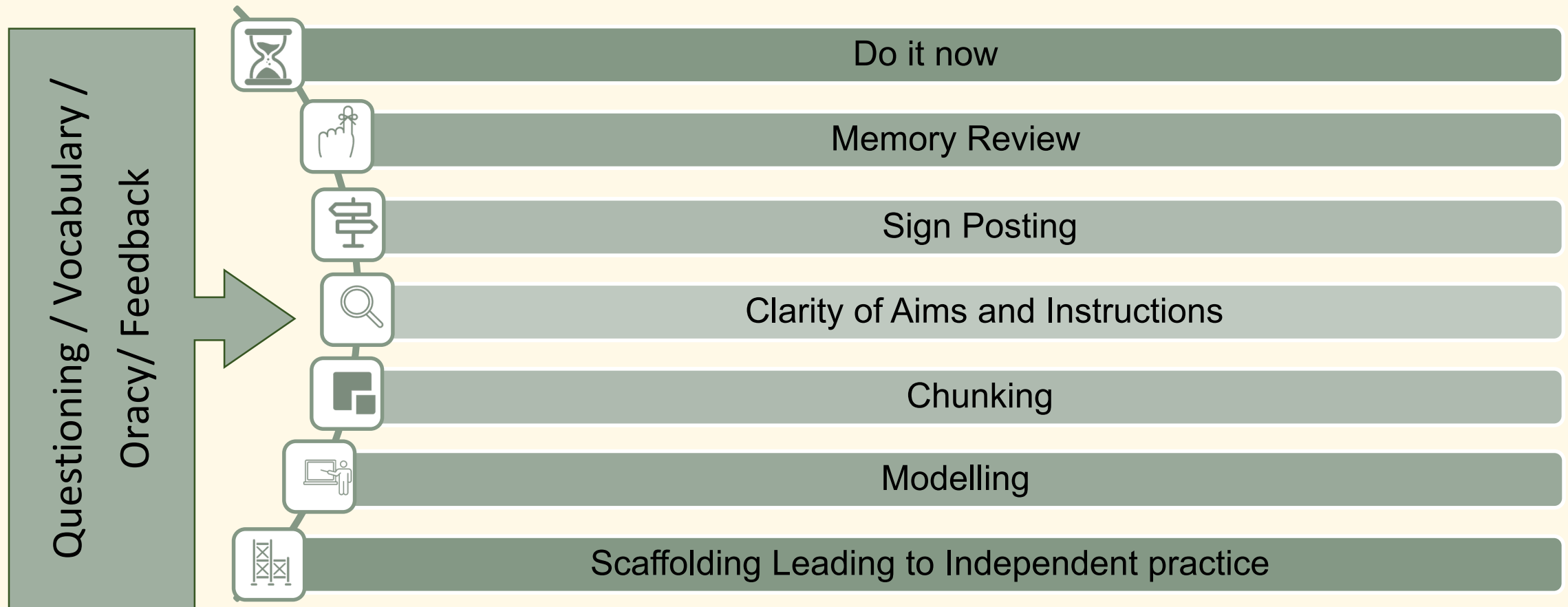
	KS3 A	KS3 B	KS3 C	Years 10 and 11
Forces and motion	Forces Balancing forces	Motion and pressure	Forces and motion	Forces in balance Forces and motion Moments and pressure
Waves	Wave properties Sound and light		Waves, sound, and light	Wave properties Electromagnetic waves
Earth and space	The Solar System The Earth and the Moon			Space
Electricity and magnetism		Electricity, circuits, and magnetism		Electric circuits Electricity in the home Electromagnetims
Energy		Energy and power Energy resources	Energy	Energy Energy transfer by heating Energy resources
Atomic, nuclear, and quantum physics				Molecules and matter Radioactivity

The 'Big Ideas' identified in Science



Working Scientifically

Lesson structure



Assessment Type	Details	Frequency
Initial baselining exercise	A test drawing on questions from across the KS3 curriculum to gain a baseline.	On entry
End of unit tests	Tests based specifically on the work covered during a topic. These are not always completed at the immediate finish of the topic so that we can test that long-term remembering has been achieved.	Ongoing
Pupil assessment	Self- assessment sheets for pupils to assess their progress against unit objectives	Ongoing
Teacher assessment	Teachers to assess pupils progress against the intended outcomes for a unit.	Ongoing
Low Stake assessments	Ongoing teacher assessment used to direct planning on the outcomes of low stakes testing.	Ongoing
Data capture	Formal data captured across all strands of the curriculum using formative and summative methods.	Once per term baselining new students

Cross Curricular Links

The whole school curriculum at Arbour has been designed with collaboration between all subject leads at its core. We want students' learning to be joined up and connected where strong links are possible. This will allow our students, many of whom have difficulties with retrieval, the best opportunity to experience content across different specialisms. This repetition and opportunities for retrieval practice will allow for deeper learning.

Our school skills builders include problem solving and creativity, which are encouraged across the curriculum. Experiments within science lessons embed these values, along with challenges and explorations in science engagement lessons. Lessons are targeted to specific types of learning in order to ignite curiosity and promote scientific thinking.

Subject Enhancements – Trips

Throughout their time at Arbour all learners will have the opportunity to participate in carefully planned curriculum visits that fit into the sequence of learning.

Examples include visits to the Jodrell Bank Discovery Centre for our key stage 3 learners when they are studying Space in the Summer term. By immersing them in real-world astronomy and science. It supports the curriculum by enhancing their understanding of space, physics, and technology through interactive exhibits and the iconic Lovell Telescope. The visit provides a unique opportunity for learners to experience cutting-edge science, making learning exciting, relevant, and memorable.

Further visits to Chester Zoo, The Science and Industry Museum and The Catalyst Discovery Centre are also planned to enhance the science experience for our learners.

Subject Enhancements – Cultural Capital

Visit to a University Science Department (KS4, Autumn Term)

Providing students with insight into higher education and cutting-edge research in subjects such as medicine, engineering, and environmental science. Activities: Lab tours, lectures from university researchers, hands-on experiments.

Links to Curriculum: Practical science skills, scientific method, applications of biology, chemistry, and physics in real-world contexts.

British Science Week (Spring Term)

A national celebration of science, technology, engineering, and maths (STEM), encouraging students to engage with real-world applications of science. Activities Include: School-wide science focuses and external visits. Links to Curriculum: STEM careers, scientific inquiry, and public engagement with science.

Museum of Science and Industry (Ongoing) – Duke of Edinburgh Expedition Enrichment

As part of British science week pupils will visit the Museum of Science and Industry. This will give pupils the opportunity to explore Britain's industrial and scientific heritage, including the development of textiles, steam power, and computing.

Activities: Interactive exhibits, workshops on engineering and physics, visits to the world's oldest passenger railway station.

Links to Curriculum: Forces, energy transfer, materials science, and engineering.

STEM Ambassador Programme (Ongoing)

Inviting STEM professionals into schools to discuss their careers and inspire students, providing real-world science applications.

Activities: Career talks, Q&A sessions, mentorship opportunities. Links to Curriculum: Understanding the role of science in society, career pathways, and the impact of scientific research.

Field Trip to a Nature Reserve or Coastal Study (KS3-KS4, Summer Term)

Observing biodiversity, ecosystems, and conservation efforts in real-world settings.

Activities: Ecological sampling, investigating human impact on the environment, conservation discussions.

Links to Curriculum: Ecology, biodiversity, adaptation, climate change, and sustainability.

These links help **enhance students' cultural capital** by exposing them to science beyond the classroom, fostering **aspirations, curiosity, and engagement** with STEM careers.

Subject Enhancements – SMSC

Spiritual Development in Science

- Encouraging a sense of wonder about natural phenomena (e.g., the vastness of space, the complexity of ecosystems).
- Exploring the big scientific questions, such as the origins of the universe and the diversity of life.
- Encouraging reflection on the impact of scientific discoveries (e.g., the discovery of DNA, the periodic table).

Curriculum Links:

KS3: The Big Bang theory, the structure of the atom, photosynthesis.

KS4: Cell biology, genetic engineering, space physics.

Social Development in Science

- Encouraging collaboration in experiments and scientific inquiry.
- Exploring how science influences society (e.g., public health, vaccination programs, renewable energy).
- Discussing the role of science in solving global challenges (e.g., pandemics, food security, biodiversity loss).

Curriculum Links:

KS3: The importance of science communication and its role in policymaking (e.g., COVID-19 research).

KS4: Studying the impact of science on technology and the economy (e.g., artificial intelligence, pharmaceutical advancements).

Moral Development in Science

Discussing ethical implications of scientific developments (e.g., cloning, genetic modification, AI).

Understanding the consequences of human actions on the environment (e.g., pollution, deforestation, climate change).

Debating the responsibility of scientists in society, including the role of medical ethics.

Curriculum Links:

KS3: Examining energy resources and sustainability, ethical issues in selective breeding.

KS4: Debating the pros and cons of genetic engineering, nuclear power, and climate change mitigation.

Cultural Development in Science

- Recognising contributions of diverse scientists (e.g., Ibn al-Haytham's work on optics, Mary Anning's fossil discoveries, Katherine Johnson's role in NASA).
- Exploring how scientific knowledge has developed across different cultures and historical periods.
- Understanding how science is applied differently across the world due to cultural and economic factors.

Curriculum Links:

KS3: The role of science in different cultures (e.g., traditional medicine vs. modern pharmacology).

KS4: The importance of international collaboration in addressing climate change, disease control, and space exploration.