Science
Vision and Intent

Co-op Academy
Grange

Our Vision for Science at Co-op Academy Grange

The world around us is ever evolving. Through medical advancements and technological development, Science has a critical role in our everyday lives. Science lessons at Co-op Academy Grange are designed therefore to support students to think for themselves, to question the natural world and to consider how theories about Science evolve over time as new technologies make way for new discoveries. Students are encouraged to develop their natural curiosity and love of learning and emerge from Co-op Academy Grange as informed, scientifically literate citizens who can contribute successfully to and make sense of the world around them.

Our Intent for Science at Co-op Academy Grange

Our Curriculum – What do we want our Science curriculum to be?

Through a carefully sequenced 5-year AQA spiral curriculum, all Co-op Academy Grange students are supported to continually embed, build upon and reinforce powerful substantive knowledge of key Scientific concepts across Biology, Chemistry and Physics from Key Stages 2-4 whilst also developing disciplinary knowledge.

All students, regardless of future education, when leaving Co-op Academy Grange must be equipped with essential Scientific literacy skills to help them develop into informed and responsible members of a school and wider community. This will enable them to be able to understand information presented to them through varied platforms helping them to make informed and responsible decisions. With a global climate crisis, a rise in preventable diseases linked to lifestyle choice and technology advancing in all industries at an unprecedented rate empowering our children to have access to this information has never been more important.

What does it look like in the classroom? (Implementation)

Teachers will steadily guide the students through a roadmap of foundational concepts to more complex and advanced topics whilst addressing any misconceptions. All lessons will be meaningful, relevant and consistent in sharing clear learning goals. Teachers will be actively questioning students and circulating, providing immediate impactful feedback to aid student progress. Students will have a sound understanding of what they will learn in the lesson, how they will learn it and how to be able to articulate how the learning fits within the 'Big Picture' and the real world. This will be achieved through the following;

Retrieval – supporting students to 'know and remember more' is an integral part of the Science curriculum this is achieved through:

- A Spiral Curriculum with spaced learning allows opportunities to continually revisit and build upon powerful knowledge and disciplinary skills
- Retrieval starters 'every lesson, every day' provide opportunities to retrieve knowledge, address misconceptions and close gaps in knowledge over time.
- Retrieval Assessment – Assess students' understanding of powerful knowledge at KS3. Synoptic style graded assessments allow additional assessment of prior learning. This allows students to retrieve previous learning and allows teachers to re-assess to evaluate the impact of classroom intervention.

Literacy – a broad range of literacy strategies are intrinsically woven into all schemes of work.

Concept maps identifying keywords are embedded into all lessons. Students are challenged and supported to use key terminology correctly in all aspects of learning.

Etymology is used throughout the curriculum to support students to decode unfamiliar words through the 'Unlocking Vocabulary' strategy

Extended writing and the use of 'long answer' questions are commonplace in all lesson sequences. Through scaffolding and effective modelling students are taught how to confidently structure and apply knowledge to evaluate, compare and discuss key Scientific ideas.

Think, Pair, Share and structured 'partner talk' activities support developing oracy skills in learners.

Reading

'Reciprocal Reading' strategy is fully embedded into KS3/KS4 SOW. The strategy exposes students to a range of Scientific texts. Through effective modelling students are explicitly taught how to read for understanding.

A range of opportunities to support 'Reading in Science' are identified in SOW.

Concept Maps of key words are differentiated in line with Fresh Start strategies to support learners with low reading ages who are accessing or have accessed the fresh start programme.

Numeracy and Working Scientifically

Mathematical principles are embedded throughout the Curriculum, they are explicitly taught in lessons before being applied to a Scientific context.

Practicals have been integrated into the curriculum to enhance students' working scientific skills throughout their educational journey from Key stage 3 to Key stage 4.

Modelling

All lesson activities are structured using 'Guided, Explicit and Independent practice'.

Students are explicitly taught exam technique through regular use of exam style application questions using a mastery approach. Students are exposed to and regularly use a range of exam specific command word terminology.

Regular use of effective modelling through practical demonstration to support understanding of abstract ideas and the development of 'working Scientifically' skills.

Assessment – Students are assessed regularly throughout the curriculum using a range of assessment methods. Assessments are tracked on learning journeys and appropriate subject specific interventions are identified on annotated seating plans and used in lessons to support all learners to progress further.

- Prior Knowledge Learning Activities
- Retrieval Assessment
- Summative Graded Assessment (Synoptic in Style)
- Formative Skill Assessment Opportunities

Enrichment

STEM Club / Young Medics Programme.
Careers Spotlight.
Dedicated – Science Enrichment days and regular homework.

What will the impact be?

Studying Science at Co-op Academy Grange will prove to be a positive and engaging experience providing our students with strong foundational knowledge acquired that will allow them to access advanced learning at a higher level. By studying our carefully sequenced curriculum, our students will be able to explore Scientific ideas and make connections between different topics, and support them to explore their interests. This approach will promote transferable skills such as critical thinking, practical skills and problem-solving, which is essential for other subjects and real-world contexts. Thus empowering them to make informed decisions and become resilient in a competitive world and a successful active member of the community.