

Co-op Academy Leeds Science Curriculum Intent 2022-23

By the end of their education, a student of at Co-op Academy Leeds will:

- Our vision for students is that they leave Co-op Academy Leeds as scientifically literate citizens, with the skills and knowledge to critically evaluate and understand the world we live in. We are determined to foster a love of learning.
- Our students will be equipped with the scientific knowledge required to understand the uses and implications of science, to create scientifically literate problem solvers. We teach students to be critical about information and to evaluate strategies and behaviours that could have an impact on the environment. We aim to foster a spirit of inquiry and to nurture curiosity. We take opportunities to incorporate topical issues into our teaching and use reading to develop students' understanding of their world.

In order to achieve a true understanding of Science, topics have been intelligently sequenced following this rationale:

- The curriculum is carefully sequenced to move from concrete to abstract, recognising the hierarchical nature of science. The sequencing of lessons within a unit is also intelligently sequenced, and knowledge organisers and powerful knowledge are used to ensure precision and subject specific vocabulary. Topics are ordered so that previous knowledge is built upon.
- The majority of units across both key stages finish with a summative assessment. Where units are short at GCSE, assessments are combined to allow extra opportunities for teacher-assessed extended writing activities. All assessments contain questions on powerful knowledge from previous units in the style of core and application questions. Key pieces of work are marked using whole class feedback strategies or individual marking; these are identified on long term plans. DIRT tasks follow each assessment. Live marking is used in lessons to give students immediate feedback and areas for improvement.
- The Science curriculum is ambitious for all, and scaffolding is used where necessary. This is designed to take cognitive load into account, for example starting all questions the same way when completing physics equations. Teachers use carefully selected models to enunciate their thought processes, modelling the best way to tackle a problem. The Science curriculum goes beyond the National Curriculum, for example, acid rain and the climate crisis is taught in Year 8 in Chemical Changes 1. The curriculum is reviewed constantly, and additional hinterland knowledge is added. This often takes the form of a reading task, where membership to the ASE is used to expose students to scientific journals and literature they wouldn't otherwise access.
- Topics include topic maps at the beginning of each lesson to provide a summary of the topic so far, and an opportunity to link what will be learnt in this lesson to previous lessons and topics.
- Topics at KS3 are named to match those in KS4, allowing students to see Science as a five year journey.

The Science curriculum will address social disadvantage by addressing gaps in students' knowledge and skills in these ways:

- Every science lesson begins with a retrieval activity from prior learning. This is designed to activate required prior knowledge and serves as an opportunity to address misconceptions. Additional spaced retrieval lessons are included at KS3 to revisit prior content, address misconceptions and provide an opportunity to close gaps in learning.
- Each topic at KS3 begins with a baseline assessment comprised of predominantly KS2 National Curriculum questions. This allows teachers to identify any gaps early and address them, ensuring all students are able to access their ambitious curriculum regardless of starting point.
- We use a booklet model at KS3 to allow all students to make accelerated progress through designated time for deliberate practice. We have high expectations for our students and we do not narrow the curriculum. Disciplinary knowledge is taught at the start of each academic year at KS3 through an investigation, and is interwoven throughout in core practicals in each unit. Disciplinary knowledge is taught in the most appropriate substantive contexts. This enables students to understand the scientific method and apply this to their world, for example analysing the statistics used in adverts.
- Every learning sequence ends with powerful knowledge questions. These act as a condensed version of the lesson, and are repeated in end of topic tests, do now activities and tutor time retrieval practice. Drilling key facts ensures all students have a level playing field regardless of starting point when learning how to apply their knowledge to unknown situations.
- Poor literacy levels are a barrier to student attainment. Topics include at least one reading task that builds on knowledge from that topic and usually takes the form of an article or journal. Reciprocal reading is used and teachers model pronunciation, with choral reading used to echo key words and phrases. Students have opportunities to practise their extended writing, and scaffolding is used for those who require it.
- Cultural capital is mapped within each unit to expose students to a rich and diverse range of hinterland knowledge. This is often achieved through wider reading, clips and a range of other platforms. Regular reviews of the curriculum allow additional cultural capital to be added as the world changes, for example including COP27 in teaching climate change.

We fully believe Science can contribute to the personal development of students at Co-op Academy Leeds in these ways:

- Science includes opportunities for discussion and interacting with viewpoints that may not be your own. Students are taught to form their own opinions about the challenges of the world around them in a local and international context, and discuss these without conflict. For example, we discuss the moral issues of using stem cells and genetically modified food, and sexism in science when learning about the structure of DNA.

- We strive to capitalise on opportunities for extracurricular learning, with a STEM Club and activities planned for British Science Week in March; the theme for 2023 is Connections. Opportunities for trips are included wherever possible, including the Thackray Medical Museum for an introduction to Organisation in year 7 and in B6 in Year 11 and a Yorkshire Water treatment plant in Year 10.
- Students are exposed to careers in science relevant to their learning throughout their science education. This includes employability skills as well as specific roles and their entry requirements.
- Our curriculum includes opportunities to discuss physical and mental well-being, and its importance. For example, students study smoking, alcohol and drug taking from a social and scientific view. Students learn about things that directly affect our cohort, for example dental care. Finally, we go above and beyond to equip students with knowledge about everyday life, for example teaching about the menopause.