

Year 9 Curriculum Intent for Science

At Dixons Cottingley we develop students to lead successful and happy lives and make a positive contribution to their community. Our curriculum in each year is designed to provide experiences, opportunities, knowledge and skills that enrich and challenge our students. We understand that the curriculum is key to determining the life chances and choices for our students and therefore we will not compromise on providing the very best.

The overall aim of the Science Faculty is to maximise each individual pupils' progress in their understanding of scientific concepts and their applications to the real world. We hope to help pupils gain the confidence to thrive in a society that is increasingly dependent on the application of science and technology. We acknowledge that many careers involve the skills and knowledge that science can provide. We are purposeful in everything we do and students begin their GCSE pathway at the start of Year 9. Pupils follow the AQA combined trilogy route.

By the end of Year 9 students at Dixons Cottingley studying Science will be exposed to the following:

- The fundamentals of biology, chemistry and physics. Within biology students B1 Cell Biology, B2 Organisation, B3 Infection and B4 Bioenergetics. Within chemistry C1 Atomic structure and the periodic table, C2 Bonding and structure, C3 Quantitative Chemistry and C9 Chemistry of the atmosphere. Lastly, within physics students will be exposed to P1 Energy, P2 Electricity, P3 Particle Model of Matter and lastly P4 Atomic structure.
- Students will develop a love for science and start to think like scientists by questioning and suggesting explanations for the science they see.
- An encouragement to link the science they learn to what they know about the world in which they live and ask questions about this.

In order to truly appreciate the subject and create deep schema, Science has been sequenced with the following rationale:

- The lessons are sequenced so the fundamentals are taught first and subsequent knowledge is built on the strong base. The students learn the introductory units for biology, chemistry and physics.
- Biology, Chemistry and Physics are interleaved to allow the students to make links across all areas of science and see them as linked rather than discrete subjects thus facilitating a deeper understanding. Spacing of topics built in within the scheme of work at the appropriate stages.
- We ensure all students have access to powerful knowledge and are given the support to develop their thinking and knowledge.
- We understand the need to push our highest ability students. The lessons are planned to challenge and develop the thinking of these students by pitching the lessons
- The lessons are planned to a high standard. There are various opportunities for AFL in order to identify and address misconceptions, using MWB activities, in addition to Q&A between teacher and student and student to student. Activities are included to address any misconceptions identified. The lessons and tasks are structured to manage cognitive load whilst still maintaining challenge. Wherever possible we use modelling to help students develop a deeper understanding of scientific concepts. The lessons encourage students to develop their thinking, question and investigate ideas for themselves.
- Practical work is a key priority in the KS4 scheme of work with all practical's included being compulsory. There are individual experiments to secure and embed knowledge of content and investigations through the year to allow constant repetition of planning, identifying variables, using a range of equipment effectively and safely, recording results in tables and graphs, creating tables and graphs, identifying anomalous results, analysing & synthesising results and evaluating results and methods. These investigations also secure and embed content knowledge.
- We do not want lack of knowledge to be a barrier to application and students in Year 9 are given a knowledge navigator quiz on a weekly basis. This is low stakes quizzing designed to encourage students to practise knowledge retrieval
- Staff carry out analysis of data from end of topic and cycle assessments through the use of QLA's and intervene at an early stage.



The Science curriculum at Cottingley has been influenced by:

- EEF Improving Secondary Science Report
- Working with Big Ideas of Science Education
- AQA Science KS4 Syllabus

The order in which they have been taught and the content in each unit has been determined by the following:

- MAT wide policy

Our Science curriculum ensures that social disadvantage is addressed through:

- Disadvantaged and SEN students need to have their books marked more frequently compared to their peers. This would allow for rapid identification of any misconceptions and errors. SEN and disadvantaged students are highlighted on staff intervention folders thereby ensuring these students are receiving the attention they need. SEN students follow the same curricular pathway as it is important that they are provided with access to the same scientific knowledge. In class this is supported through clearly differentiated teaching which will include access to seeing and conducting practical's
- Exposing our students to content that provides a deeper understanding of the world around them. The construction of our science curriculum not only ensures that students are taught the relevant knowledge, but also provides them with the skills to interrogate the world around them. This innate ability to question the world and to analyse information gives all our students, but especially our disadvantaged students, a complement of skills that will benefit their long term learning. We believe that without the power to question and develop hypotheses using scientific methods, individuals are dependent on those that possess these attributes and are unable to challenge the world around them.
- Our belief is that homework is used for deliberate practice of what has been taught in lessons. We also use retrieval practice and spaced revision to support all students with committing knowledge to long term memory. Homework in KS4 is designed to give students exposure to exam style questions and allow them to practise the skill of applying their knowledge. Homework is marked in class and students are then set targets based on their misconceptions.

Opportunities to build an understanding of social, moral and ethical issues are developed alongside links to the wider world, including careers, through:

- The schemes of work ensure topical issues are covered to allow students to have an educated and informed opinion on global issues. In Year 9 this includes renewable and non-renewable sources of energy balancing the advantages and disadvantages of each; carbon footprint and the issues surrounding global climate change; healthy lifestyle – an important topic for the community in Bradford.
- There is an annual careers fair where the students can discuss potential careers of interest and learn about careers related to science.

Further Information can be found in:

- Long term plans
- Knowledge navigator sheets
- Schemes of work
- EEF Improving Secondary Science Report
- Working with Big Ideas of Science Education
- AQA Science KS4 Specification