Hayesfield GIRLS' SCHOOL | MIXED SIXTH

Curriculum Booklet
2024-2025

Head of Chemistry: Mair Thomas

Chemistry Curriculum Intent:

"Don't let anyone rob you of your imagination, your creativity, or your curiosity. It's your place in the world; it's your life. Go on and do all you can with it and make it the life you want to live."

Mae Jemison,
First African American woman astronaut

At Hayesfield, we aim to inspire a lifelong love of science in all our students and equip them with the knowledge they will need to navigate an ever more scientific world. We believe that all students should have the scientific literacy to be able to evaluate critically evidence – this way, they can explain the world around them and make healthy choices whilst becoming responsible citizens.

As Hayesfield is a comprehensive school that takes students across the full range of prior ability, our curriculum reflects the needs of all our students, regardless of their starting point, and allows them to achieve their full potential. We strive to ensure that we both challenge and support students to work to the best of their ability at all times. As our students are high prior attainers who have been successful at KS4 our KS5 chemistry curriculum is designed to challenge all our students, whilst supporting those who struggle to transition to the rigours of A-Level, to ensure that it is ambitious for all.

We are also mindful that our students come to us having had different experiences of prior schooling. We have a strong focus on closing gaps in cultural capital in Chemistry, which will help remove barriers to previously disadvantaged students' achievements in school, future learning and the world of work.

Across the two-year journey, our intent for every student is to:

- challenge themselves and their peers to be the best chemist they can be, and believe they have the ability to succeed in their chemistry lessons and beyond
- develop a lifelong interest in chemistry
- achieve their best possible academic qualifications, enabling them to confidently take their next steps in life, whether in education, apprenticeships or the world of work
- safely acquire analytical and practical skills that will help them in their next steps, whether in chemistry or elsewhere
- become chemically literate and be able to apply the chemistry they learn to understand and appreciate the natural world, and make the best choices in the increasingly science-led world around us
- achieve meaningful qualifications that will allow students to move to the next stage in their educational careers

The Chemistry curriculum supports our students to become scientifically literate to be able to understand and evaluate scientific articles in the news or in literature, to communicate their understanding effectively and with confidence and to understand and engage with scientific issues so that they can form valid opinions and make informed decisions.

Our school's motto is 'Achieving Ambitions' and we want our students to pursue careers across the spectrum of Science, Technology and Engineering, challenging any stereotypes. Inviting guest speakers and holding afterschool activities focused on careers in medicine, for example, enable our students to see how science at school leads to rewarding careers.

Subject Curriculum Implementation:

A-level chemistry is the perfect partner to all other KS5 scientific, mathematical or technological subjects, complementing and working harmoniously to build and develop the scientists of the future. We guide all students to learn and build their skills to be scientifically literate and prepared for future studies beyond A-level, or application within the workplace. We provide comprehensive support for all students to maximise their opportunities after completing the course, allowing them to access universities, employment or apprenticeships. Many A-level chemistry students use the skills and knowledge gained to further their education beyond A-levels, including degrees and high-level apprenticeships, the sciences, medicine and mathematics.

A-level chemistry students receive high-quality education, teaching and feedback from a team of experienced teachers. Students have access to the individual support that they need, as well as opportunities to stretch and challenge their understanding. This includes the chance to deepen and expand their experience of physics beyond the classroom and specification, making the most of local trips, activities and talks.

Year 12 begins by revisiting and building on the key practical skills needed to successfully complete the wide range of experiments we complete throughout the course. This builds and deepens the laboratory skills they started to develop as GCSE students. Over the year, we then revisit many topics that the students previously studied, such as atomic structure, quantitative chemistry, energetics as well as rates of reaction, securing key knowledge and broadening and deepening students' existing knowledge.

Year 13 then builds upon the core concepts of year 12 by exploring new areas of chemistry as well as developing the fundamental aspects and linking them to mathematical analysis. These draw together many of the fundamentals encountered in year 12, and help students to see the how the different aspects of chemistry are interlinked giving them a greater understanding of the ‘bigger picture’.

Over the two-year course, students develop their practical skills, completing many experiments that require a level of skill, dexterity and analysis far beyond the rigours of GCSE science. In addition, students develop their mathematical skills, applying them to different and unfamiliar situations in preparation for their next step academically or into the world of work.

A-level chemistry is challenging, with concepts that may sometimes appear complex or beyond our everyday understanding. Teaching and lessons are designed to unpack these difficult ideas, breaking them down into bite-size chunks to make them more accessible. Mathematical skills are also steadily developed during the course, building students’ confidence and abilities as the science demands.

Throughout the course, students complete a series of summative assessments that allow both teachers and students to monitor their progress. Alongside these, students regularly complete formative assessments such as quizzes and weekly questions to support and deepen their knowledge and understanding.

Allocated Curriculum Time:

	Year 12	Year 13
Fortnightly lesson allocation	8	8

Year 12

Exam Board: AQA

Specification: A level chemistry 7405

Term	Curriculum Foci Areas	
1	**3.1.1 Atomic structure** ● Orbital theory how it was developed ● Ionisation energy **3.1.1 Amount of substance** ● The mole, reacting masses and titrations ● The ideal gas equation	**Assessment details** ● Term 1 assessment ● 50 mins
2	**3.1.3 Bonding** ● Intermolecular forces and intramolecular forces ● Shapes of molecules **3.3.1 Introduction to organic chemistry** ● Nomenclature and isomerism ● Reaction mechanisms	**Assessment details** ● Term 2 assessment ● 50 mins
3	**3.3.2 Alkanes, 3.3.3 Halogenoalkanes** ● Fractional distillation, cracking and combustion ● Nucleophilic substitution, elimination, ozone depletion **3.1.4 Energetics** ● Enthalpy change and Hess's Law ● Calorimetry	**Assessment details** ● Term 3 assessment ● 50 mins
4	**3.3.4 Alkenes, 3.3.5 Alcohols, 3.3.6 Organic analysis** ● Structure bonding and reactivity ● Identification using test tube reactions and spectrometry **3.1.7 Oxidation, reduction and redox equations** ● Identify Redox reactions and write redox equations	**Assessment details** ● Term 4 assessment ● 50 mins
5	**3.1.5 Kinetics** ● Collision theory and how to affect rates ● Maxwell-Boltzmann distribution **3.2.1. Periodicity, 3.2.2 Group 2, 3.2.3 Group 7** ● Period 3 elements and trends ● Group 2 and 7 reactions and properties	**Assessment details** ● Paper 1 Inorganic and physical chemistry ● Paper 2 organic and physical ● Each exam is 1hr 30 mins
6	**3.1.6 Chemical equilibria, Le Chatelier's principle** ● Chemical equilibria and Le Chatelier's principle ● Kc for homogeneous systems **3.1.8 Thermodynamics** ● Born-Haber cycles and entropy	**Assessment details** ● Term 6 assessment ● 50 mins

Year 13

Term	Curriculum Foci Areas	
1	**3.3.7 Optical isomerism, 3.3.8 Aldehydes and ketones, 3.3.9 Carboxylic acids, 3.3.10 Aromatic chemistry** ● Identification of optical isomers ● Reactions and structure of aldehydes, ketones, carboxylic acids and aromatic compounds **3.1.11 Electrode potentials and electrochemical cells** ● Electrode potentials and cells ● Commercial applications	**Assessment details** ● 2 AS exams ● Paper 1 Inorganic and physical chemistry ● Paper 2 organic and physical ● Each exam is 1hr 30 mins
2	**3.3.11 Amines, 3.3.12, Polymers, 3.3.13 Amino acids, proteins and DNA, 3.3.14 Organic synthesis, 3.3.15 NMR, 3.3.16 Chromatography** ● Preparation and reactions of amines and polymers ● Formation of organic compounds **3.2.5 Transition metals** ● Properties and reactions including catalytic behaviour ● Formation of coloured compounds	**Assessment details** ● Term 2 assessment ● 50 mins
3	**3.2.6 Reactions of ions in aqueous solutions** ● Identification of transition metal ions in solution ● Behaviour of ions in solution **3.1.12 Acids and bases** ● Determination of pH ● pH curves, titrations and indicators ● Action of buffers	**Assessment details** ● 2 Mock exams ● Paper 1 Inorganic and physical chemistry ● Paper 2 organic and physical ● length of each exam is 2hr
4	**3.2.4 Properties of period 3 elements and their oxides** ● Reactions of period 3 elements with oxygen ● Properties of period 3 oxides **3.1.9 Rate equations, 3.1.10 Equilibrium constant Kp for homogeneous systems** ● Determination of rate equations from practical data ● Partials pressures and determination of Kp	**Assessment details** ● Paper 3 inorganic, organic and physical (all content) ● length of exam is 2hr
5	**Revision and Exams**	

Revision and Support: http://www.hayesfield.com/index.php/gcse-academic-support/

How to support your son/daughter with his/her learning:

Your son/daughter will be working hard in all lessons and when completing their homework, however their focus and efforts will increase as assessments loom. Please ensure that your son/daughter gets a healthy amount of sleep and continues to eat well. Give them plenty of support and encourage them to seek help when things get tricky, their teachers are always happy to help.

Below is a list of other resources that your son/daughter may benefit from using when working outside of lesson time, completing homework or revising.

Useful resources:

Hayesfield resources

- Hayesfield A-level chemistry website - http://www.hayesfield.com/index.php/a-level-chemistry/
- Hayesfield A-level chemistry google class - you son/daughter will have joined this group at the start of the course

Books and Revision guides

- CGP A-level chemistry AQA textbook - https://www.cgpbooks.co.uk/secondary-books/as-and-a-level/science/chemistry/catb73-a-level-chemistry-for-aqa-year-1-2
- CGP A-level Chemistry AQA revision guide - https://www.cgpbooks.co.uk/secondary-books/as-and-a-level/science/chemistry/car73-a-level-chemistry-aqa-year-1-2
- Collins A-level chemistry AQA textbook s for year 1 and year 2- https://collins.co.uk/collections/aqa-a-level-chemistry
- Oxford A-level chemistry AQA textbook f- https://global.oup.com/education/product/9780198351825/?region=uk

Websites

- AQA A-level Chemistry - https://www.aqa.org.uk/subjects/science/as-and-a-level/chemistry-7404-7405/specification-at-a-glance
- Seneca - https://senecalearning.com/en-GB/
- A-Level chemistry- https://www.a-levelchemistry.co.uk/aqa-a-level-chemistry.html
- Khan Academy - https://www.khanacademy.org/

Final Assessment Structure:

Component	Weighting	Content	Proposed Date of Examination
Paper 1	35%	Exam ● Relevant physical chemistry topics (sections 3.1.1 to 3.1.4, 3.1.6 to 3.1.8 and 3.1.10 to 3.1.12) ● Inorganic chemistry (section 3.2) ● Relevant practical skills ● 105 marks ● Duration - 2hrs	May/June 2025
Paper 2	35%	Exam ● Relevant physical chemistry topics (sections 3.1.2 to 3.1.6 and 3.1.9) ● Organic chemistry (section 3.3) ● Relevant practical skills ● 105 marks ● Duration - 2hrs	May/June 2025
Paper 3	30%	Exam ● Any content ● Any practical skills ● 90 marks ● Duration - 2hrs	May/June 2025
Practical Endorsement for Chemistry	Reported Separately	Non-exam assessment ● Completion of a minimum of 12 assessed practicals throughout year 12 and 13	Throughout year 12 and 13, reported May 2025

Please see exam board websites for up-to-date information:
https://www.aqa.org.uk/subjects/science/as-and-a-level/chemistry-7404-7405/specification-at-a-glance