Chemistry A Level — Key Stage 5 Curriculum Plan — Year 12

Exam Board:	*OCR*
Qualification:	*H432*
Assessment Information:	*3 exams in year 13, 2 x 135 minutes, 1 x 90 minutes*
Link to official specification	

Department Information:

Chemistry is a highly successful subject at Furze Platt, regularly attracting around 30 students in each sixth form year group, equivalent to two classes each year. The Department aims to provide a supportive, stimulating, dynamic and academically challenging experience for all students. Over recent years, the Department has consistently achieved high outcomes for students in both the academic work and their practical endorsement.

ACHIEVE in the curriculum:

The curriculum has been designed with the ACHIEVE values at its core. Lessons have been written to encourage ambition and endurance with the level of challenge included. They have also been written with the intent of being enjoyable and giving opportunities for students to celebrate their own successes. Collaboration and versatility are two key aspects of the scientific method and students will develop these through the completion of their practical endorsement in the subject, something that will require them to plan, complete, and evaluate their own investigations. Students will develop integrity through their completion of independent home learning and through self-marking and peer-marking their work.

Curriculum Aims & Intent:

The course is designed to develop students' appreciation and understanding of how chemistry and science underpin our everyday lives, with the aspiration of inspiring the next generation of chemists and innovators. Over the full course, students will learn things such as how the different types of chemical bonds and structures influence a material's properties and uses, how the speed of chemical reactions can be controlled to enable greater efficiencies and economical viability, and how chemical analysis enables forensic identification of unknown substances. A significant number of chemistry students continue to study the subject or a related science at university and the aim of the department is to ensure that students have the necessary knowledge, understanding, study skills, and independence to succeed in higher education.

Resources:

Textbook: Oxford University Press A-Level Chemistry for OCR A textbook (available online via Kerboodle)
Revision guide and workbooks: Oxford University Press A-Level Chemistry for OCR A revision guide, Pearson Revise OCR AS/A Level Chemistry Revision Workbook, Illuminate Publishing Mathematics for A Level Chemistry: A Course Companion
Websites: Physics and Maths Tutor

How we keep parents informed:

Year 12 - Progress reports are published 4 times per year, in October, January, March and July, with a face-to-face parents' evening in November.

How parents can help their child:

Check Class Charts to keep track of homework that has been set and the dates of upcoming assessments.
Encouraging students to develop a habit of continual cyclic revision of prior learning, in which students are always revising prior content along with their current learning. They may wish to use flash cards or mind maps, but should also attempt past paper questions via websites such as Physics and Maths Tutor.
Liaise with teachers and attend Parents' evening.
Secure copies of the textbooks, revision guides, and workbooks listed above.

What we study and when:					
Term	**Unit, Topic Or Summary Of Work Covered**	**Knowledge, Understanding & Skills Developed**	**ACHIEVE / Personal Development Focus**	**How The Work Is Assessed**	**Careers Links**
1	**Module 2 (Chapters 2 – 6)**	The major aims of this unit are for students to understand: • Atomic structure • Determination of the number of moles in solids, solutions, and gases • Reactions of acids and bases • Redox and oxidation numbers • Structure and properties of ionic and covalent substances • The shape of molecules The different types of Intermolecular forces	The ACHIEVE will be present throughout all terms of year 12, most notably in the following ways: **Ambition** will be modelled through the references to the previous science pioneers whose work much of our learning is based upon and demonstrated by students when they seek out additional practice and revision materials to work on. **Collaboration** is required through paired work in both theory and practical activities. **Happiness** will be celebrated through the progression of learning, the improvement of grades, and the enjoyment of practical work. **Integrity** will be required when completing home learning, self-marking	Written assessments to be completed after chapters 3, 4, and 6.	The topics taught in module 2 would be used within careers such as materials scientists, laboratory technicians, physicists, and quality assurance.
2	**Module 3 (Chapters 7 – 8)** **Module 4 (Chapters 11 – 13)**	The major aims of this unit are for students to understand: • Periodicity and patterns in the periodic table • Ionisation energies and their trends • The reactions of the elements in groups 2 and 7, and their compounds • Chemical testing for negative anions • The terminology and diagrammatic representations of organic chemistry • The reactions and properties of alkanes and alkenes • The nature of sigma and pi covalent bonding The electrophilic addition and free radical substitution mechanisms		Written assessments to be completed after chapters 8, 12, and 13.	The topics taught in this term would be used within careers such as forensic scientists, metallurgist,
3	**Module 3 (Chapter 9)** **Module 4 (Chapters 14 – 15)**	The major aims of this unit are for students to understand: • The concept of enthalpy and the application of Hess' law within Hess cycles • The experimental methods for determining enthalpy changes and their limitations • The use of bond enthalpies • The reactions and properties of alcohols and haloalkanes • The nucleophilic substitution mechanism The environmental impact of chlorofluorocarbons on the ozone layer		Written assessments to be completed after chapters 9 and 15.	The topics taught in this term would be used within careers such as energy scientist, environmental scientist, food technologist, pharmacist, and medicinal scientist.
4	**Module 3 (Chapter 10)** **Module 4**	The major aims of this unit are for students to understand: • The rate of chemical reactions and how this can be determined experimentally		Written assessments to be	The topics taught in this term would be used within

	(Chapters 16 – 17)	• The action of homogeneous and heterogeneous catalysts on rates of reaction • How the Boltzmann distribution can be used to explain rates of reaction • The application of le Chatelier's principle on dynamic equilibrium • The equilibrium constant, K_c • Reflux and distillation as practical procedures • The use of synthetic routes to create a target molecule The use of infrared spectroscopy and mass spectrometry as tools in chemical analysis	work, and attending academic support clinics. **Endurance** will be required as students stay on top of the academic demands of the course and persevere when they find content challenging, asking their teachers for additional guidance at support clinics. **Versatility** will be demonstrated as they simultaneously build their understanding of the three main threads of chemistry: organic, inorganic, and physical, as well as they develop numerous transferable skills such as analysis, problem solving, and lateral thinking.	completed after chapters 10 and 17.	careers such as pharmacologist, biochemist, metallurgist, industrial chemist, and chemical engineer.
5	**Module 5 (Chapters 18 – 19)**	The major aims of this unit are for students to understand: • The different possible orders of reaction and their effect on rates of reaction • The use of concentration-time graphs and rate-concentration graphs to show order of reaction • The rate-determining step of a multi-step reaction • The effect of temperature and pressure on the rate constant • Calculations based upon K_c and K_p How to use K_c and K_p to control the position of a dynamic equilibrium		Written assessment to be completed after chapter 19.	The topics taught in this term would be used within careers such as chemical engineer, pharmaceutical chemist, chemical process analyst, and petrochemistry scientist.
6	**PPE Revision Module 6 (Chapter 25)**	The major aims of this unit are for students to understand: • The evidence for moving away from the Kekule model of benzene • The delocalised pi electron system within benzene and its effect on reactivity • The electrophilic substitution mechanism • The properties and reactions of phenol The effect of directing groups on the position of substitution		PPE in July to cover content from chapters 2 – 17.	The topics taught in this term would be used within careers such as pharmaceutical chemist, toxicologist, and perfume or flavour chemist.

** Practical skills required for the practical endorsement in chemistry are assessed throughout the year through practical activities. There are currently 9 such tasks planned to take place within year 12.*