

EASTBURY SUBJECT CURRICULUM

Subject	A2 Chemistry
Overview	<p>Year 13 students are at a stage where they are building on AS knowledge through exploring new subject material and applying knowledge to unfamiliar situations.</p> <p>In year 12 they will have deepened knowledge on GCSE work around moles, bonding, energetics and environmental chemistry. This knowledge is still required and will be tested in the A2 course.</p> <p>The A2 Chemistry course is structured according to Units with new modules in each unit introduced termly. The two units which form the focus of A2 Chemistry are F324 (Organic Chemistry) and F325 (Physical Chemistry). Physical and Organic Chemistry will be taught concurrently. Practical tasks which comprise 10% of the A Level are completed each term.</p> <p>Schemes of work are set and underpinned by a strong appreciation of A Level Chemistry, evaluative and analytical skills, the ability to link with Maths, specialist subject vocabulary and literacy, home learning and discussion.</p>
Term by term	
Autumn	<p>F324 Module 1 Rings acids and amines.</p> <p>Students begin to explore organic chemistry concepts in more detail. This begins with a study of Aromatic compounds starting with the delocalised model of Benzene. The electrophilic substitution reactions of Benzene and Phenol will also be studied.</p> <p>Other organic chemistry concepts which will be studied at this time are the reactions of carbonyl compounds including; chemical tests to identify aldehydes and ketones, esterification and the chemistry of triglycerides. The course also looks at the reactions of amines namely; basicity of amines, preparation of amines and synthesis of Azo dyes. Students will have the opportunity to conduct experiments with some of the organic compounds under study.</p> <p>F235 Module 1 – Rates, equilibrium and pH</p> <p>Students will build on AS work which touched on rates of reaction (Collision theory) and equilibrium. This module involves a lot of calculations and students are expected to bring a calculator to all lessons.</p> <p>Regarding rates of reaction students will begin to use concentration-time graphs to determine the initial rate of a chemical reaction. This will be through practical work as well as using theoretical data. Students will then move on to using rate of reaction data to deduce orders of reaction, calculate values for the rate constant and suggest possible mechanisms for reactions involving a rate determining step.</p> <p>The module will also look at chemical equilibrium and calculation of the equilibrium constant. The principles underpinning chemical equilibrium will be used to explain the chemistry of acids and bases including; the acid dissociation constant, ionic product of water and calculation of pH(strong acids, weak acids, bases and buffer solutions).</p>
Spring	<p>F324 Module 2 Polymers and synthesis</p> <p>In this term students study the synthesis and uses of organic polymers namely amino acids, polyesters and polyamides. The importance of chirality and optical isomerism in organic compounds is also explored.</p> <p>In this module students are expected to link concepts and ideas from AS Chemistry as well as other A2 Chemistry modules to be able to design organic</p>

	<p>synthetic pathways for aliphatic and aromatic compounds. This is a major part of the course and helps unify Chemistry concepts which have been taught over the course of AS and A2 Chemistry.</p> <p>F324 Module 3 Analysis Halfway through the spring term students will start to look at the use of advanced analytical techniques in identifying organic compounds and determining molecular structure. The main analytical techniques explored at this time are Gas chromatography, Thin-layer Chromatography and mass spectrometry. Students will also have an opportunity to carry out experiments using some of these techniques.</p> <p>F325 Module 2 Energy In this module students will deepen AS knowledge on enthalpies of reaction. Students will study the following: lattice enthalpy, enthalpies of solution, hydration enthalpies and constructing Born-Haber cycles. Students will also study the feasibility of chemical reactions. This will be through learning on entropy, redox reactions and half cells. As with all chemistry modules Students will have an opportunity to explore the concepts through practical activities.</p>
<p>Summer</p>	<p>F324 Module 3 Analysis Students will Continue their study of analytical techniques with a focus on Nuclear Magnetic Resonance (NMR). Students will first learn the principles underpinning Carbon NMR spectroscopy and use these to solve problems requiring the identification of unknown compounds. They will then build on this knowledge and apply the same principles to proton NMR.</p> <p>F325 Module 3 Transition elements Students will study the chemistry of transition metals including; properties of transition metals, catalysis and precipitation reactions, formation of complex ions, ligand substitution and stability constants. Students will have an opportunity to conduct a number of practicals involving transition metals including redox titrations to determine concentration of a sample of transition metal.</p>
<p>Homework</p>	<p>Homework is given twice a week and students are expected to spend at least 1 hour on each piece. Homework's will vary in task incorporating research, pre-reading, practice question on Doodle (https://www.doddlelearn.co.uk/) and exam questions. Please check planners, www.showmyhomework.com and the student's Assessment booklets to check progress and effort.</p> <p>Although the Chemistry department will set regular homework it must be emphasised strongly that at this stage in their learning students should be engaged in extra independent learning activities which they structure and manage on their own. It is important for students to design and stick to a regular study timetable, making sure that they are putting in at least 5 hours extra study time per week to focus on Chemistry. This time should ideally be spent reviewing learning, attempting past exam questions, mind-mapping, making revision cards and doing further reading around the Chemistry topics they have studied as well as future topics.</p>

<p>Additional information</p>	<p>Essential equipment:</p> <ul style="list-style-type: none"> • Basic equipment for learning – blue/black pen, green pen, pencil, eraser, ruler. • The Chemistry department conducts practical experiments on a regular basis and students are expected to purchase a Lab coat which is to be used when doing practical experiments. • Chemistry involves a lot of calculations and students are expected to bring a calculator with them to all lessons. <p>At least three Chemistry practical tasks which form 10% of the Chemistry A-Level grade will be completed by students at various times during the year. The timing of the practical tasks will be determined by publication of practical tasks by OCR and availability of resources.</p> <p>The Chemistry department will from time to time run intervention sessions for students depending on their need. It is expected that students attend and engage with whatever intervention will be put in place for them.</p>
<p>Useful resources</p>	<p>Here are some excellent websites for research and information. You can use these to structure independent learning activities.</p> <p>http://ocr.org.uk/qualifications/as-a-level-gce-chemistry-a-h034-h434/ OCR Chemistry A information webpage (including specification)</p> <p>https://www.doddlelearn.co.uk/ Doodlelearn – revision app</p> <p>http://chemnotes.org.uk/ocr.html Chemnotes - revision notes for OCR Chemistry A</p> <p>http://www.chemguide.co.uk/ Chemguide</p> <p>http://www.knockhardy.org.uk/ppoints.htm Knockhardy - chemistry revision powerpoints</p>