AQA A Level Chemistry

Vision statement - Our vision is to develop confident, analytical and independent chemists who understand how chemical principles explain the structure, behaviour and interactions of substances and their importance in the wider world. Students will develop the knowledge, mathematical reasoning and practical skills required to solve problems and progress into further study and careers across chemistry and related fields.

Intent - Our AQA A Level Chemistry curriculum is designed to develop confident, analytical and independent chemists who understand how the structure and behaviour of substances can be explained using fundamental chemical principles. Students explore chemistry from the behaviour of individual particles and chemical bonds through to complex reactions and industrial processes, developing an appreciation of the central role chemistry plays in medicine, materials, energy, industry and the environment.

The curriculum is carefully sequenced to establish a secure foundation in atomic structure, amount of substance, bonding, energetics and chemical reactions before progressing to increasingly complex inorganic, organic and physical chemistry. Students develop their understanding of periodicity, group chemistry, equilibria, kinetics, thermodynamics, redox chemistry and electrochemistry alongside the systematic study of organic compounds, including alkanes, halogenoalkanes, alcohols, alkenes, carbonyl compounds, carboxylic acids, amines, amino acids, aromatic chemistry, polymers and organic synthesis.

Students are taught to recognise relationships between structure, bonding, reactivity and properties and to apply these principles to unfamiliar chemical situations. Mathematical and quantitative skills are embedded throughout the course, including calculations involving moles, concentrations, gas volumes, empirical and molecular formulae, enthalpy changes, equilibrium constants, rates and electrochemical cells. Students develop the ability to interpret data, identify patterns, make predictions and justify conclusions using appropriate chemical reasoning.

Practical chemistry is an integral part of the curriculum. Students develop confidence in selecting and using appropriate apparatus, carrying out chemical reactions safely, making accurate measurements and recording observations using accepted scientific conventions. Required practical activities develop skills including titration, calorimetry, rates of reaction, equilibrium, qualitative analysis, electrochemical investigations and organic preparation. Students learn to evaluate methods, identify sources of uncertainty and suggest realistic improvements to experimental procedures.

The curriculum promotes precision, logical thinking and problem-solving through retrieval practice, structured calculations, practical application and regular exposure to unfamiliar examination contexts. Students learn to communicate chemical ideas using accurate terminology, equations, mechanisms, structures and representations. By the end of the course, students should be able to use their knowledge of chemical principles to explain, predict and evaluate chemical behaviour, providing a strong foundation for further study and careers in chemistry, medicine, engineering, pharmacy, materials science and related fields.

Why study Chemistry at The Sixth Form at Ridgewood?

- A level Chemistry attempts to answer the big question 'what is the world made of' and it's the search for this answer that makes this subject so fascinating.
- From investigating how one substance can be changed drastically into another, to researching a new wonder drug to save millions of lives, the opportunities that chemistry provides are endless.
- One of our largest departments, the Science team boasts 10 teachers and three technicians. Within this team we have 3 highly qualified specialised Chemistry teachers, whose passion and expertise within their subject is contagious.
- We have three specialist post-16 laboratories in Faraday where the majority of teaching takes place, one for each of Biology, Chemistry and Physics.
- Since the A level reform we have highly resourced the practical aspect of the course, and we have equipment in school to complete a wealth of hand on practical's including making aspirin.
- Former alumni of the Chemistry department at Ridgewood have progressed to study Medicine, Dentistry, Chemistry, and Biomedical science, Pharmacology, Biochemistry, Engineering, Mathematics and Chemical Engineering, Law.

What topics will I study in this subject?

Topic	What this means
Organic Chemistry	You will explore the properties and reactions of different groups of chemicals, learning how to name, draw and show the reactions they undergo using IUPAC notation. You will study in depth common organic molecules and the interconversions between these, for example, you will study how anti-cancer drugs work and how aspirin is synthesised. Spectroscopic techniques used to identify these different molecules are covered in theoretical and practical contexts. This will culminate in several Required Practical activities where you will research, plan and execute investigations to demonstrate the concepts covered and your new knowledge.
Physical Chemistry	You will study a range of physical properties of chemicals such as atomic structure and the nature of different chemical bonds. This module of work also contains most of the calculations on the course including amount of substance calculations where you will learn how to calculate the mass, volume, concentration, pressure and amount in moles of different chemical reactions. The industrial applications of rates of reaction and chemical equilibrium are explored in detail as well as more complex thermodynamic considerations. Physical Chemistry contains 6 of the 12 required practical's but the skills and calculations you learn during this module will link to just about every other Chemistry topic!
Inorganic Chemistry	You will explore the properties and trends of group 2, group 7 and period 3 of the periodic table. As well as this you will investigate the transition metals in more detail. You will carry out experiments to explore the reactions of transition metal ions with simple compounds to form coloured complexes and explain the origins of this colour. You will also explain how and why transition metals are used as catalysts in chemical reactions.

What skills will I need in this subject?

Skill	What this skill involves in this subject
AO1 – recall/ remembering facts	Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures

A02 – Application of these facts	Apply knowledge and understanding of scientific ideas, processes, techniques and procedures. This may be when discussing a theory, in a practical context, when handling qualitative or quantitative data.
A03 – Scientific principal	Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues. This involves making judgements and reaching conclusions as well as developing refined practical skills.

What will my lessons involve?

- Chemistry lessons at Ridgewood will contain a variety of different tasks to suit all learners needs, however since this course contains a lot of content some of the lessons will be traditional teacher led lecture style lessons followed by application of the content.
- In all lessons there will be the opportunity to reflect on your knowledge and understanding either individually, with the help of a peer or in response to teacher feedback.
- The course contains a stand-alone practical qualification so there will be lots of opportunities to conduct hands on practical activities.
- Since this is a linear course with 3 exams at the end of it retrieval practice in the form of fact recall quizzes will be completed regularly to help your retention of knowledge.
- Teacher led worked examples and guidance on exam technique will be embedded into lessons to help you achieve the best grade possible.
- We know most pupils learn best by having the opportunity to discuss your learning either with your peers or with a teacher so there will be regular opportunities to ask questions and work in groups.

What will my independent study involve?

- A large portion of your success at A-level is the quality of your independent study work. Independent study in A-level chemistry will largely consist of making revision resources and answering questions.
- We expect you to spend 9 hours over 2 weeks completing high quality independent study for this course.
- By the end of the course our top achieving pupils will have completed past exam questions several times.
- A portion of your independent study will also consist of conducting research by searching online, in text books or revision guides. This could be either finding practical methods to conduct in the class or researching content prior to lessons.
- As a linear course retrieval practice is essential to achieve the best grades. This involves testing yourself on prior learning frequently and revisiting previous topics.
- It is important for you to regularly reflect on your strengths and weaknesses and make improvements to these. The most successful A level chemistry students are the ones that do this the most by completing additional notes and questions on areas of weakness. Practice, with feedback, makes perfect.

How will I be assessed?

Percentage exam assessment - 100%	Percentage coursework assessment - 0%

Assessment	Details of assessment
Paper 1	2 hour written exam based around Physical and inorganic Chemistry. This involves answering traditional long and short style questions. It is worth 105 marks and counts for 35% of your A-level.
Paper 2	2 hour written exam based around Physical and Organic Chemistry. This involves answering traditional long and short style questions. It is worth 105 marks and counts for 35% of your A-level.
Paper 3	2 hour written exam that assesses any content and has a large focus on practical skills. This is worth 90 marks and 30% of your A-Level. It will contain 40 marks of question focusing on practical techniques, 20 marks of questions testing knowledge from across the specification and 30 marks of multiple choice questions.

How do I know this is the right course for me?

- Studying A level Chemistry is not only interesting and challenging it also opens up many future career possibilities as it contains strong links with the other sciences, Mathematics and Engineering.
- The content follows on nicely from the GCSE Chemistry course but the demands and skill level are a lot higher, therefore you have to be willing to dedicate your time to developing these.
- There are a lot more calculations required in A level chemistry in comparison to GCSE so you must enjoy solving numerical problems, and algebraic rearrangements.

What our pupils say:

- “At GCSE you are taught about chemical reactions that these reactants make these products. During A level you learn why this happens. This is what I find the most fascinating about the course.”
- “I found the demands of the course hard to cope with at first and this is quite different from GCSE but the teachers are really supportive and helped me to structure my independent study time more effectively so that I could progress.”