Course Transition

Bridging the Gap
from School to College

Warlingham
Sixth Form College

Year 11 > Year 12 Transition
Summer Term 2022
A Level Chemistry

CHEMISTRY

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COURSE OVERVIEW

Course Title:

AQA A Level Chemistry (7405)

Why Should I Study A Level Chemistry?

Chemistry is all about studying the interactions between chemicals and using our understanding to improve on current materials science, leading to new materials with specific properties, whether that is plastics that biodegrade or pharmaceuticals treating new diseases and conditions.

Chemistry covers the principles that govern reactions and lead to innovative new materials being created to meet the demands of future technologies. A mainstay of medicine it can lead to careers in the medical sciences, whether that is research or practicing medicine.

Students will gain skills such as critical thinking and problem solving to elicit synthetic pathways to make specific materials, understanding the use of chemicals in our lives and how they interact in the 21st century, and how we can overcome some of the problems associated with our lifestyles. Organisation and analytical thinking skills linked to observation through practical experiments and predicting outcomes of chemical interactions.

Course Overview

The course covers a number of units that come together to give a thorough insight into chemical reactions and practical applications of Chemistry. This will develop students' holistic approach to problem solving as the course progresses, with multiple aspects of Chemistry coming together. The specific units covered are:

- Atomic Structure and Bonding
- Energy in Reactions
- Kinetics
- Chemical Equilibria
- Oxidation, Reduction and Redox reactions
- Inorganic Chemistry and the Periodic Table
- Organic Chemistry
- Organic Analysis
- Thermodynamics
- Rate Equations
- Equilibrium Constants, Kp for Homogeneous systems
- Electrode Potentials and Electrochemical cells
- Acids and Bases
- Reactions of Ions in Aqueous solutions
- Further Organic Chemistry and Analysis

COURSE OVERVIEW

Course Entry Requirements

Applicants should have a grade 6-6 or higher in GCSE Combined Science or a grade 6 or higher in GCSE Chemistry if they sat triple Science.

It is also strongly recommended that you have a grade 6 or higher in GCSE Mathematics.

Assessment

Assessments are taken at the end of Year 13 and consist of three papers, each being two hours long.

The exam paper content is outlined below:

Paper 1	Paper 2	Paper 3
What's assessed • 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	**What's assessed** • Relevant Physical chemistry topics (sections 3.1.2 to 3.1.6 and 3.1.9) • Organic chemistry (Section 3.3) • Relevant practical skills	**What's assessed** • Any content • Any practical skills
How it's assessed • written exam: 2 hours • 105 marks • 35% of A-level	**How it's assessed** • written exam: 2 hours • 105 marks • 35% of A-level	**How it's assessed** • written exam: 2 hours • 90 marks • 30% of A-level
Questions 105 marks of short and long answer questions	**Questions** 105 marks of short and long answer questions	**Questions** 40 marks of questions on practical techniques and data analysis 20 marks of questions testing across the specification 30 marks of multiple choice questions

There is a practical endorsement aspect to the course that aims to improve students' laboratory experience and give them the necessary experimental skills to carry out work in a laboratory.

This consists of 12 assessed practical tasks focusing on core aspects of carrying out experiments in a safe and consistent manner to acquire data for processing.

Where can Chemistry take me?

Chemistry is a highly regarded A Level course accepted as a suitable grade for most courses, however, it is specifically required for many Science based degrees at University. These include Chemistry, Dentistry, Medicine, Chemical Engineering, Pharmacy, Pharmacology, Food Sciences and Forensic Science.

OUR EXPECTATIONS

College Expectations for Academic Success

The College will work closely with all students and parents to create a purposeful, creative and stimulating environment in which students are encouraged to fully develop - both academically and personally.

We will expect you to take responsibility for your own behaviour and learning. The current College Committee along with the student body have discussed and agreed that students should commit to:

- Ensuring academic success through regular attendance and punctuality at all required registrations, lessons, supervised study lessons and Inspire Periods. Attendance which drops below 95% reduces Key Stage 5 performance by at least one grade, so it is taken very seriously.
- Completing all set tasks on time to the best of your ability, making full use of study periods and homework to enable you to meet all deadlines.
- Using study time effectively by bringing all required equipment and resources with you and making full and regular use of the College study rooms and LRC, respecting the need for silent studying conditions.
- Working closely with all your teachers to develop an effective working relationship based on mutual respect and discussing your work with them on a regular basis and meeting targets set.
- Developing your skills as an independent, self-evaluative learner and work closely with your tutor in monitoring and discussing your academic progress. As an independent learner, if you miss a lesson, it is your own responsibility to find the teacher and catch up with the work missed.
- Organising your work efficiently and effectively into folders for each subject, making full use of individual subject expectations and using Cornell Notes daily to ensure work in your folders is relevant and meaningful.
- Keeping mobile phones out-of-sight in all classrooms and during assemblies so that lessons are not disturbed and/or important information is missed.
- Attending all parents' evenings and arrange appointments with your teachers to discuss your progress and work.

Course-specific Expectations for Academic Success

- Attend ALL lessons, if this is not possible, notes and other work need to be completed before the following lesson.
- Dress appropriately for handling chemicals, (you may bring your own lab coat if desired)
- Attend the after school surgery sessions to go over the work covered.

OUR EXPECTATIONS

- CPAC Practical endorsement lessons form part of your final pass grade for practical skills, as such, the practical MUST be completed, Where this is not possible within the timetabled slot a suitable time must be agreed by both the student AND the supervising teacher.
- Students are all expected to have a scientific calculator with them in lessons.
- As with all Laboratories, health and safety instructions must be strictly followed.
- It is expected that students will develop their individual learning skills throughout the A level course. This means they are expected to have read through the relevant chapter of the text book before the lesson. This will assist with understanding key terminology introduced in the lesson.
- Homework tasks are to be completed by the deadline given. They are often used in the following lesson or cover knowledge required to move on to the next concept covered within the learning journey.
- Notes should be organised in a way that allows you to access information you have recorded in a timely manner. They should be good enough to revise from.

USING CORNELL NOTES

The Cornell Notes system is a note-taking system devised by Walter Pauk, an education professor at Cornell University. It is a proven method that establishes a more effective learning process.

It is designed to help the user think and reflect upon the notes they have made as well as making them more useful for revision purposes.

Please click here to watch a video that explains how to take Cornell Notes properly.

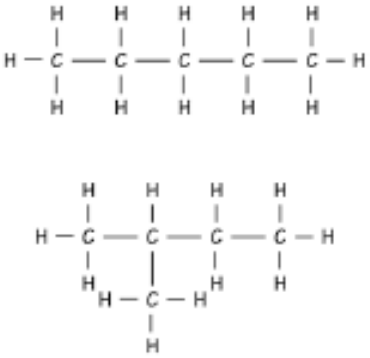
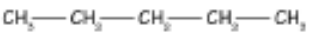
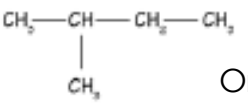
Here is an example of Cornell note taking in a Chemistry context.

Note the main body of the page has the notes taken in the lesson.

The left side bar has questions based specifically on the section of notes it is alongside.

The bottom outlines a brief summary of what the notes contain.

Comparing Molecular and Structural Formula

What does the molecular formula tell you?	Shows the type and number of atoms but not the arrangement
What does the structural formula tell you?	Shows how the atoms are arranged and bonded to each other. 
How do we write a structural formula as a condensed structural formula?	 Or even $CH_3(CH_2)_3CH_3$  Or $CH_3CH(CH_3)CH_2CH_3$

SUMMARY: We can write the formulae of organic molecules in a number of different ways: Molecular, Structural and condensed structural. Subscript numbers are used to show how many atoms are present of a particular type.

REVIEW / REVISE

You will need to review the work you have done in GCSE on the following topics to make sure you clearly understand the main concepts:

- Atomic Structure
- Ionic and Covalent bonding
- The Mole
- Calculations involving masses
- Empirical Formulae
- Hydrocarbons

WATCH

Essential Viewing:

Royal Institution

The Magic of Chemistry: https://www.youtube.com/watch?v=0g8lANs6zpQ

Chemical Curiosities: https://www.youtube.com/watch?v=ti_E2ZKZpC4

The Mystery of Matter: Unruly Elements: https://www.youtube.com/watch?v=wbuDmY5gpXQ

- How did Mendeleev come up with the periodic table? Take Cornell Notes identifying the key points that led to the development of the modern Periodic table.

Royal Society

The elements of Chemistry: https://www.youtube.com/watch?v=bou6Ank4m5Y

https://www.ted.com/talks/daniel_dulek_how_big_is_a_mole_not_the_animal_the_other_one

You might also want to watch these interesting videos on Chemistry:

TED Talks

https://www.ted.com/talks/jakob_magolan_a_crash_course_in_organic_chemistry/up-next

https://www.ted.com/talks/jon_bergmann_just_how_small_is_an_atom/up-next

https://www.ted.com/talks/
george_zaidan_and_charles_morton_the_uncertain_location_of_electrons

LISTEN TO

Cobalt (A brief history)

https://www.wnycstudios.org/podcasts/science-friday/segments/scifri-extra-science-diction-word-cobalt

The Episodic Table of Elements (Stories of the Elements)

https://www.feedspot.com/infiniterss.php?_src=feed_title&followfeedid=4969134&q=site:https%3A%2F%2Ffeeds.podcastmirror.com%2Fepisodictable

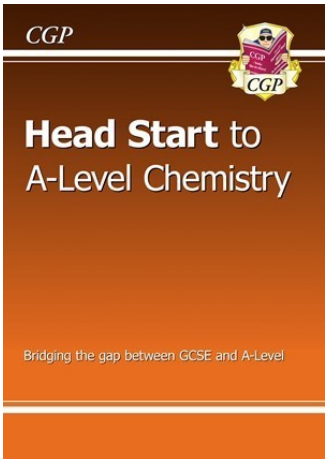
Chemistry in its Element (Podcasts on a bewildering array of different chemicals)

https://www.feedspot.com/infiniterss.php?_src=feed_title&followfeedid=4968400&q=site:http%3A%2F%2Fchemistryinitselement.libsyn.com%2Frss

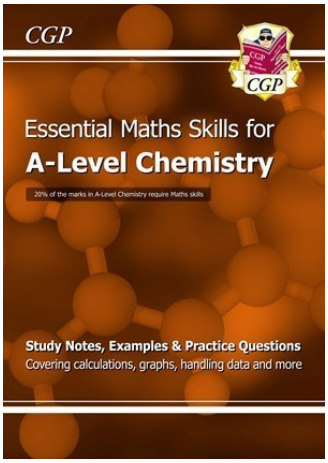
READ

Preparation for A Level Chemistry

Head Start to A-Level Chemistry



A-Level Chemistry: Essential Maths Skills



Further Reading for fun and pleasure

- The Secret Life of the Periodic Table by Dr. Ben Still
- The Elements by Theodore Gray
- Molecules by Theodore Gray
- Bad Science by Ben Goldacre (not specifically Chemistry but a good read about critical thinking!)
- The Periodic Table by Primo Levi

Apps for the Technologically Savvy

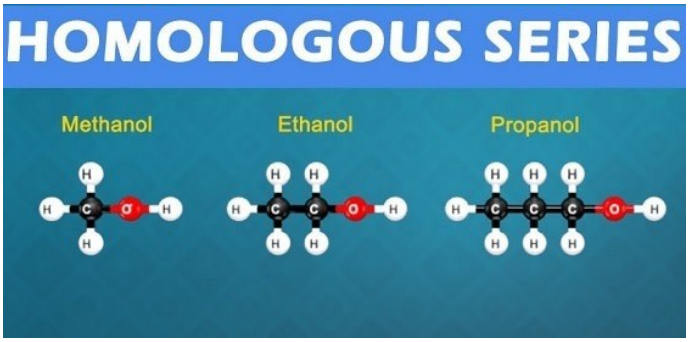
- General Chemistry Course Assistant
- RSC Periodic Table

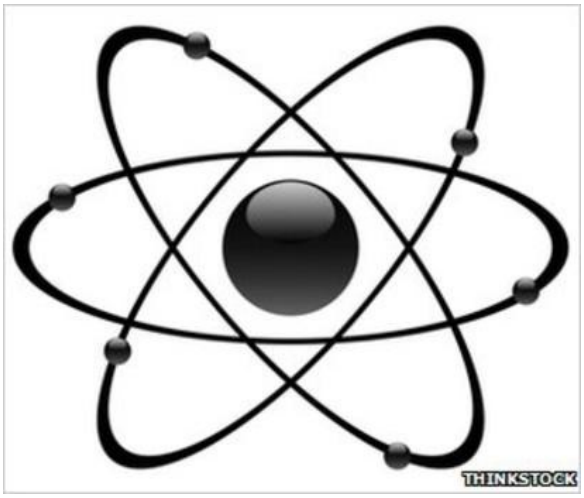
Websites

- ThoughtCo. Chemistry: https://www.thoughtco.com/chemistry-4133594
- Compound Interest: https://www.compoundchem.com/

RESEARCH

What is a homologous series? Design a mind map/ poster outlining the main homologous series in Organic Chemistry. Include each series' functional group and any information YOU feel is relevant.





Based on your knowledge of Atomic Structure at GCSE and research, explain how, with reference to subatomic particles, the atom is arranged. Include reference to electron orbitals. Use Harvard referencing for any resources you use.

Your explanations, tables and diagrams should not take up more than one side of A4.

COMPLETE

Complete the research tasks on Organic homologous series and atomic structure.

Make sure you use the Harvard reference system for any sources you use (or it is considered plagiarism!)

Guide to Harvard reference system:

https://www.mendeley.com/guides/harvard-citation-guide

APPENDICES / RESOURCES

AQA Chemistry website:

https://www.aqa.org.uk/subjects/science/as-and-a-level/chemistry-7404-7405

AQA A Level Chemistry Specification:

https://filestore.aqa.org.uk/resources/chemistry/specifications/AQA-7404-7405-SP-2015.PDF

AQA Required Practical Handbook:

https://filestore.aqa.org.uk/resources/chemistry/AQA-7404-7405-PHBK.PDF

Chemguide:

https://chemguide.co.uk/

Doc Browns Chemistry:

http://docbrown.info/index.htm