STEPNEY ALL SAINTS

— LEARN - PRAY - ACHIEVE —

A Level Chemistry Transition Pack

“Chemistry begins in the stars. The stars are the source of the chemical elements, which are the building blocks of matter and the core of our subject.”

PETER ATKINS, 1940 TO PRESENT

A guide for Year 11 pupils to help you get ready for A-level Chemistry at Stepney All Saints Sixth Form, including everything from topic guides to online learning resources.

Why study Chemistry?

Chemistry helps you to develop research, problem solving and analytical skills. It will help you to challenge ideas and work through tasks using logic and step-by-step reasoning. You will also undertake a series of practicals to develop your skills which help in analysis and interpretation of both quantitative and qualitative results. Chemistry often requires teamwork and communication skills too, which is great for project management.

Chemistry is one of the most popular “facilitating” A levels and underpins a wide range of science-based degree courses and careers. A level Chemistry will prepare you for a future in Chemistry, Pharmacy, Pharmacology, Neuroscience, Chemical Engineering, Biochemistry, Biomedical Sciences, Medicine, Dentistry and many more.

Course Structure: A Level Chemistry

At A Level, we follow the OCR A specification. The course content is divided into six teaching modules and each module is further divided into key topics.

OCR A: Unit Overview & Course Structure

A Level summary

Below is a breakdown of the 4 modules taught during Year 1 and the 2 modules taught in Year 2 (module one is integrated over the two years of the A Level course).

<table>
<tr><th>CONTENT OVERVIEW</th><th>ASSESSMENT METHOD & WEIGHTING</th></tr>
<tr><td rowspan="4">• Module 1 – Development of practical skills in chemistry (Year 1&2)
• Module 2 – Foundations in chemistry (Year 1)
• Module 3 – Periodic table and energy (Year 1)
• Module 4 – Core organic chemistry (Year 1)
• Module 5 – Physical chemistry and transition elements (Year 2)
• Module 6 – Organic chemistry and analysis (Year 2)

Component 01 assesses content from modules 1, 2, 3 and 5.

Component 02 assesses content from modules 1, 2, 4 and 6.

Component 03 assesses content from all modules (1 to 6).</td><td>Periodic table, elements and physical chemistry (01)
100 marks
2 hours 15 minutes
WRITTEN PAPER

A level = 37%</td></tr>
<tr><td>Synthesis and analytical techniques (02)
100 marks
2 hours 15 minutes
WRITTEN PAPER

A level = 37%</td></tr>
<tr><td>Unified chemistry (03)
70 marks
1 hour 30 minutes
WRITTEN PAPER

A level = 26%</td></tr>
<tr><td>Practical endorsement in chemistry
(04)
(non-exam assessment)</td></tr>
</table>

Course Breakdown

Below is a breakdown of the modules by key topics.

MODULE	KEY TOPICS
Module 1 – Development of practical skills in Chemistry	• Practical skills assessed in a written examination • Practical skills assessed in the practical endorsement
Module 2 – Foundations in chemistry	• Atoms, compounds, molecules and equations • Amount of substance • Acid–base and redox reactions • Electrons, bonding and structure
Module 3 – Periodic table and energy	• The periodic table and periodicity • Group 2 and the halogens • Qualitative analysis • Enthalpy changes • Reaction rates and equilibrium (qualitative)
Module 4 – Core organic chemistry	• Basic concepts • Hydrocarbons • Alcohols and haloalkanes • Organic synthesis • Analytical techniques (IR and MS)
Module 5 – Physical chemistry and transition elements -YEAR 2	• Reaction rates and equilibrium (quantitative) • pH and buffers • Enthalpy, entropy and free energy • Redox and electrode potentials • Transition elements
Module 6 – Organic chemistry and analysis -YEAR 2	• Aromatic compounds • Carbonyl compounds • Carboxylic acids and esters • Nitrogen compounds • Polymers • Organic synthesis • Chromatography and spectroscopy (NMR)

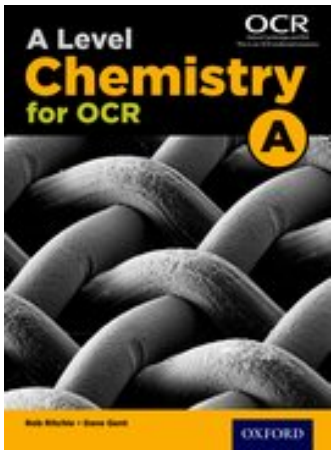
Exams

End of Year 12: H032/01 (Paper 1), H032/02 (Paper 2)

End of Year 13: H432/01 (Paper 1), H432/02 (Paper 2), H432/03 (Paper 3)

Key Textbooks:

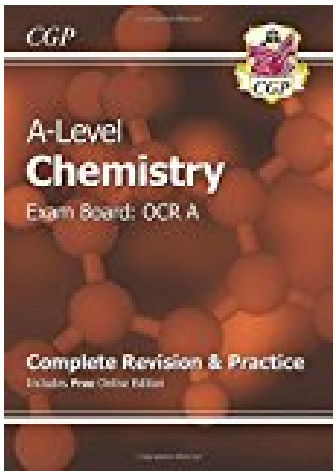
A Level Chemistry for OCR A (Paperback) Authors **Rob Ritchie** and **Dave Gent** Oxford University Press



Core textbook used in our school. Excellent preparation for the new A Level from OCR's Resource Partner. Covers both Year 1 and Year 2 content (online access will be provided at start of course).

ISBN: 978-0-19-835197-9

A Level Chemistry for OCR A Complete Revision & Practice (Paperback)



Complete Revision & Practice book has both years of OCR A A-Level Chemistry.

ISBN: 978-1-78294-302-0

Further resources (specification, specimen papers and past exam papers) from the Exam Board OCR are available in the following link below:

http://www.ocr.org.uk/qualifications/as-a-level-gce-chemistry-a-h032-h432-from-2015/

Use the following resources for extra support:

- **http://www.creative-chemistry.org.uk/**
- **http://www.chembook.co.uk/**
- **http://www.franklychemistry.co.uk/**
- **http://2012books.lardbucket.org/books/principles-of-general-chemistry-v1.0/index.html**
- **http://www.docbrown.info/page19/OCR_GCE_chem_A_Level_2015.html**
- https://www.chemguide.co.uk/
- https://www.rsc.org/

Pre-Knowledge Topics: Week 1

A level Chemistry will use your knowledge from GCSE and build on this to help you understand new and more demanding ideas. Complete the following tasks to make sure your knowledge is up to date and you are ready to start studying:

Research activities

To get the best grades in A Level Chemistry you will have to develop your independent research skills and master making your own notes on challenging topics. Remember, you are a prospective A level Chemist, you should aim to push **your** knowledge.

Use the Cornell notes system: http://coe.jmu.edu/learningtoolbox/cornellnotes.html to help you with the tasks below. Minimum one page of notes **for each task.**

These tasks cover work for **three weeks.** *Make a plan to spread these tasks out over this period.*

Task: Model of the atom

Research how the model of the atom changed over time. Identify the various models of the atom, the scientists behind these models and the evidence that developed overtime in to the changes that led to the present day accepted model.

Useful Web links:
https://www.ck12.org/book/ck-12-physical-science-for-middle-school/section/5.2/
https://www.sisd.net/cms/lib/TX01001452/Centricity/Domain/1297/The_history_of_the_atom_Notes-_condensed.pdf

Useful YouTube link:
https://www.youtube.com/watch?v=GOJFznzSZhM

Extension: Do the same for the **Development of the Periodic Table over time**.

Useful Web links:
https://www.rsc.org/periodic-table/history/about

Useful YouTube link:
https://www.bbc.co.uk/programmes/b00q2mk5

Pre-Knowledge Topics: Week 2

Research activities

Task: The chemistry of fireworks

What are the component parts of fireworks? What chemical compounds cause fireworks to explode? What chemical compounds are responsible for the colour of fireworks? Link ideas back to Topics covered in GCSE Physics (**SP6/CP6 Electrons and Orbits**) and Chemistry (**SC25 Flame Tests and Photometry**).

Useful Web links:
https://edu.rsc.org/resources/chemistry-of-fireworks/1145.article
https://edu.rsc.org/resources/firework-resources/1218.article
https://edu.rsc.org/resources/types-of-fireworks/1211.article
https://www.acs.org/content/acs/en/education/students/highschool/chemistryclubs/activities/fireworks.html

Useful YouTube link:
https://www.youtube.com/watch?v=nPHegSulI_M

Task: Aspirin

What was the history of the discovery of aspirin, how do we manufacture aspirin in a modern chemical process?

Useful Web links:
https://edu.rsc.org/download?ac=14527
https://www.pharmaceutical-journal.com/news-and-analysis/infographics/a-history-of-aspirin/20066661.article?firstPass=false

Useful YouTube link:
https://www.youtube.com/watch?v=amTAuK25P6c

Pre-Knowledge Topics: Week 3

Research activities

Task 4: The hole in the ozone layer

Why did we get a hole in the ozone layer?
What chemicals were responsible for it?
Why were we producing so many of these chemicals?
What is the chemistry behind the destruction of the ozone layer?

Useful Web links:

https://edu.rsc.org/resources/on-this-day-oct-11--nobel-prize-for-ozone/11011.article
https://www.chemistryworld.com/news/antarctic-ozone-layer-is-on-the-mend/1010091.article
https://www.britannica.com/science/ozone-layer
https://www.chemguide.co.uk/organicprops/haloalkanes/uses.html
https://docbrown.info/page07/ASA2group7f.htm
https://www.scienceskool.co.uk/free-radical-substitution-and-cfcs.html

Useful YouTube link:

https://www.youtube.com/watch?v=x_DS7Otdh-Q
https://www.youtube.com/watch?v=k61xuVa0Hb0
https://www.youtube.com/watch?v=-TOmbgTm1pg