

SUMMER HOMEWORK

Transition Pack for A Level Chemistry

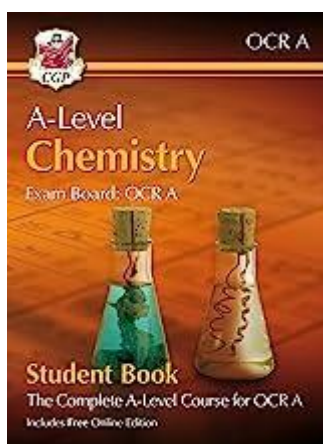
A guide to help you get ready for A-level Chemistry



This pack contains activities and resources to prepare you to start an A level in Chemistry in September. It is aimed to be used over the Summer Holidays to ensure you are ready to start your course in September.

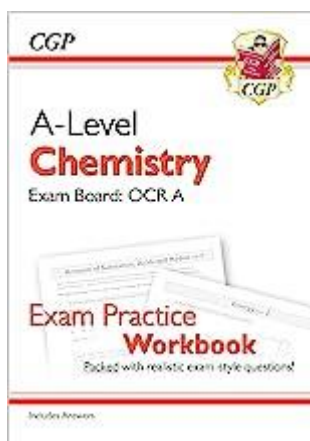
WHAT YOU WILL NEED TO PURCHASE before September!

A-Level Chemistry for OCR A: Year 1 & 2 Student Book with Online Edition: course companion for the 2023 and 2024 exams (CGP OCR A A-Level Chemistry)



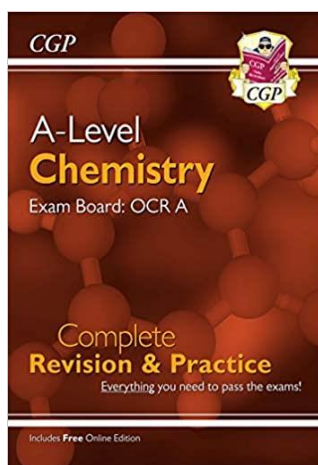
YOU MAY ALSO LIKE TO BUY (BUT NOT ESSENTIAL)

A-Level Chemistry: OCR A Year 1 & 2 Exam Practice Workbook - includes Answers: superb for the 2023 and 2024 exams (CGP OCR A A-Level Chemistry)

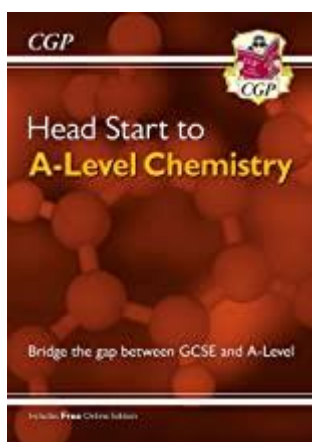


A-Level Chemistry: OCR A Year 1 & 2 Complete Revision & Practice with Online

Edition: ideal for the 2023 and 2024 exams (CGP OCR A A-Level Chemistry)



You *may* wish to purchase CGP Head Start to A Level Chemistry - it recaps all the tricky topics from GCSE that AS builds on. It will also be useful for reference throughout the course.



- A WHITE LABORATORY COAT (to allow you to participate in practical lessons – if you do not have one, you will not be allowed to participate!)
- 3 A4 ring binders each with a full set of dividers (**or** 1 lever arch folder and 1 ring binder)
- Scientific calculator.

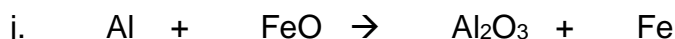
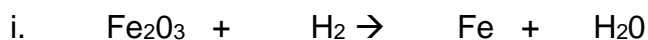
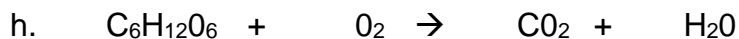
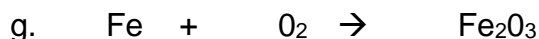
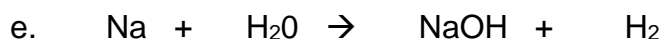
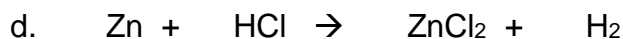
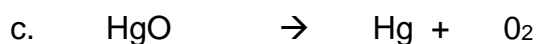
Summer Homework:

Complete **TASKS 1 & 2** and present in a NEAT format.

All tasks will be collected in during your FIRST Chemistry lesson, you will also sit a baseline test on the work in the first few weeks.

Task 1

Q 1 Balance the following equations



Q 2 Answer the following questions on moles.

- a) How many moles of phosphorus pentoxide (P_4O_{10}) are in 85.2g?

- b) How many moles of potassium in 73.56g of potassium chlorate (V) (KClO_3)?

- c) How many moles of water are in 249.6g of hydrated copper sulfate(VI) ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$)? For this one, you need to be aware the dot followed by $5\text{H}_2\text{O}$ means that the molecule comes with 5 water molecules so these have to be counted in as part of the molecules mass.

- d) What is the mass of 0.125 moles of tin sulfate (SnSO_4)?
- e) If I have 2.4g of magnesium, how many g of oxygen(O_2) will I need to react completely with the magnesium? $2\text{Mg} + \text{O}_2 \rightarrow \text{Mg}$

Q3 Answer the following questions

- a) What is the concentration (in mol dm^{-3}) of 9.53g of magnesium chloride (MgCl_2) dissolved in 100cm^3 of water?
- b) What is the concentration (in mol dm^{-3}) of 13.248g of lead nitrate ($\text{Pb}(\text{NO}_3)_2$) dissolved in 2dm^3 of water?
- c) If I add 100cm^3 of 1.00 mol dm^{-3} HCl to 1.9dm^3 of water, what is the concentration of the new solution?
- d) What mass of silver is present in 100cm^3 of 1mol dm^{-3} silver nitrate (AgNO_3)?
- e) The Dead Sea, between Jordan and Israel, contains $0.0526\text{ mol dm}^{-3}$ of Bromide ions (Br^-), what mass of bromine is in 1dm^3 of Dead Sea water?

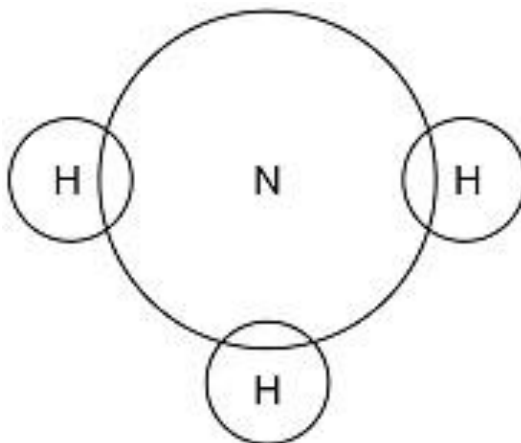
Q4 a) Explain why sodium oxide has a high melting point.

b) Explain why alloys are harder than pure metals.


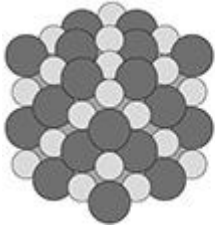
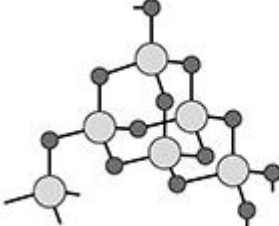
c) Explain how electricity is conducted in a metal. To gain full marks you must include a description of the structure and bonding of a metal.

d) Draw a dot and cross diagram showing the bonding in Magnesium chloride

e) Complete the dot and cross diagram for the ammonia molecule shown below. Show only the electrons in the outer shell of each atom.



f) The table below shows the structures of three compounds.

Compound	Structure
Carbon dioxide	 <p>Key</p> <p>● O ● C</p>
Magnesium oxide	 <p>Key</p> <p>● O²⁻ ● Mg²⁺</p>
Silicon dioxide	 <p>Key</p> <p>● O ● Si</p>

Compare the structure and bonding of the three compounds:

- carbon dioxide
- magnesium oxide
- silicon dioxide.

Task 2 - Independent research:

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

Research activities

Use your online searching abilities to see if you can find out as much about the topic as you can. Remember if you are a prospective A level chemist, you should aim to push **your** knowledge.

You can make a 1-page summary sheet/ poster for one you research:

Option 1: 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?

Option 2: Why is copper sulfate blue?

Copper compounds like many of the transition metal compounds have got vivid and distinctive colours – but why?

Option 3: Aspirin

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

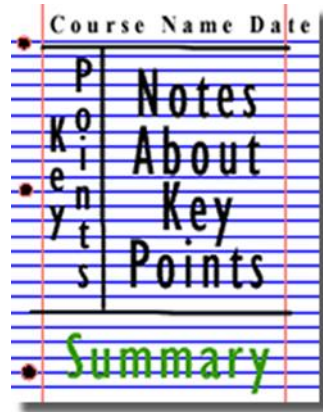
Option 4: The hole in the ozone layer

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 ozone destruction?

Option 5: ITO and the future of touch screen devices

ITO – indium tin oxide is the main component of touch screen in phones and tablets. The element indium is a rare element and we are rapidly running out of it. Chemists are desperately trying to find a more readily available replacement for it. What advances have chemists made in finding a replacement for it?

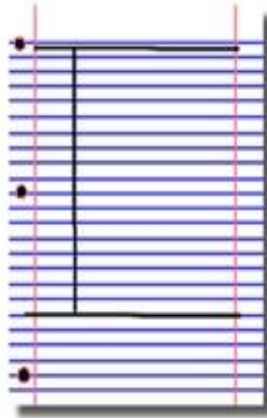
*This sheet on Cornell notes is a help sheet to show you how to make notes



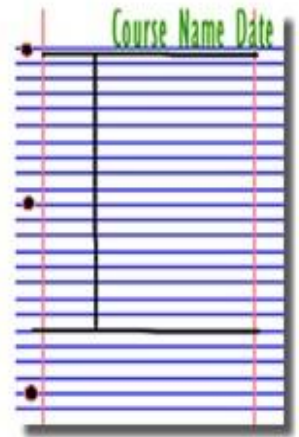
Cornell Notes

Research, reading and note making are essential skills for A level Biology, Chemistry and Physics study. For the independent research task, you could produce 'Cornell Notes' to summarise your reading.

1. Divide your page into three sections like this



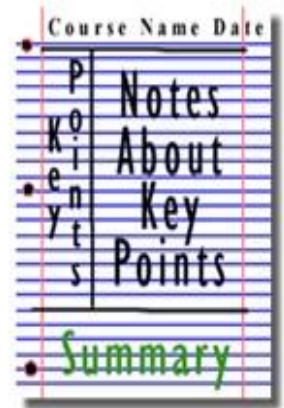
2. Write the name, date and topic at the top of the page



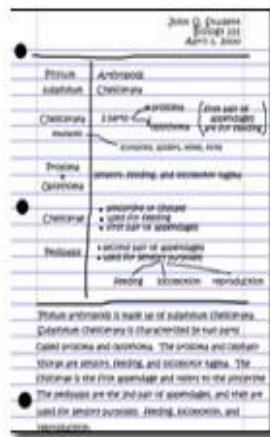
3. Use the large box to make notes. Leave a space between separate idea. Abbreviate where possible.



4. Review and identify the key points in the left hand box

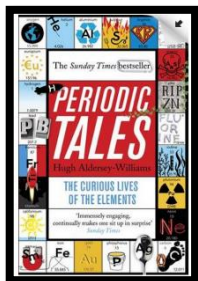


5. Write a summary of the main ideas in the bottom space



*The following book recommendations are to encourage you to use alternative resources and are optional:

Book Recommendations



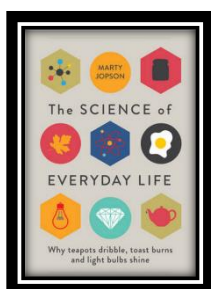
Periodic Tales: The Curious Lives of the Elements (Paperback) Hugh Aldersey-Williams

ISBN-10: 0141041455

<http://bit.ly/pixlchembook1>

This book covers the chemical elements, where they come from and how they are used. There are loads of fascinating insights into uses for chemicals you would have never even thought about.

The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson

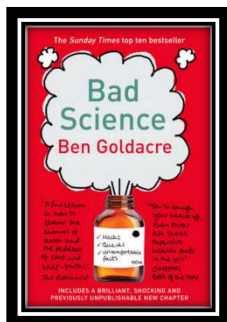


ISBN-10: 1782434186

<http://bit.ly/pixlchembook2>

The title says it all really, lots of interesting stuff about the things around you home!

Bad Science (Paperback) Ben Goldacre

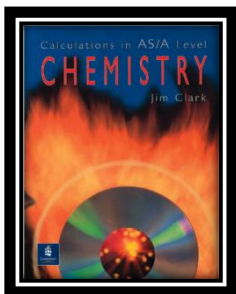


ISBN-10: 000728487X

<http://bit.ly/pixlchembook3>

Here Ben Goldacre takes apart anyone who published bad / misleading or dodgy science – this book will make you think about everything the advertising industry tries to sell you by making it sound 'scieny'.

Calculations in AS/A Level Chemistry (Paperback) Jim Clark



ISBN-10: 0582411270

<http://bit.ly/pixlchembook4>

If you struggle with the calculations side of chemistry, this is the book for you. Covers all the possible calculations you are ever likely to come across. Brought to you by the same guy who wrote the excellent chemguide.co.uk website.