A level Chemsitry

Year 11-12 Transition

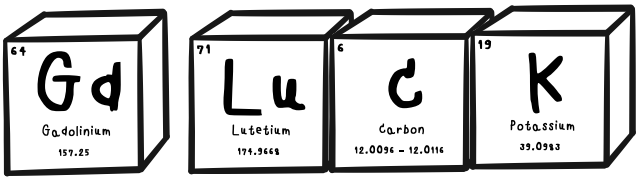
Interest and PreLearning Tasks

WHAT TO EXPECT:

A level Chemistrywill use your knowledge from GCSE and build on this to help you understand new and more demanding ideas.

Expectations

1. Complete the following tasks to ensure your knowledge is current and that you are fully prepared to begin studying effectively. These tasks are designed to refresh key concepts, identify any gaps in understanding, and help you start your learning with confidence and clarity.



A Level Chemistry

Some books to read this summer:

The Disappearing Spoon – Sam Kean
→ Stories about the periodic table (poison, explosions, strange discoveries). Very readable and memorable.

Napoleon's Buttons – Penny Le Couteur & Jay Burreson
→ How molecules shaped history (wars, medicine, trade). Great links to real-world chemistry.

Why Chemical Reactions Happen – Keeler & Wothers
→ Explains why chemistry works, not just what happens. Very helpful for A Level understanding.

Molecules – Theodore Gray
→ Beautifully illustrated book showing everyday substances and how they're built.

Stuff Matters – Mark Miodownik
→ Explores everyday materials like glass, chocolate, and steel in a really engaging way.

Liquid Rules – Mark Miodownik
→ Fun look at liquids (coffee, blood, oil) and their chemistry.

Periodic Tales – Hugh Aldersey-Williams
→ A creative journey through the periodic table with lots of quirky insights.

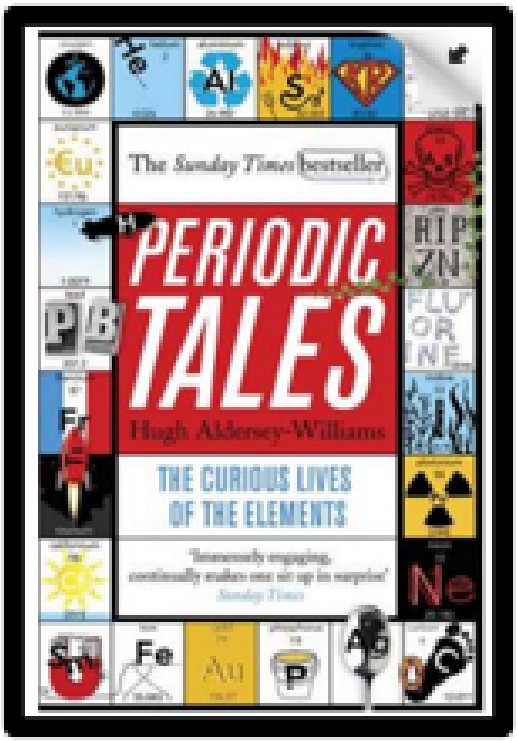
The Elements – Theodore Gray
→ Stunning visuals with fascinating facts about every element.

Task:

Read a book! A whole one. From cover to cover.

Write about it. A summary of the content, what was good and what was not so good.

Would you recommend it to someone? Why? If not, why not?



A Level Chemistry

Listen to a podcast or watch a TV programme. TED talk?

Get out of you comfort zone and do something different. Watch or listen to something that you haven't before.

BBC Inside science -

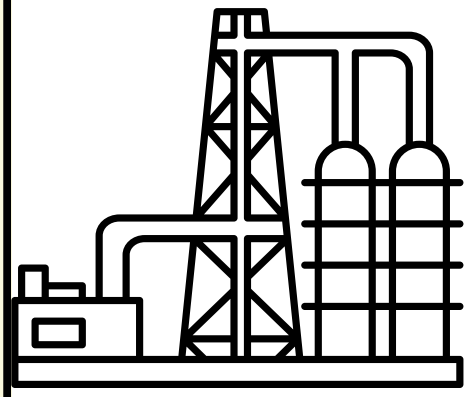
Zoe science and nutrition -

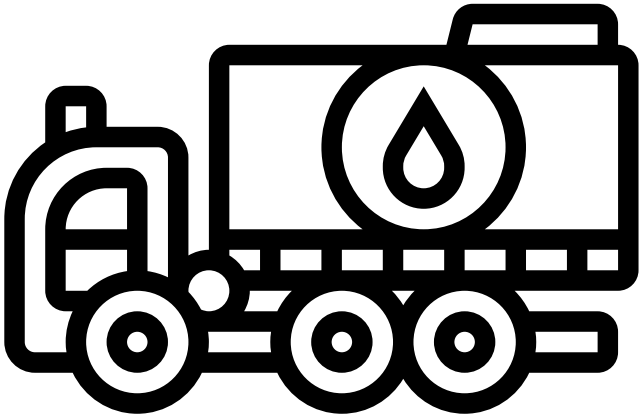
TED Talk on chemistry

Task:

Think about what you have seen or listened to. Was it interesting? Would you watch/listen to another episode?

If you could research and present your own science podcast what would you do? What do you think is a global problem that needs to be solved? Or what is important to you?





A Level Chemistry

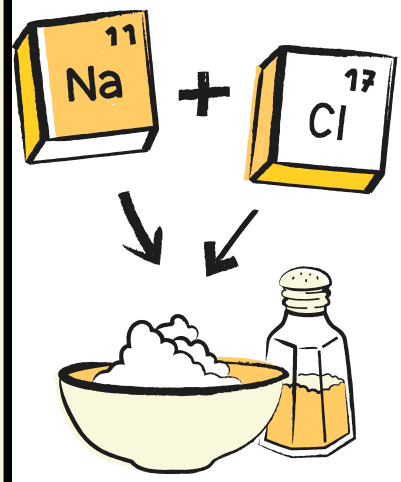
SCIENTIFIC AND INVESTIGATIVE SKILLS:

The OCR A Level Chemistry practicals are actually a really engaging and hands-on part of the course, bringing the theory to life in a fun and meaningful way. From watching colours suddenly change in titrations to measuring temperature jumps in energetic reactions, each practical feels like solving a mini scientific puzzle. You get to use proper lab equipment, carry out real techniques like distillation and chromatography, and even build simple batteries! There's something especially satisfying about getting accurate results or identifying unknown substances using chemical tests. Overall, these experiments make chemistry feel active, exciting, and rewarding—helping students see that it's not just about equations on a page, but about discovering how the world works in a lively and practical way.

Task:

Produce a glossary for the following key words:

- Atom
- Element
- Compound
- Mixture
- Mole
- Ion
- Isotope
- Electron configuration
- Orbital
- Bonding
- Covalent
- Ionic
- Metallic
- Electronegativity
- Intermolecular forces
- Enthalpy
- Entropy
- Activation energy
- Equilibrium
- Rate of reaction
- Catalyst
- Oxidation
- Reduction
- Redox
- Acid
- Base
- pH
- Alkane
- Alkene
- Functional group



A Level Chemistry

Research skills:

As you move from Year 11 into Year 12, developing strong research skills becomes essential for success in your studies, as you will be expected to work more independently and engage with more complex ideas. Good research allows you to find accurate, relevant information, evaluate its reliability, and use it effectively to support your arguments. Reliable sources include academic textbooks, peer-reviewed journals, and trusted educational websites such as university pages or organisations like the BBC Bitesize or NHS for science topics. You should be cautious when using sources like Wikipedia or random blogs; while they can be useful as a starting point, they are not always reliable enough to reference in your work. Learning how to compare sources, check authorship, and identify bias will help you build well-informed, credible assignments and prepare you for further education.

TASK

Use your online searching abilities to see if you can find out as much about a topic as you can. Choose from:

1: The chemistry of fireworks
What are the component parts of fireworks?

2: Why is copper sulfate blue?
Copper compounds like many of the transition metal compounds have got vivid and distinctive colours – but why?

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

Task 4: The hole in the ozone layer
What is the chemistry behind the ozone destruction and repair?

research sites:

- Journals - Scientific Research Publishing (scirp.org)
-
- Journals | Royal Society (royalsociety.org)

A Level Chemistry

Electronic structure, how electrons are arranged around the nucleus

A Periodic Table can give you the proton / atomic number of an element, this also tells you how many electrons are in the atom.
You will have used the rule of electrons shell filling, where:
The first shell holds up to 2 electrons, the second up to 8, the third up to 8

At A level you will learn that the electron structure is more complex than this, and can be used to explain a lot of the chemical properties of elements.
The 'shells' can be broken down into 'orbitals', which are given letters:'s' orbitals, 'p' orbitals and 'd' orbitals.

Task:

Now that you are familiar with s, p and d orbitals try these problems, write your answer in the format: $1s^2$, $2s^2$, $2p^6$ etc.

Q1.1 Write out the electron configuration of:
a) Ca b) Al c) S d) Cl e) Ar f) Fe g) V h) Ni i) Cu j) Zn k) As

Q1.2 Extension question, can you write out the electron arrangement of the following ions:
a) K^+ b) O^{2-} c) Zn^{2+} d) V^{5+} e) Co^{2+}

Websites:

You can read about orbitals here:

Chemguide

Doc Brown

$_3Li = 1s^2\ 2s^1$