CHEMISTRY

Get ready for A-level!

Transition Work Year group: Year 12 Subject:

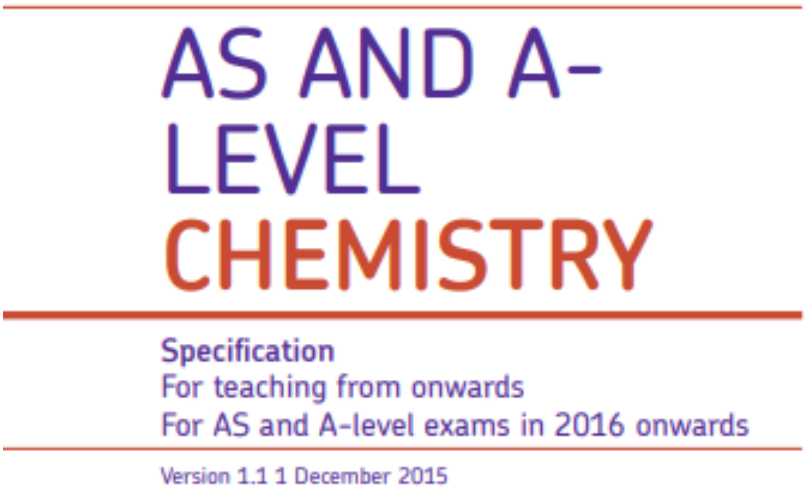
Chemistry

Qualification: A Level

Examining Board: AQA

Link for specification AQA Chemistry

AS and A-level Chemistry Specification Specifications for first teaching in 2015 (aqa.org.uk)



Transition to Sixth Form:

Sixth Form Study

You are likely to study 3 subjects at Bolder Sixth form. Each subject will have six lessons per week. You can expect to engage in a wider range of learning strategies in lessons as well as independently. These could be anything from:

- Making and organising presentations.
- Seminar style reading and group work.
- Use of debate, discussion-based learning, TED-talks, and documentaries.
- Wider reading outside of lesson hours.
- Extended 1-1 practice of practical or experimental work.
- Flip learning – learning in your own time and presenting what you have found to the class.

Independent Study

A Levels and Applied Qualifications will require more study to be completed by you independently rather than with a teacher. At Bolder we recommend that you spend the same time studying outside of lessons as you do in lessons. Therefore, if you have 6 hours of Biology per week, this means that 6 hours should be spent revisiting notes, revising content, completing practice questions outside of the classroom each week also.
This pack will support you with starting to practice independent study over the summer period which will help you understand what works best for you.

What do you need to complete?

Over the summer it is expected that you engage with this transition booklet to support with your movement into A level Chemistry.

You must make a total of 200 credits through the summer.

The points for each task are outlined below:

1. Engaging with a recommended book and writing a summary – 100 credits.
2. Completing a task from 'Getting ahead' – 50 credits.
3. Research activities – 25 credits.
4. Documentaries and Ted talks – 25 credits.
5. Completing a day trip with photo evidence and written summary – 100 credits.

You can decide what combination of tasks to complete, but this must add up to 200 credits. These must also be evidenced on your return in September.

Getting ahead!

In A level Chemistry you will need to build on your knowledge from GCSE. Here are some links that you can use to look over some topics:

Physical chemistry: Atomic structure, Isotopes and Mass Spectroscopy
(350) AQA 1.1 Atomic Structure REVISION - YouTube
Atomic properties menu (chemguide.co.uk)
Atom | Definition, Structure, History, Examples, Diagram, & Facts | Britannica

Task: Write a small report about the atomic structure of an element of your choice.
You can include the following:

1. Explains what atomic orbitals are and discusses their shapes and relative energies
2. How to work out and write the electronic structures for atoms
3. What ionisation energies are and how and why they vary around the Periodic Table
4. why atomic radii vary around the Periodic Table.

Organic chemistry: Different functional groups and reactions
(350) AQA 3.1 Introduction to Organic Chemistry REVISION - YouTube
Chemguide: core chemistry - organic chemistry menu
Mechanism Inspector (rsc.org)

Task: Produce a wall display to put in your classroom in September. You should use images, keywords and explanations to:

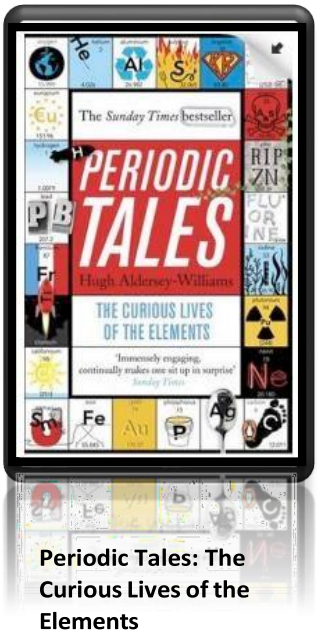
1. Name all the different organic homologous families, give example for each one.
2. Name the test and the result for the presence of each functional group in these homologous organic families.
3. Explain the impact of using fossil fuels on the environment and why biofuel is a possible replacement.
4. What is a reaction mechanism? Why is it important it to know it?

Inorganic chemistry: Group 7 The Halogens
Periodic Table Group 7 menu (chemguide.co.uk)
(350) AQA 2.3 Group 7, the halogens REVISION - YouTube
Chlorine - Element information, properties and uses | Periodic Table (rsc.org)

Task: Write a leaflet about the manufacturing of chlorine and its uses. Include images or diagrams when appropriate.
You can include the following
1. General chemical and physical properties of group 7, focusing on chlorine.
2. Describe and explain the trend in oxidising ability of the Group 7 elements
3. Describe and explain the tests for halide ions using silver nitrate solution
4. Describe the manufacture of chlorine by the electrolysis of sodium chloride solution and the uses of chlorine in the industry or in our daily life.

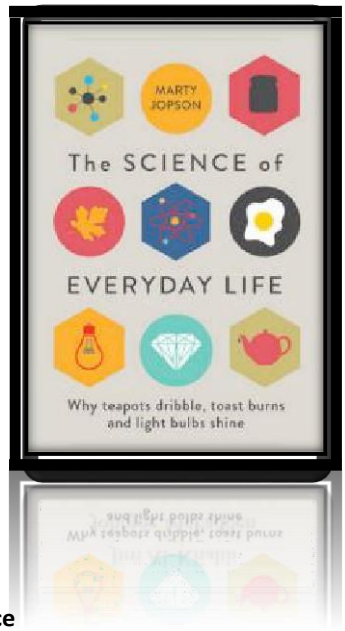
Book Recommendations

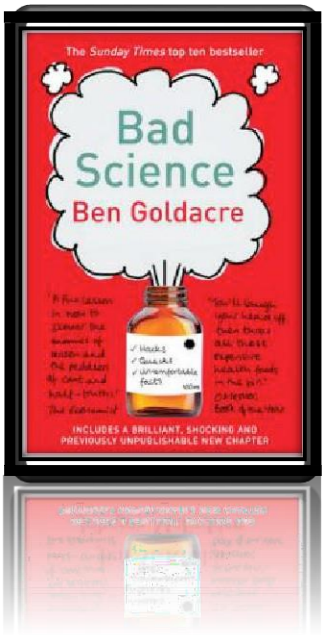
Kick back this summer with a good read. The books below are all popular science books and great for extending your understanding of chemistry



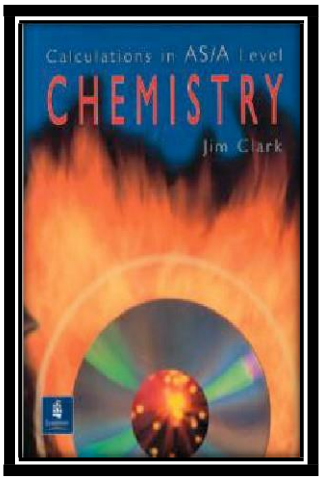
Periodic Tales: The Curious Lives of the Elements
This book covers the chemical elements, where they come from and how they are used. There are loads of fascinating insights into uses for chemicals you would have never even thought about.

The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine
The title says it all really, lots of interesting stuff about the things around your home!

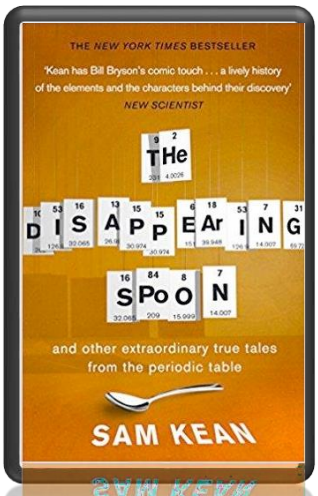




Bad Science
Here Ben Goldacre takes apart anyone who published bad / misleading or dodgy science – this book will make you think about everything the advertising industry tries to sell you by making it sound 'sciencey'.



Calculations in AS/A Level Chemistry
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.

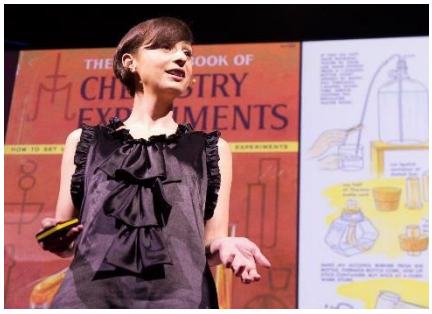


One of our crowning scientific achievements is also a treasure trove of passion, adventure, betrayal and obsession. **The Disappearing Spoon** follows the elements, their parts in human history, finance, mythology, conflict, the arts, medicine and the lives of the (frequently) mad scientists who discovered them

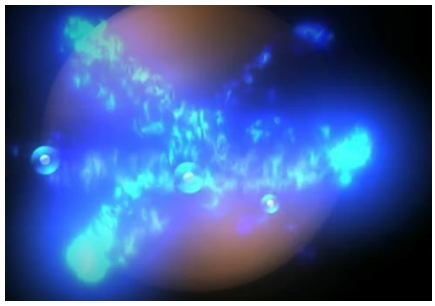
Movie Recommendations

If you have 30 minutes to spare, here are some great presentations (and free!) from world leading scientists and researchers on a variety of topics. They provide some interesting answers and ask some thought-provoking questions. Use the link or scan the QR code to view:

Play with Smart Materials
Available at :
https://www.ted.com/talks/catarina_mota_play_with_smart_materials Ink that conducts electricity; a window that turns from clear to opaque at the flip of aswitch; a jelly that makes music. All this stuff exists, it's time to play with it. A tour of surprising and cool new materials.



Just how small is an atom?
Available at :
https://www.ted.com/talks/just_how_small_is_an_atom
Just how small are atoms? Really, really,really small. This fast-paced animation from TED-Ed uses metaphors (imagine a blueberry the size of a football stadium!) to give a visceral sense of just how small atoms are.



Battling Bad Science
Available at :
https://www.ted.com/talks/ben_goldacre_battling_bad_science#t-44279
Every day there are news reports of new health advice, but how can you know if they're right? Doctor and epidemiologist Ben Goldacre shows us, at high speed, the ways evidence can be distorted, from the blindingly obvious nutrition claims to the very subtle tricks of the pharmaceutical industry.

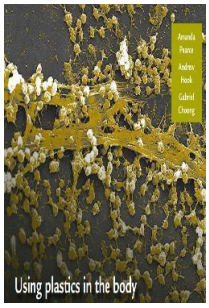
How Spectroscopy Could Reveal Alien Life
Available at :
https://www.ted.com/talks/garik_israelian_what_s_inside_a_star
Garik Israelian is a spectroscopist, studying the spectrum emitted by a star to figure out what it's made of and how it might behave. It's a rare and accessible look at this discipline, which may be coming close to finding a planet friendly to life.

Research Activity

Aimed at students aged 14-19, Catalyst magazine is packed with interesting articles on cutting-edge science, interviews and new research written by leading academic. It also includes a booklet of teacher notes, full of idea and lesson plans to bring the articles to life in the classroom. For each of the following topics you are going to use the resources to produce one page of Cornell style notes. Us the link of scan the QR code to take you to the resources.

Topic 1: Using Plastics in the Body
Available at:
https://www.stem.org.uk/resources/elibrary/resource/382317/using-plastics-body

This Catalyst article looks at how scientists are learning to use polymers for many medical applications, including implants, bone repairs and reduction in infections.



Topic 2: Catching a Cheat
Available at:
https://www.stem.org.uk/resources/elibrary/resource/348453/catching-cheat

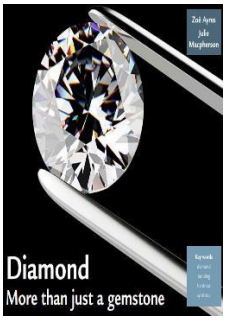
This Catalyst article looks at analytical chemists who are involved in many kinds of testing, including drug testing to catch cheats in sport.

Topic 3: The Bizarre World of High Pressure Chemistry
Available at:
https://www.stem.org.uk/resources/elibrary/resource/266699/bizarre-world-high-pressure-chemistry

This Catalyst article investigates high pressure chemistry and discovers that, when put under extreme pressure, the properties of a material may change dramatically.

Topic 4: Diamond: More than just a gemstone
Available at:
Diamond more than just a gemstone.pdf (stem.org.uk)

This Catalyst article looks at diamond and graphite which are allotropes of carbon. Their properties, which depend on the bonding between the carbon atoms, are also examined.



Topic 5: Microplastics and the Oceans
Available at:

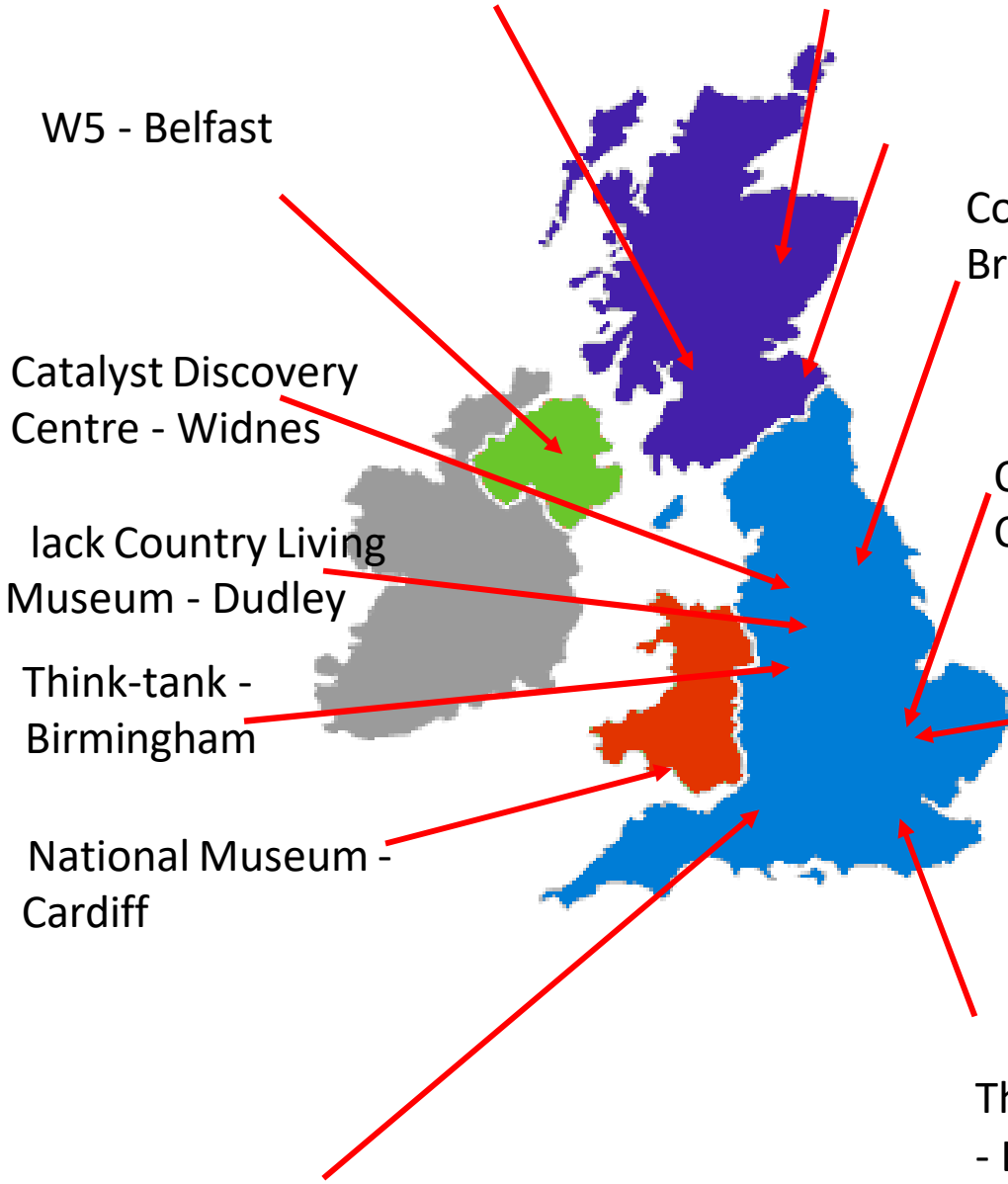
https://www.stem.org.uk/resources/elibrary/resource/266716/microplastics-and-oceans
This Catalyst article looks at microplastics.

Ideas for Day Trips

If you are on holiday in the UK, or on a staycation at home, why not plan a day trip to one of these :

Glasgow Science Centre - Glasgow

Dundee Science Centre - Dundee



W5 - Belfast

Colour Experience - Bradford

Catalyst Discovery Centre - Widnes

Cambridge Science Centre - Cambridge

lack Country Living Museum - Dudley

Think-tank - Birmingham

The Whipple Museum - Cambridge

National Museum - Cardiff

The Faraday Museum - London

Bristol Science Centre - Bristol

Science on Social Media

Science communication is essential in the modern world and all the big scientific companies, researchers and institutions have their own social media accounts. Here are some of our top tips to keep up to date with developing news or interesting stories:

Follow on Twitter:

Satlers' Institute - Our activities include Festivals of Chemistry; Chemistry Camps; Curricula; Awards for Technicians, Graduates, A Level Students; and Seminars
@salters_inst

Daily A Level Chemistry Facts – Daily Chemistry Facts (Based on the A-Level AQA spec but most facts work with all)
@chemAlevels

Chemistry News –The latest chemistry news from only the best sources
@chemistrynews

Compound Interest– Graphics exploring everyday #chemistry. Winner of @absw 2018 science blog award
@compoundchem

Chemistry World – Chemistry magazine bringing you the latest chemistry news and research every day. Published by the Royal Society of Chemistry.
@ChemistryWorld

Royal Society of Chemistry - Promote, support and celebrate chemistry. Follow for updates on latest activities
@RoySocChem

Periodic Videos– Chemistry video series by @BradyHaran & profs at the Uni of Nottingham - also see @sixtysymbols & @numberphile
@periodicvideos

Find on Facebook:

Science Now - Science Now is a dedicated community that helps spread science news in all fields, from physics to biology, medicine to nanotechnology, space and beyond!

National Science Foundation – As an independent federal agency, NSF fund a significant proportion of basic research. For official source information about NSF, visit www.nsf.gov

Science News Magazine - Science covers important and emerging research in all fields of science

BBC Science News - The latest BBC Science and Environment News: breaking news, analysis and debate on science and nature around the world

Scientific American - Scientific American is the authority on science and technology for a general audience, with coverage that explains how research changes our understanding of the world and shapes our lives.