

Getting Ready For *Chemistry*

Your Name

We are delighted you have chosen to study Chemistry at Worthing College.

Instructions: This pack will help you make the best possible start to studying this subject.

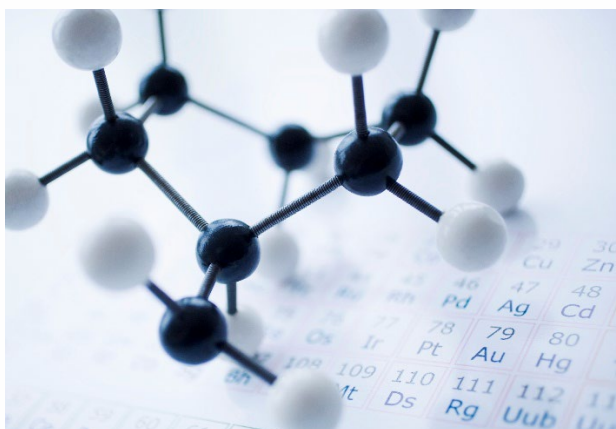
The tasks in this pack:

- should take you **about 4 hours to complete**.
- should be handed into your teacher when teaching starts
- are also available on the internet – follow the links in the document.

If you need help: The tasks are designed to get a bit more difficult as you work through them as they are preparing you for studying at a higher level and to become an effective independent learner. You should try to get as far as you can working on your own but if you do need help, please email us at gettingreadyfor@worthing.ac.uk, telling us which Getting Ready For pack you are working on and what help you need. Help is available throughout the summer holidays.

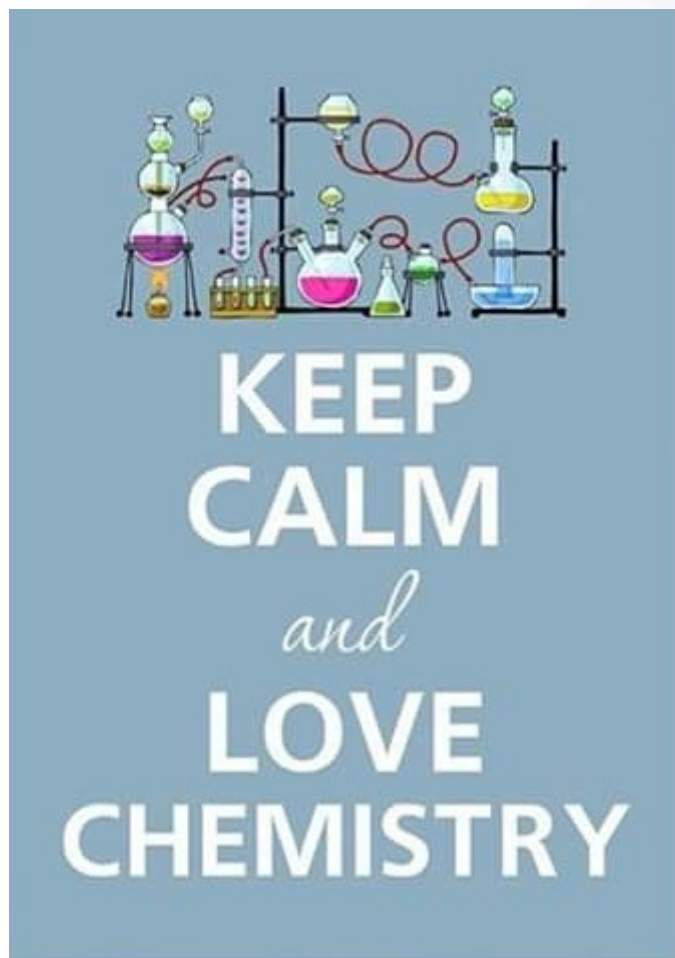
Skills Focus for this Getting Ready for Pack

Building on your GCSE knowledge through independent research, mathematical skills, interpreting & handling data



Task	Information
1 Research and building on GCSE knowledge	Research activities Choose one of the five topics to research, where you can look at the wider information on some of the topics, we will cover in Year 1. Follow the instructions and write a page of notes, including pictures or diagrams where appropriate. Include a list of any sources used. This will be asked to be handed in your first lesson in September.
2 Wider scientific knowledge	Research Choose from the topics listed and find out more about at least one that interests you. Write a page of Cornell notes ready to hand in during the first lesson.
3 Fun!	Science in social media Have a look through the books and link section of the pack to see if anything interests you. Enjoy!
4 Building on GCSE knowledge	Chemsheets Complete the Chemsheets and bring your answers to your first lesson. This work will be marked, and feedback given.

So you are considering A Level Chemistry?



This pack contains a programme of activities and resources to prepare you to start an A level in Chemistry in September. It is aimed to be used after you complete your GCSE, throughout the remainder of the summer term and over the Summer Holidays to ensure you are ready to start your course in September.

Equipment

- ✓ **Pens, pencils, ruler, highlighter etc**

- ✓ **Scientific Calculator**

The one you used at GCSE is fine for A-Level Chemistry

- ✓ **A4 Folder**

Most students get a small one to bring into college every day and a lever arch one to store notes from past topics at home.

- ✓ **A4 Paper**

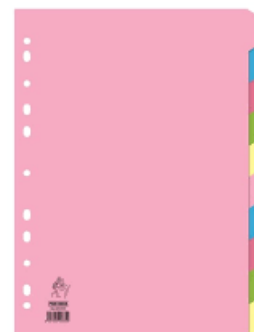
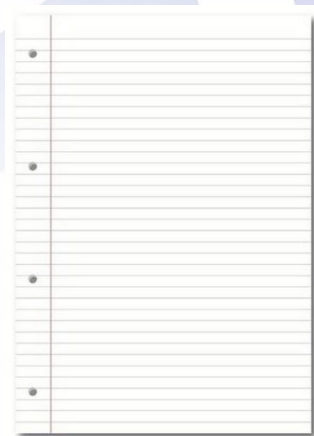
Loose paper is better than a notebook as you will need to file pages in different places and add to your lesson notes during independent study. Bringing a notebook to lesson also means you are unlikely to bring a folder, and you'll need a folder to store handouts, worksheets and topic tests.

- ✓ **Dividers**

Useful to separate your notes into topics.

- ✓ **Phone/iPad**

We will use online resources in lessons, and you will submit work online so access to the internet in lesson is useful. Please don't worry if you can't, we have laptops that you can use in class if needed.



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 for each one you research using Cornell notes:

<https://docs.google.com/document/d/1X5vuSm8piiUwnsoYlyTt28inijWNTBvj7-jGWTUSmSQ/edit?tab=t.0>

Task 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?

Task 2: Why is copper sulfate blue?

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

Task 3: Aspirin

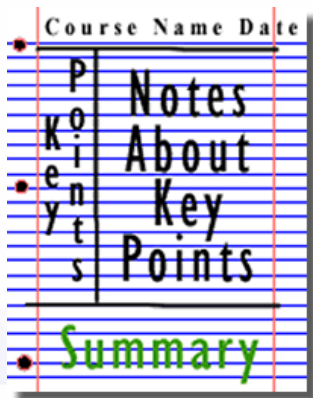
What was the history of the discovery of aspirin, how do we manufacture aspirin in a modern chemical process?

Task 4: The hole on 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?

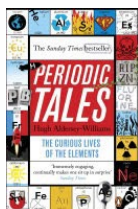
Task 5: ITO and the future of touch screen devices

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?



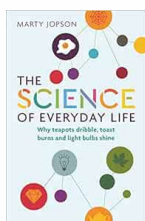
Book Recommendations

Periodic Tales: The Curious Lives of the Elements (Paperback) Hugh Aldersey-Williams
(ISBN-10: 0141041455)



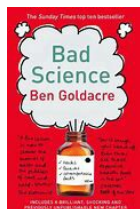
This book covers the chemical elements, where they come from and how they are used. There are loads of fascinating insights into uses for chemicals you would never even think about.

The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson (ISBN-10: 1782434186)



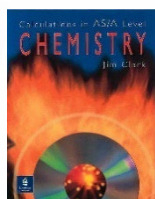
The title says it all really, lots of interesting stuff about the things around your home!

Bad Science (Paperback) Ben Goldacre (ISBN-10: 000728487X)



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 'sciency'.

Calculations in AS/A Level Chemistry (Paperback) Jim Clark (ISBN-10: 0582411270)



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.

Salters' Advanced Chemistry: Chemical Storylines (Paperback) George Burton
(ISBN-10: 0435631195)



Do not feel you need to buy the latest edition (unless you are doing Salters chemistry!) You can pick up an old edition for a few pounds on eBay, gives you a real insight into how chemistry is used to solve everyday problems from global pollution through feeding to world to making new medicines to treat disease.

Videos to watch online

Rough Science – The Open University – 34 episodes available

Real scientists are ‘stranded’ on an island and are given scientific problems to solve using only what they can find on the island. Great fun if you like to see how science is used in solving problems.

There are 6 episodes in total : <https://www.youtube.com/roughscience>

A thread of quicksilver – The Open University

A brilliant history of the most mysterious of elements – mercury. This program shows you how a single substance led to empires and war, as well as showing you some of the cooler properties of mercury.

<http://bit.ly/pixlchemvid2>

10 weird and wonderful chemical reactions

10 good demonstration reactions, can you work out the chemistry of any... of them?

<http://bit.ly/pixlchemvid3>

Chemistry in the Movies

Fantastic 4 2005 & 2015: Superhero movie

Michio Kaku explains the “real” science behind fantastic 4

<https://www.youtube.com/Michio Kaku>

Dante’s Peak 1997: Volcano disaster movie.

Use the link to look at the Science of acids and how this links to the movie.

https://www.youtube.com/watch?v=asAd-E5_HPo



SYNOPTIC GCSE 2 – HYDROCHLORIC ACID (HCl)



ACIDS

Hydrochloric acid is a strong acid.

- a) What is an acid?
-
-
-
- b) What is meant by *strong* in the context of an acid?
-
-
-

REACTIONS

Salts are made when hydrochloric acid reacts with metals and bases. Complete these word equations:

- c) magnesium + hydrochloric acid →
-
- d) sodium oxide + hydrochloric acid →
-
- e) zinc carbonate + hydrochloric acid →
-
- f) ammonia + hydrochloric acid →
-

MAKING A SALT

- g) Outline the steps to make pure, dry crystals of the salt copper chloride by reacting copper carbonate with hydrochloric acid. Copper carbonate is insoluble in water.
-
-
-
-
-
-
-
-
-
-

TITRATION

- h) In a titration, 20.55 cm³ of 0.100 mol dm⁻³ hydrochloric acid neutralises 25.00 cm³ of sodium hydroxide solution. Calculate the concentration of the sodium hydroxide solution.



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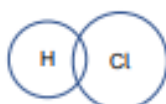
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BONDING

- i) Give the electron structure of the H⁺ and Cl⁻ ions formed when HCl reacts with water to form hydrochloric acid.
- H⁺ Cl⁻
- j) In its natural state, HCl is a simple molecular substance. A stick diagram of a hydrogen chloride molecule is shown. Complete the dot-cross diagram to show the outer shell electrons.



REACTION RATES

- k) Explain why the reaction between 2.0 mol dm⁻³ hydrochloric acid and magnesium is faster than the reaction between 1.0 mol dm⁻³ hydrochloric acid and magnesium.

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SYNOPTIC GCSE 6 – SODIUM CHLORIDE (NaCl)



STRUCTURE & BONDING

- a) What type of bonding is there in sodium chloride?
Ionic / covalent / metallic (circle the correct answer)
- b) Give the electron structure of the Na^+ and Cl^- ions.
 Na^+ Cl^-
- c) Explain why sodium chloride has a high melting point.

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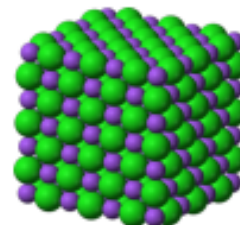
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EMPIRICAL FORMULA

This diagram represents the ions in the sodium chloride lattice.

The formula of sodium chloride is NaCl

- d) Use the diagram to explain what this formula means.



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ANALYSIS

Sodium chloride contains Na^+ and Cl^- ions. Describe a simple test for each of these ions and give the expected result.

- e) Na^+ ions
test
result
- f) Cl^- ions
test
result

ELECTROLYSIS

The products of the electrolysis of aqueous sodium chloride are chloride at the positive electrode and hydrogen at the negative electrode.

- g) Complete the half equations for these processes.



- h) Explain why hydrogen is formed at the negative electrode rather than sodium.

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SALT SOLUTION

- i) Give two differences between the boiling point of salt dissolved in water compared to pure water.

1.

2.

- j) Give two differences between the melting point of salt dissolved in water compared to pure water.

1.

2.

REACTING MASSES

- k) Calculate the mass of sodium chloride that can be formed from 11.5 g of sodium reacting with an excess of chlorine.



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GCSE REVISION 30

Atoms, ions, equations, Periodic Table, structure & bonding

- 1** a) In what order did Mendeleev mainly arrange the elements in his Periodic Table?
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b) What order we do now know he placed the elements in?
c) State two key things that he did that no one had done before that made his Table work?
1.....
.....
2.....
.....
d) Why was his Table accepted?
.....
.....
- 2** Sodium is a metal in Group 1 of the Periodic Table. Bromine is a non-metal in Group 7.
a) Name these groups. Group 1 = Group 7 =
b) Describe metallic bonding.
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c) Explain why sodium is soft.
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d) Give the formula of bromine.
e) Explain why bromine has a low boiling point.
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f) Sodium reacts with bromine to form sodium bromide. Explain why this reaction takes place in terms of electrons.
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g) Give the formula of the ions in sodium bromide. sodium ions = bromide ions =
h) Write a balanced equation for the reaction of sodium with bromine.
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.....
i) Explain why sodium bromide has a high melting point.
.....
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- 3** Potassium is a Group 1 metal. Copper is a transition metal. Complete the table to show two similarities and two differences in each of the physical and chemical properties of these metals.

		similarities	differences
physical properties	1		
	2		
chemical properties	1		
	2		

- 4** Complete the following table about some atoms and ions.

Particle	Atom or ion	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons	Electron structure
${}^6\text{Li}^+$							
		7	14				2,8
				16	16	18	

- 5** What method would you use to separate each of the following mixtures?

- ethanol from a solution of sugar in ethanol
- ethanol from a mixture of water and ethanol (they are miscible liquids)
- water from a mixture of hexane and water (they are immiscible liquids)
- iron filings from a mixture of iron filings with water

- 6** The diameter of the nucleus of a hydrogen atom is 10000 times smaller than the diameter of the atom. The atom has a diameter of 106 pm. Calculate the diameter of the nucleus in m in standard form.

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Area	Strength	To develop	Area	Strength	To develop	Area	Strength	To develop
Done with care and thoroughness			Can explain why metals are soft			Compare Gp 1 & transition metals		
Good SPG			Can explain why molecules have low bp			Distinguish chemical & physical		
Gives clear explanations			Can write formulae			Work with PNE numbers		
Knows what Mendeleev did			Can deduce ion charges			Can determine separation techniques		
Why Mendeleev's table accepted			Can balance equations			Can use standard form		
Name groups			Can explain why reactions occur			Can convert units		
Describe metallic bonding			Can explain high mp of ionic cpd					

Work Placement Week

All students are required to participate in a **compulsory** week-long work placement. It is recommended that the placement chosen is either relevant to your course, or relevant to what your future career aspirations are.

Work placement form submission deadline

All L2 and L3 students studying on triple or double courses will be given their work placement week dates by their course leaders when they start in September. The deadline to submit your placement forms are as follows:	Date of work placement week	Deadline for returning completed form
	Dec-25	24th October 2025
	January / February 2026	24th October 2025
	March / April 2026	19th December 2025
	May / June 2026	13th February 2026
All students studying 2 or more single subjects will have the option of either carrying out their work placement during: <ul style="list-style-type: none"> • February half term • Easter holidays • May half term • 22nd – 26th June 2026 The deadline to submit your placement forms are as follows:	Date of work placement week	Deadline for returning completed form
	February half term (16th - 20th February)	Friday 24th October 2025
	Easter holidays (27th March - 13th April)	Friday 19th December 2025
	May half term (26th - 29th May)	Friday 13th February 2026
	22nd – 26th June	Friday 1st May 2026