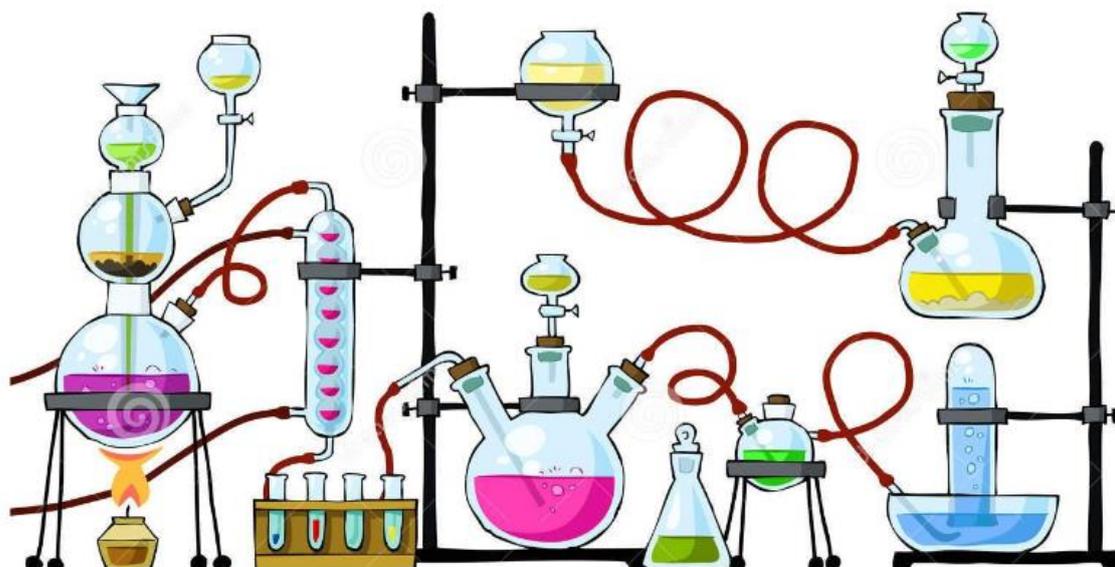


A-Level Chemistry Transition booklet

***"Every aspect of the world today, even politics and international relations, is affected by chemistry."
Linus Pauling (1901 – 1994)***



Welcome to chemistry at SJBC!

This transition work is designed to help you bridge the gap between your GCSE studies and A-Level.

Why do transition work?

Preparation is crucial for studying A-Levels. A-Levels require you to be an independent learner. Although you will be studying fewer subjects, A-Levels require different study skills and the volume of work is greater due to the increased demand of depth and detail.

The exercises in this booklet will ensure you are ready for A-Level chemistry in September.

Is transition work assessed?

YES! In September, your chemistry teacher will ask you for your transition work, and it will be assessed.

You must bring all the work with you for your first Year 12 chemistry lesson in September.



Research activities

Use your online searching abilities to find out as much about the following topics, and make a one-page summary for each using Cornell notes, see the link below:

<http://coe.jmu.edu/learningtoolbox/cornellnotes.html>

You will make Cornell notes during the two year course, so get as much practice as you can.

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 sulphate blue?

Copper compounds like many of the transition metal compounds have 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 in the ozone layer

Why did we get a hole in the ozone layer? What chemicals were responsible for this? 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?

Worksheet 1: Atomic structure and the Periodic Table

Complete the following sentences and definitions to give a summary of this topic.

Structure of an atom

The nucleus contains ...

The electrons are found in the ...

To work out the number of each sub-atomic particle in an atom we use the Periodic Table (PT). The number of protons is given by ...

In a neutral atom the number of electrons is ...

To work out the number of neutrons we ...

State what is meant by the following terms.

1 Relative atomic mass

2 Relative molecular mass

3 Isotope

4 Relative isotopic mass

Structure of an ion

When an atom becomes an ion, only the number of _____ changes.

For positive ions this _____ by the number equivalent to the charge on the ion.

For negative ions this _____ by the number equivalent to the charge on the ion.

Worksheet 2: Chemical formulae

Write the formulae of the following compounds.

Copper(II) sulphate	
Nitric acid	
Copper(II) nitrate	
Sulphuric acid	
Sodium carbonate	
Aluminium sulphate	
Ammonium nitrate	
Nitrogen dioxide	
Sulphur dioxide	
Ammonia	
Ammonium sulphate	
Potassium hydroxide	
Calcium hydroxide	

Worksheet 3: Cations and anions

Complete the table below to show the substance, its formula and its individual ions.

Substance	Formula	Cation (exact number)	Anion (exact number)
Sodium bromide			
	KI		
Silver nitrate			
Copper(II) sulphate			
	NaHCO ₃		
Magnesium carbonate			
Lithium carbonate			
	Ca(HSO ₄) ₂		
Aluminium nitrate			
Calcium phosphate			
Potassium hydride			
Sodium ethanoate			
	KMnO ₄		
Potassium dichromate(VI)			
Zinc chloride			
Strontium nitrate			
Sodium chromate(VI)			
Calcium fluoride			
Potassium sulphide			
Magnesium nitride			
Lithium hydrogensulphate			
	(NH ₄) ₂ SO ₄		

Worksheet 4: Writing equations

**Write: (a) the chemical equation, and
(b) the ionic equation for each of the following reactions.**

1. Magnesium with sulphuric acid

2. Calcium carbonate with nitric acid

3. Hydrochloric acid with sodium hydroxide

4. Aqueous barium chloride with aqueous sodium sulphate

5. Aqueous sodium hydroxide with sulphuric acid

6. Aqueous silver nitrate with aqueous magnesium chloride

7. Solid magnesium oxide with nitric acid

8. Aqueous copper(II) sulphate with aqueous sodium hydroxide

9. Aqueous lead(II) nitrate with aqueous potassium iodide

10. Aqueous iron(III) nitrate with aqueous sodium hydroxide

Become a better chemist..

READ SOME BOOKS

1. ***Why Chemical Reactions Happen.*** Keeler and Wothers
2. ***The chemistry of explosives.*** Akhavan, Jacqueline
3. ***The periodic kingdom – a journey into the land of the chemical elements.*** Atkins, Peter
4. ***Chemistry in the market place.*** Selinger, Ben
5. ***Bad science.*** Goldacre, Ben
6. ***Bad Pharma.*** Goldacre, Ben
7. ***The chemistry of fragrances.*** Pybus, David & Sell, Charles
8. ***Prometheans in the lab – chemistry and the making of the modern world.*** McGrayne, Sharon Bertsch

VISIT SOME WEBSITES

1. **Catalyst** (<http://www.catalyststudent.org.uk/>), a science magazine for students aged 14-19
2. Resources for students collated by **Royal Society of Chemistry** (<http://www.rsc.org/Education/SchoolStudents/index.asp>)
3. **Chemistry World magazine** (<http://www.rsc.org/chemistryworld/index.asp>)
4. **ChemNet society** (<http://www.rsc.org/Membership/Networking/ChemNet/index.asp>)
5. **New Scientist** (<http://www.newscientist.com>)
6. The Periodic Table **videos** from the University of Nottingham (<http://periodicvideos.com>)
7. AS/A level resources from the **University of Liverpool** (<http://www.liv.ac.uk/chemistry/Undergrad/ALevel.html>)
8. **Animations** of organic reactions mechanisms (<http://www.chemtube3d.com/ALevel.html>)
9. A level chemistry **notes** (<http://www.chemguide.co.uk>)