St Paul's Catholic School and Sixth Form

Transition Work for Sixth Form

"Let your light shine before others." – Matthew 5:16

Sixth Form, the St Paul's way — with Christ at the heart of it all.

OCR A Chemistry at St Paul's Catholic School and Sixth Form

The purpose of completing the task below is to re-visit your GCSE knowledge of atomic structure and bonding.

After completing the task, you will be able to:

- Identify numbers of subatomic particles form atoms, ions and isotopes
- Deduce molecular formula of simple covalent and ionic compounds
- Draw dot and cross diagrams for covalent molecules and ionic compounds
- Develop your research abilities.

Due date: Monday 1st September 2025

Task 1	Task 1 will include using your online researching abilities.
Task 2	In Task 2 you will revisit your understanding of the structure of atoms, ions and isotopes.
Task 3	Finally in Task 3, you will demonstrate your understanding of bonding and structure of simple covalent molecules and ionic compounds.

Specification: OCR A Chemistry

Links to website: AS and A Level - Chemistry A - H032, H432

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Task 1

You should make a 1-page summary for **one** of the options below that you research using Cornell notes:
http://coe.jmu.edu/learningtoolbox/cornellnotes.html

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?

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Task 2

Write the definitions of atomic number and mass number.

Complete the table below, showing your understanding of atomic structure and how atoms can become ions.

Atom	Atomic No.	Electron Configuration	Gains /loses e-	No. of e- gained/loss	Ion formula produced	Electronic configuration
Li	3	2,1	loses	1e-	Li^+	$[2]^+$
Na						
Mg						
Al						
F						
O						
S						

Describe what is meant by the terms oxidation and reduction in terms of oxygen and electrons. Choose examples to show each process.

Write the Definition of an isotope and complete the missing data on the isotopes of carbon in the table below - use your definition above, and your understanding of atomic structure and isotopes.

Example	Atom	Atomic No.	Mass No.	No. of protons	No. of electrons	No. of neutrons
1		6	12			
2	C					7
3				6		8
4					7	8

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Task 3

Research the formula of the common cations and anions.

Cations (positive ions)	
Group 1 e.g. Li^+	
Group 2 e.g. Mg^{2+}	
Hydrogen	
Aluminium	
Ammonium	

Anions (negative ions)			
Group 7 e.g. F^-		Hydroxide	
Group 6 e.g. O^{2-}		Phosphate	
Nitrate		Ethanoate	
Carbonate		Nitrite	
Sulphate		Sulphite	

Use the common ion bank you have created above (for ionic compounds only) provided and your understanding, to practise deducing (working out) the correct molecular formula for these named :

Ionic Compounds		Covalent elements or compounds	
Sodium sulphate:		Iodine:	
Ammonium nitrate:		Carbon monoxide:	
Aluminium sulphate:		Methane:	
Ammonium carbonate:		Hexane:	
Calcium phosphate:		Ammonia:	

Draw a dot and cross diagram to show the ionic or covalent bonding for each compound/ molecule in the table above.