



Summer Bridging Unit

This work is to be completed over the summer and handed in to your subject teacher at the end of your third full week in Sixth Form.

Name: Date:

Work to be completed	How this will link to the start of course in September	Progress - <i>teacher use only</i>
<p>Task 1: The Evolution of Atomic Structure Goal: Review GCSE atomic models and research the model used at A-Level.</p> <p>Part A: GCSE Recap Draw and label the Bohr model for a Magnesium atom (2, 8, 2). List the relative mass and charge for protons, neutrons, and electrons.</p> <p>Part B: A-Level Research Research the terms "sub-shells" and "orbitals" (s, p, d). Find out why the Bohr "shell" model is considered oversimplified for larger atoms. Research the "Aufbau Principle" and try to write the electron configuration for Magnesium using s, p, d, f notation</p>	<p>In GCSE, you learn electrons are simply in shells. In A-Level, you learn shells are divided into sub-shells and orbitals, which explains the specific structure of the Periodic Table and patterns in Ionisation Energy.</p>	<p>1: Above the expected standard of an A Level study 2: The expected standard of A Level study 3: Below the expected standard of A Level study</p> <p>Above:</p> <p>Below:</p> <p>Meeting:</p>

<p>Task 2: Mastery of the Mole & Gas Laws Goal: Strengthen GCSE calculation skills and prepare for the high mathematical demand. Part A: GCSE Recap Define Relative Formula Mass (M_r) and the Mole. Calculate the number of moles in 5.00 g of anhydrous sodium carbonate (Na_2CO_3).</p> <p>Part B: A-Level Research Research the "Ideal Gas Equation": $PV = nRT$. Identify the required units for each variable. Explain Avogadro's Law: why do different gases at the same temperature and pressure occupy the same volume?</p>	<p>GCSE focuses on reacting masses and gas volumes at room temperature (Molar gas volume = 24dm^3). A-Level introduces gas volumes dependent on temperature and using specific units which differ from GCSE.</p>	<p>Above:</p> <p>Below:</p> <p>Meeting:</p>
<p>Task 3: A-Level practical endorsement</p> <p>Research and write a detailed method for required practical 3: 'To investigate how the rate of the reaction of sodium thiosulfate with hydrochloric acid changes as the temperature of the reaction is changed.'</p> <p>Use the link in the 'useful resources' section to remind yourself of the 'disappearing cross' practical. You may remember this from GCSE.</p> <p>You need to include:</p> <ul style="list-style-type: none"> -Specific apparatus to use -Your measurement strategy: what will you measure, and how will you measure it, to determine the rate? -Identify the independent, dependent and control variables. State how you will control these. -Reference any websites you use using the full web address and write down the date you accessed the site. 	<p>The practical endorsement requires you to complete 12 practical activities to cover various skills. This method will form part of your portfolio of evidence for this.</p> <p>Keep a copy of your method as it will be used as part of your practical endorsement.</p>	<p>Above:</p> <p>Below:</p> <p>Meeting:</p>

Additional information

Useful resources to support:	Task 3: https://filestore.aqa.org.uk/resources/chemistry/AQA-7404-7405-P3.PDF
Essential equipment for September:	Calculator
Optional: Further ways to demonstrate intellectual curiosity:	<p>Research modern developments in chemistry. Is there a new technology, medicine, technique which interests you?</p> <p>Organic Mechanisms & Skeletal Formulae Goal: Move from basic naming of alkanes to understanding the "mechanisms" of how reactions occur.</p> <p>Part A: GCSE Recap Draw the "displayed formula" (showing all bonds) for Propane and Propene. Explain the difference between a saturated and unsaturated hydrocarbon using the Bromine water test.</p> <p>Part B: A-Level Research: Research "Skeletal Formulae"—the shorthand way A-Level chemists draw molecules. Draw the skeletal formula for Butane and But-1-ene.</p> <p>Research "Electrophilic Addition." Find a diagram of a "curly arrow" mechanism showing Bromine reacting with Ethene. What does a "curly arrow" represent in a chemical mechanism?</p>