



Subject: Year 9 Atomic Structure and the Periodic Table

Overarching Topic: Atomic Structure and the Periodic Table			
<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>The periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties. The historical development of the periodic table and models of atomic structure provide good examples of how scientific ideas and explanations develop over time as new evidence emerges. The arrangement of elements in the modern periodic table can be explained in terms of atomic structure which provides evidence for the model of a nuclear atom with electrons in energy levels.</p>		
	Critical	Core	Pinnacle
<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<ul style="list-style-type: none"> • What are compounds, elements and atoms? • How do we use chemical symbols? • How do you write a word equation? • What is a mixture? • How has the model of atoms changed over time? • What are the sub atomic particles? • How has the periodic table changed over time? 	<ul style="list-style-type: none"> • How do you write a balanced symbol equation? • How do you separate mixtures? • What is the scientific evidence for a nucleus? • How can you use the periodic table to calculate the number of sub atomic particles? • How is the periodic table related to electronic structure? • What are the trends in groups 1, 7 and 0? 	<ul style="list-style-type: none"> • Why do scientists change their ideas of atomic models? • How can we explain the existence of neutrons? • What are isotopes and how can they be used? • How does electronic structure relate to trends in groups? • Will our ideas of the atomic structure change in the future? • Are there sub atomic particles that are smaller than electrons?
	<p>TRIPLE ONLY QUESTIONS</p> <ul style="list-style-type: none"> • Where are the transition metals in the periodic table? 	<p>TRIPLE ONLY QUESTIONS</p> <ul style="list-style-type: none"> • How do the properties of transition metals relate to their uses? 	<p>TRIPLE ONLY QUESTIONS</p> <ul style="list-style-type: none"> • Why do transition metals have different properties to alkali metals?
<p>The Key Skills/ Techniques</p>	<p>The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.</p>		
	<p>Skill/Technique</p>	<p>How will this skill be developed?</p>	
	1. Graphing & Drawing	Draw graphs with suitable scales, axes and units. Correct line of best fit. Appreciation of anomalies and processed data. Scientific drawing of cells, concepts and scientific equipment.	
	2. Variables	Identify independent, dependent and control variables and devise experiments to include these to ensure valid results. Appreciation of uncertainty.	
	3. Data Analysis	Describe, explain and predict trends. Graph and table data interpretation. Identify links and patterns within and between topics. Statistical analysis of data to include mode/median/mean/range determination. Drawing justified conclusions from presented data.	
	4. Application	Apply known and taught theory in unfamiliar contexts. Making links to taught theory and extracting key ideas. Communicating using correct scientific terminology.	
5. Working Scientifically	Identify hazards and planning to limit risk. Describe how to improve accuracy/precision/repeatability/reproducibility/validity. Evaluate reliability of methods and investigations, taking in to account data analysis.		

