

## Independent Scholarship Award: A Level Chemistry

Bronze	Silver	Gold
<p>1. Work through the exercises (sections 1, 2, 3, 4ab, 5, 7, 8, 9 and 11a) in Edexcel's "Moles, Formulae and Equations" (<a href="https://chemstuff.files.wordpress.com/2012/01/moles-formulae-equations-questions.pdf">https://chemstuff.files.wordpress.com/2012/01/moles-formulae-equations-questions.pdf</a>), ensure that you can rearrange any algebraic equation to change the subject as required. Keep a record of these and make a record of those you have difficulty with. <b>Not every calculation must be done, a selection (at least 10) from each section will suffice.</b></p> <p>2. Use the same workbook to practice some of the chemical equations in section 6.</p> <p>3. Can you draw dot-and-cross diagrams for any ionic or covalent substance? Eg NaCl, H<sub>2</sub>O, CH<sub>4</sub>, CH<sub>3</sub>OH, H<sub>2</sub>CO, C<sub>2</sub>H<sub>2</sub>, MgO, N<sub>2</sub>, CaF<sub>2</sub>, ethene, ethanoic acid, sodium hydroxide.</p> <p>4. Can you explain which of the substance in 3 (above) have low/high melting points, conduct electricity.</p>	<p>1. From the workbook (in Bronze) and your GCSE notes on Ionic Equations (eg Unit 5) do the equations in section 10.</p> <p>2. If you did the Separate Chemistry GCSE then sections 4c-g and 11b should be familiar, if you did the Trilogy GCSE, then use the information given and attempt the same. <b>Again, not every calculation must be done, a selection from each section will suffice.</b></p> <p>3. The Royal Society of Chemistry has published a series of quizzes "Transition Skills Starters for Ten". <a href="http://www.rsc.org/learn-chemistry/resource/res00002362/starters-for-ten-chapter-0-transition-skills">http://www.rsc.org/learn-chemistry/resource/res00002362/starters-for-ten-chapter-0-transition-skills</a></p> <p>Complete the series</p> <ul style="list-style-type: none"><li>- 1 Basic Chemistry competencies</li><li>- 2 Basic Maths competencies</li><li>- 3 Basic Practical competencies</li></ul>	<p>1. Find the BBC documentary series "<b>Chemistry: A Volatile History</b>" (<a href="https://hdclump.com/?s=volatile">https://hdclump.com/?s=volatile</a> 3 episodes) and watch it, especially episode 2 (The order of the Elements) as this will feature in the course.</p> <ul style="list-style-type: none"><li>- Write a summary (1 page) of one of the episodes you watched, including some of the key chemical reactions featured – you will need to research some of these, so include a reference in the correct format (<a href="https://www.ocr.org.uk/Images/208932-chemistry-practical-skills-handbook.pdf">https://www.ocr.org.uk/Images/208932-chemistry-practical-skills-handbook.pdf</a> Appendix 7).</li></ul> <p>2. Read one of the books on the reading list and write a summary (500 words) detailing why you found it interesting (or not!).</p>

## Potential Reading List for A Level Chemistry

**Periodic Tales: The Curious Lives of The Elements - Hugh Aldersey-Williams** | 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 have never even thought about.

### **H<sub>2</sub>O: A Biography of Water - Phillip Ball**

Philip Ball's gloriously offbeat and intelligent book conducts us on a journey through the history of science, folklore, the wilder scientific fringes, cutting-edge physics, biology and ecology, to give a fascinating new perspective on life and the substance that sustains it. After reading this book, drinking a glass of water will never be the same again.

### **Why Chemical Reactions Happen - James Keeler**

'Why Chemical Reactions Happen is one of nature's secrets....This insightful book reveals in clear and impressive style what motivates molecules to metamorphose into something new. It supplies all the essentials for understanding entropy and how to choreograph molecular transformations to its music.

### **Chemistry: A Very Short Introduction (Very Short Introductions) - Peter Atkins**

In this *Very Short Introduction* to Chemistry, he encourages us to look at chemistry anew, through a chemist's eyes, in order to understand its central concepts and to see how it contributes not only towards our material comfort, but also to human culture. Atkins shows how chemistry provides the infrastructure of our world, through the chemical industry, the fuels of heating, power generation, and transport, as well as the fabrics of our clothing and furnishings.

### **The Disappearing Spoon and Other Extraordinary True Tales from the Periodic Table - Sam Kean**

One of our crowning scientific achievements is also a treasure trove of passion, adventure, betrayal and obsession. The Disappearing Spoon follows the elements, their parts in human history, finance, mythology, conflict, the arts, medicine and the lives of the (frequently) mad scientists who discovered them.

### **The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine - Marty Jopson**

Have you ever wondered why ice floats and water is such a freaky liquid? Or why chillies and mustard are both hot but in different ways? Or why microwaves don't cook from the inside out?

In this fascinating scientific tour of household objects, *The One Show* presenter and all-round Science Bloke Marty Jopson has the answer to all of these, and many more, baffling questions about the chemistry and physics of the everyday stuff we use every day.