

Sample Teaching Plan  
Unit G631: Electrons in Action

**Suggested teaching time**

Plan is based on 12 weeks at 5 hours per week (4 hours contact time + 1 hour directed study).

The learning activities are suggestions only. Teachers may wish to develop alternative strategies. The plan should be read alongside the G631 Specification and, in particular, the Assessment Evidence Grid (attached for your reference).

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
1	3.12.1 Electrochemical Change AO1a	<ul style="list-style-type: none"> <li>teacher-led discussion of work done at AS level.</li> </ul> <p>Discussion related to:</p> <ul style="list-style-type: none"> <li>redox in terms of electron transfer</li> <li>topics linked to oxidation and oxidation number</li> <li>basic practical experimental work linked to redox – test tube reactions / refer to <math>\text{KMnO}_4</math> / titration work with iron tablets</li> <li>equations linked to experimental work</li> <li>students begin research on basic understanding of electrochemistry to include redox and examples of the applications of electrochemical change.</li> </ul> <p><b>Student focus Assignment A1.</b></p>	<p>Online resources:</p> <p><a href="http://www.practicalchemistry.org/">www.practicalchemistry.org/</a></p> <ul style="list-style-type: none"> <li>useful practical details</li> </ul> <p><a href="http://www.rsc.org/education/teachers/learnnet/practical/index3.htm">www.rsc.org/education/teachers/learnnet/practical/index3.htm</a></p> <ul style="list-style-type: none"> <li>video clips for practical techniques</li> </ul> <p><a href="http://www.rsc.org/education/">www.rsc.org/education/</a></p>

**It is important that candidates are guided to the content of the specification Pages 55 & 52 3.12.2 Principles and Applications of commercial cells to ensure that they understand the concepts needed for the assignment.**

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
2 – 5	3.12.2 Principles and Applications of Commercial Cells  AO1b (part)  AO3a b c  AO2b	<ul style="list-style-type: none"> <li>teacher-led introduction of basic understanding of cells and half cells</li> <li>students research to support requirements of Assignment A2</li> <li>introduction to measuring electrode potentials through simple experimental work</li> <li>student assignment work to support the research requirements for applications of producing an electric current and practical requirements to show that changing conditions affects the emf of a cell.</li> </ul> <p><b>Student focus Assignment A2.</b></p>	Chemistry in Context : Electrochemical cells.  <p><b>Take care to assess AO1b in both assignment A2 &amp; B1.</b></p>
<p><b>It is important that candidates are guided to the content of the specification Pages 52 &amp; 53 3.12.3 Electrolysis and Extraction of metals to ensure that they understand the concepts needed for the assignment.</b></p>			
6 – 9	3.12.3 Electrolysis and the extraction of metals  AO1b (part)  AO3a b c  AO2b (part)	<ul style="list-style-type: none"> <li>teacher-led introduction of basic understanding of electrolysis ( refer to 3.12.3 – pages 52 -53)</li> <li>students research to support requirements of Assignment B1</li> <li>introduction to electrolysis through simple experimental work</li> <li>student assignment work to support the research requirements for applications of producing metals using electrolysis and practical requirements to show that changing conditions affects the mass of copper produced.</li> </ul> <p><b>Student focus Assignment B 1.</b></p>	Candidates will need to cover the requirements of 3.12.3 from the specification and use their notes/research to complete the assignment.  Use experimental work to include: <ul style="list-style-type: none"> <li>electrolysis of <math>\text{CuSO}_4</math> – Cu &amp; graphite electrodes</li> <li>demo of <math>\text{PbBr}_2</math> (check Health and Safety).</li> <li>electrolysis of NaCl – graphite electrodes.</li> </ul> <p><b>Take care to assess AO1b in both assignment A2 and B1.</b></p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
<b>Check throughout the practical work that candidates are doing sufficient calculations to cover AO2b</b>			
<b>10 – 11</b>	3.12.4 Fuel cells AO2a b	<p>Introductory discussion on developmental of fuel cells that convert chemical energy into electrical energy.</p> <p>Students could begin by given individual information from 3.12.4 to research and explain.</p> <p><b>Fuel cell; voltaic cell; energy density; electric vehicles; renewable sources.</b></p> <p>Assignment C can then be used to focus the students on their individual evidence for AO2b.</p> <p>Assignment D can also be used to support evidence of calculations for AO2b.</p>	<p><b>Fuel cells LSN Triple Science resource</b></p> <p><a href="http://www.triplescience.org.uk/tripsci/">www.triplescience.org.uk/tripsci/</a></p>
<b>12</b>	Portfolio collation	<p>Students to revisit work as necessary.</p> <p>Collation and organisation of portfolio work.</p>	