

Sample Teaching Plan
Unit G629: Synthesising organic chemicals

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 G629 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 – 2	3.10.1 Organic compounds and functional groups AO1(a)	<p>Organic Compounds and Functional Groups</p> <p>Introduction of organic chemistry; to include aliphatic & aromatic compounds, functional groups & bonding.</p> <p>To build on functional group analysis from AS (G621)</p> <p>Discuss the classifications of organic compounds.</p> <ul style="list-style-type: none"> find and use data about organic compounds –functional group focus practically investigate functional groups give guidance on functional groups to be studied (ref 3.10.1). <p>Research work on isomerism: introduce different types and link to use of isomers.</p> <p>Student focus : Assignment A</p>	<p>A Level Chemistry text books</p> <p>e.g. OCR A Level Applied Science Heinemann, ISBN 978-0-435692-12-4</p> <p>Teacher hand out notes and/or resource-based introduction notes.</p> <p>Suitable GCSE/AS textbooks.</p> <p>Chemistry in Context 5th edition Graham Hill.</p> <p>http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1202115622321</p> <p>http://www.rsc.org/Education/Teachers/Resources/PracticalScience.asp</p> <p>Ref: thalidomide</p> <p>Assignment A and linking to Assessment criteria AO1(a).</p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
2 – 5	3.10.2 Types of Chemical Reaction AO1(b) 3.10.3 Manufacture and Purification of Organic Compounds 3.10.4 Determination of Yield and Purity AO3 (a), (b), (c), (d) & (e)	<p>Introduction of the link between functional groups and types of chemical reactions. (ref. 3.10.2)</p> <p>Students can be given a reaction type to research and then present to other students.</p> <ul style="list-style-type: none"> work could be either teacher or student centred and research based and then complete assignment A2. <p>Student focus : Assignment A2</p> <p>Link to AO3 the preparation and purification of a chosen organic compound</p> <p>Introduce work required for this preparation:</p> <ul style="list-style-type: none"> carry out a full risk assessment - independent work for MB3 include planning for MB2 and MB3 include justification of techniques used for MB3 use ratio, proportion and percentages to work. <p>Evaluate practical work – for MB3 adapt the method to maximise the yield</p> <ul style="list-style-type: none"> research and use appropriate techniques to purify and check the purity of the product. <p>Check students' practical ability is assessed throughout their work.</p> <p>Student focus : Assignment C1</p>	<p>http://www.cambridgestudents.org.uk/subjectpages/chemistry/asalchemistry/links</p> <p>Use assignment C1 & link to assessment criteria AO1(b).</p> <p>Organic preparation: any compound which in the preparation and purification will introduce a range of chemical techniques, e.g.</p> <ul style="list-style-type: none"> reflux distillation recrystallisation filtering under reduced pressure mp determination Solvent separation <p>Depending on the nature of the class / equipment available candidates could do the same or different preparations.</p> <p>COSHH data to be available for student's use.</p> <p>Use the assessment criteria to support students in ensuring they are given the opportunity to cover all AO3 requirements and AO2(c).</p> <p>http://www.practicalchemistry.org/</p> <p>http://home.clara.net/rod.beavon/apparatus.htm (information on drawing apparatus).</p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
			Also publications from RSC: paracetamol/aspirin. Use assignment C1 – adapt to organic compound chosen.
6 - 7	3.10.6 Industrial Manufacture of Chemical Compounds AO2(a)	<p>Student centred work to show researched evidence of a process used to manufacture a chosen organic compound.</p> <p>To identify:</p> <ul style="list-style-type: none"> • factors to be considered to ensure a safe process • economic considerations. <p>Remind students of referencing techniques; correct use researched material;</p> <p>Report to:</p> <ul style="list-style-type: none"> • show selection of research material • show good interpretation of material used • be clearly and concisely presented • evaluation & justification (for higher MBs). <p>In addition to support research with information on costs and benefits of chosen products to:</p> <ul style="list-style-type: none"> • individuals • companies • society. <p>Student focus : Assignment B1</p>	<p>Essential Chemical Industry Chemical Industry Education Centre. (C.I.E.C.) 185 342 577 X</p> <p>Assignment B1</p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
8 - 11	<p>3.10.5 Therapeutic drugs and medicines AO1(c)</p> <p>AO3(a), (b), (c), (d) & (e)</p>	<p>Research and activities related to drugs and medicines. Discussion/ debate on types of drugs and their applications impact on society. Research on principles of drug action.</p> <p>Preparation of a useful drug The preparation and purification of a chosen organic compound. Link to AO1(c). Introduce work required for this preparation.</p> <p>Discuss drugs suitable for preparation:</p> <ul style="list-style-type: none"> • carry out a full risk assessment – independent work for MB3 • include planning for MB2 and MB3 • include justification of techniques used for MB3 • use ratio, proportion and percentages to work out amounts of substances – include recording of measurements of substances used – all MBs • use the chemical equation to work out the theoretical yield – for processing – all MBs • purify the product by recrystallisation or distillation – justify for MB3 • calculate the percentage yield and evaluate the method used – for processing • evaluate practical work – for MB3 adapt the method to maximise the yield • research and use appropriate techniques to purify and check the purity of the product. 	<p>Candidate based research using book and electronic resources.</p> <p>Use of video, DVD and other commercially produced audiovisual resources.</p> <p>Up to date chemical catalogues or Health and Safety handbooks that list the hazards of the materials used and prepared in this assignment.</p> <p>Link with Unit G620 (aspirin) preparation could be also used here – not advisable to repeat aspirin preparation if done previously.</p> <p>Aspirin – use RSC resource.</p> <p>Paracetamol – use RSC resource.</p> <p>Paracetamol – a curriculum resource.</p> <p>Use assignment B and link to assessment criteria AO1b.</p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
		Student focus : Assignment C2	<p>Organic preparation: Any compound that in the preparation and purification will introduce a range of chemical techniques e.g.</p> <ul style="list-style-type: none"> • reflux • distillation • recrystallisation • filtering under reduced pressure • mp determination • solvent separation <p>Depending on the nature of the class / equipment available candidates could do the same or different preparations.</p> <p>COSHH data to be available for student's use.</p> <p>Use the assessment criteria to support students in ensuring they are given the opportunity to cover all AO3 requirements and AO2(c).</p>
12	Portfolio collation	<p>Students to revisit work as necessary.</p> <p>Collation and organisation of portfolio work.</p>	