

**Sir John Cass Red Coat School Programme of Study – Key Stage 5**  
**Subject: Chemistry**

Year 12	Year 13
<p><b>Topics Covered/ Areas of Focus:</b></p> <p><b>Module 1: Practical skills assessed in a written examination</b></p> <ul style="list-style-type: none"> <li>• Development of practical skills in Chemistry</li> <li>• Practical skills assessed in the practical endorsement</li> </ul> <p><b>Module 2:</b> Foundations in chemistry covering concepts required throughout the remaining modules.            Includes:</p> <ul style="list-style-type: none"> <li>• Atoms, compounds, molecules and equations.</li> <li>• Amount of substance.</li> <li>• Acid–base and redox reactions.</li> <li>• Electrons, bonding and structure.</li> </ul> <p><b>Module 3:</b> Periodic table and energy.            Includes:</p> <ul style="list-style-type: none"> <li>• The periodic table and periodicity.</li> <li>• Group 2 and the halogens.</li> <li>• Qualitative analysis.</li> <li>• Enthalpy changes.</li> <li>• Reaction rates and equilibrium (qualitative).</li> </ul> <p><b>Module 4:</b> Core organic chemistry.            Includes:</p> <ul style="list-style-type: none"> <li>• Basic concepts.</li> <li>• Hydrocarbons.</li> <li>• Alcohols and haloalkanes.</li> <li>• Organic synthesis.</li> </ul>	<p><b>Topics Covered/ Areas of Focus:</b></p> <p><b>Module 1:</b> Development of practical skills continues into Year 13</p> <p><b>Module 5:</b> Physical chemistry and transition elements.            Includes:</p> <ul style="list-style-type: none"> <li>• Reaction rates and equilibrium (quantitative).</li> <li>• pH and buffers.</li> <li>• Enthalpy, entropy and free energy.</li> <li>• Redox and electrode potentials.</li> <li>• Transition elements.</li> </ul> <p><b>Module 6:</b> Organic chemistry and analysis.            Includes:</p> <ul style="list-style-type: none"> <li>• Aromatic compounds.</li> <li>• Carbonyl compounds.</li> <li>• Carboxylic acids and esters.</li> <li>• Nitrogen compounds.</li> <li>• Polymers.</li> <li>• Organic synthesis.</li> </ul> <p>Chromatography and spectroscopy (NMR).</p>

<ul style="list-style-type: none"> <li>Analytical techniques (IR, MS).</li> </ul>	
<p><b><u>Skills Development &amp; Expected Progress:</u></b></p> <p>Development of practical competency for Chemistry. Skills of planning, implementing, analysis and evaluation. Pupils will develop quantitative techniques, including use of volumetric apparatus. Pupils must meet or exceed their minimum target grades in the End-of-Year 1 Exam in order to progress to Year 13.</p>	<p><b><u>Skills Development &amp; Expected Progress:</u></b></p> <p>Skills of planning, implementing, analysis and evaluation are continued and further developed in Year 13. More advanced practical activities will allow pupils to enhance these essential skills in preparation for undergraduate studies. Pupils must meet or exceed their minimum target grades in the End-of-Year Mock Exams in order to be entered for the External Exams.</p>
<p><b><u>Assessment:</u></b></p> <p><b>There is regular assessment to determine progress in accordance with the school policy</b></p> <p><b>Internal Assessment:</b> Assessed Homework (weekly), End-of-Chapter Tests, End-of-Module Tests and End-of-Year 1 Exam (essential prerequisite for progression to Year 13 is for pupils to achieve their Minimum Target Grade).</p> <p><b>Practical Endorsement:</b> Candidates complete a minimum of 12 practical activities to demonstrate practical competence (over Year 1 and 2 of the A Level course).</p> <p><b>External Assessment:</b></p> <p>New A Levels will be fully linear so assessment of a student's knowledge and understanding of the whole course takes place at the end of two years of study (end of Year 13).</p>	<p><b><u>Assessment:</u></b></p> <p><b>There is regular assessment to determine progress in accordance with the school policy</b></p> <p><b>Internal Assessment:</b> Assessed Homework (weekly), End-of-Chapter Tests, End-of-Module Tests and End-of-Year Mock Exams (essential prerequisite for External Exam Entry is for pupils to achieve their Minimum Target Grade).</p> <p><b>External Assessment:</b></p> <p><b>Paper 1:</b> Raw Marks (100), Weighting (37%) Assesses the content from Modules 1, 2, 3 and 5</p> <ul style="list-style-type: none"> <li>Section A - Consists of Multiple choice questions</li> <li>Section B - Consists of structured questions and extended response questions covering theory and practical skills</li> </ul> <p><b>Paper 2:</b> Raw Marks (100), Weighting (37%) Assesses the content from Modules 1, 2, 4 and 6</p> <ul style="list-style-type: none"> <li>Section A - Consists of Multiple choice questions</li> <li>Section B - Consists of structured questions and extended response questions covering theory and practical skills</li> </ul>

	<p><b>Paper 3:</b> Raw Marks (70), Weighting (26%) Assesses the content from Modules 1 to 6</p> <ul style="list-style-type: none"> <li>Consists of structured questions and extended response questions covering theory and practical skills</li> </ul> <p><b>Practical Endorsement:</b> Performance reported separately to the A Level grade. Internal assessment subject to external moderation (Pass/Fail)</p>
<p><b><u>Literacy:</u></b></p> <p>The A Level specification emphasises the development of chemical literacy skills, which are assessed at the end of the course. Extended response questions are included in internally assessed components. Pupils develop the ability of using and processing written information on a chemical problem. Pupils will use chemical knowledge and skills for understanding information in questions based on a given context (for example in an industrial process, or environmental problem).</p>	<p><b><u>Literacy:</u></b></p> <p>Literacy skills are further developed in Year 13. Extended response questions are included in internally and externally assessed components. Pupils will be challenged to provide fuller answers, justify their ideas and use appropriate scientific terminology. Student talk will be encouraged through questioning, group work and presentations.</p>
<p><b><u>Numeracy:</u></b></p> <p>20% of the question paper assessment covers mathematical skills as part of the new regulatory requirements. These include:</p> <ul style="list-style-type: none"> <li>Handling data (finding arithmetic means, identify uncertainties in measurements and use appropriate number of significant figures)</li> <li>Use ratios, fractions and percentages</li> <li>Substitute numerical values into algebraic equations using appropriate units for physical quantities</li> <li>Solve algebraic equations</li> <li>Translate information between graphical, numerical and algebraic forms</li> <li>Plot two variables from experimental or other data</li> <li>Draw and use the slope of a tangent to a curve as a measure of rate of change</li> <li>Use angles and shapes in regular 2-D and 3-D structures</li> </ul>	<p><b><u>Numeracy:</u></b></p> <p>Mathematical skills are further developed in Year 13. These include:</p> <ul style="list-style-type: none"> <li>Use calculators to find and use power, exponential and logarithmic functions</li> <li>Use logarithms in relation to quantities that range over several orders of magnitude</li> <li>Determine the slope and intercept of a linear graph</li> </ul> <p>Calculate rate of change from a graph showing a linear relationship</p>

Understand the symmetry of 2-D and 3-D shapes	
<p><b><u>ICT:</u></b></p> <p>Pupils will use appropriate software and/or tools to process data, carry out research and report findings.</p> <p>Pupils will undertake research projects and present as power points to the group. Sources of information will need to be cited demonstrating that research has taken place, supporting planning and conclusions.</p>	
<p><b><u>Life in Modern Britain:</u></b></p> <p>Pupils will develop the deep understanding of their subject that will prepare them for life in modern Britain. Willingness to participate in group discussions and class debates will be encouraged from the outset. Respecting the views of others and showing tolerance through group work and presentations. Nominating group leaders and respecting democratic values are just some of the British values that will be actively reinforced. All lessons promote independent learning, facilitating pupils to become independent enquirers with advice and encouragement to read around their subject and go beyond the scope of the syllabus. Question answering periods and class discussions promote respectful dialogue. This will prepare students for employment and provide opportunities in industry to apply these skills such as technician roles and quality control and for further education.</p>	
<p><b><u>SMSC:</u></b></p> <p>Spiritual, moral, social and cultural aspects of the Chemistry syllabus are developed throughout the course. For example, in green chemistry the recycling of plastics and use of alternatives or modification of polymers to minimise environmental damage are studied. The impact of CFCs on the ozone layer and greenhouse gases are explored. Cultural aspects look at the contribution of scientists throughout history from around the world. Social skills are developed through group work, cooperating well with others and showing respect for the views of their peers.</p>	
<p><b><u>Meeting the needs of individual students &amp; Additional Support:</u></b></p> <p>Students who are struggling with the course content are expected to approach their teacher and/or academic tutor in this subject for extra support. Differentiated tasks cater for pupils of all abilities and stretch and challenge activities target more able pupils so that all pupils reach their potential.</p>	
<p><b><u>Extra-Curricular Activities &amp; Club:</u></b></p> <p>There is extensive support from extension classes to individual support from academic mentors.</p>	<p><b><u>Extra-Curricular Activities &amp; Club:</u></b></p> <p>Support is continued in Year 13 to make sure pupils are working at or above their target minimum grade. Intense revision sessions are provided in the run up to external examinations.</p>

<p><b><u>Independent Study/ Homework:</u></b></p> <p>Independent study is a core attribute for success at KS5 and beyond. This is encouraged from day one. Students are expected to undertake a minimum of 5 hours of Chemistry homework per week. In addition to this they are expected to read around the subject in advance of the lesson. Details of the learning outcomes are in their Study Guides with references to their text books. Students are expected to make accurate notes and practice past exam papers regularly.</p>	<p><b><u>Independent Study/ Homework:</u></b></p> <p>Independent study skills established in Year 12 are continued into Year 13. Expectations on homework and reading around the subject in advance of lessons are maintained throughout the course. Practicing past exam papers/questions is encouraged for exam preparation.</p>
<p><b><u>Resources for Learning Support and VLE:</u></b></p> <p>The VLE and sixth form library provide access to wide ranging resources and areas for study.</p> <p><b>Recommended Reference Books</b></p> <p>A Level Chemistry A for OCR A (2015), Oxford University Press, 978-0-19-835197 9</p> <p>A-Level Chemistry: OCR A Year 1 &amp; AS (2015), CGP, 978 1 78294 290 0</p> <p><b>Useful websites</b></p> <p><a href="http://www.ocr.org.uk/">http://www.ocr.org.uk/</a></p> <p><a href="http://www.chemguide.co.uk/">http://www.chemguide.co.uk/</a></p> <p><a href="http://www.a-levelchemistry.co.uk/">http://www.a-levelchemistry.co.uk/</a></p> <p><a href="http://www.youtube.com/user/wwwrscorg">http://www.youtube.com/user/wwwrscorg</a></p> <p><a href="http://www.s-cool.co.uk/a-level/chemistry">http://www.s-cool.co.uk/a-level/chemistry</a></p> <p><a href="http://www.docbrown.info/">http://www.docbrown.info/</a></p>	<p><b><u>Resources for Learning Support and VLE:</u></b></p> <p>Pupils are given access to lesson resources including power points and revision material. Pupils are able to work individually or in groups.</p> <p><b>Recommended Reference Books</b></p> <p>A Level Chemistry A for OCR A, Oxford University Press, 978-0-19-835197 9</p> <p>A-Level Chemistry: OCR A Year 1 &amp; 2 (2015), CGP, 978 1 78294 302 0</p> <p><b>Useful websites</b></p> <p><a href="http://www.ocr.org.uk/">http://www.ocr.org.uk/</a></p> <p><a href="http://www.chemguide.co.uk/">http://www.chemguide.co.uk/</a></p> <p><a href="http://www.a-levelchemistry.co.uk/">http://www.a-levelchemistry.co.uk/</a></p> <p><a href="http://www.youtube.com/user/wwwrscorg">http://www.youtube.com/user/wwwrscorg</a></p> <p><a href="http://www.s-cool.co.uk/a-level/chemistry">http://www.s-cool.co.uk/a-level/chemistry</a></p> <p><a href="http://www.docbrown.info/">http://www.docbrown.info/</a></p>