

Subject	Year 10 Chemistry Threshold Concepts – Spring Term	How to support students' learning
Energy changes	<p><b>Exothermic and endothermic reactions</b></p> <p><b>Energy transfer during exothermic and endothermic reactions</b></p> <ul style="list-style-type: none"> <li>• Distinguish between exothermic and endothermic reactions on the basis of the temperature change of the surroundings</li> <li>• Evaluate uses and applications of exothermic and endothermic reactions given appropriate information</li> </ul> <p><b>Reaction profiles</b></p> <ul style="list-style-type: none"> <li>• Draw simple reaction profiles (energy level diagrams) for exothermic and endothermic reactions showing the relative energies of reactants and products, the activation energy and the overall energy change, with a curved line to show the energy as the reaction proceeds</li> <li>• Use reaction profiles to identify reactions as exothermic or endothermic</li> <li>• Explain that the activation energy is the energy needed for a reaction to occur</li> </ul> <p><b><i>The energy change of reactions (HT only)</i></b></p> <ul style="list-style-type: none"> <li>• <i>Students should be able to calculate the energy transferred in chemical reactions using bond energies supplied</i></li> </ul> <p><b>Triple only</b></p>	<p>Encourage your child to visit this website to learn about energy change reactions and reaction profile diagrams <a href="#">Exothermic and Endothermic Reactions (AQA) – the science hive</a></p> <p>Encourage your child to watch this video on calculating bond energies <a href="#">GCSE Chemistry - Bond Energies #44 (Higher tier) - YouTube</a></p>

<p>Analysis</p>	<p><b>Chemical cells and fuel cells</b></p> <p><b>Cells and batteries</b></p> <ul style="list-style-type: none"> <li>• Interpret data for relative reactivity of different metals and evaluate the use of cells</li> </ul> <p><b>Fuel cells</b></p> <ul style="list-style-type: none"> <li>• Evaluate the use of hydrogen fuel cells in comparison with rechargeable cells and batteries</li> <li>• Write the half equations for the electrode reactions in the hydrogen fuel cell</li> </ul> <p><b>Pure substances</b></p> <ul style="list-style-type: none"> <li>• Use melting point and boiling point data to distinguish pure from impure substances.</li> </ul> <p><b>Formulations</b></p> <ul style="list-style-type: none"> <li>• Identify formulations given appropriate information. Students do not need to know the names of components in proprietary products.</li> </ul> <p><b>Chromatography</b></p> <ul style="list-style-type: none"> <li>• Explain how paper chromatography separates mixtures</li> <li>• Suggest how chromatographic methods can be used for distinguishing</li> </ul>	<p>Encourage your child to visit this website to learn about hydrogen fuel cells <a href="#">GCSE CHEMISTRY - What is a Hydrogen Fuel Cell? - What are the Advantages of a Hydrogen Fuel Cell? - What are the Disadvantages of a Hydrogen Fuel Cell? - GCSE SCIENCE.</a></p>
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	<p>pure substances from impure substances</p> <ul style="list-style-type: none"> <li>• Interpret chromatograms and determine Rf values from chromatograms</li> <li>• Provide answers to an appropriate number of significant figures.</li> </ul> <p><b>Testing for gases</b></p> <ul style="list-style-type: none"> <li>• Identify a test for Hydrogen using a burning splint held at the open end of a test tube of the gas. Hydrogen burns rapidly with a pop sound</li> <li>• Identify a test for Oxygen with a glowing splint inserted into a test tube of the gas, the splint relights</li> <li>• Identify a test for Carbon Dioxide using an aqueous solution of calcium hydroxide (lime water). When carbon dioxide is shaken with or bubbled through limewater the limewater turns milky (cloudy)</li> <li>• Identify a test for Chlorine using litmus paper. When damp litmus paper is put into chlorine gas the litmus paper is bleached and turns white</li> </ul> <p><b>Triple only</b></p> <p><b>Flame tests</b></p> <ul style="list-style-type: none"> <li>• <b>Identify some metal ions (cations) - Lithium, sodium, potassium, calcium and copper compounds</b></li> </ul> <p><b>Metal hydroxides</b></p>	<p>Encourage your child to visit BBC bitesize to read about separating mixtures using chromatography and how to calculate Rf values <a href="#">Chromatography - Purity and separating mixtures - OCR Gateway - GCSE Combined Science Revision - OCR Gateway - BBC Bitesize</a></p> <p>Encourage your child to watch this video on the tests for different gases <a href="#">GCSE Chemistry - How to Test for Gases - Testing for Chlorine / Oxygen / Hydrogen / CO2 #64 - YouTube</a></p> <p>Encourage your child to visit BBC bitesize to read about the tests used to identify ions in compounds <a href="#">Testing for ions and gases - Testing</a></p>
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**•Students should be able to write balanced equations for the reactions to produce the insoluble hydroxides.**

**Testing for anions**

**•Students should be able to recall the tests for carbonates, sulphates and halide ions**

**Instrumental methods**

**•Students should be able to state advantages of instrumental methods compared with the chemical tests in this specification**

**Flame emission spectroscopy**

**•Students should be able to interpret an instrumental result given appropriate data in chart or tabular form, when accompanied by a reference set in the same form, limited to flame emission spectroscopy**

[for ions and gases - GCSE Chemistry \(Single Science\) Revision - Other - BBC Bitesize](#)