



Lessons Sequence							
<b>TOPIC (S)</b> <b>USING</b> <b>RESOURCES</b>	<ol style="list-style-type: none"> <li>1. The Earth's resources</li> <li>2. Potable water</li> <li>3. Analysis and purification of water samples (required practical)</li> <li>4. Waste water treatment</li> <li>5. Alternative methods to extract metals</li> <li>6. Life cycle assessments</li> <li>7. Recycling</li> <li>8. <b>Corrosion and it's prevention</b></li> <li>9. <b>Alloys as useful materials</b></li> <li>10. <b>Ceramics, polymers and composites</b></li> <li>11. <b>The Haber process</b></li> <li>12. <b>NPK fertilisers</b></li> </ol>						
<b>Knowledge &amp; Skills development</b>	<ul style="list-style-type: none"> <li>• State examples of natural products that are supplemented or replaced by agricultural and synthetic products</li> <li>• Distinguish between finite and renewable resources given appropriate information.</li> <li>• Extract and interpret information about resources from charts, graphs and tables</li> <li>• Use orders of magnitude to evaluate the significance of data</li> <li>• Distinguish between potable water and pure water</li> <li>• Describe the differences in treatment of ground water and salty water and give reasons for each step</li> <li>• Describe the process of treating waste water to make it potable</li> <li>• Comment on the relative ease of obtaining potable water from waste, ground and salt water</li> <li>• Describe the processes of phytomining and bioleaching to extract copper from low grade ores</li> <li>• Be able to carry out simple comparative LCAs for shopping bags made from plastic and paper</li> <li>• Evaluate ways of reducing the use of limited resources, given appropriate information</li> <li>• <b>Describe experiments and interpret results to show that both air and water are necessary for rusting</b></li> <li>• <b>Explain sacrificial protection in terms of relative reactivity</b></li> <li>• <b>Recall a use of specific alloys</b></li> <li>• <b>Interpret and evaluate the composition and uses of alloys other than those specified given appropriate information</b></li> <li>• <b>Compare quantitatively the physical properties of glass and clay ceramics, polymers, composites and metals</b></li> <li>• <b>Explain how the properties of materials are related to their uses and select appropriate materials</b></li> <li>• <b>Apply the principles of dynamic equilibrium in Reversible reactions and dynamic equilibrium to the Haber process</b></li> <li>• <b>Explain the trade-off between rate of production and position of equilibrium</b></li> <li>• <b>Explain how the commercially used conditions for the Haber process are related to the availability and cost of raw materials and energy supplies</b></li> <li>• <b>Recall the names of the salts produced when phosphate rock is treated with nitric acid, sulphuric acid and phosphoric acid</b></li> <li>• <b>Compare the industrial production of fertilisers with laboratory preparations of the same compounds, given appropriate information</b></li> </ul>						
<b>Assessment / Feedback Opportunities</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Targeted questioning throughout topic</td> <td style="width: 25%;">Teacher assessment of practical skills during investigation - verbal</td> <td style="width: 25%;">Knowledge Recall Quizzes</td> <td style="width: 25%;">Deep marking of written task in students books</td> <td style="width: 25%;">Topic Test</td> <td style="width: 25%;">Targeted exam questions – teacher or self-assessed</td> </tr> </table>	Targeted questioning throughout topic	Teacher assessment of practical skills during investigation - verbal	Knowledge Recall Quizzes	Deep marking of written task in students books	Topic Test	Targeted exam questions – teacher or self-assessed
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<b>Cultural Capital</b>	<ul style="list-style-type: none"> <li>• Local Impact- local waste management company Veola</li> </ul>						

<b>SMSC / Promoting British Values</b> (Democracy, Liberty, Rule of Law, Tolerance & Respect)	<ul style="list-style-type: none"> <li>• Effect of fly-tipping on the environment</li> <li>• Impact of drinking dirty water on health in other countries</li> <li>• Listening to others during presentations</li> <li>• Working in groups during practicals or research tasks</li> </ul>
<b>Reading opportunities</b>	<ul style="list-style-type: none"> <li>• News articles</li> <li>• Recommended Read: All About Chemistry (Big Questions) (Robert Winston)</li> </ul>
<b>Key Vocabulary</b>	<p>Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest</p> <p>Agriculture, Potable, Microbe, Pure, Ground Water, Distillation, Filtration, Sterilisation, Sedimentation, Finite, Limited, Phytomining, Bioleaching, Alloy, Composition, Physical, Properties, Composites, Polymers, Commercial, Industrial, Fertilisers</p>
<b>Digital Literacy</b>	<p>SharePoint resources including topic quizzes</p> <p>Possible use of excel to plot graphs and analyse data, powerpoint, word, etc to present information, internet for research</p>
<b>Cross-Curricular Links</b>	<p>Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators</p>
<b>Careers</b>	<p>Environmental scientists, politicians, water treatment workers, careers within companies like united utilities, metal workers and mining, chemical manufacturing</p>