



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

SMSC / Promoting British Values (Democracy, Liberty, Rule of Law, Tolerance & Respect)	<ul style="list-style-type: none"> • Effect of fly-tipping on the environment • Impact of drinking dirty water on health in other countries • Listening to others during presentations • Working in groups during practicals or research tasks
Reading opportunities	<ul style="list-style-type: none"> • News articles • Recommended Read: All About Chemistry (Big Questions) (Robert Winston)
Key Vocabulary	<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>
Digital Literacy	<p>Firefly 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>
Cross-Curricular Links	<p>Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators</p>
Careers	<p>Environmental scientists, politicians, water treatment workers, careers within companies like united utilities, metal workers and mining, chemical manufacturing</p>