

Chemistry – Using resources – Checklist

4.10.1. Using the Earth's resources and obtaining potable water	Taught	Practiced	Mastered
Define the terms: <ul style="list-style-type: none"> • finite • renewable. Explain the differences between the two terms using suitable examples.			
Define the terms: <ul style="list-style-type: none"> • potable water • pure water. Explain the differences between the two terms. Extended writing: describe the process of desalination. Extended writing: describe the process of distillation Extended writing: explain why distillation separates substances. Grade 9: explain what happens to substances during the process of distillation in terms of intermolecular forces of attraction.			
Extended writing: describe the processes of Phytomining & Bioleaching			
Evaluate the impacts and benefits of biological methods of extracting metal.			

4.10.2 Life cycle assessment and recycling	Taught	Practiced	Mastered
Describe what a LCA is using a suitable example. Use information to interpret the LCA of a given material or product.			
Discuss the negative issues relating to LCAs and why caution should be used when using them. Discuss the issues relating to using limited resources to generate energy. Extended writing: describe the environmental impacts of obtaining raw materials from the Earth.			

4.10.3 Using materials	Taught	Practiced	Mastered
<p>Define the following terms using suitable examples:</p> <ul style="list-style-type: none"> • corrosion • rusting • sacrificial protection. <p>Describe how to prevent corrosion using the examples:</p> <ul style="list-style-type: none"> • oxide coating on aluminium • zinc on iron • magnesium on steel. <p>Use suitable examples to explain why corrosion can be prevented using barriers and the role of sacrificial barriers if appropriate to the example used.</p>			
<p>Define the terms:</p> <ul style="list-style-type: none"> • alloy • high carbon steel • low carbon steel. <p>Using diagrams, describe the difference between metals and their alloys. Describe the composition of common alloys and their uses.</p> <p>State properties of examples of alloys. Explain, in relation to the structure, why these alloys have these properties.</p>			
<p>Describe how the following are produced and give uses for each:</p> <ul style="list-style-type: none"> • soda-lime glass • borosilicate glass • clay ceramics • low-density poly(ethene) • high density poly(ethene) • composites. <p>Using diagrams, describe the structure of the following polymers:</p> <ul style="list-style-type: none"> • thermosoftening • thermosetting. <p>Use these diagrams and descriptions to explain why the following happens when heated:</p> <ul style="list-style-type: none"> • thermosoftening polymers melt • thermosetting polymers do not melt. 			

4.10.4 The Haber process and the use of NPK fertilisers	Taught	Practiced	Mastered
<p>State where the raw materials in the Haber process come from.</p> <p>Describe the process for manufacturing ammonia.</p> <p>Write a balanced symbol equation for the manufacture of ammonia. Use this to describe the reaction in terms of reactants, products, conditions and number of moles.</p> <p>Recall the following topics:</p> <ul style="list-style-type: none"> • dynamic equilibrium • temperature affecting the rate of a reaction • pressure. <p>Explain how each of these affects the Haber process reaction.</p> <p>Discuss the effect of the following conditions on the reaction:</p> <ul style="list-style-type: none"> • a high temperature • a low temperature • a high pressure • a low pressure • use of a catalyst • no catalyst. <p>Discuss the pros and cons of these varying conditions.</p> <p>Explain the trade-off between the rate of the reaction and the position of the equilibrium.</p> <p>Explain how the conditions used in industry affect the equilibrium position, rate and costs of the reaction.</p>			
<p>Extended writing: compare how fertilisers are produced in industry and in the laboratory.</p> <p>Investigate what was used as fertilizer before the industrial preparation of fertilisers was invented.</p> <p>Haber's ambiguous morality could be discussed in the context of his work with fertilisers compared to his work on poison gas in World War I.</p>			