

Knowledge Organiser – Sustainable Development

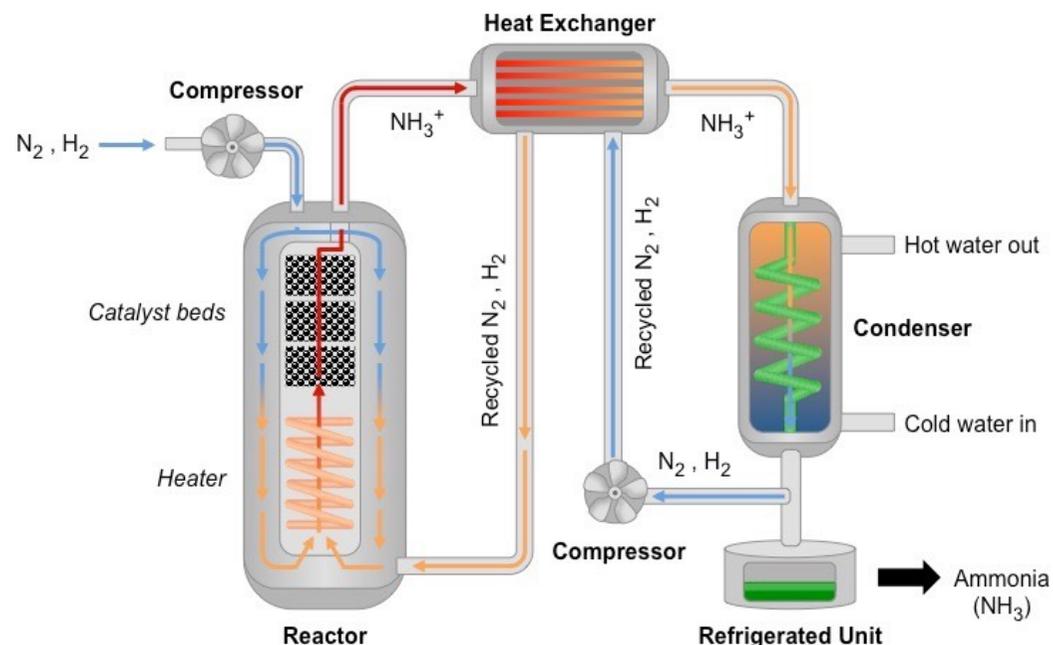
Knowledge and Content

- State examples of natural products that are supplemented or replaced by agricultural and synthetic products
- Distinguish between potable water and pure water
- Describe the differences in treatment of ground water and salty water
- Describe how sewage is treated
- Compare the ease of treating waste water, groundwater and salt water
- Describe the processes of phytomining and bioleaching
- Describe the components of a Life-Cycle Assessment (LCA) and interpret LCAs of materials or products from information
- Describe ways of recycling and reusing materials and explain why these processes are important
- Show that air and water are needed for rusting
- Describe the composition of common alloys
- Compare glass, 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 to the Haber process
- Explain how the commercially used conditions for the Haber process are related to the availability and cost of raw materials and energy supplies, control of equilibrium position and rate

Mathematical and Practical Skills

- Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation.
- Compare quantitatively the physical properties of materials
- Translate information between graphical and numerical form
- Understand and use the symbols =, <, <<, >>, >, ~
- Use ratios, fractions and percentages
- Make order of magnitude calculations
- Recognise and use expressions in standard form
- Recognise and use expressions in decimal form
- Solve simple algebraic equations
- Understand and use simple mathematical symbols
- Construct and interpret frequency tables and diagrams, bar charts and histograms
- Make estimates of the results of simple calculations

Haber Process



Key Terms

Keyword	Definition
Ceramics	Materials made by heating clay, or other compounds, to high temperatures (called firing) to make hard, but often brittle, materials, which make excellent electrical insulators.
Alloy	A mixture of two or more elements at least one of which is a metal.
Carbon Footprint	The total amount of carbon dioxide and other greenhouse gases emitted over the full lifecycle of a product, service or event.
Composites	Materials made of two or more different materials, containing a matrix or binder surrounding and binding together fibres or fragments of another material which acts as the reinforcement.
Galvanised	Iron or steel objects that have been protected from rusting by a thin layer of zinc metal at their surface.
Le Chatelier's Principle	When a change in conditions is introduced to a system at equilibrium, the position of equilibrium shifts so as to cancel out the change.
Rusting	The corrosion of iron.
Equilibrium	The point in a reversible reaction at which the forward and backward rates of reaction are the same. Therefore, the amounts of substances present in the reacting mixture remain constant.
Life Cycle Assessment	Carried out to assess the environmental impact of products, processes or services at different stages in their life cycle.