

Year 11 C15: Using our resources (separate science only). Chemistry – Science Faculty

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:
<p>This chapter builds upon understanding of the oxidation and reduction of metals and their ions from C5. Pupils learn what rusting is and then how it can be prevented. A number of other useful materials are studied in this chapter including revisiting polymers (C11) in more detail.</p> <p>The Haber process is studied in great detail, building upon ideas introduced in chapter 8 (C8). Including how the product of the process, ammonia, can be converted into useful fertilisers both experimentally and industrially.</p>	<ul style="list-style-type: none"> • Rusting • Useful alloys • The properties of polymers • Glass, ceramics and composites • Making ammonia – the Haber process • The economics of the Haber process • Making fertilisers in the lab • Making fertilisers in industry 	<p>Titration Galvanise Thermosetting Thermosoftening Alloy Composite</p>
Challenge and Support:	World wide learning/ links to 21 st century:	Cultural capital/ Industry/ Enrichment:
<ul style="list-style-type: none"> • <i>Pupils will be challenged to explain why the Haber process is considered to be a 'compromise' between increased yield and increased rate of reaction. This requires drawing on</i> 	<ul style="list-style-type: none"> • Fertilisers produced in the way described in this chapter have allowed the human population to grow to the size it has. Approximately 40% of the worlds population relies on food grown using fertilisers produced by the Haber process. 	<ul style="list-style-type: none"> • The UK has a large ceramics industry. • Modern aircraft use new composites to reduce weight and therefore carbon emission and noise. • Composites are rapidly replacing traditional materials in manufacturing.
Historical, Social, Moral, Spiritual, Cultural context:	Cross curricular links/ literacy/numeracy:	Common misconceptions:
<ul style="list-style-type: none"> • Fritz Haber was a Jewish German scientist who used his understanding of chemistry to help the Germans produce more explosives in world 	<ul style="list-style-type: none"> • Links to GCSE/KS3 biology: NPK fertilisers in plants. 	<ul style="list-style-type: none"> • <i>All metals rust</i> • <i>If you speed up a reaction you will increase the amount of product you get</i>

war 1, as well as pioneering chemical weapons. His life provides a great opportunity to look at the ability of science to impact the world in unexpected ways. Haber was awarded the Nobel Prize in 1918, should he have been?

- *24 carat gold makes the best jewellery*

Assessment timeline:

- *regular EPPQs*
- *end of unit test (separate science only)*
- *EPPQ homework task*
- *in lesson questioning and other progress checks*

Home learning

- *EPPQ homework booklet*

Feedback

- *Students self/peer mark homework booklets and set revision goals based on understanding.*
- *Feedback based on the end of the unit test (separate science only).*

Length of unit (duration indicated in lessons)

C15.1	C15.2	C15.3	C15.4	C15.5	C15.6	C15.7	C15.8	C15 test
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Unit: C15 Using our resources, Chemistry