

Year 10 C7: Energy Changes. Chemistry – Science Faculty

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:
<p>In this chapter, students will learn about the energy transfers that occur during chemical reactions. They should understand that an exothermic reaction transfers energy from the system to the surroundings, and an endothermic reaction transfers energy from the surroundings to the system. This is a key concept that students should be confident with. Students should be able to interpret experimental data to identify if a reaction is exothermic or endothermic and should be able to describe some uses of exothermic and endothermic reactions.</p> <p>Students will further develop their qualitative understanding of the energy transfers in a reaction into a quantitative understanding. They should be confident with sketching and interpreting reaction profile diagrams and higher-tier students should be able to use bond energies to calculate overall energy changes for a reaction, identifying if it is exothermic or endothermic.</p> <p>Separate science students will also apply their understanding of the reactivity series and electrolysis to chemical cells and fuel cells.</p>	<ul style="list-style-type: none"> • Exothermic and endothermic reactions • Using energy transfers from reactions • Reaction profiles • Bond energy calculations • Chemical cells and batteries (separate science) • Fuel cells (separate science) 	<ul style="list-style-type: none"> • Exothermic • Endothermic • Enthalpy • Reactant • Product
Challenge and Support:	World wide learning/ links to 21 st century:	Cultural capital/ Industry/ Enrichment:
<ul style="list-style-type: none"> • <i>Worked examples of bond energy calculations given and explained in class.</i> • <i>More challenging bond energy calculations using chemicals containing double and triple bonds provided.</i> 	<ul style="list-style-type: none"> • New catalysts are being developed that allow the reaction profiles (energy level diagrams) to follow different pathways to produce products using less energy. • We can calculate how much energy is in the fuel we use and compare potential replacement fuels using bond energy 	<ul style="list-style-type: none"> • Energy conservation and temperature control are important to the success of any large manufacturing industry. Some of the processes involved in the production of steel take in energy while others release energy. Understanding of what processes release and absorb energy allows them to be undertaken in a more economical

	<p>calculations.</p> <ul style="list-style-type: none"> Hydrogen fuel cells are seen as a potentially clean alternative to burning petrol and diesel in cars. 	<p>way.</p>
Historical, Social, Moral, Spiritual, Cultural context:	Cross curricular links/ literacy/numeracy:	Common misconceptions:
<ul style="list-style-type: none"> <i>.Analysing the use of hydrogen fuel cells as a potential replacement for petrol in cars. Pupils must consider the benefits and drawbacks of implementing these technologies in an attempt to reduce global warming.</i> 	<ul style="list-style-type: none"> <i>Links with GCSE biology units B8 and B9 which look at photosynthesis and respirations, these are example of exothermic and endothermic reactions.</i> 	<ul style="list-style-type: none"> <i>If a reaction is exothermic, all of the changes in bonds release heat.</i> <i>If a chemical absorbs heat it will get hotter.</i>
Assessment timeline:		
<ul style="list-style-type: none"> <i>regular EPPQs</i> <i>end of unit test</i> <i>EPPQ homework task</i> <i>in lesson questioning and other progress checks</i> 		
Home learning		
<ul style="list-style-type: none"> <i>EPPQ homework booklet</i> 		
Feedback		
<ul style="list-style-type: none"> <i>Students self/peer mark homework booklets and set revision goals based on understanding.</i> <i>Feedback based on the end of the unit test.</i> 		

Length of unit (duration indicated in lessons)

C7.1	C7.2	C7.3	C7.4	C7.5 (separate science only)	C7.6 (separate science only)	C7 test
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Unit: C7: Energy changes, Chemistry