Ravens Wood School

KS3 Curriculum Plan

Subject: Year 8 Chemical Energy

Overarching Topic: Chemical Energy			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	• Chemical reactions are happening inside your body every moment of every day. For example, our bodies use the food we eat to provide chemical energy which allows up to produce the molecules our bodies need to live. We can all appreciate that water does not spontaneously boil at room temperature; instead we must heat it. Because we must add heat, boiling water is a process that chemists call endothermic. Clearly, if some processes require heat, others must give off heat when they take place. These are known as exothermic. • Understanding what happens at the bond level during a chemical reaction is a fundamental skill and can be applied across all of Biology, Chemistry and Physics. It also encourages students to think about how chemical reactions can be used as energy sources. Students have already studied the Periodic Table and Elements in year 7 and will have studied Types of Reaction in year 8, so should be familiar with the concepts of bonds being formed between atoms and then atoms rearranging in reactions as bonds break and reform. They also study energy changes in Physics later in the year. The same concept is revisited at KS4, where bond energy calculations also have to be completed. Links also to Respiration and Photosynthesis in KS3 and KS4.		
	Critical	**Core**	**Pinnacle**
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	What is an atom? What is a bond? What does endothermic mean? What does exothermic mean? What are examples of endothermic and exothermic reactions? What is a catalyst? What is activation energy?	Does it take energy to make or break bonds? How do you explain whether overall a reaction is endothermic or exothermic, using what is happening at the bond level in your answer? How do you use experimental observations to distinguish exothermic and endothermic reactions? How do you use a diagram of relative energy levels of particles to explain energy changes observed during a change of state? How does a catalyst work?	How do you predict whether a chemical reaction will be exothermic or endothermic given data on bond strengths? Can I use energy data to select a reaction for a chemical hand warmer or cool pack? In your life, do you think endothermic or exothermic reactions are more important?
The Key Skills/ Techniques	**The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.**		
	Skill/Technique	**How will this skill be developed?**	
	1. Graphing & Drawing	Draw graphs with suitable scales, axes and units. Correct line of best fit. Appreciation of anomalies and processed data. Scientific drawing of cells, concepts and scientific equipment.	
	2. Variables	Identify independent, dependent and control variables and devise experiments to include these to ensure valid results. Appreciation of uncertainty.	
	3. Data Analysis	Describe, explain and predict trends. Graph and table data interpretation. Identify links and patters within and between topics. Statistical analysis of data to include mode/median/mean/range determination. Drawing justified conclusions from presented data.	
	4. Application	Apply known and taught theory in unfamiliar contexts. Making links to taught theory and extracting key ideas. Communicating using correct scientific terminology.	
	5. Working Scientifically	Identify hazards and planning to limit risk. Describe how to improve accuracy/precision/repeatability/reproducibility/validity. Evaluate reliability of methods and investigations, taking in to account data analysis.