Yr12 Chemistry – Unit 3.1

MAGHULL HIGH SCHOOL – CURRICULUM MAP

	Sequence		
TOPIC (S) **ENERGETICS**	1. Enthalpy Change 2. Calorimetry	3. Applications of Hess' Law 4. Bond enthalpies	
Knowledge & Skills development	• Know reactions can be endothermic or exothermic. • Know enthalpy change (ΔH) is the heat energy change measured under conditions of constant pressure. • Know standard enthalpy changes refer to standard conditions ie 100 kPa and a stated temperature (eg ΔH298Θ). • Define standard enthalpy of combustion (ΔcHΘ) d • Define standard enthalpy of formation (ΔfHΘ). • Know the heat change, q, in a reaction is given by the equation q = mcΔT where m is the mass of the substance that has a temperature change ΔT and a specific heat capacity c. • Use this equation to calculate the molar enthalpy change for a reaction • Use this equation in related calculations. • Understand that the correct units need to be used in q = mcΔT • Report calculations to an appropriate number of significant figures, given raw data quoted to varying numbers of significant figures. • Understand that calculated results can only be reported to the limits of the least accurate measurement	• **Required practical 2** Measurement of an enthalpy change. • Find ΔH for a reaction by calorimetry. Examples of reactions could include: dissolution of potassium chloride, dissolution of sodium carbonate, neutralising NaOH with HCl, displacement reaction between CuSO4 + Zn, combustion of alcohols. • Use Hess's law to perform calculations, including calculation of enthalpy changes for reactions from enthalpies of combustion or from enthalpies of formation. • Define the term mean bond enthalpy • Understand that bond enthalpies are mean values across a range of compounds containing that bond. • Use mean bond enthalpies to calculate an approximate value of ΔH for reactions in the gaseous phase • Explain why values from mean bond enthalpy calculations differ from those determined using Hess's law. •	
Assessment / Feedback Opportunities	Exam questions – teacher assessed	Exam questions – self assessed	Extended writing task – teacher assessed	Deep marking of required practical in lab books	Topic assessment
Cultural Capital	• Use of a calorimeter				
SMSC / Promoting British Values **(Democracy, Liberty, Rule of Law, Tolerance & Respect)**	• Linking calorimetry to food and diet, and the requirement of 'counting calories' in our society.				
Reading opportunities	• Recommended Read: Reactions: An Illustrated Exploration of Elements, Molecules, and Change in the Universe, Theador Gray				

Key Vocabulary	Enthalpy, Exothermic, Endothermic, Calorimetry, Hess's Law, Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest, Absolute, Uncertainty, Error
Digital Literacy	The use of a data logger to analyse temperature changes during a reaction MSOffice35 apps including SharePoint
Cross-Curricular Links	Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators
Careers	Regulatory Affairs, Quality Assurance, Environmental Protection, Public Health, Chemical Health and Safety