Yr12 Chemistry – Unit 6.2

	Sequence		
TOPIC (S) **AMOUNT OF SUBSTANCE**	1. RAM 2. The Mole and Avogadro's constant	3. The ideal gas equation 4. Empirical and molecular formula	5. Balanced equations

Knowledge & Skills development	• Define relative atomic mass (Ar) and relative molecular mass (Mr) in terms of 12C • Know that the term relative formula mass will be used for ionic compounds. • Describe the Avogadro constant as the number of particles in a mole. • Be aware that the mole can be applied to electrons, atoms, molecules, ions, formulas and equations. • Know the concentration of a substance in solution is measured in mol dm–3. • Carry out calculations: using the Avogadro constant, using mass of substance, Mr, and amount in moles, using concentration, volume and amount of substance in a solution. • Know the ideal gas equation $pV = nRT$ with the variables in SI units, and use it in calculations • Define the empirical formula as the simplest whole number ratio of atoms of each element in a compound. • Define molecular formula as the actual number of atoms of each element in a compound.	• Calculate empirical formula from data giving composition by mass or percentage by mass • Calculate molecular formula from the empirical formula and relative molecular mass. • Write equations (full and ionic). • Know the formula for percentage atom economy: (molecular mass of desired product /sum of molecular masses of all reactants) ×100 • Describe economic, ethical and environmental advantages for society and for industry of developing chemical processes with a high atom economy. • Write balanced equations for reactions studied • Balance equations for unfamiliar reactions when reactants and products are specified. • Use balanced equations to calculate: masses, volumes of gases, percentage yields, percentage atom economies, concentrations and volumes for reactions in solutions • **Required practical 1** Make up a volumetric solution and carry out a simple acid–base titration

Assessment / Feedback Opportunities	Exam questions – teacher assessed	Exam questions – self assessed	Extended writing task – teacher assessed	Required practical write up in lab book	Topic assessment
Cultural Capital	• Trip to an industrial chemical plant to observe chemical processes				
SMSC / Promoting British Values (Democracy, Liberty, Rule of Law, Tolerance & Respect)	• Discussion 'why should being wasteful be discouraged'				
Reading opportunities	• Recommended Read: A Mole of Chemistry: An Historical and Conceptual Approach to Fundamental Ideas in Chemistry, Dr. Caroline Desgranges				

Key Vocabulary	Relative atomic mass, Relative molecular mass, Avagadro's constant, Mole, Concentration, Empirical formula, Molecular formula, Atom economy, Yield, 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 excel to plot graphs and analyse data 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, conversion of units Literacy – evaluation and discussion
Careers	Analytical Chemist, Chemical Engineer, Analytical Chemist, Chemical Engineer, Water chemist, Pharmacist