Meden School Curriculum Planning							
Subject	Chemistry	**Year Group**	12	**Sequence No.**		**Topic**	3.1.2 Amount of Substance

Retrieval	Core Knowledge	Student Thinking
What do teachers need to **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need to teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
All of C3 from GCSE. Titration practical from C4.	**3.1.2.1 Relative Atomic Mass and Relative Molecular Mass** Relative atomic mass and relative molecular mass in terms of ^{12}C. The term relative formula mass will be used for ionic compounds. Relative atomic mass (A_r): The relative atomic mass of an element is the average mass of its atoms, compared to 1/12th the mass of a carbon-12 atom Relative molecular mass (M_r): The relative molecular mass is the sum of the relative atomic masses of all of the atoms in the molecule. **3.1.2.2 The Mole and the Avogadro Constant** The Avogadro constant as the number of particles in a mole. (6.02×10^{23}) The mole as applied to electrons, atoms, molecules, ions, formulas and equations. The concentration of a substance in solution, measured in mol dm–3. Moles = Mass(g)/ Ar or Mr Concentration = moles/volume(dm^3)	Use of titrations in the medical and forensic world. How is Titration Used in the Pharmaceutical Industry? (reagent.ie) Use of titration in drug analysis, metallurgy etc. Metal Titration Applications | METTLER TOLEDO (mt.com)

	Number of particles = moles x Avogadro constant 3.1.2.3 The Ideal Gas Equation The ideal gas equation is pV=nRT, P= pressure in Pa V = Volume in m3 N= number of moles R= gas constant T= Temperature in K **3.1.2.4 Empirical and Molecular Formula** Empirical formula is the simplest whole number ratio of atoms of each element in a compound. Molecular formula is the actual number of atoms of each element in a compound. The relationship between empirical formula and molecular formula. Students should be able to: • calculate empirical formula from data giving composition by mass or percentage by mass • calculate molecular formula from the empirical formula and relative molecular mass. **3.1.2.5 Balanced Equations and Associated Calculations** Equations (full and ionic). Percentage atom economy is: molecular mass of desired product × 100 sum of molecular masses of all reactants Economic, ethical and environmental advantages for society and for industry of developing chemical processes with a high atom economy. Students should be able to: • write balanced equations for reactions studied • balance equations for unfamiliar reactions when reactants and products are specified.	

	Students should be able to use balanced equations to calculate: • masses • volumes of gases • percentage yields • percentage atom economies • concentrations and volumes for reactions in solutions. Students could be asked to find: • the concentration of ethanoic acid in vinegar • the mass of calcium carbonate in an indigestion tablet • the Mr of MHCO3 • the Mr of succinic acid • the mass of aspirin in an aspirin tablet • the yield for the conversion of magnesium to magnesium oxide • the Mr of a hydrated salt (eg magnesium sulfate) by heating to constant mass. **Required practical 1** Make up a volumetric solution and carry out a simple acid–base titration. Students must be able to describe the correct procedure for carrying out both activies. Students select appropriate titration data (ie identify outliers) in order to calculate mean titres. Students determine uncertainty when two burette readings are used to calculate a titre value.	