

# CHEMISTRY – YEAR 10 – Quantitative Chemistry HIGHER

A QUANTITATIVE CHEMISTRY		
1	Conservation of mass	No atoms are lost or made during a chemical reaction. Mass of products equals the mass of reactants, in a closed system
2	Relative formula mass, $M_r$	Sum of the relative atomic masses of the atoms in the numbers shown in the formula.
3	Relative Atomic Mass, $A_r$	Average mass of the isotopes of an element relative to 1/12th carbon-12 atom
4	Moles	Avogadro's constant = $6.02 \times 10^{23}$ The mass of 1 mole of a compound is equal to the $M_r$ , or the $A_r$ for an element.
5	Limiting reagents	The reactant that is completely used up is the limiting factor.
6	Excess Reagent	More than required is added to ensure the limiting reagent completely reacts.

B IMPORTANT EQUATIONS		
1	% by Mass	$= \frac{\text{Total } A_r \text{ for every atom of the element}}{M_r \text{ of compound}} \times 100$
2	Number Moles	$= \frac{\text{mass (g)}}{M_r}$
3	Number of atoms/molecules/ions	$= \text{moles} \times 6.02 \times 10^{23}$
4	Concentration ( $\text{g/dm}^3$ )	$= \frac{\text{mass of solute (g)}}{\text{volume of solution (dm}^3\text{)}}$
5	Concentration ( $\text{mol/dm}^3$ )	$= \frac{\text{moles}}{\text{volume (dm}^3\text{)}}$
6	Volume Conversion	$\frac{\text{cm}^3}{1000} = \text{dm}^3$