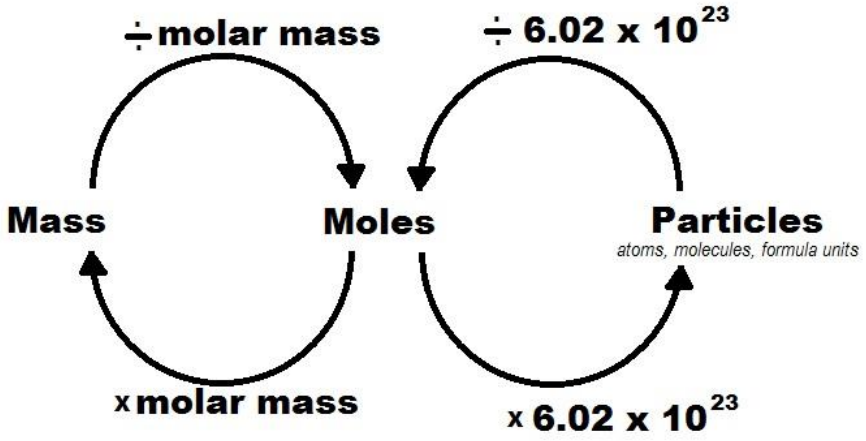
Chemistry Topic 3: Quantitative chemistry

1. Keywords	
Conservation of mass	No atoms are made or lost during a chemical reaction. The mass before the reaction must equal the mass after a reaction IN A CLOSED SYSTEM
Closed system	A container which no chemicals can escape. Eg a sealed bottle
Relative formula mass (Mr)	Sum of relative atomic masses from periodic table
Balanced equation	When the sum of the Mr on the left equals the sum of the Mr on the right
Uncertainty	The percentage of a result that might be wrong. Shown from differences between repeats
Limiting reactant	The reactant which runs out first

2. Moles (HT ONLY)	
Mole	The number of particles needed to make the mass equal the atomic mass
Avogadro constant	6.022×10^{23} particles in 1 mole



3a. Concentration		
$$C = \frac{mass}{V}$$		
C	Concentration	g/dm^3
$mass$	mass	g
V	volume	dm^3 (litres)

3b. Concentration (HT ONLY)		
$$C = \frac{\mathrm{m}}{V}$$		
C	Concentration	mol/dm^3
m	mole	mol
V	volume	dm^3 (litres)

4. Percentage yield (TRIPLE ONLY)

$$\%\text{Yield} = \frac{\text{actual mass}}{\text{expected mass}} \; x \; 100$$

%Yield	Percentage yield	%
mass of actual	Mass of product actually obtained	g
Maximum mass	The theoretical maximum mass possible	g

5. Atom economy (TRIPLE ONLY)

$$\%\ \text{Atom economy} = \frac{Mr\ of\ desired\ product}{\text{Sum of Mr for all reactants}} \; x \; 100$$

% Atom economy	Percentage atom economy	%
Mr of desired product	Relative formula mass of the product you want	g/mol
Sum of Mr for all reactants	The total of all the react Mr added together	g/mol

6. Volume of gases (TRIPLE HT ONLY)

1 mole of gas occupies 24 dm^3	If 20°C and 1 atmosphere pressure
Equal moles occupy the same volume	