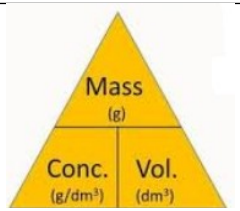
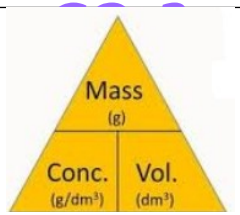
H	1	2	3	4	5	6
1	Number of molecules in 88g of CO_2?	Burning Mg in air results in a product of greater mass	sum of reactant M_r = sum of product M_r	No of electrons in one mole of electrons?	Law of constant composition	It is not always possible to obtain the calculated theoretical mass of a product
2	between 2CO and CO_2?	M_r	Balanced symbol equations	g/dm^3	Law of conservation of mass	6.02×10^{23}
3		% yield	$24\ dm^3$	In a catalytic converter, $2CO + O_2 \rightarrow 2CO_2$ If 0.4 moles of carbon monoxide react, how many moles of carbon dioxide are made?		Change in mass in non-enclosed system
4	Avogadro constant	Balanced symbol equation	Product mass = reactant mass	Mass of 0·1 moles of CH_3CH_2OH?	Mol/dm^3	Relative formula mass
5	Atom Economy: Compare $3H_2 + N_2 \rightarrow 2NH_3$ with $NH_4NO_3 + KOH \rightarrow NH_3 + H_2O + KNO_3$		$NaOH + HCl \rightarrow NaCl + H_2O$ If 25.0 cm^3 of 0.5 mol/dm^3 NaOH reacts with 23.9 cm^3 of HCl, what is the concentration of the acid?		moles	Atom economy
6	Loss of gas into the air for example	$NaOH + HCl \rightarrow NaCl + H_2O$ How much sodium chloride is possible from reacting 4g sodium hydroxide?		Same volume at same temperature and pressure	Why use a reactant in excess?	$CaCO_3 \rightarrow CaO + CO_2$ Theoretical mass of CaO when 100g $CaCO_3$ decomposes?

H	1	2	3	4	5	6
1	Number of molecules in 88g of CO_2?	?	sum of reactant M_r = sum of product M_r	No of electrons in one mole of electrons?	Law of constant composition	It is not always possible to obtain the calculated theoretical mass of a product
2	Difference between 2CO and	M_r	Balanced symbol equations	g/dm^3	?	6.02×10^{23}
3		% yield	?	In a catalytic converter, $2CO+O_2 \rightarrow 2CO_2$ If 0.4 moles of carbon monoxide react, how many moles of carbon dioxide are made?		Change in mass in non-enclosed system
4	?	Balanced symbol equation	Product mass = reactant mass	Mass of 0·1 moles of CH_3CH_2OH?	Mol/dm^3	Relative formula mass
5	Atom Economy: Compare $3H_2 + N_2 \rightarrow 2NH_3$ with $NH_4NO_3 + KOH \rightarrow NH_3 + H_2O + KNO_3$		$NaOH + HCl \rightarrow NaCl + H_2O$ If 25.0 cm^3 of 0.5 mol/dm^3 NaOH reacts with 23.9 cm^3 of HCl, what is the concentration of the acid?		moles	?
6	Loss of gas into the air for example	$NaOH + HCl \rightarrow NaCl + H_2O$ How much sodium chloride is possible from reacting 4g sodium hydroxide?		?	Why use a reactant in excess?	$CaCO_3 \rightarrow CaO + CO_2$ Theoretical mass of CaO when 100g $CaCO_3$ decomposes?

F	1	2	3	4	5	6
1	No atoms are made or lost in a chemical reaction	Burning Mg in air results in a product of greater mass	sum of reactant M_r = sum of product M_r	A_r	Law of constant composition	It is not always possible to obtain the calculated theoretical mass of a product
2	Difference between 2CO and	M_r	Balanced symbol equations	g/dm^3	Balance... $NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$	solution
3	How many atoms of each element in $(NH_4)_2SO_4$?	% yield	Relative atomic mass	solute	Mass÷volume	Observed change in mass in open system
4	Loss of gas into the air for example	Balanced symbol equation	Product mass = reactant mass	M_r of CH_3CH_2OH?	Sustainable development	Relative formula mass
5	Making a measurement always result in uncertainty. What reasons are there for this?		$\%\ \text{Yield} = \frac{\text{Mass of product actually made}}{\text{Maximum theoretical mass of product}} \times 100$		Law of conservation of mass	Atom economy
6	Word equation	Reversible reaction, loss of product or unexpected reaction	$C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ 120g of C produces 440g of CO_2. How much O_2 reacted?		Actual yield	solvent

F	1	2	3	4	5	6
1	No atoms are made or lost in a chemical reaction	Burning Mg in air results in a product of greater mass	sum of reactant M_r = sum of product M_r	A_r	?	It is not always possible to obtain the calculated theoretical mass of a product
2	Difference between 2CO and	?	Balanced symbol equations	g/dm^3	Balance... $NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$	solution
3	How many atoms of each element in $(NH_4)_2SO_4$?	% yield	Relative atomic mass	?	Mass÷volume	Observed change in mass in open system
4	?	Balanced symbol equation	Product mass = reactant mass	M_r of CH_3CH_2OH?	Sustainable development	Relative formula mass
5	Making a measurement always result in uncertainty. What reasons are there for this?		$\%\ \text{Yield} = \frac{\text{Mass of product actually made}}{\text{Maximum theoretical mass of product}} \times 100$		Law of conservation of mass	?
6	?	Reversible reaction, loss of product or unexpected reaction	$C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ 120g of C produces 440g of CO_2. How much O_2 reacted?		Actual yield	solvent

4.10 Using Resources revision checklist

Can you…	☹	😐	☺
a) State the law of conservation of mass and appreciate that no atoms are lost or made during a chemical reaction			
b) correctly use the multipliers in equations in normal script before a formula and in subscript within a formula			
c) explain any observed changes in mass (in open systems) during a chemical reaction, given the balanced symbol equation for the reaction and explain these changes in terms of the particle model			
d) represent the distribution of results and make estimations of uncertainty			
e) use the range of a set of measurements about the mean as a measure of uncertainty			
f) moles can apply to atoms, molecules, ions, electrons, formulae and equations			
g) use the relative formula mass of a substance to calculate the number of moles in a given mass of that substance (and vice versa)			
h) calculate the masses of substances shown in a balanced symbol equation			
i) calculate the masses of reactants and products from the balanced symbol equation and the mass of a given reactant or product			
j) explain the effect of a limiting quantity of a reactant on the amount of products it is possible to obtain in terms of amounts in moles or masses in grams			
k) calculate the mass of solute in a given volume of solution of known concentration in terms of mass per given volume of solution			
l) (HT only) explain how the mass of a solute and the volume of a solution is related to the concentration of the solution			
m) evaluate ways of reducing the use of limited resources, given appropriate information			
n) calculate the percentage yield of a product from the actual yield of a reaction			
o) (HT only) calculate the theoretical mass of a product from a given mass of reactant and the balanced equation for the reaction			
p) calculate the atom economy of a reaction to form a desired product from the balanced equation			
q) (HT only) explain why a particular reaction pathway is chosen to produce a specified product			
r) explain how the concentration of a solution in mol/dm^3 is related to the mass of the solute and the volume of the solution			
s) calculate the volume of a gas at room temperature and pressure from its mass and relative formula mass			

t) calculate volumes of gaseous reactants and products from a balanced equation and a given volume of a gaseous reactant or product	