Formulae, Molecular Formulae and Empirical Formulae

How to calculate empirical (experimental) formulas:

	If you are lucky you may be given masses		
1.	Write down what **elements** are present in the compound (including oxygen if there is mass missing)	e.g. Cu	e.g. O
2.	Write down the **masses** of each element present	e.g. 32.0g	e.g. 8.0g
3.	Divide **mass** of each element by $\mathbf{A_r}$	32.0/63.55 = 0.5	8.0/16.0 = 0.5
4.	multiply each result by the same number to **obtain simplest possible formula with whole numbers (integers)**	x2 = 1	x2 = 1
5.	Write down the **empirical formula**	**CuO**	

You may only be given % composition

1.	Write down what elements are present in the compound (including oxygen if there is mass missing)	Cu	O
2.	Write down **% composition by mass**:	80%	20%
	Find the $\mathbf{A_r}$ of each element from Periodic Table (P.T.) or memory*	63.55	16.00
3.	Find the ratio of **% composition / $\mathbf{A_r}$**	80/63.55 = 1.26	20/16.00 = 1.25
4.	Divide by smallest number to **obtain relative proportions****	1	1
5.	Write down the **empirical formula**	**CuO**	

- Try questions 2 and 3 on handout 2

- Question 4 is H/W

Practical

- calcium carbonate → calcium oxide + carbon dioxide
- $CaCO_3 \rightarrow CaO + CO_2$

- What is the M_r of $CaCO_3$ CaO and CO_2?
- 100.09, 56.08 and 44.01

- If you heat 1 g of calcium carbonate, it will decompose to give calcium oxide and carbon dioxide. How much carbon dioxide gas will be given off?

- 0.44 g. (44% by mass of the original calcium carbonate)