

WHAT ARE EQUATIONS ?

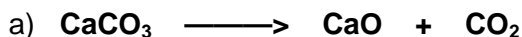
It's an equation Jim, but not as mathematicians know it!

What does the following equation tell you ? $\text{H}_2\text{SO}_4 + 2\text{NaOH} \longrightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$

- *Initially, it says* sulphuric acid reacts with sodium hydroxide to give sodium sulphate and water
- *but more importantly it says* you will need two sodium hydroxides to react with every one sulphuric acid
 or, to put it another way you need twice as many sodium hydroxides as sulphuric acids
- *in posh chemical terms it says* moles of NaOH = 2 x moles of H_2SO_4

BUT IT DOESN'T MEAN... 2 NaOH's = 1 H₂SO₄ - IT ISN'T A MATHS EQUATION!

Q.1 Look at the following equations and answer the questions about them;



If you start with 60 CaCO_3 's, how many CaO 's will you get ?



If you start with 20 H_2SO_4 's, how many KOH 's will you need ?

How many H_2SO_4 's will you need to make 100 H_2O 's ?

How many KOH 's will you need to make 20 H_2O 's ?

How many KOH 's will you need to make 1840 K_2SO_4 's ?

MOLES

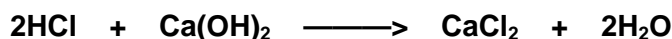
- General*
- the mole is the standard unit of amount ... its value is 6.022×10^{23} - known as Avogadro's Constant
 - it is a way of expressing large numbers in an 'easier to say' way!
 - the number of moles of a substance can be calculated as follows ...

$$\text{MOLES} = \text{MASS} / \text{MOLAR MASS}$$

re-arranging

mass	=	moles x molar mass
molar mass	=	mass / moles

Q.2 Look at the following equation and answer the questions;



If you start with 0.1 moles of $\text{Ca}(\text{OH})_2$ how many HCl 's will you need ?

If you start with 0.2 moles of HCl how many CaCl_2 's will you make ?

How much HCl will you need to make 0.002 moles of H_2O 's ?