

$$\text{Number of moles} = \frac{\text{Mass (g)}}{\text{Relative formula mass } M_r}$$

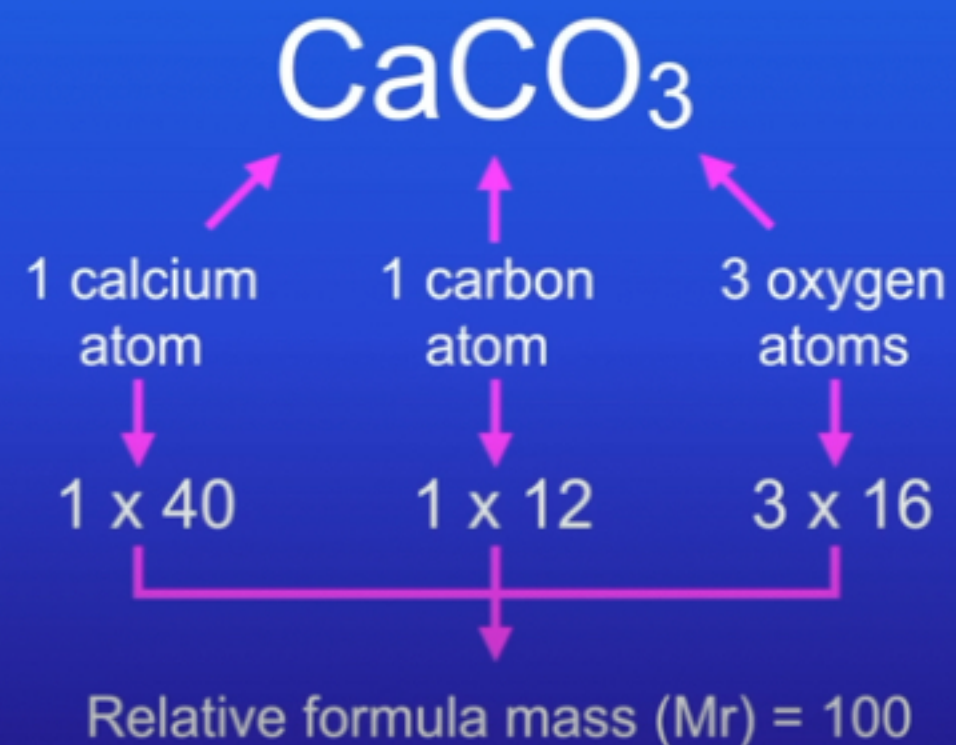
You are given a sample of calcium carbonate (CaCO_3) with a mass of 300g. Calculate the number of moles of calcium carbonate in the sample.

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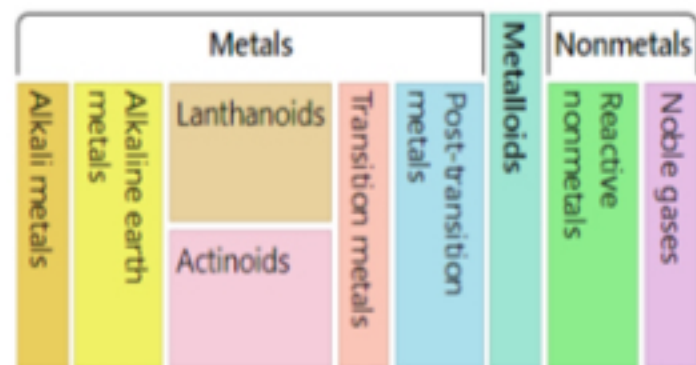
$$\text{Number of moles} = \frac{\text{Mass (g)}}{\text{Relative formula mass } M_r}$$

$$\text{Number of moles} = \frac{300 \text{ g}}{100}$$

$$\text{Number of moles} = 3 \text{ moles}$$

												Pnictogens		Chalcogens		Halogens							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18						
1 H Hydrogen 1.008	Atomic Symbol Name Weight																	2 He Helium 4.0026					
3 Li Lithium 6.94	4 Be Beryllium 9.0122																	5 B Boron 10.81	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180
11 Na Sodium 22.990	12 Mg Magnesium 24.305																	13 Al Aluminium 26.982	14 Si Silicon 28.085	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.45	18 Ar Argon 39.948
19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.867	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.630	33 As Arsenic 74.922	34 Se Selenium 78.971	35 Br Bromine 79.904	36 Kr Krypton 83.798						

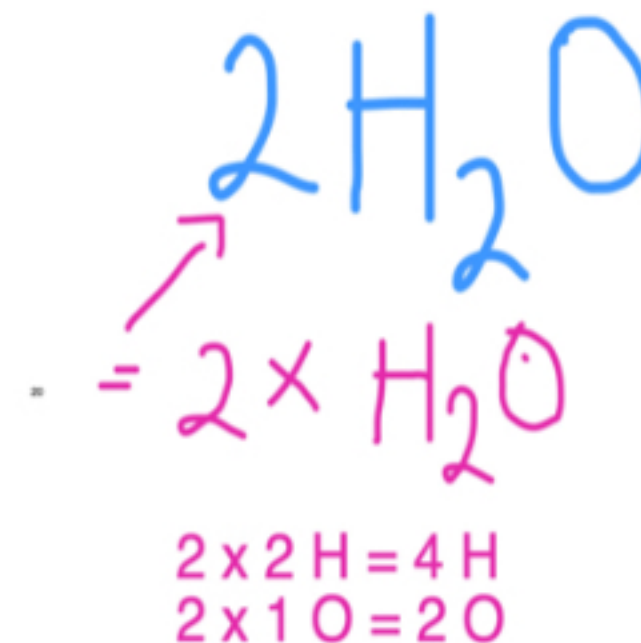
- C** Solid
- Hg** Liquid
- H** Gas
- Rf** Unknown



Al = 26.982 rounded to 27 = 1 mol of Al = 27g
 Fe = 55.845 rounded to 56 = 1 mol of Fe = 56g

Hydrogen and Oxygen

Compound - elements that are bonded together.



Your Turn

You are given 380 grams of magnesium chloride (MgCl_2). How many moles of magnesium chloride have you been given?

$$A_r \text{ Mg} = \underline{24} \quad A_r \text{ Cl} = \underline{35.5}$$



$$35.5 \times 2 = \underline{71}$$

$$71 + 24 = \underline{\underline{95}}$$

$$\frac{380}{95} = 4 \text{ mols}$$

Find the relative atomic mass of Copper sulfate



Cu = 64 (relative atomic mass)

S = 32 (4 atoms = $4 \times 32 = 128$)

Copper sulfate relative atomic mass = $(128 + 64)$ 192

How many mols are in 960g of Copper sulfate?

$$\text{mols} = \frac{\text{mass in g}}{\text{relative atomic mass (Mr)}}$$

$$\frac{\text{mass} = 960\text{g}}{\text{Mr} = 192} = 5\text{mols}$$

How many mols are in 306g of Aluminium oxide?



Oxygen

2 atoms of Al (Al = 27, $2 \times 27 = 54$)

3 atoms of O (O = 16, $3 \times 16 = 48$)

Relative atomic mass of Aluminium oxide = 102

$$\frac{\text{mass (g)}}{\text{Mr}} = \text{Mols}$$

$$\frac{306}{102} = 3 \text{ mols}$$

This shows us that we have 4 lots of Aluminium oxide

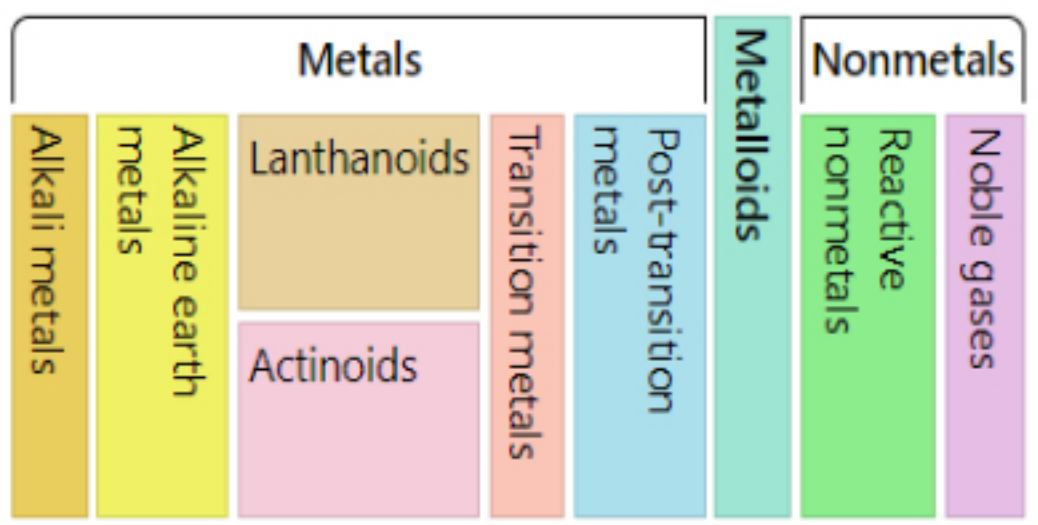
Work out the Mr of:





		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 Pnictogens	16 Chalcogens	17 Halogens	18																
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C Solid
Hg Liquid
H Gas
Rf Unknown



How many mols are in 216g of water



$$\frac{216}{18} = 12 \text{ mols}$$