

## Relative Mass and the Mole

(How far you go is up to you)

### What?

Calculate the following masses for a chemical formula:  $\text{H}_2$ ,  $\text{H}_2\text{O}$ ,  $\text{CO}_2$ ,  $\text{H}_2\text{SO}_4$

Think of the molar mass for a substance as the mass of one mole of that substance. One mole of a substance is the amount of substance that has the same number of particles as there are atoms in exactly 12g of  $^{12}\text{C}$ . The number of particles in a mole is  $6.02 \times 10^{23}$ . This is the same for all substances. The amount of substance is measured in moles and is written as  $n$ . The mass of a substance is measured in grams. The number of moles is calculated by dividing the mass of a substance by the relative mass of the substance. The number of moles is calculated by dividing the mass of a substance by the relative mass of the substance.

### Worked Example

Methane		Ethane		Mass of methane (g)	Mass of ethane (g)
Number of moles (n)	Relative mass (M <sub>r</sub> )	Number of moles (n)	Relative mass (M <sub>r</sub> )		
1	16	1	30	16	30
2		2			
3		3			
4		4			
5		5			
6		6			

1. Calculate the mass of 2 moles of:
  - a. Methane (CH<sub>4</sub>)
  - b. Ethane (C<sub>2</sub>H<sub>6</sub>)
2. Calculate the mass of 3 moles of:
  - a. Methane (CH<sub>4</sub>)
  - b. Ethane (C<sub>2</sub>H<sub>6</sub>)
3. Calculate the mass of 4 moles of:
  - a. Methane (CH<sub>4</sub>)
  - b. Ethane (C<sub>2</sub>H<sub>6</sub>)