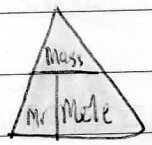
Mass of element = $\frac{\text{Percentage of element in compound}}{100\%} \times$ mass of compound

Empirical formula

The proportion of each element in a compound is fixed. The empirical formula tells us the simplest whole number ratio of elements in a compound

Example A sample of hydrogen sulphide gas was broken down into its elements - hydrogen and sulfher.
It was found to contain 6% hydrogen and 94% sulphur.
What is its empirical formula? (Ar values H:1, S:32.)
Step 1 convert to grams - 6g Hydrogen, 94g Sulphur.
Step 2 find the number of moles of each element present
moles of H = 6 ÷ 1 = 6 moles of S = 94 ÷ 32 = 2.9.



H:S (Divide by the smallest number
6:2.9 to get a ratio of x:1)
2:1 (to whole numbers)
Formula = H_2S.

A student adds 4.8g of magnesium to excess dilute hydrochloric acid. What mass of magnesium chloride would be made?
(Mg = 24, Cl = 35.5)
$Mg + 2HCl \rightarrow MgCl_2 + H_2$.
$Mg + 2HCl \rightarrow MgCl_2 + H_2$
= mass ✓ x ?

$= \frac{4.8}{Mg} \times Mg Cl_2$

$= \frac{4.8}{2.4} \times 24 + (35.5 \times 2)$

$= 19g$.