RELATIVE ATOMIC MASS

The relative atomic mass (A_r) of atoms is the average mass of all the different isotopes of an element (taking into account the amount of each isotope) on a scale where ^{12}C atoms have a mass of exactly 12.

Imagine you have 90 balls with mass 200 g, and 10 balls with mass 300 g. The average mass of the balls is given by:

$$\text{Average mass of balls} = \frac{\text{total mass of all the balls}}{\text{total number of balls}} = \frac{[\,(90 \times 200) + (10 \times 300)\,]}{90 + 10} = \frac{21000}{100} = 210 \text{ g}$$

The relative atomic mass of atoms is worked out in a similar way:

$$\text{Relative atomic mass } (A_r) = \frac{\text{total mass of all atoms}}{\text{total number of atoms}}$$

Element	Isotopes	Abundance	Relative atomic mass (A_r) (to 3sf)
Chlorine	$^{35}_{17}Cl$	75.8%	$A_r = \frac{[\,(35 \times 75.8) + (37 \times 24.2)\,]}{75.8 + 24.2} = \frac{3548.4}{100} = 35.5$ (3sf)
	$^{37}_{17}Cl$	24.2%	
Lithium	$^{6}_{3}Li$	7.6%	
	$^{7}_{3}Li$	92.4%	
Bromine	$^{79}_{35}Br$	50.7%	
	$^{81}_{35}Br$	49.3%	
Copper	$^{63}_{29}Cu$	69.2%	
	$^{65}_{29}Cu$	30.8%	
Fluorine	$^{19}_{9}F$	100.0%	
Magnesium	$^{24}_{12}Mg$	79.0%	
	$^{25}_{12}Mg$	10.0%	
	$^{26}_{12}Mg$	11.0%	
Iron	$^{54}_{26}Fe$	5.8%	
	$^{56}_{26}Fe$	91.8%	
	$^{57}_{26}Fe$	2.1%	
	$^{58}_{26}Fe$	0.3%	
Krypton	$^{78}_{36}Kr$	0.4%	
	$^{80}_{36}Kr$	2.3%	
	$^{82}_{36}Kr$	11.6%	
	$^{83}_{36}Kr$	11.5%	
	$^{84}_{36}Kr$	57.0%	
	$^{85}_{36}Kr$	17.3%	