Different systems used for describing measurements of various physical quantities are:

(a) **CGS system** It is based on centimetre, gram and second as the units of length, mass and time respectively.

(b) **FPS system** A British system which used foot (ft), pound (lb) and second (s) as the fundamental units of length, mass and time respectively.

(c) **MKS system** It is the system which uses metre (m), kilogram (kg) and second (s) respectively for length, mass and time; ampere (A) was added later on for electric current.

(d) **SI system** (1960) International system of units or SI units contains following seven basic and two supplementary units:

Basic Physical Quantities and Their Corresponding SI Units

Physical quantity	Name of SI unit	Symbol for SI unit
Length (l)	metre	m
Mass (m)	kilogram	kg
Time (t)	second	s
Electric current (I)	ampere	A
Thermodynamic temperature (T)	kelvin	K
Amount of substance (n)	mole	mol
Luminous intensity (I_v)	candela	Cd

Supplementary units It includes plane angle in radian and solid angle in steradian.

Prefixes

The SI units of some physical quantities are either too small or too large. To change the order of magnitude, these are expressed by using prefixes before the name of base units. The various prefixes are listed as:

3. Atoms can neither be created nor destroyed during any physical or chemical change.
4. Compounds or molecules result from combination of atoms in some simple numerical ratio.

Limitations

(i) It failed to explain how atoms combine to form molecules.

(ii) It does not explain the difference in masses, sizes and valencies of the atoms of different elements.

Atomic Mass

It is the average relative atomic mass of an atom. It indicates that how many times an atom of that element is heavier as compared with $\frac{1}{12}$th part of the mass of one atom of carbon-12.

$$\text{Average atomic mass} = \frac{\text{average mass of an atom}}{\frac{1}{12} \times \text{mass of an atom of } C^{12}}$$

The word average has been used in the above definition and is very significant because elements occur in nature as mixture of several isotopes. So, atomic mass can be computed as

- $\text{Average atomic mass} = \dfrac{RA\,(1) \times \text{at. mass}\,(1) + RA\,(2) \times \text{at. mass}\,(2)}{RA(1) + RA(2)}$

  Here, RA is relative abundance of different isotopes.

- In case of volatile chlorides, the atomic weight is calculated as

$$\text{At. wt.} = \text{Eq. wt.} \times \text{valency}$$

and

$$\text{valency} = \frac{2 \times \text{vapour density of chloride}}{\text{eq. wt. of metal} + 35.5}$$

- According to Dulong and Petit's rule,

$$\text{Atomic weight} \times \text{specific heat} = 6.4$$

Gram Atomic Mass (GAM)

Atomic mass of an element expressed in gram is called its gram atomic mass or gram-atom or mole-atom.