1.1.1 The Unit

Learning Objectives:

- Recall the base units
- Differentiate between base and derived units
- Use unit prefixes correctly
- Estimate physical quantities

SI Units

- SI Units are the international standard system of measurement.
- A measurement will consist of a Quantity (number) and a Unit.
- E.g. – 100 kg 12.5 m/s -273.15 K

Quantity	Unit	Abbreviation
Mass	kilogram	kg
Length	metre	m
Time	second	s
Temperature	kelvin	K
Electrical current	ampere	A
Amount of substance	mole	mol
Luminous Intensity	candela	cd

Derived Units

- All other measured quantities have units that are derived from these base units
- Example – unit of speed = distance/time

$= m/s = ms^{-1}$

Example – unit of acceleration $= \frac{\triangle \text{in velocity}}{\text{time}}$

$= \frac{m/s}{s} = ms^{-2}$

Prefix	Name	Abbreviation
$X10^{-12}$	pico	p
$X10^{-9}$	nano	n
$X10^{-6}$	micro	μ
$X10^{-3}$	milli	m
$X10^{-2}$	centi	c
$X10^{3}$	kilo	k
$X10^{6}$	Mega	M
$X10^{9}$	Giga	G
$X10^{12}$	Terra	T

Estimation

- When working in physics it is important to think about the answers we find.
- Does the answer make sense? Is it reasonable.
- To do this we need to be able to estimate what would be a reasonable answer.
- So if we are calculating the mass an elevator can lift safely and we get an answer of 1500 kg does that seem reasonable?

Try These

- Mass of Sun (Earth = 6.00×10^{24}kg)
- Mass of a silver 54 plate Mondeo estate
- Length of this science lab
- Height of house
- Litres in a bath
- Power of a human
- Power of a horse
- Power of a power station