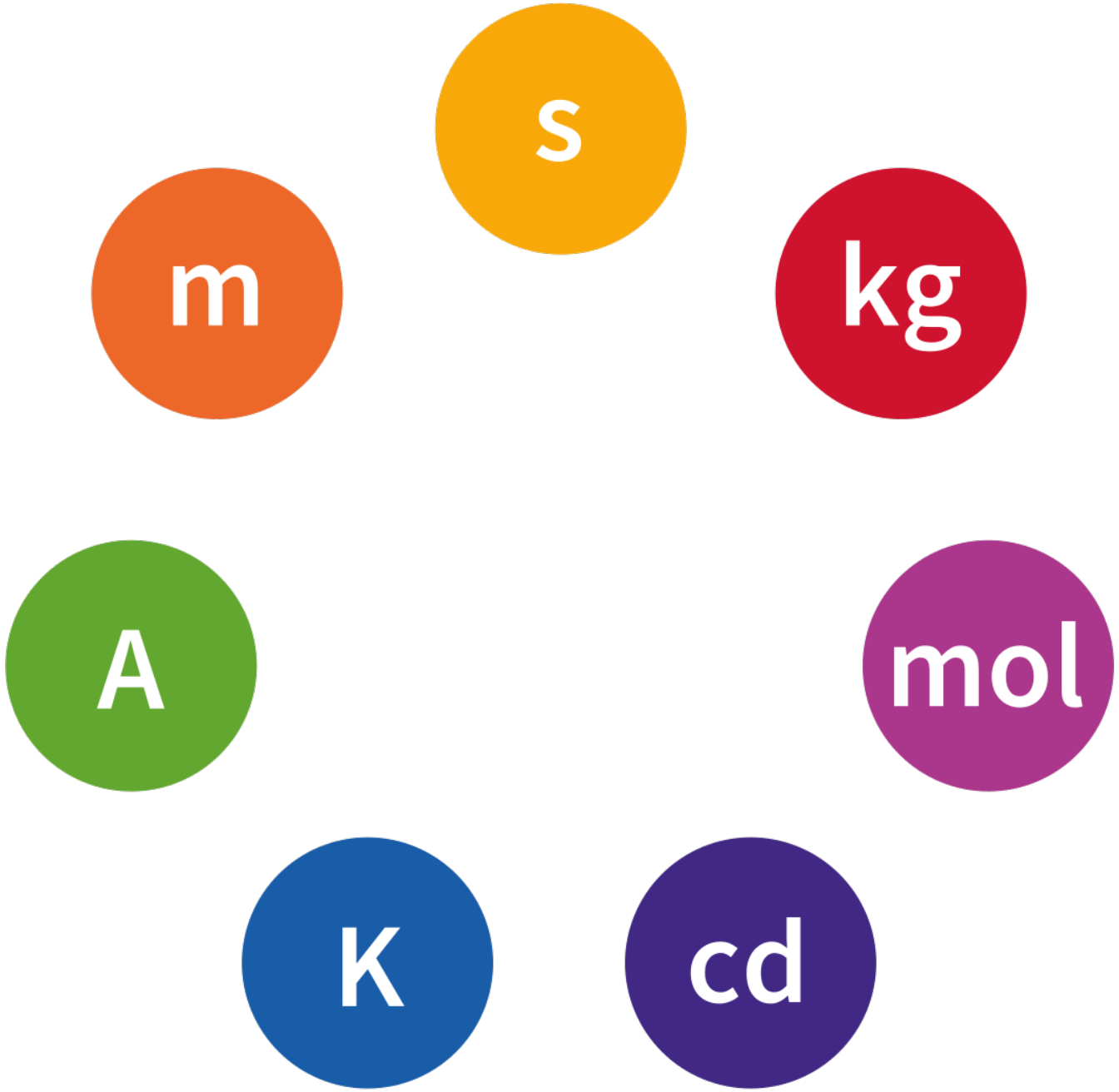
SI Units



Learning Objectives

- History of SI Units
- SI Base Units
- SI units prefix
- Frequent unit for length, mass, and volume
- Basic unit conversion

History of SI Units

- The International System of Units, universally abbreviated SI (from the French *Le Système International d'Unités*), is the modern metric system of measurement.
- The SI was established in 1960 by the 11th General Conference on Weights and Measures (CGPM, *Conférence Générale des Poids et Mesures*)

SI Base Units

- The **SI base units** are the standard **units** of measurement defined by the International System of **Units** (**SI**)

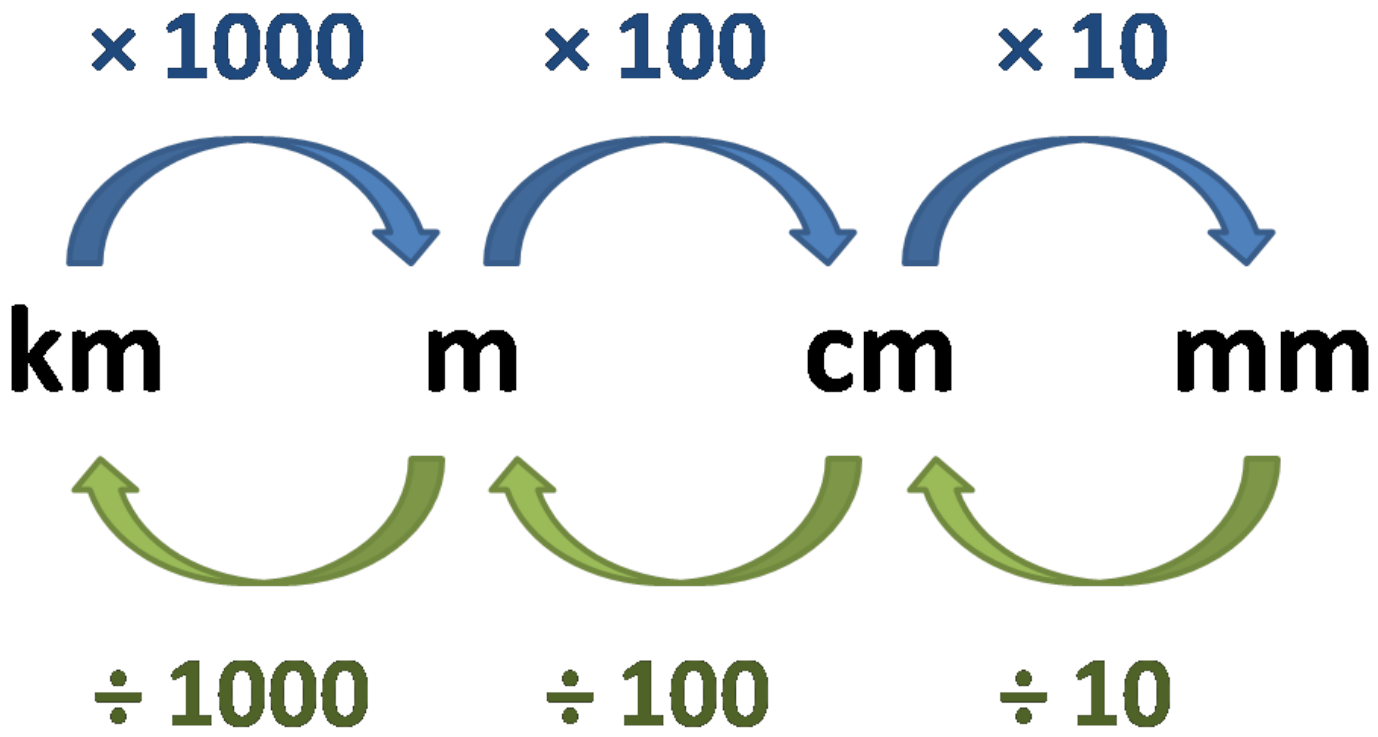
Base Quantity	Unit	Symbol
Length	meter	M
Mass	kilogram	Kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mole	mol
Luminous intensity	candela	cd

SI Unit Prefix

Common Prefixes used with SI Units			
Prefix	Symbol	Meaning	Order of Magnitude
giga-	G	1 000 000 000	10^{9}
mega-	M	1 000 000	10^{6}
kilo-	k	1 000	10^{3}
hecto-	h	100	10^{2}
deka-	da	10	10^{1}
	base unit	1	10^{0}
deci-	d	0.1	10^{-1}
centi-	c	0.01	10^{-2}
milli-	m	0.001	10^{-3}
micro-	μ	0.000 001	10^{-6}
nano-	n	0.000 000 001	10^{-9}

Useful Units (Length)

- Length is a measurement of distance or dimension
- km = kilometer
- m = meter
- cm = centimeter
- mm = millimeter

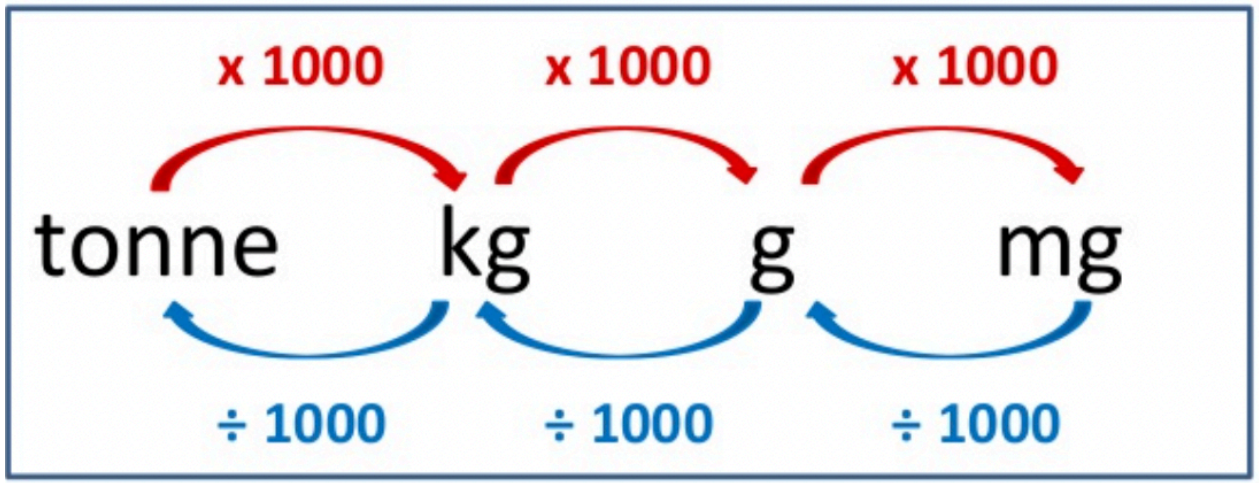


Useful Unit for Volume

- Volume is the amount of space an object takes up
- Liter (L), milliliters (mL)
- 1L = 1 cubic decimeter = 1000 mL = 1000 cubic centimeter

Useful Unit for Mass

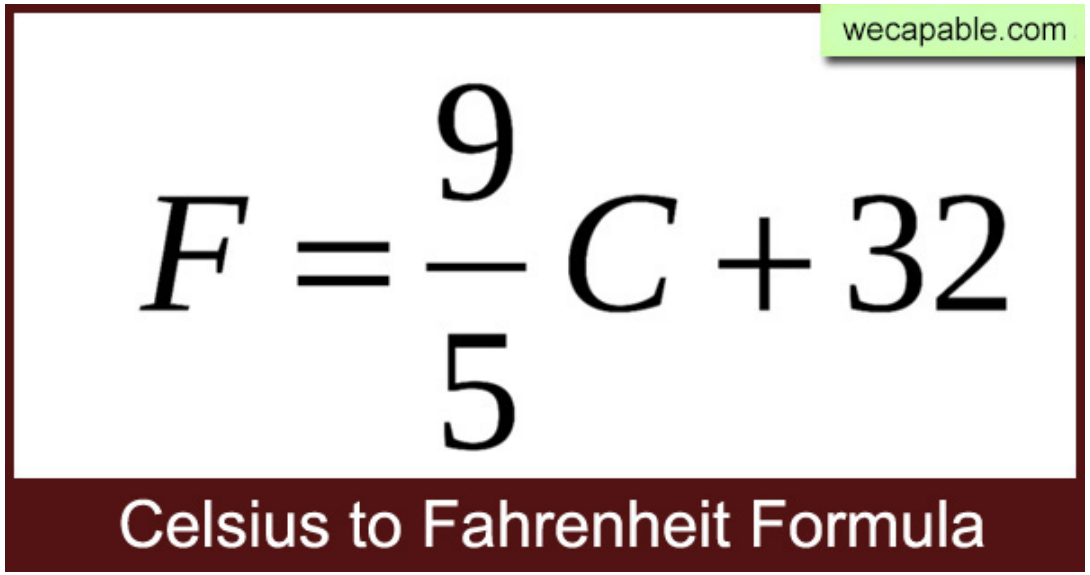
- Tonne, kg, g, mg
- 1 tonne = 1000 kg
- 1kg =1000g
- 1g = 1000mg
- Mass is a measure of the amount of matter in an object.



Useful Unit for Temperature

- Temperature measures how hot or cold an object is.
- Kelvin to Celsius
- Fernite to Celsius

$$T_K = T_C + 273.15$$



Unit Conversion

- 1 m = 39.3701 inches
- 1 m = 3.28094 feet
- 1 kg = 2.204 ibs
- 1 liter = 0.264 galloms