Noteset 5C (Part 1) - Unit Conversion Review

Dimensional Analysis

The process of working with measurements in science.

Measurement : Quantity + Unit + Label

- **Quantity** - Number (0-9, decimals)
- **Unit** - System of measure (mass, length, etc)
  Division of measurement (g, kg, mg, etc)
- **Label** - Description of measurement.

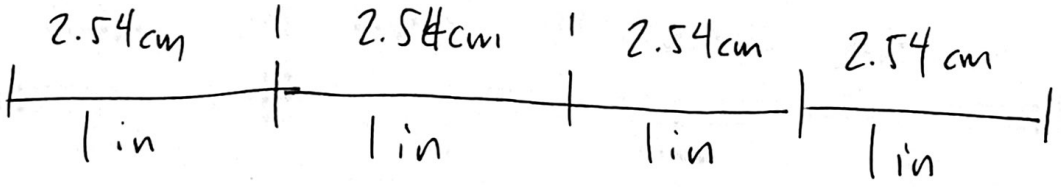
Ex: $\underbrace{32.9}_{\text{Quantity}}\ \underbrace{g}_{\text{unit}}\ \underbrace{NaCl}_{\text{label}}$ $\underbrace{23.99}_{\text{quantity}}\ \underbrace{g/mol}_{\text{unit}}\ \underbrace{Ca}_{\text{label}}$

Conversion Factor

Relationship between two measurements that are equal, divide to equal 1.

inch and cm

$1\text{ in} = 2.54\text{cm}$ $\quad \frac{1\text{ in}}{2.54\text{cm}} = \frac{2.54\text{cm}}{1\text{ in}} = 1$

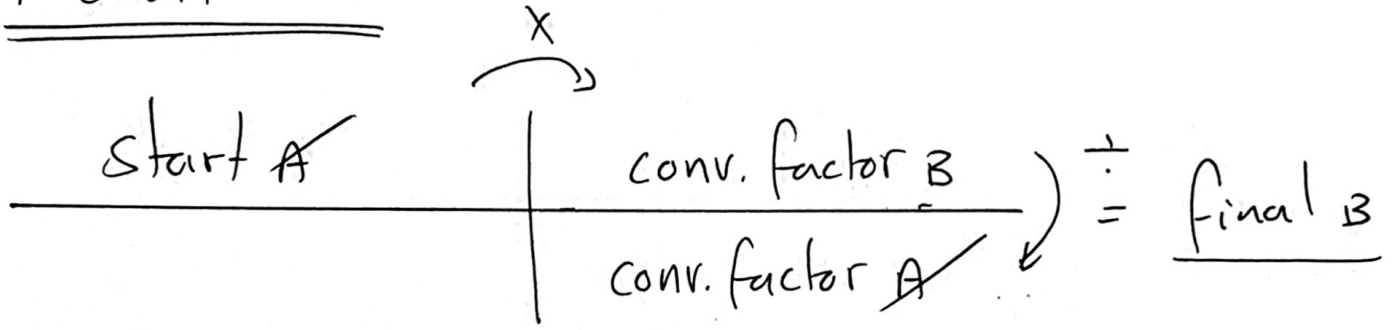


Dimensional Analysis / Unit conversion Process

Conversion Factor $\frac{\text{Conv. A}}{\text{Conv. B}}$

Start A $\longrightarrow$ Final B (conversion)

T-chart Method



$$= \frac{\text{start} \cdot \text{conv. B}}{\text{conv. A}} = \text{final B}$$

Ex: 25.0 cm $\longrightarrow$ in (convert to in)

1 in = 2.54 cm $\left(\frac{1\text{ in}}{2.54\text{ cm}} = 1\right)$

$$\frac{25.0\text{ cm} \mid 1\text{ in}}{2.54\text{ cm}}$$

$$= \frac{25.0\text{ in}}{2.54} = 9.84\text{ in}$$

Ex2 1.82 in $\longrightarrow$ cm (convert to cm)

1 in = 2.54 cm $\left(\frac{1\text{ in}}{2.54\text{ cm}} = 1\right)$

$$\frac{1.82\text{ in} \mid 2.54\text{ cm}}{1\text{ in}}$$

$$= \frac{1.82 \cdot 2.54\text{ cm}}{1} = 4.63\text{ cm}$$