Conversions
&
Dimensional Analysis

Dimensional Analysis

- _____ is just a big word for going from one unit to another.
- Have you ever converted inches into feet or years into days?
- If so, then you have done dimensional analysis

Dimensional Analysis

- _____ – method of problem-solving that focuses on changing units

- _____ – a ratio of equal values used to go from one unit to another
  – Example: 1 foot = 12 inches
  – Can be written as 1   foot
                                12 inches

Rules for Dimensional Analysis

1. **ALWAYS** start with the _____ !!!
2. Draw a _____ sign and a line
3. Place the unit to be canceled on the bottom
4. Place a _____ on the line you have drawn
5. Cross out units and see what you have left.
6. You must have one on _____ & one on the _____

$$\frac{A \ x \ \ B}{A}$$

Let's try an example…

Let' s convert 32.5 inches to feet.

You're not really done yet…

- What did we forget?
  – _____ !!!
- What operation are we doing?
  – _____
- So what do we look at?
  – _____
- The answer becomes…

2.71 feet

Try this example…

- How many seconds are in 82.95 minutes?

What if you need to Change 2 Units?

Convert 65 miles per hour to kilometers per second

(0.625 miles = 1 Km)

Conversions with Prefixes

- Conversions with prefixes are done in exactly the same manner

- You just have to know the prefixes

Prefixes

Prefix	Symbol	Value
Giga	G	1×10^{9}
Mega	M	1×10^{6}
Kilo	K	1×10^{3}
Deci	d	1×10^{-1}
Centi	c	1×10^{-2}
Milli	m	1×10^{-3}
Micro	µ	1×10^{-6}
Nano	n	1×10^{-9}
Pico	P	1×10^{-12}
Femto	f	1×10^{-15}

Rules with Prefixes

- The rules are the same…
- Start with the _____
- Place the cross out unit on the bottom
- Place conversion unit on top
- Keep crossing out until you get what you want

A few differences

- Always remember that _____ will go with your **prefix**
- The number in _____ will go with your **base unit**
- You can only go from a prefix to a base unit

Let's try one

- Convert 100 nm into m

Try this one…

- Convert 785 mm to km

Temperature Conversions

- The three units for measuring temperature are…

  1. _____

  2. _____

  3. _____

To Convert Among Temperatures Use These Formulas

- °F = 1.8 °C + 32

- °C = 0.56 (°F − 32)

- K = °C + 273

Try these examples

- Convert 35 °C to Kelvin

Example

- Convert 55 ºC to ºF

Example

- Convert 95.8 ºF to ºC

Example

- Convert 75.0 °F to Kelvin