CHE1031 Quick guide: Unit Prefixes, Conversions, and Significant Figures

Prefix:	One-letter:	Commonly:	Means:	For Conversions
Giga-	G	billion	10^9	10^9 x/ 1 Gx
Mega-	M	million	10^6	10^6 x/ 1 Mx
Kilo-	k	thousand	10^3	10^3 x/ 1 kx
Deca-	da		10^2	
BASE UNIT			**10^0**	
Deci-	d		10^{-1}	
Centi-	c		10^{-2}	10^2 cx /1 x
Milli-	M		10^{-3}	10^3 mx /1 x
Micro-	μ		10^{-6}	10^6 μx /1 x
Nano-	n		10^{-9}	10^9 nx /1 x
Pico-	p		10^{-12}	10^{12} px /1 x
Femto-	f		10^{-15}	10^{15} fx /1 x

When converting with Greek prefixes, I suggest the following approach:

- Compare the base unit and prefix and determine which is larger.
- Assign the larger unit a value of 1 in the fractional conversion factor
- Assign the smaller unit the value of 10^x in the fractional conversion factor
- Place the conversion factor in the problem matching units diagonally
- Compute!

How many digits in this figure are <u>significant</u>?

- Leading zeros are NEVER significant
- Trapped zeros are ALWAYS significant
- Lagging (or trailing) zeros are significant ONLY if the follow a decimal

Calculations with <u>sig figs</u>:

- **<u>Multiplication & division</u>:** Answer can have only as many sf as the least number of sf in the calculation
- **<u>Addition & subtraction</u>**: Number of digits in front of the decimal is not limited. Number of digits following the decimal is limited by the number with least digits after the decimal

Unit conversion: 'Old' units cancel out diagonally, leaving only the 'new' units desired

$$\frac{\cancel{x}\quad \cancel{y}\quad \cancel{z}\quad \cancel{a}\quad b}{\cancel{x}\quad \cancel{y}\quad \cancel{z}\quad \cancel{a}} = b$$

Conversion factors are <u>exact numbers</u> and, therefore, do not affect the number of sig figs in a conversion problem