Mr. Dehne Chem 1H AMSAT

Name: _____

Date: _____

Per#: ___

MeasCalc

Topic #2

Objectives

- Utilize the SI units used for measuring quantities in the laboratory.
- Define common prefixes used in science.
- Select the appropriate prefix to indicate a measurement in the metric system.
- Convert between different units using the factor-label method (dimensional analysis).
- Rearrange a basic algebraic equation.
- Utilize significant figures.
- Express numbers in scientific notation.
- Perform calculations utilizing numbers expressed in scientific notation.
- Utilize a calculator in the performance of mathematical calculations.
- Construct a graph from experimental data.
- Evaluate a graph.

Vocabulary

- accepted value
- accuracy
- conclusion
- conversion factor
- density
- derived unit
- dimensional analysis
- direct proportion (directly proportional)
- experimental control
- hypothesis
- inverse proportion (indirectly proportional)
- mass
- model
- natural law
- observation
- percentage error
- precision
- qualitative
- quality
- quantitative
- quantity
- scientific method
- scientific notation
- SI (unit)
- significant figure
- surroundings
- system
- theory
- variable
- volume
- weight

Formulas/Conversions/Diagrams/Drawings

- Basic scaffolding for dimensional analysis

  Relationship between given unit and unknown unit: #X = #Y (ideal number, conversion factor)

  $$\text{given (X)} \times \frac{\#\,Y}{\#\,X} = \text{new amount of Y}$$

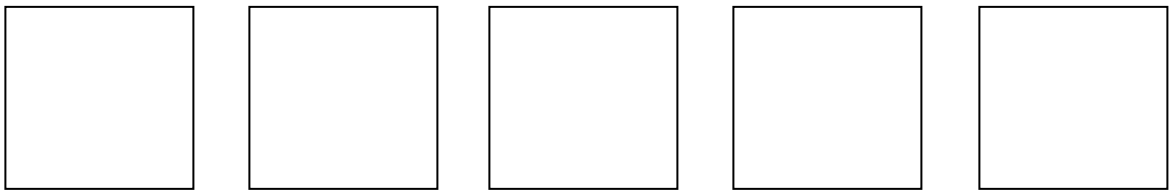
  From the above relationship (conversion factor), #X is the denominator and #Y is the numerator

  - For example, convert 100mL to L. Where 1000mL = 1.00L (relationship, conversion factor).

    $$100\text{mL} \times \frac{1.00\text{L}}{1000\text{mL}} = \frac{(100)(1.00\text{L})}{(1000)} = 0.1\text{L}$$

- Density: D = mass/volume = m/V (ratio of mass to volume)
- % error = $\frac{\text{value}_{\text{accepted}} - \text{value}_{\text{experimental}}}{\text{value}_{\text{accepted}}} \times 100\%$
- $y/x = k$ (direct proportion)
- $y = kx$ (equation for a straight line that passes through the origin (0,0))
- $xy = k$ (indirect(inverse) proportion)
- $y = k/x$ (equation for a curved line (hyperbola))
- Density device

- Stages in the scientific method



- Graphing

Mass	Volume	Slope

Graph data. Draw a best fit line.

Label: x-axis, y-axis, independent variable, dependent variable, x unit, y unit, major intervals and title of graph.

Calculate the slope by taking two points and using the slope formula:

$$m = (y_2-y_1)/(x_2-x_1)$$