

CHAPTER 1-1

- I. What is Chemistry?
 - A. Definition:
 - B. Why is Chemistry considered to be the central science?
 - 1.
 - C. Why is Chemistry is important?
 - 1.

CHAPTER 1-2

- I. What is the Scientific Method?
 - a.
 - b.
- II. The Steps of the Scientific Method are:
 - a. **Observation**
 - i. Definition:
 - b. **Hypothesis**
 - i. Definition: .
 - c. Perform an **experiment**
 - i. Definition:
 - ii. What is a variable?
 - iii. What is an experimental control?
 - d. **Conclusion**
 - i. Definition:
- III. Laws and Theories
 - a. A **law** tells us
 - b. A **theory** (model) is.

CHAPTER 1-3

- I. What makes up a measurement?
 - a. .
 - b. Measurements always consists of two parts:
 - i.
 - ii.
 1. 2 different systems used to measure
 - a.
 - b.
- II. The metric system is built around a set of base units for seven quantities, which include :

Quantity	Unit	Abbreviation
1.		
2.		
3.		
4.		
5.		
6.		
7.		

III. Metric prefixes

- a. Preceding each base unit in the metric system is a prefix which represents a factor of ten needed to define larger and smaller units than the base unit. For instance the prefix “mega” means “one million” or 10^6 .
- b. A table listing large factor metric prefixes is shown below.

mega	kilo	hecto	deca	BASIC UNIT	deci	centi	milli	micro
(M)	(k)	(h)	(da)	(m)	(d)	(c)	(m)	(μ)
1,000,000	1000	100	10	1	.1	.01	.001	.000001
10^6	10^3	10^2	10^1	1	10^{-1}	10^{-2}	10^{-3}	10^{-6}

IV. Converting factors

- a. After memorizing the Metric prefixes it is quite simple to write out conversion factors relating one metric unit in terms of another.
 - i. Examples:
- b. Converting metric units

- i. Suppose we wished to convert 234.6 mm into km, and we can construct these conversion factors, knowing the values of the metric prefixes and their symbols.

$$1000 \text{ mm} = 1 \text{ m} \qquad 1000 \text{ m} = 1 \text{ km}$$

- a. Set up the problem as follows, representing each conversion factor in an equivalent fractional form.

$$234.6 \text{ mm} \times \frac{1 \text{ m}}{1000 \text{ mm}} \times \frac{1 \text{ km}}{1000 \text{ m}}$$

(fractional forms of conversion factors)

- b. Divide and multiply all units to insure that you will obtain the unit you desire (km)

$$234.6 \text{ mm} \times \frac{1 \text{ m}}{1000 \text{ mm}} \times \frac{1 \text{ km}}{1000 \text{ m}}$$

- 1000 ~~mm~~ 1000 ~~m~~
- c. Divide and/or multiply the decimal numbers to obtain the numerical value of the final answer.

$$234.6 \times \frac{1}{1000} \times \frac{1 \text{ km}}{1000} = 0.0002346 \text{ km}$$

- ii. Lets convert 234.1 tons into ounces.

$$234.1 \text{ ~~ton~~} \times \frac{2000 \text{ ~~lb~~}}{1 \text{ ~~ton~~}} \times \frac{16 \text{ oz}}{1 \text{ ~~lb~~}} = 7,491,200 \text{ oz}$$

CHAPTER 1-5

- I. Making measurements
 - a. Measurements are uncertain for two reasons
 - i.
 - ii.
- II. Reliability in Measurement
 - a. Precision –
 - b. Accuracy -

CHAPTER 1-6

- I. Significant Digits
 - a. What are significant digits in a measurement?
 - i.
 - b. Rules for significant digits
 - i. Nonzero integers.
 - ii. Zeros. There are three classes of zeros.
 1. *Leading zeros*
 2. *Captive zeros*
 3. *Trailing zeros*
- II. Significant Digits in Calculations
 - a. Rules for Using Significant Figures in Calculations
 - i. Exact numbers
 - ii. For multiplication or division,
 - iii. For addition or subtraction,

- b. Rules for Rounding Off
 - i. If the digit to be removed
 - a.
 - b.

III. Scientific Notation

- a. Scientific notation is used to show ...
- b. The power of 10 depends on

IV. Percents and Percent Error

- a. Percent error is determined by

V. Ratios

- a. Also known as conversion factors are two parts of a statement that relates the two units. For example $2.54 \text{ cm} = 1 \text{ inch}$.
Density is defined as ...

CHAPTER 1-7

I. Dimensional Analysis

- a. Definition:
- b. What is a unit equality?
 - i.
- c. What is a conversion factor?
 - i.

II. How to use dimensional analysis.

- a.
- b.
- c.
- d.
- e.

III. Graphing

- a. What is the purpose of constructing a graph?
- b. What are the two types of variables plotted on a graph and on what axis are they plotted?