Honors Chemistry Summer Assignment 2015-2016 Due: 1st day of school - 2015

Mrs. Clark – email me immediately if you have any problems (or questions) with the assignment. I am happy to help you! You will have a test over the following assignment during the first week of school.

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There are four parts to the assignment.

It includes the vocabulary terms. You should be able to match the term to its definition on the test.

You must memorize the first 30 elements. If given the symbol you should be able to write the element name and vice versa. You do not need to know atomic number or order etc.

You need to memorize the metric prefixes and be able to do conversion factors. This will be reviewed during the first week BEFORE your assessment. Practice problems should be completed.

You need to review scientific notation and complete the practice problems.

Part one of assignment - Vocabulary

**Core Knowledge - Vocabulary – Define in 1-2 sentences and give an example**

Atom

Element

Proton

Neutron

Electron

Physical Property

Chemical Property

Physical Change

Chemical Change

Atomic number

Atomic mass

Ion

Isotope

Periodic Table of Elements

Metals

Metalloids

Density

Mass

Weight

Volume

Grams

Liters

Part Two – Basic knowledge of the Periodic Table

**Know the names of the elements that correspond to the following chemical symbols:**

**elements 1-30, that is hydrogen through zinc. You may use any periodic table, but here is a link to one:**

**http://www.periodni.com/download/periodic\_table-color.pdf**

Part Three - Conversions

Memorize the following:

Metric Prefixes

**Prefix Prefix symbol meaning equivalent**

Mega M million 1 Mg = 106 g

Kilo k thousand 1 kg = 103 g

Deca da ten 1 dag = 101 g

Base unit ( like grams, meters, liters, etc..)

Deci d one tenth 1 g = 101 dg

Centi c one hundredth 1 g = 102 cg

Milli m one thousandth 1 g = 103 mg

Micro µ one millionth 1 g = 106 µg

Nano n one billionth 1g = 109 ng

Pico p one trillionth 1 g = 1012 pg

**Conversion Factors**

**I. Definition: A ratio of two measurements that are equal to one another.**

(Top value = bottom value)

\*\*The total conversion factor = 1 (unity)

Ex. $1.00 = 100 cents $1.00 = 100 cents

100 cents $1.00

4 quarters = 100 cents 4 quarters = 100 cents

100cents 4 quarters

**II. When a measurement is multiplied by a conversion factor, the value of the measurement remains the same because the unit compensates for any switch.**

Ex. $3.00 (100 cents ) = 300 cents

( $1.00 )

**III. The process of using conversion factors to solve problems is called Dimensional Analysis. This process will be used all year as we learn more conversion factors!**

**Metric worksheet. Practice Problems**

**Solve using your knowledge of the prefixes and use conversion factors. Show all work!!**

**I. Make the following conversions:**

a) 74 cm to meters

b) 8.32 x 10-3 kg to grams

c) 0.00527 cal to kcal

d) 8.60 g to micrograms

e) 9.62 kJ to Joules

f) 9.52 m to dm

g) 5.0 x 104 mm to km

h) 0.0074 cg to µg

i) 3.3 x 105 ng to mg

j) 6.29 x 10-6 dg to µg

k) 0.234 nm to cm

Part four – working with exponents

Scientific Notation (Standard Exponential Form)

**I. A number is written as the product of two numbers: a coefficient and a power of ten.**

Example: 12,000,000 = 1.2 x 107

.0072 = 7.2 x 10-3

(a) The coefficient should be number between 1 and 9.9

(b) The superscript is the power of 10 or the exponent.

(c) The exponent indicates how many times the coefficient must be multiplied by 10 to equal the number. (Ex) 2.3 x 10 x 10 x 10 = 2300 = 2.3 x 103

(d) Count the number of places the decimal has been moved to the left. (Ex) 120000 = 1.2 x 105

(e) Numbers less than one have a negative exponent. The number 0.00072 is written as 7.2 x 10-4. The negative exponent indicates that the exponent must be divided by 10 four times to equal 0.00072.

**II. To multiply numbers written in exponential form, multiply the coefficients and add the exponents.**

(Ex) (3.0 x 104)(2.0 x 102) = (3x2) x 104+2 = 6.0 x 106

**III. To divide numbers, divide the coefficients and subtract the exponent in the denominator from the exponent in the numerator.**

(Ex) 3.0 x 105

6.0 x 102

= 3.0 x 105-2

= 0.50 x 103

= 5.0 x 102

**IV. To add and subtract numbers in scientific notation, the exponents must be the same.**

(Ex) (3.42 x 10-5)- (2.5 x 10-6) = (3.42 x 10-5)- (0.25 x 10-5)

= (3.42 – 0.25) x 10-5

= 3.14 x 10-5

**Practice Problems:**

**1. Express the following numbers in correct scientific notation:**

a) 52.3

b) 0.000345

c) 0.005

d) 0.029

e) 180

f) 40,230,000

g) 34.5

h) 765

**2. Solve the following and place answers in correct scientific notation:**

a) (6.0 x 10-3)(1.5 x 101)

b) (8.8 x 102)(1.5 x 104)

c) 5.2 x 102

1.3 x 10-7

d) 1.36 x 1012

8.00 x 1015

e) (6.6 x 10-8)-(4.0 x 10-9)

f) (3.75 x 105) + (6.53 x 103)