7900 East Shelby Drive
Memphis, TN 38125

May 21, 2012

Dear Honors Chemistry Student:

I am very excited about your interest in taking Honors Chemistry for the 2012-2013 school year. This class is a rigorous course and my expectations are high and demanding. The summer assignment is due the first week of school. The due dates are listed below:

August 9, 2012- Chemistry Additional Assignments- Scientific Notation, Significant Figures, Significant Figures and Calculations, and Dimensional Analysis (Metric Conversions).

August 10, 2012- Chemistry Test will cover the Ion Memorization List and Periodic table of Elements Memorization List (Elements 1-36)

August 13, 20120- Article Summary Due (make sure you read the handout on plagiarism and citations and references).

Remember ALL of the assignments are due on the dates above. NO EXCUSES NO EXCEPTIONS. LATE WORK will not be accepted. NO ASSIGMENT= F

Have a wonderful summer!!!!!!

Sincerely,

Ms. Bonds
cbonds@scsk12.org

Southwind High School
HONORS Chemistry
Summer Assignment 2012 Part 1

ION MEMORIZATION LIST

Directions: Memorize this list of ions. It is important that you memorize the ions EXACTLY as they are typed. This includes capital or lowercase letters, subscripts and superscripts. The spelling of the ion name must also be exactly correct. Even a one letter difference means the difference between sulfate ($SO_4{}^{2-}$) and sulfite ($SO_3{}^{2-}$). Look for patterns to make memorization easier. **You must memorize the ion list below. You will be given an ion TEST during the first week of class.**

You must understand these terms:

ION, CATION, MONATOMIC ION, ANION, POLYATOMIC ION, SUBSCRIPT, SUPERSCRIPT, ROMAN NUMERALS, TRANSITION METALS

MONATOMIC IONS

POSITIVE

$\underline{1^+}$	$\underline{2^+}$
H^+ Hydrogen	Be^{+2} Beryllium
Li^+ Lithium	Mg^{+2} Magnesium
Na^+ Sodium	Ca^{+2} Calcium
K^+ Potassium	Sr^{+2} Strontium
Rb^+ Rubidium	Ba^{+2} Barium
Cs^+ Cesium	Ra^{+2} Radium
Fr^+ Francium	

NEGATIVE

$\underline{1^-}$	$\underline{2-}$	$\underline{3-}$
F^- Fluoride	O^{-2} oxide	N^{-3} nitride
Cl^- Chloride	S^{2-2} sulfide	P^{-3} phosphide
Br^- Bromide	Se^{-2} selenide	As^{-3} arsenide
I^- Iodide	Te^{-2} telluride	
At^- Astatide		
H^- Hydride		

MULTIPLE CHARGED MONATOMIC IONS

Cu^+ copper (I) Fe^{+2} iron (II) Pb^{+2} lead (II)
Cu^{2+} copper (II) Fe^{+3} iron (III) Pb^{+2} lead (IV)

Sn^{+2} tin (II) $(Hg_2)^{+2}$ mercury (I)
Sn^{+4} tin (IV) Hg^{+2} mercury (II)

CONSTANT CHARGE TRANSITION METAL IONS

Ag^+ Silver
Ni^{+2} Nickel
Cd^{+2} Cadmium
Zn^{+2} Zinc

POLYATOMIC IONS – In this section you are responsible for the ions that are in **BOLD.**

POSITIVE

NH_4^{+1} **Ammonium**
H_3O^{+1} **Hydronium**

NEGATIVE

1-	**2-**	**3-**
$C_2H_3O_2^{-1}$ **acetate**	CO_3^{-2} **carbonate**	PO_4^{-3}**phosphate**
OH^{-1} **hydroxide**	$Cr_2O_7^{-2}$ **dichromate**	PO_3^{-3} phosphite
NO_3^{-1} **nitrate**	$C_2O_4^{-2}$ oxalate	
NO_2^{-1} **nitrite**	O_2^{-2} peroxide	
MnO_4^{-1} **permanganate**	SO_4^{-2} **sulfate**	
ClO^{-1} hypochlorite	SO_3^{-2} **sulfite**	
ClO_2^{-1} chlorite	CrO_4^{-2} **chromate**	
ClO_3^{-1} **chlorate**		
ClO_4^{-1} **perchlorate**		
HCO_3^{-1} **hydrogen carbonate or bicarbonate**		
CN^{-1}**cyanide**		

Look at a periodic table and see if you can identify a pattern for the charges of the monatomic ions… this will enable you to know the charge (in most cases) by its location.

PERIODIC TABLE MEMORIZATION LIST

Directions: Memorize the first 36 elements on the periodic table. It is important that you memorize the symbol and the spelling of the element correctly. This includes symbols that have two letters that are capital and lowercase letters. To access a periodic table go to http://chemistry.about.com/od/periodictableelements/a/printperiodic.htm , and click on Black/white printable periodic tables. **You will be given a TEST the first week of school.**

SCIENTIFIC NOTATION

Directions: Review the rules for scientific notation. You should be able to change a standard number into scientific notation and a number in scientific notation to a standard number. **Complete the Scientific Notation Worksheet. This is a GRADE.**

A coefficient raised to a power. It expresses a number as a product of a number between 1 and 10 and the appropriate power of 10. In other words the coefficient has to be between 1-9.9.
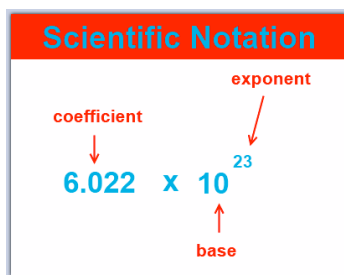
Large Numbers- move the decimal point to the left and the exponent is positive. The number of moves gives you the exponent. Start at the very end of the large number and move to the left. Remember the coefficient has to be between 1-9.9. This lets you know where to stop when you are moving the decimal point. To write the number in scientific notation back to standard move the decimal point to the right based on the exponent number.

Example: $8900000000 = 8.9 \times 10^9$ $6.7 \times 10^4 = 67,000$
            $5678 = 5.678 \times 10^3$ $1.2 \times 10^5 = 120,000$
            $4500000000000 = 4.5 \times 10^{12}$ $2.3 \times 10^2 = 2,300$

Small Numbers- move the decimal point to the right and the exponent is negative. The number of moves give you the exponent. To write the number in scientific notation back to standard move the decimal point to the left based on the exponent number.

Example: $0.001 = 1.0 \times 10^{-3}$ $8.9 \times 10^{-2} = 0.089$
            $0.00987 = 9.87 \times 10^{-3}$ $1.2 \times 10^{-3} = 0.0012$
            $0.0000876 = 8.76 \times 10^{-5}$ $3.4 \times 10^{-5} = 0.000034$

SIGNIFICANT FIGURES

Directions: Review the rules significant figures. You should be able to count the number of significant figures in a number, and you should be able to perform the basic mathematic functions (addition, subtraction, multiplication, and division) and provide the correct number of significant figures in your answer. **Complete the Significant Figures Worksheet. This is a GRADE.**

Rules to determine how many significant numbers has in a measured quantity:

1. All nonzero digits are significant. For example, 457 cm has three significant figures; 1.2985 g has five significant figures.

2. Zeros between nonzero digits are significant (Captive zeros). For example, 1005 kg has four significant figures; 1.03 cm has three significant figures.

3. Zeros (leading zeros- zeros that are at the beginning of the number. The decimal point does not matter as long as the zeros are at the beginning. ex. 0.0003, 0.09) to the left of the first nonzero digits in a number are not significant; they merely indicate the position of the decimal point. For example, 0.02g has one significant figure; 0.0026 cm has two significant figures.

4. When a number ends in zeros that are to the right of the decimal point, and has a nonzero digit in front of the zeros are significant. For example, 0.0200g (remember leading zeroes are not significant) has three significant figures; 3.0 cm has two significant figures.

5. Trailing zeros that come at the end of a number are not significant unless there is a decimal point in the number. For example, 130 cm has two significant figures; 10,300g has three significant figures; 0.0030000 has five significant figures. (Remember leading zeros are not significant).

6. In exponent (power) form, the exponent term does not contribute to the significant figures. Thus, Planck's constant h = **6.67** X 10^{-34} J×s which has only three significant figures. Look at the coefficient only when counting significant figures of number in scientific notation. For example **3.00** x 10^{6} has three significant figures.

SIGNIFICANT FIGURES IN CALCULATIONS

In Addition and Subtraction: When adding or subtracting, the number of significant digits is determine by the number given in the problem that has the least number of significant figures to the right of the decimal place. After solving the problem your answer should have the same number of significant figures to the right of the decimal place.

Example: Adding

26.46 ← this has 2 significant figure after the decimal point +4.123 ← this has 3 significant figure after the decimal point. After adding the two numbers the total was 30.583 rounds off to →
30.58 (Rounding off the results of the above sum to the least significant figure which is 2)

 26.46   (has 2 significant figures
+ 4.123 (has 3 significant figures after the decimal)
30.583 rounds off to 30.58

Example: Subtracting

26.46 (this has 2 significant figure after the decimal)

-4.123 (this has 3 significant figure after the decimal)

 22.337 rounds off to → 22.34

Multiplication and Division: In multiplying or dividing, the number of **significant figures** in the answer, regardless of the position of the decimal point, equals that of the quantity that has the smaller number of **significant figures**.

Example: Multiplying

2.61
x 1.2 this has the smaller number of **significant figures** 2
3.132 rounds off to → 3.1 has 2 **significant figures**

Example: Dividing

2.61 ÷ 1.2 = 2.175 rounds off to → 2.2

Units of Measurements

Directions: Memorize the conversion factors. **You will be given a quiz on the unit of measurements.**

Length: Base Unit (meters)

1 kilometer (km) = 1000 meters (m)

1 meter (m) = 100 centimeters (cm)

1 centimeter (cm) = 10 millimeters (mm)

1 meter (m) = 10 decimeter (dm) = 100 centimeters (cm)

1 hectometer (hm) = 100 meters

1 dekameter (dam) = 10 meters

1 meter = 1000 millimeters (mm)

Volume: Base Unit (Liters)

1 liter (L) = 1000 milliliters (mL)

1 liter (L) = 1000 centimeters^3 (cm^3)

1 Liter = 10 deciliter (dL)

1 Liter = 100 centiliter (cL)

1 kiloliter (kL) = 1000 L

1 hectoliter (hL) = 100 L

1 dekaliter (daL) = 10 L

Mass: Base Unit (Grams)

1 kilogram (kg) = 1000 grams (g)

1 hectogram (hg) = 100 grams (g)

1 dekagram (dag) = 10 grams (g)

1 gram (g) = 10 decigrams (dg)

1 gram (g) = 100 centigrams (cg)

1 gram (g) = 1000 milligrams (mg)

DIMENSIONAL ANALYSIS

Directions: Review the rules for one step and two step conversions. You must write the steps exactly how I have written them in the rules. We do not move decimal points using dimensional analysis. **Complete the Conversion Factor Worksheet. This is a GRADE.**

Dimensional analysis is a process that allows changing of units. If you were going to change from centimeters to meters dimensional analysis allows an easy way to change. To start you must decide what the conversion factor is, so we know that 100 centimeters = 1 meter.
In dimensional analysis you can setup the equation like this.

One Step Conversions

Remember your **BASE UNITS**- meters (m), Liters (L), and grams (g).

Problem: 2g = _____ kg

Step 1: Write the given.

$$2g$$

Step 2: Write the multiplication symbol and the division line.

$$2g \times _____$$

Step 3: The unit that is given is placed in the denominator.

$$2g \times _____$$
$$g$$

Step 4: The unit that you are looking for is placed in the numerator.

$$2g \times _____ kg$$
$$g$$

Step 5: Choose your conversion factor.

$$1kg = 1000g$$

Step 7: Place the numbers with the appropriate units. The number in front of kg (kilograms) is placed in front of the kg in your set up, and the number in from of g (grams) in place in front of the g in your set up.

$$2kg \times \underline{\_\_\_\_1000_____} g = 2000 \ g$$
$$1 \quad kg$$

Two Step Conversions

Remember your **BASE UNITS**- meters (m), Liters (L), and grams (g).

Problem: 200 mg = _____ kg

Step 1: Write the given.

200 mg

Step 2: Write the multiplication symbol and the division line.

200 mg x _____ x _____

Step 3: The unit that is given is placed in the denominator.

200 mg x _____ x _____

mg

Step 4: The base unit is placed in the numerator.

200 mg x _____g__ x _____kg

mg   g

Step 7: Choose your two conversion factors.

1000 mg = 1g   and   1 kg = 1000g

Step 8: Place the numbers with the appropriate units.

200 mg x _____1____g_ x _____1_____kg = 0.0002 kg

1000 mg   1000   g

Name _____ Date _____ Period ____

Significant Figures Worksheet

Directions: Determine the number of significant digits in each of the following, and write the number in the blank.

a) 6.571 g   _____

b) 0.157 kg   _____

c) 28.0 ml   _____

d) 2500 m   _____

e) 0.0700000 g   _____

 f) 30.07 g   _____

g) 0.106 cm   _____

h) 54.52 cm   _____

i) 0.12090 mm   _____

j) 0.0067 g   _____

k) 2.690 g   _____

 l) 0.0230 cm   _____

m) 43.07 cm   _____

n) 26.509 cm   _____

o) 6.70×10^{23} atoms   _____

p) 8.9×10^{2} molecules _____

q) 9.00×10^{4} atoms   _____

r) 0.0067830 nm   _____

s) 0.0987 cm   _____

t) 4.51×10^{4} atoms   _____

Name _____ Date _____ Period _____

<u>Significant Calculations Worksheet</u>

Directions: Evaluate. Make sure the correct number of significant figures are in the final answer. <u>TEN POINTS WILL BE DEDUCTED FOR NOT SHOWING YOUR WORK.</u> Place a box around your final answer. Use your own paper. Please write legibly.

a) 16.5 + 8 + 4.37
b) 13.25 + 10.00 + 9.6
c) 2.36 + 3.38 0.355 + 1.06
d) 0.0853 + 0.0547 + 0.0370 + 0.00387
e) 25.37 + 6.850 + 15.07 + 8.056
f) 23.27 - 12.058
g) 13.57 - 6.3
h) 2.6 x 3.78
i) 6.54 x 0.37
j) 3.15 x 2.5 x 4.00
k) 0.085 x 0.050 x 0.655
l) 3.08 x 5.2
m) 0.0036 x 0.02
n) 4.35 x 2.74 x 3.008
o) 35.7 x 0.78 x 2.3
p) 35 / 0.62
q) 39 / 24.2
r) 40.8 / 5.05
s) 0.58 / 2.1
t) 0.075 / 0.030

Name _____ Date _____ Period _____

Scientific Notation Worksheet

Directions: Express the following in scientific notation. Write the answer in the blank.

a) 0.00003   _____

c) 55000000   _____

e) 0.000007   _____

b) 8000000   _____

d) 0.002   _____

 f) 65 000   _____

g) 5.67 x 10^{-9} _____

h) 1.34 x 10^{-3} _____

i) 4.0 x 10^{-6} _____

j) 8.7 x 10^{-2} _____

k) 2.2 x 10^{-5} _____

l) 67000   _____

m) 0.0056   _____

n) 0.00012   _____

o) 98000000000 _____

p) 7.8 x 10^{12} _____

q) 8.91 x 10^{4} _____

r) 1.40 x 10^{5} _____

s) 3000000000 _____

t) 5.0 x 10^{3} _____

Name _____ Date _____ Period _____

Units of Measurements

Directions: Evaluate. <u>TEN POINTS WILL BE DEDUCTED FOR NOT SHOWING YOUR WORK.</u> Place a box around your final answer. Use your own paper. Please write legibly.

1. 256 m = _____ cm

2. 97.25 cm = _____ mm

3. 952 g = _____ mg

4. 0.574 m = _____ cm

5. 5.287 L = _____ mL

6. 785.3 km = _____ m

7. 84.363 km = _____ cm

8. 872 km = _____ mm

9. 95,824 cm = _____ mm

10. 8.26 kL = _____ ml

11. 36 mm = _____ cm

12. 857 cm = _____ mm

13. 8.52 mg = _____ g

14. 975 mm = _____ cm

15. 9,824 cm = _____ m

16. 74.21 cm = _____ km

17. 0.254 g = _____ kg

18. 96 mm = _____ km

19. 12.5 cm = _____ m

20. 0.85 mL = _____ L

HONORS CHEMISTRY SUMMER 2012 ASSIGNMENT Part 1
SOUTHWIND HIGH SCHOOL

Find **1** article that has something to do with chemistry. The articles can come from newspapers, magazines or the internet. You must clip or print out each article and include it with your report. You can go to the library and find articles in TIME, NEWSWEEK, DISCOVER, SCIENTIFIC AMERICAN, newspapers, etc. that have something to do with chemistry. This assignment is due on Friday, August 13, 2012.

The report should include the following:

The name or title of the report.
E.g. Acids Rain in Maine

A summary of the article in **your own words (3 paragraphs)**.
Do not repeat the article word for word. It is the purpose of this assignment that you think and make it relevant to yourself. Put the article in your own words.

The paper should be typed in Times New Roman (12 point font).
The margins of the paper should be 1-inch top, bottom, left and right.
This report is worth 100 points.

Questions to Answer:
How does the topic covered in the article affect you in your daily life?
E.g. Does acid rainwater affect the quality of fishing in a lake that you frequently fish in on vacation?

What did you learn from the article that you did not know prior to reading it?
E.g. I knew about acid rainwater but I didn't know that it could affect fish in a lake.

Have fun this summer and take a little time out to learn!

REMEMBER TO PARAPHRASE AND CITE WITHIN THE TEXT AND YOU MUST HAVE A REFERNCE PAGE APA STYLE.   USE PURDUE ONLINE WRITING LAB. Use the following website for APA
http://owl.english.purdue.edu/owl/resource/560/01/
  OR http://research.lesley.edu/apa **Review the following PowerPoints on plagiarism** www.qacps.k12.md.us/qhs/teachers/boones/**plagiarism**.ppt *or* www.mtlsd.org/**highschool**/stuff/10%20**plagiarism**%20tutorial.**ppt**

IF YOU PLAGIARIZE THAN YOU WILL RECEIVE AN F. IF NO CITATIONS ARE THE TEXT OR NOT HAVING A REFERNCE PAGE = F (0)

Name _____ Date _____ Period _____

HONORS CHEMISTRY SUMMER 2012 ASSIGNMENT RUBRIC
SOUTHWIND HIGH SCHOOL

Title (12 Points Possible)

Title is on the front page.

Title is in 12 pt font/bold/underlined

Title is placed in the center of page.

Title page has the student's name (typed in the center of page).

Title page has the name of the course (typed in the center of the page).

Title page has the date due (typed in the center of the page).

Points Possible 12

TOTAL POINTS

Summary (30 Points Possible)

Summarize the article 2 paragraphs (10 points)

Question #1 (10 points)

Question #2 (10 points)

Points Possible 30

TOTAL POINTS

Writing Technique (50 Points Possible)

Report is typed.

Text of report is doubled spaced (not the title page or the table or figure labels).

Block type is used (Tahoma or Times New Roman).

12 point font used (except for the title).

Personal pronouns and other words and phrases referring to lab group members are NOT present.

Words are spelled correctly.

 Punctuation is present.

All sentences are complete (Fragment or run on sentences are not present).

Section titles are present and are in correct order (as indicated in the "Formal Lab Report Guide").

Citations present (NO CITATIONS= F)

Points Possible 50

TOTAL POINTS

References (3 Possible Points)

All references are present (NO REFERENCES=F)

All references are clear.

All references are cited APA style.

Points Possible 8

TOTAL POINTS

TOTAL POINTS   _____ /100 POINTS

If citations and references are not present in the article summary the student will receive an automatic F. All students should refer to the following website for writing in APA style http://www.apastyle.org/ or http://owl.english.purdue.edu/owl/resource/560/01/ (Purdue Online Writing Lab) These sites are very helpful for writing in APA.   Review the following Powerpoints on plagiarism www.qacps.k12.md.us/qhs/teachers/boones/**plagiarism**.**ppt** *or www.mtlsd.org/**highschool**/stuff/10%20**plagiarism**%20tutorial.**ppt**