Chemistry Summer Homework 2018-19

Welcome to Chemistry I!

The purpose of this summer assignment is to learn/review some mathematical terms and processes that we will be using in the fall. Although this assignment will not be graded, it will prepare you for success in Chemistry I in the fall.

1.   Read Chapter 2, "Measurements and Calculations" in the *Modern Chemistry* textbook. This textbook should be on nfoxscience.com under chemistry. This is the link o the folder: https://drive.google.com/drive/folders/0ByWJhtUE0UVzRy1YY21oSFVFR3c?usp=sharing

    If you need help on the topics in that section, here are some suggested videos to watch:
    Unit Conversion https://www.youtube.com/watch?v=5tHpDzXP-lg
    Significant Figures: https://www.youtube.com/watch?v=Sno64ghj7nA
    Calculating with Significant Figures: https://www.youtube.com/watch?v=2eXC6s9X6Wc
                                    https://www.youtube.com/watch?v=o5BmoMDJLRY
    Scientific Notation: https://www.youtube.com/watch?v=Dme-G4rc6NI
    Calculating with Scientific Notation: https://www.youtube.com/watch?v=PYTp75sryWA
                                    https://www.youtube.com/watch?v=ciFOlirz4Js
    Dimensional Analysis: https://www.youtube.com/watch?v=7N0lRJLwpPI
    General Overview: https://www.youtube.com/watch?v=hQpQ0hxVNTg

If you have any questions about the assignment email me at nkfox@caddoschools.org Note: I will be unavailable for portions of the summer, but will do my best to get back to you as quickly as possible.

Scientific Measurements

SI Units:

1. Label each of the following measurements by the quantity each represents. For instance, a measurement of 10.6 kg/m^3 represents density.

a. 5.0 g/mL   b. 37 s   c. 47 J   d. 39.56 g

e. 25.3 cm^3 f. 325 ms   g. 500 m^2 h. 30.23 mL

i. 2.7 mg   j. 0.005 L

Unit Conversion:

2. Complete the following conversions:

    a. 10.5 g = _____ kg   b. 1.57 km = _____ m

    c. 3.54 µg = _____ g   d. 3.5 mol = _____ µmol

    e. 1.2 L = _____ mL   f. 358 cm^3 = _____ m^3

    g. 548.6 mL = _____ cm^3

3. Write conversion factors to represent the following equalities:

    a. 1 m^3 = 1,000,000 cm^3 b. 1 in. = 2.54 cm

    c. 1 µg = 0.000001 g   d. 1 Mm = 1000000 m

Dimensional Analysis:

Read the following page, paying special attention to the sample problems:
http://www2.ucdsb.on.ca/tiss/stretton/Basic_skills/Dimensional_Analysis_Contents.htm

4. Complete "Practice Problems Level 1" Problems 1-10. You must show your work for all problems!

5. Complete "Practice Problems Level 2" Problems 1-10. You must show your work for all problems!

Percentage Error:

6. A student measures the mass of a sample as 9.67 g. Calculate the percent error, given that the correct mass is 9.82 g. You must show your work!

7. A handbook gives the density of calcium as 1.54 g/cm^3. What is the percent error of a density calculation of 1.25 g/cm^3 based on lab measurements? You must show your work!

8. What is the percent error of a length measurement of 0.229 cm if the correct value is 0.225 cm? You must show your work!

Significant Figures

9. How many significant figures are there in each of the following measured values?

a. 2804 m   b. 2.84 km   c. 5.029 m   d. 0.003068 m

e. 4.6×10^5 m   f. 4.06×10^{-5} m   g. 750 m   h. 75 m

i. 75,000 m   j. 75.00 m   k. 75,000.0 m   l. 10 cm

10. Perform the following calculations. You must show your work! Do not just use your calculator. Write your answer with the correct number of significant figures:

a. 45. 761 g – 42.65 g   b. 1.6 km + 0.62 km

c. 0.340 cg + 1.20 cg + 1.018 cg   d. 6.000 nm – 202 nm

e. 5.44 m – 2.6103 m   f. 18.00 L + 14 L

g. 23.5 kg ÷ 4.615 m^3 h. 0.2 km ÷ 5.4 s

i. 5.761 cm × 6.20 cm   j. 11.00 m m × 12.10 m × 3.53 m

k. 12 m × 6.41 m   l. 16.25 g ÷ 5.1442 mL

Scientific Notation

11. Write each measurement in scientific notation. Write your answer with the correct number of significant figures:

     a. 76.0°C   b. 212 nm   c. 56.021 g   d. 0.78 L

     e. .07612 m   f. 763.01 g   g. 10,301,980 nm   h. 001 nm

12. Write each number is standard form. Write your answer with the correct number of significant figures:

     a. 7.050×10^{-3} g   b. 4.00005×10^{7} mg   c. 2.3500×10^{4} mL

     e. 1.07×10^{4} g   f. 1.07×10^{-4} nm   g. 1.07×10^{-8} J

13. Perform the following calculations. You must show your work! Do not just use your calculator. Write your answer with the correct number of significant figures:

a. 8.41×10^{4} J $+ 9.71 \times 10^{4}$ J

b. 5.11×10^{2} L $- 4.2 \times 10^{2}$ L

c. 8.2×10^{3} s $+ 4.0 \times 10^{3}$ s

d. 6.3×10^{-2} mg $- 2.1 \times 10^{-1}$ mg

e. 1.013×10^{3} g $+ 8.62 \times 10^{2}$ g $+ 1.1 \times 10^{1}$ g

f. 2.82×10^{6} m $- 4.9 \times 10^{4}$ m

g. 1.1012×10^{4} mm $+ 2.31 \times 10^{3}$ mm $+ 4.573 \times 10^{2}$ mm