

Chemistry I Objective Review 1 World of Chemistry Chapters 1 & 5

1. Define these terms:  
dependent variable      experiment      theory      natural law      chemistry  
independent variable      Liter      percent error      experimental control      hypothesis
2. List and describe the steps of the scientific method. Given a description of an experiment, be able to identify the steps and design elements of the experiment.
3. List 10 lab safety rules and be able to recognize infractions of all rules given in class.
4. List all SI base units, their symbols, and the quantities they measure.
5. List the derived SI units and symbols for area, volume, force, pressure, and energy.
6. List the steps of problem solving using dimensional analysis.
7. Express 10 kg as grams, milligrams, and micrograms in the manner described in objective 6.  
Express 3219  $\mu\text{L}$  as mL, and L
8. Explain how the Celsius scale is designed including the significance of zero degrees, one hundred degrees, and degree size.
9. Describe the Kelvin scale including the significance of zero and degree size. Convert 1000 C to Kelvin and 100 K to Celsius.
10. Explain the rules for determining the uncertain digit using a digital and/or analog display.
11. How many significant figures does each of these have?  
40697.033      303400      30.09
12. Solve showing correct number of significant digits:  
a.  $248.48 \text{ g} + .07 \text{ g} + 19.1 \text{ g} = \underline{\hspace{2cm}}$       b.  $4.284 \text{ mL} * (22.638 \text{ mL} - 1.3 \text{ mL}) = \underline{\hspace{2cm}}$
13. Express these numbers in scientific notation:  
a. 6506000      c. .000632      e. .00303  
b. .0000002      d. 12345400000      f. 6
14. A pH 7.0 standard solution was tested with a pH meter five times with the following results:  
7.1      7.1      6.7      7.3      7.2  
What is the percent error of the meter?
15. Explain how to calculate the density of an object. An  $8.0 \text{ cm}^3$  lump of metal has a density of  $2.70 \text{ g/cm}^3$ . What is the mass of the lump?.
16. Calculate the number of seconds in a year, decade, and century. Express your answer in scientific notation where possible. Show your work including canceled units.