Chemistry Summer Assignment 2015

Answer all questions with correct units and in **significant figures** when possible.

1. List the basic steps of the scientific method.
2. What is the difference between an independent and dependent variable?
3. What is the purpose of a control group in an experiment?
4. Describe the difference between chemical and physical properties and give two examples of each kind of property.
5. Label each substance below as either homogeneous mixture (solution), heterogeneous mixture, compound, or element.
   a. salt _____ e. nickel _____
   b. ice _____ f. concrete _____
   c. 14 carat gold _____ g. air _____
   d. oxygen _____ h. milk _____
6. Density Problems:
   a. Determine the density of an object that has a mass of 15.2g and a volume of $3.7cm^3$.
   b. Gold has a density of 19.30 g/cm^3. What is the volume of a 6.33g piece of gold?
   c. What is the volume of a slice of aluminum that has a density of 2.70 g/mL and a mass of .415 kg?
7. Describe the difference between potential and kinetic energy.
8. Complete the following table regarding metric prefixes (tell the value of each prefix and abbreviation).

Giga	Mega	Kilo	Hecto	Deca	Base	Deci	Centi	Milli	Micro	Nano	Pico

9. What is the difference between accuracy and precision? Is it possible to be accurate but not precise?
10. Fill out the table rounding off to the correct number of significant figures.

Number of sig figs →	2	3	4	5
1279.45 g				
27.0456 L				
0.027769 m				
0.00033025 s				

11. Determine the number of significant figures in the following numbers:
    a. 23.40_____ d. 0.003 _____ g. 1200 _____
    b. 1.08 _____ e. .4500 _____ h. 2.30300 _____

c. 500 _____ f. 16.00 _____ i. 0.020 _____

12. Convert 65 mi/hr to m/s.
13. Convert 125 miles/day to km/s.

Honors Problems:

1. The diameter of the sun is estimated to be 1,442,000 km and its average density is 1.4 g/cm^3. What is its mass in kilograms? (use $V=4\pi r^3/3$)
2. How many years have you lived if you have been alive 1 billion seconds?
3. The doctor tells you that you need to take 15mL of medicine a day until you are healthy. You buy a gallon of medicine from the pharmacy. How many days would this medicine last you?