Packet 2

Practice

1) Describe the differences between qualitative and quantitative data.

2) How is a law different from a theory?

3) Describe each of the following changes as *physical* or *chemical*.

a) Gas bubbling out of a newly opened, delcious orange soda.	b) Heating sugar to form a dark, black color.
c) Production of ATP upon the ingestion of sugar	d) Water in a glass slowly losing volume.
e) Mixing water and oil, shaking, and watching the two separate. As a bonus Jeopardy question, which will be on top?	

4) Define each of the following as a mixture, element, or compound.

a) Piece of aluminum	b) Hard sand at an ocean beach
e) Ethylene glycol (substance used as antifreeze)	d) Tungsten (metal with highest melting point)
c) Hydrogen peroxide the kind you find in your medicine cabinet (used as a disinfectant)	

5) Describe the difference between mass and weight.

6) What are the three most common states of matter?

7) List 3 properties of each state of matter.

New Discovery

Come up with an idea that a knowledge of chemistry is needed in order to develop it. The idea that you come up with needs to be big. Not "I want to make hockey sticks that won't break" (easy use a wooden one), this needs to be a large idea. I want a paragraph on how chemistry will be used in the development of your idea. There should be *at least* two properties of your product that should be chemically tested. We will be discussing your ideas and thoughts in class and talking about how chemistry would be involved in bringing your idea to reality.

Measurement: Are You Accurate?

We are going over the different types off data you can collect while performing a lab. The first step to understanding how a chemistry lab works is to understand how you will take measurements. When reporting information, qualitative information is good, but quantitative measurements are taken more seriously. Which of the following statements gives you a better idea about what happened:

1 – "The beaker got hot and steam was emitted from the surface of the water."

2 – "The temperature of the water rose 25.3°C and 0.243 grams of water was lost due to vaporization."

The second statement tells us much more about what happened in this situation. In order to make statements like this, what do we need? Instrumentation, although some of us picture ourselves with super human powers to read temperatures with our hands, we need calibrated instruments. The following procedures will describe different situations in which you will use different measuring techniques.

I. What Is My Mass?

1. Obtain a collection of marbles and a weigh boat.
2. Place weigh boat on scale and zero the scale.
    a. Zeroing the scale will give you a relative zero, meaning the mass of the weigh boat will be discounted.
3. Using the weigh boat, obtain the total mass of the marbles and write out in your lab notebook.
4. Move to another scale with either a greater or lesser degree of accuracy and repeat steps 2 and 3.

II. What Is The Volume

1. Obtain a rectangular piece of metal.
2. Using a ruler, measure the length, height, and width of the piece of metal. Write down your measurements.
3. Fill a graduated cylinder to the a certain mark with water. Make sure you measurement is exact. If you are having problems getting an exact value, use a pipette to change the volume by smaller amounts.
4. Tilt the graduated cylinder and slide your metal block into the cylinder. Remember, these are glass and can break, DO NOT allow the block to fall in too quickly.
5. Once the block has been placed in the cylinder, record the new volume of water.

III. Data Collection and Interpretation

1. Obtain a container with a liquid.
2. Obtain a graduated cylinder and determine the mass of the cylinder.
3. Determine a volume of the liquid using a graduated cylinder and record in your lab book.
4. Place the now filled cylinder on the same balance you measured the mass of the cylinder and record the mass.
5. Record your observations in your lab book.
6. Place a small piece of magnesium metal in your liquid and record your observations.
7. Place several drops of a solution of sodium carbonate in your solution to determine if it is a mixture or a compound.

Questions

1. Which scale was most accurate and why would you refer to it as the most accurate?

2. Using your measurements with a ruler, calculate the volume of your cube. Using water displacement, determine the volume of your cube. Compare your results and write out which method you believe is most accurate and defend your choice.

3. Create a data table indicating all the data your have collected.

4. What did you learn about your liquid from the tests that you ran on it? Make sure to use all the information you recorded during part III. When explaining what you learned, do not use bullet points but write out full sentences, yes you will be graded on how well you describe your liquid.