Name_____**Section**_____
Partner_____

CHM 111 Lab 1 Report Form

This needs to be turned in to your instructor. It should be printed, not handwritten. You can fill in the blanks by hand. Each individual needs to turn in their own work, do not work with anyone else. This (and all lab work) is covered by the Honor Code. One sample (and only one) of each type of calculation should be attached on a separate sheet. (For this lab, you should have one calculation for finding mass, one calculation for finding volume, one calculation for finding density, one calculation for finding average density and one calculation for finding average deviation.)

Using your data in Table 1, ***calculate*** the values for water asked for in the table below. Note that calculated values and raw data are not the same thing, none of these values should be exactly what's in Table 1.

	Exact volume (mL)	Mass top loading (g)	Density Top loading (g/mL)	Mass analytical (g)	Density Analytical (g/mL)
~ 1 mL					
~ 10 mL					
~ 25 mL					
~ 50 mL					
Average					
Avg Dev.					

1. Use the volume and mass (top loading) data to draw a graph where the slope gives the density. Graphing tips can be found on the lab web page. Whenever you are asked to draw a graph, it must be computer generated and submitted with your report. Give the equation of the line in the format y = mx+b. _____

2. Logically, what should the value of "b" be? _____ Your calculated value should be slightly different from this. Is this a measure of accuracy or precision? Explain.

3. Based on the graph, what is the average density of water?_____

4. Look up the value for density of water at the approximate temperature in a reliable reference and cite.
   _____

Circle the correct word from the underlined choices:

5. Based on the average deviation, top loading / analytical balance was better. It was more accurate / precise.

6. Based on the literature value and average density, the top loading / analytical balance was better. It was more accurate / precise.

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Now calculate the average density of water and average deviation for the data you got from the two other groups. Copy your values from the previous table to the last row.

Group names	Avg density anayltical	Avg deviation
Your group		

7. Which of these three groups was most accurate?

8. Which of these three groups was most precise?

Identify the unknown metal
As always, attach sample calculations.

What was the density of water that you measured last week? _____

1. What's the density of your unknown metal?_____ Unknown # _____If you can't figure out how to find it on your own, click here for directions.

2. Using the chart in the introduction and your critical thinking skills, identify your metal._____

   Identify one source of error and classify it as random or systematic. "Human error" or "blunder" is NOT a scientific source of error.

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Hints for finding density of an unknown metal

- What's mass of the metal?_____
- To find the volume of a solid, we need a known volume container. To find the volume of the Erlenmeyer flask, we can use the density of water. What's the mass of water that completely fills the flask (no metal)?_____
- What's the volume of this mass of water, using the density of water you calculated last week? _____ This is the volume of the flask.
- What mass of water did it take to fill the flask when the metal was present?_____
- What is the volume of the water in the previous question?_____
- Subtract the volume of water from the volume of the flask to get the volume of the metal. _____

Divide mass of metal by volume of metal to get the density.

Use logic as well as density to evaluate the identity of your unknown metal.