Name_____Section_____

CHM 115 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 <u>each type of calculation</u> should be attached on a separate sheet.

Part A – Density of water, accuracy and precision

I. Using the raw 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 chemistry department web page. 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.

    _____

5. Calculate the **average** deviations for both top loading and analytical densities using equation from the introduction. Always show work, remember not to round any sig figs until the final answer.

 Circle the correct word from the underlined choices:

6. Based on the average deviation, <u>top loading / analytical balance</u> was better. It was more <u>accurate / precise</u>.

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

Part B – Identify the unknown metal

As always, attach sample calculations.

8. What's the density of the unknown metal?_____ Unknown # _____.

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

Hints for finding density of an unknown metal

- What's mass of the metal from Table 3?_____
- 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) from Table 3?_____
- What's the volume of this mass of water, using the density from your graph in part A? _____ 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.