ANALYTICAL WEIGHING, LIQUID TRANSFER, AND DENSITY OF A METAL

REPORT

Name:_____

Date: _____ **Section:**_____

Analytical Weighing

	Trial 1	Trial 2	Trial 3
Experimental Mass of Known Object:			
Known Mass:			
Difference:			
Methods of Determining Masses	**Data**	**Units**	
(a) mass of wash bottle			
(b) mass of dry beaker			
(c) mass of weighing bottle with salt			
(d) mass of weighing bottle with residual salt			
(e) mass of beaker with salt			
(f) mass of beaker plus salt and water			
(g) mass of wash bottle after water transfer			
	Mass of Salt	**Mass of Water**	
Method 1(addition)			
Method 2 (difference)			
Difference in Methods (tenths of milligrams)			
Difference in Methods (percentage)			

Comments:

Pipette Transfer

	Trial 1	**Trial 2**	**Trial 3**
Mass of beaker before water addition			
Mass of beaker after water addition			
Mass of water added			
Lab temperature:		Water density:	
	Trial 1	**Trial 2**	**Trial 3**
Volume of water added			
Average Volume delivered:		***Rel. Std. Dev.:	

***Note:** Read the appendix in the lab manual - Rel. Std. Dev.or RDS.*

Comments:

Post Lab Discussion/Questions for Methods Section:

1. Which method of weighing (addition or difference) do you think is the more accurate method? Why?

2. Why does the wash bottle lose very little water to evaporation?

3. What impact on weighing do your fingerprints have?

4. ***Why*** does the temperature of the lab play a role in the determination of water density?

Density of a Metal Object

Your Graduated Cylinder Calibration Data

	Trial 1	**Trial 2**	**Trial 3**
Final Buret Reading (mL)			
Initial Buret Reading (mL)			
Calibrated Volume (mL) ($V_f - V_i$)			
Average Calibrated Vol. (mL)			
Standard Deviation***** (mL)			

***Note:** Read the appendix in the lab manual - Standard Deviation.*

Your Unknown Metal Data *Sample (unknown metal) #:_____*

	Trial 1	**Trial 2**	**Trial 3**
Mass of Metal Sample (g)			
Final Buret Reading (mL)			
Initial Buret Reading (mL)			
Volume (mL) of water added to the cylinder with metal ($V_f - V_i$)			
Volume (mL) occupied by metal *(use calibrated volume*)			
Metal Density (g/mL = g/cm^3)			
Density Uncertainty*			
Average Density (g/mL = g/cm^3)			
Standard Deviation Density (g/mL = g/cm^3)			

***Note:** Read from lab manual - pages 22-24.*

Show the calculation of the density uncertainty (Trial 1) using the following info:

- Balance uncertainty is 0.0002 g for each measurement.
  - if the balance screen shows 5.1234 g, then mass is 5.1234 ± 0.0002 g
- Buret uncertainty is 0.05 mL for each reading.
  - if the dispensed volume ($V_f - V_i$) is 5.12 mL, then vol. becomes 5.12 ± 0.10 mL

  (± 0.10 mL because there are 2 readings and uncertainties are added for additions or subtractions: 0.05 mL + 0.05 mL = 0.10 mL)
- The density calculation involves a division. Convert the absolute uncertainties of mass and volume into relative uncertainties expressed as % (an example is shown on page 24 in the lab manual).

Continue the calculation of the density uncertainty (Trial 1) here:

Post Lab Question (entire lab)
Would you characterize this lab as conforming to the Principles of Green Chemistry? Support your answer.