# **Mass and Volume Lab Report Rubric**

## The report must be **typed**. No exceptions***. Each section must begin with a heading (- 5 points if the heading is omitted)*.**

# **1. Title Page 1. 5 points ‘**

## The title page must contain all of these items else your score is 0:

## the title of the experiment,

## your name,

## the date,

## period number,

* lab group color

## and names of your lab partners.

# **Introduction and Background**

## **2. State the purpose of the experiment (what you hope to accomplish) 2. 5 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## **3. State the background, theory and formulas 3. Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## **4. State the hypothesis, variables and calculated quantity. 4. 5 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## **5. Give a brief overview of the experiment: 5. 5 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

# **6. Methods ‘ 6. 10 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## This section contains the procedure and lists the important materials used.

## Explain how you studied the problem or performed the experiment.

## Explain how you studied the problem or performed the experiment. You should include enough detail so most high school student could repeat your experiment

# **Data and Results**

## **7. Data tables** **7. 5 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## You use the table attached to the end of this document and it must be completely filled in. In addition to the mass of the sample, the volume of the sample and the density of the sample you must include

* Deviation
* Percent deviation
* Average experimental value of Density
* Average deviation (mean deviation)
* Average percent deviation (Mean Percent Deviation)
* **Class averages for density of your two metals shown at bottom of data table.**
* Numbers are neatly ‘lined up”

## **8. Graphs** (you must use a printed graph like the one we did in Excel) and include the following **8.** **10 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. x axis is labeled with the name of the IV found in the data table.
2. y axis is labeled with the name of the **DV** found in the data table.
3. Title: The effect of \_\_\_\_\_ (the IV) \_\_\_\_\_\_\_\_ on \_\_\_\_ (the DV) \_\_\_\_\_ or Mass vs. Volume.
4. Scale the axes (numbers)
5. Show the origin
6. Plot both sets of points on the same graph
7. Draw a best fit lines (trend line) for both metals on one graph
8. Include the linear equation of each line (y = mx +b)
9. Include the R2 value
10. Show the 5% test calculation and if you y-intercept is equal to or less that 5% of the maximum y value (mass) then state that your y intercept is negligible and should be considered zero: rewrite the equation excluding the value of ‘b’.
    1. If your value of b is > 5% max y, try 10% test instead of the 5% test.

## 9. Any observations relevant to the conclusions of the experiment should be described as well. **9. 5 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**10. Error Reporting**  **10. 5 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* If you include a revised data table, you must include your original “unrevised” data table.
* Explain in the results section why you revised the calculations in your revised data table.
* Explain that you suspected that one or two of your values were in error because it had a large % experimental error, or large % deviation or a value had a large variation. State which values are erroneous and the numeric value of the error or deviation.
* Explain that for the purposes of this investigation, density values with percent deviation values and or percent error values greater than 20% should be considered potential outliers.

# **Conclusion**

**11. Copy and answer the lab questions. List the questions and answers. 11. 8 Pt.s \_\_\_\_\_\_\_\_\_\_\_**

# 12. **Restate the purpose of the study. You can copy the purpose form the lab handout. 12. 2 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_**

# **13. The conclusion is a response to the purpose of the experiment. State the major findings of the experiment. If the purpose is to determine density, the ID of the metal, the precision and accuracy of the data then each of these are the major findings. 13. 5 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_**

# **14. Explain how the data supports your findings. 14. 10 Pt.s \_\_\_\_\_\_\_\_\_\_\_\_\_**

* State if your data was or was not precise.

## State the percent experimental error.

## State if your average density was or was not accurate.

* Is your graph reliable (y intercept is negligible; slope & your experimental density are in reasonable agreement).

**15. Discuss errors 15. 5 Pt.s \_\_\_\_\_\_\_\_\_**

**16. Reflection 16. 10 Pt.s \_\_\_\_\_\_\_\_\_**

* What new learning took place? How could you improve the experiment? How could you prevent the errors if you did the experiment again

Why is this new learning important? How could you improve the experiment? How could you prevent the errors if you did the experiment again?

What further investigations could be done?