

Name _____

Regents Physics

Section _____

Lab 1 - Rules for Gathering and Plotting Data
'Why Do Scientists Plot Data?'

Objectives:

- a. Learn how to report a measurement using significant digits. (show precision)
- b. Plot a graph of mass vs. volume for water, rubbing alcohol, and ethylene glycol
- c. Find the relationship between mass and volume.
- d. Use the slope to calculate an important characteristic of each liquid studied
- e. Use your plot to determine the mass of a large tank of water.

Our water jug contained _____ ml of water.

I predict the mass of the water jug is _____ (We'll do this later) **6 pts**

Materials: _____

(2 pts)

Procedure (You don't need to use all the steps) *Explain what you did in this lab so clearly that someone who was not in our lab that day could easily reproduce what you did. (4 pts)*

1. Mass the _____ mL graduated cylinder.

2. _____

3. _____

4. _____

Data

Mass of the empty graduated cylinder = _____ grams (2 pts)

Add the correct units inside each set of parenthesis (4 pts)

Data (4 pts)

Volume of Liquid ()	Mass of Water ()	Mass Of alcohol ()	Mass Of Ethylene Glycol ()
0	0	0	0

1. What is the formula for density? (3 pts) - **As always, answer in a full sentence.**

An answer is in a full sentence when you know what the question was just by reading the answer.

2. Measuring the mass, length, and width of Aluminum (3 pts)

Find the length and width of the aluminum in **centimeters** using the rules of measurement you learned.

Length - _____ **Guess** the thickness of the foil _____

Width - _____ Mass - _____

Analysis - Plotting - Finding the 'Perfect' within the imperfect.

1. Plot the mass (y-axis) vs. volume (x-axis) using the rules you learned. **(15 pts)**
2. Draw a single, **best-fit, straight line** for all three plots. **(15 pts)**
DO NOT CONNECT THE DOTS THE WAY YOU DID IN LIVING ENVIRONMENT
3. Use a point that hits your line of best fit to calculate the **density** of each liquid.

15 pts

Equation

Substitution with units

Answer with units

(decimal form, not a fraction)

Water

Isopropyl Alcohol

Ethylene Glycol

4. Use two points on your line of best fit to calculate the slope of all 3 lines. *Include the units. ANSWER IN **DECIMAL FORM**, NOT FRACTION*

(15 pts)

Equation

Substitution with units

Answer with units

(decimal form, not a fraction)

Water

Alcohol

Ethylene Glycol

5. Using your plot, estimate the mass of water with a volume of 16.0 ml, 27.0 ml, & 44.0 ml. **(3 pts) **** Include Units Now and whenever you write a number in this class (1 pt deduction)**

6. Write an equation for the graph of each line. (Hint: $y = mx + b$) **(3 pts)**

*Note: We use **decimals** in science, not fractions*

My Y variable = _____ **My X variable** = _____

Water -

Alcohol -

Ethylene Glycol -

7. a) The density of aluminum is 2.7 gm/cm^3 . Use this to calculate the volume of the aluminum foil you were given in the lab. (Use your info from page 2) **(5 pts)**

Equation

Substitution with units

Answer with units

$$D = M/V$$

b) Now CALCULATE the thickness of the aluminum foil from the volume.

Volume Formula - $V = L \times W \times \text{thickness} =$

Thickness = _____

8. If X grams of water has a volume of Y ml, what is the volume of 4X grams of water? **(1 pt)**

9. A trucker was asked to transport 3600 bottles of water, each of which has a volume of 330 ml, but she realizes she first must determine if her truck can withstand that load. Find the mass, in grams, of this water. Show all Work. **(4 pts) Max. truckload is 1.4 million gms**

D = _____

Can her truck withstand this load? Yes or No?