

Density Lab



- This lab is worth 60 POINTS and will not be one of the grades droppable at the end of the marking period.
- There will be 4 people per group (or 3 people but you will each have *more work* to do).
- The lab report will be broken down into several areas of responsibility:
 - Lab leader will:
 - Turn in the lab report for the whole group.
 - Write the title of the report.
 - Write the purpose of the report.
 - Create a data table at the end of the report where you will calculate the PERCENT ERROR for the three different groups of data.
 - Write the summary – examining the data from all 3 densities (which will be given to you by your lab partners – you just copy/paste what they give you).
 - Include the specific web resources.
 - Lab person #1 will:
 - Write the materials list and detailed procedure for finding the density of the **WOODEN BLOCK**.
 - Create the data table for the measurements gathered AND the final density calculations.
 - Create the calculations section for the density of the wooden block.
 - Density calculations should be written out to 0.01 place.
 - Give your electronic document to the lab leader so that they can copy/paste your work into the master lab report.
 - Lab person #2 will:
 - Write the materials list and detailed procedure for finding the density of the **PAPER CLIPS**.
 - Create the data table for the measurements gathered AND the final density calculations.
 - Create the calculations section for the density of the paper clips.
 - Density calculations should be written out to 0.01 place.

- Give your electronic document to the lab leader so that they can copy/paste your work into the master lab report.
- Lab person #3 will:
 - Write the materials list and detailed procedure for finding the density of the **UNKNOWN LIQUID**.
 - Create the data table for the measurements gathered AND the final density calculations.
 - Create the calculations section for the density of the unknown liquid.
 - Density calculations should be written out to 0.01 place.
 - Give your electronic document to the lab leader so that they can copy/paste your work into the master lab report.

Heading:

- Lab leader – be sure to include the FULL names of each lab partner, block and date.

Title:

- Lab leader – be sure to create a lab title that is complete (but not wordy) and makes sense. Make sure the title is specific – not just something vague like “Density Lab”.

Purpose:

- Lab leader – be sure to start the purpose statement with, “The purpose of this experiment is to.....”.

General Information for Materials and Procedure and Data Table and Calculation sections:

- Each lab partner will create a materials list, procedure, data table, calculations section for *their* substance.
- Lab leader – divide this part of the lab report into three parts in this format below– you will be copy/pasting from what your lab partners give you – include lab partners full name next to each Part number:
 - Part I: Density of Wooden Block - include lab partner full name
 - Materials for Density of Wooden Block
 - Procedure for Density of Wooden Block
 - Data Table for Density of Wooden Block
 - Calculations for Density of Wooden Block
 - Part II: Density of Paperclips - include lab partner full name
 - Materials for Density of Paperclips
 - Procedure for Density of Paperclips
 - Data Table for Density of Paperclips
 - Calculations for Density of Paperclips
 - Part III: Density of Unknown Liquid - include lab partner full name
 - Materials for Density of Unknown Liquid
 - Procedure for Density of Unknown Liquid
 - Data Table for Density of Unknown Liquid
 - Calculations for Density of Unknown Liquid

Materials:

- Lab partners – use a bulleted list and then list tools first, list objects and chemicals last.

Procedure:

- Number your steps **1.** to whatever number you need.
- Never use “Then....” or “Next” in your procedure (remember, you are already using numbers for each step).

- Never include more than one thing to do in a single step.
- Never use “you” in a procedure.
- Never include directions on how to calculate anything – this belongs in the calculations section.
- Never use slang (as in “grab” or “cut on” or “stick” or “dump” etc.) in a procedure.
- Be CERTAIN that you are using the correct number of decimal places in terms of each measuring instrument (remember, CALIBRATION and how you record your data based on this).

Data Table:

- Lab partners – be sure to have separate columns in your data table for mass, volume, density. NEVER “mix measurements” within the same column. Use separate columns for mass, volume, density.
- Lab partners – be sure to include the proper units for mass, volume, density.
- Lab leader:
 - Lab leader will show ACCURACY of the data in the report –
 - Accuracy is often described by % **error** – higher accuracy means low percent error!
 - From the density measurements that your lab partners give you, you will create *another* separate data table showing the % **error** for each material. Again, this will be a SEPARATE data table (after Parts I, II, and III are complete) and goes AFTER all three parts.
 - % error = $\frac{|\text{Theoretical value} - \text{Experimental value}|}{\text{Theoretical value}} \times 100$

Note that the numerator has the absolute value symbols included.

- % error should be written to 0.01 place.
- Theoretical values for substances:
 - $D_{\text{wooden block}} =$ (see your teacher – each numbered block is different)
 - $D_{\text{paperclips}} = 7.00 \text{ g/mL}$
 - $D_{\text{unknown liquid}} = 1.06 \text{ g/mL}$
- Be sure to SHOW how you calculate each % error above (show ALL your setup!).

Calculations:

- Lab partners – be sure to clearly identify (labeling) *how* you calculate your data. Show all your work!

Summary:

- Lab leader will write this section. The leader will carefully examine the data collected and try to explain WHY the results were what they are. Be sure to focus on YOUR LAB RESULTS (including error!). Be sure to use the internet to help you make good explanations and to WHY you got what you got. Remember, the summary should never discuss topics that are not relevant to the lab. And, any of your explanations you get from the internet should MAKE SENSE TO YOU (copy/pasting is a waste of time and it’s also plagiarism).

Sections to be Assessed	Points Received	Points Possible
Heading and Title and Purpose		2
Part I: Materials, Procedure, Table, Calculations		15
Part II: Materials, Procedure, Table, Calculations		15
Part III: Materials, Procedure, Table, Calculations		15
Error Table and Summary		13
TOTAL		60

