

Enriched LAB NOTEBOOK REQUIREMENTS and WRITING GUIDE

One of the major goals of science is to be able to clearly and accurately describe results of experimentation and research. In order to achieve this goal, you will keep an accurate, chronological notebook of all lab work, using a scientific format.

Maintaining a well-kept and accurate lab notebook is the most important component of good laboratory performance. The effort invested in developing good habits of notebook use now will be repaid many times over for students pursuing a career in the sciences

Lab Notebook Basics

- You will need one notebook for you and your lap partner. Please write on the cover both of your names and the class period. This notebook will remain in Mr Allan's classroom, so if one partner is gone it is available for the other partner to work on.

- All writing must be entered legibly in **permanent blue or black ink**. If an error is made, it should be marked through with a single line so as not to obscure the original entry. Example: ~~You made a mistake~~

- All graphs must be properly labeled. Computer generated graphs must be permanently glued into your notebook or they will not be graded.

The Format of Your Lab Report

For each lab we do in Enriched Chemistry, you will write up a formal lab report in your lab book. The lab report is a formal document, so use proper grammar and punctuation

Every lab report should include the following sections with headings:

Section Headings: All sections (excluding the title) start with a section heading as presented below. This signifies that you are starting a new section.

Items 1-4 and empty data tables (item 5) are the required Pre-Lab for every experiment. This should be completed and brought to class on lab day.

1. **Title** Placed at the top of the first page, this should include the title of the experiment, the name(s) of the person(s) performing the experiment, and the date it was performed.

2. **Objective** This is a statement of the purpose of the lab. What are the main reasons you are performing this experiment? Be specific...don't just restate the title or copy the generic objectives from the given lab packet.

3. **Procedure** A numbered sequence of steps you will follow as you perform the experiment, **in your own words**. Try to be brief, but include enough detail so you can follow this in the lab. Must be HAND-written (not a copy of the procedures given to you).
4. **Pre-Lab Questions:** show all work if mathematical calculations are required. Answer questions in complete sentences. (some labs will NOT have pre-lab questions)
5. **Data/Observations** This is where you record all the measurements and observations you made during the lab, and attach any graphs and charts generated during or after the lab to display your data. All data should be organized into labeled data table with correct significant figures and labeled units. Graphs and charts maybe created or computer generated, but must include titles, axes labels and units where applicable.
6. **Calculations** You must show at least ONE sample calculation for reach piece of date in your table that not simply a measured value. For example, if you record the number of moles of NaCL, but you obtained that from measuring the mass of NaCl, you must show in the calculations section how you got the number Includes formula, substitution, units (with appropriate conversions) as well as answers for all calculations
7. **Conclusion** This is a **brief** paragraph where you:
 - a. restate your hypothesis/objective
 - b. quote data that proves you met or did not meet the objective
 - c. describe possible sources of error **and** how they affected your data
 - d. Describe a new experiment (new variables) that is related to this study but serves to expand our understanding of this topic.

For example, "We supported the hypothesis that adding solutes lower freezing points of pure substances because when we added NaCl, the freezing point dropped by 5 degrees Celsius." Also use this section to analyze sources of error and how those errors influenced your data. Instrumental and human errors exist in all experiments and should not be mentioned as a source of error. If human error ruined your data, then the experiment should be repeated before it is written up.

ADDITIONAL LAB DO's and DON'Ts

Data Analysis Section

<i>DO</i>	<i>DON'T</i>
present the <u>data</u> you collected	give opinion that your data was good or bad
discuss <u>how</u> you obtained your data and explain complex calculations	describe details of the procedure again or explain every addition or subtraction step in words
refer to data tables, charts, and graphs by their title (i.e. Figure 1-2)	use the phrase, "our graph shows..." or start sentences with numbers
analyze <u>how</u> your data supports or rejects your hypothesis or objective	assume the reader will understand your data without an explanation
focus on <u>facts</u> you can support with your data and/or observations	describe what you think or what you think should have happened
compare your results to known or expected values by calculating percent error, difference, standard deviation, etc.	expect the reader to trust your results without proof

Conclusion Section

<i>DO</i>	<i>DON'T</i>
briefly restate the objective ("In this lab we...")	list procedural steps
state whether or not you met the objective and provide <u>simple</u> data to support this statement	write, "We met the objective." and fail to support this statement with proof
list/explain any significant errors <u>and</u> how they influenced the data	write, "human error messed up our lab" or unjustly blame the equipment
make suggestions for improving the procedure, process and/or outcome of this experiment if you were to repeat it	criticize the procedure or equipment without offering an idea for fixing the problem