**AP CHEMISTRY 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. Furthermore, some universities now require

submission of your A.P. Chemistry notebook before they will grant A.P. credit in chemistry even if you

score a "5" on the A.P. chemistry exam.



**Lab Notebook Basics**

* A lab notebook must be permanently bound. Ringed binders or spiral bound books are not suitable. (At a professional level, lab notebooks may become a legal document for many reasons. In that case a spiral notebook in which pages could be torn out without notice would not hold up in court.)
* 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 mistike~~
* Your name and contact information should be written on the front cover.
* On page 1: **Design** an aesthetically pleasing cover page. Include your FULL name, course title (AP Chemistry), Period, Lab Period, Classroom, the school year, your teacher’s name and a graphic. You may “decorate” the cover page using appropriate “CHEMISTRY” graphics ONLY.

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| **Table of Contents** |
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* Pages 2-3 are *reserved*\* for your table of contents. Neatly write “Table of Contents” centered on the top line. Then create a neat table (using ruler and ink) with columns shown below. For each lab you will complete the columns as shown on the table. Your teacher will record the grade earned. \**Note*: The number of pages each student will require for the table of contents varies depending on neatness, size of handwriting, etc. All students will leave two pages for the table of contents.
* **Number** all RIGHT HAND pages ONLY in upper outside corner, in ink.

Page number here (RIGHT SIDE ONLY)

* The left side page is for your notes and rough work. It will NOT be graded. Do NOT number the left side page
* Number all pages in advance at the bottom right corner and ***never*** remove pages.

LEAVE BLANK—Use for rough work, questions, notes to yourself. NOT GRADED

* All graphs must be properly labeled. Computer generated graphs must be permanently glued into your notebook or they will not be graded.
* Percent errors greater than 10% may result in point deductions on lab reports.

**The Format of Your Lab Report**

For each lab we do in A.P. 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. For the purposes of this class, your target audience is other A.P. Chemistry students who have NOT done the lab you are writing up. Therefore, write on a level such that students with similar background knowledge to yours could use your lab report to repeat your procedure and verify your data and conclusions without having access to the lab manual or handout you used. 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 1-5 and empty data tables (item 6) 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. **Equipment** A **bulleted** list of all the equipment and chemicals you will use in this experiment
4. **Procedure**  A numbered sequence of steps you will follow as you perform the experiment. 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).
5. **Pre-Lab Questions:** show all work if mathematical calculations are required. Answer questions in complete sentences.
6. **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 date 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.
7. **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
8. **Data Analysis** This is the main part of your lab report where you :
	1. *present* the date you collected
	2. *discus* how you obtained the date (explain calculations, but don't restate procedure)
	3. *analyz*e why the date is relevant

This section of the lab should contain only statements that you can support with your date, NOT your opinions. Every statement should be backed up by quoting your data and/or referencing by title, relevant tables, charts or graphs within your report. For example, in your "data" section you will further analyze that data: "We used an electronic temperature probe and determined the freezing point of sample #1 to be -5° C as noted in Figure 2 by the flat portion of the curve. This shows that the addition of solute (NaCl) lowered the freezing point by 5° C when compared to the curve of the pure sample shown in Figure 1." This will undoubtedly be the longest and most difficult section to write up in every lab report.

1. **Conclusion**  This is a **brief** paragraph where you:
	1. restate your hypothesis/objective
	2. quote data that proves you met or did not meet the objective
	3. describe possible sources of error **and** how they affected your data
	4. 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**

 