**AP CHEMISTRY LAB NOTEBOOK**

**REQUIREMENTS and WRITING GUIDE**

**LAB Notebook Set-Up**

* A bound graph paper notebook is generally acceptable for a lab notebook. Notebooks with perforated pages are NOT acceptable and you will be required to replace it.
* **Number** all RIGHT HAND pages ONLY in lower outside corner, in ink.
* 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.
* 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.
* The left side page is for your notes and rough work. It will NOT be graded. Do NOT number the left sid page

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| --- |
| **Table of Contents** |
| **Lab Number** | **Lab Title** | **Page Number** | **Grade** |
| 1 | Common Lab Equipment | 4-8 | 25/25 |
| 2 | Common Lab Procedures | 8-13 | 22/25 |
| 3 | Percent Composition of Silver oxide | 14-21 | 59/70 |
| 4 |  |  |  |
| 5 |  |  |  |



Page number here (RIGHT SIDE ONLY)

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

 Page 2

**Your Laboratory Notebook—Is it important?**

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 ink. If an error is made, it should be marked through with a single line so as not to obscure the original entry.
* Your name and contact information should be written on the front cover.
* Reserve the first few pages of the notebook for a table of contents.
* Number all pages in advance at the bottom right corner and never remove pages.
* 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 paraphrased, paragraph form 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. **Results (Data, Visual Observations, Graphs, Calculations,)**
 **Data Table/Observations**

Title that tells what data was collected

Organized logically for reader to understand

Units are included in row and/or column headings

Data is legible with correct significant figures

Must include authentication stamp of signature that data was collected in lab

#### Graphs

Has all components of graph (title, appropriate scale, axis labels with units, equation if appropriate)

May be hand created or computer generated

Graphs illustrate data or calculations. Must serve purpose (do not include graphs that do not illustrate data example: pie graph for percent composition of mixture)

Provides summary statement of meaning of graph including equation where appropriate

##### Calculations

Models how you manipulated data for one complete trial or set. [Model means to show the procedures with 1 set of actual data rather than all trails or sets of data.] Includes formula, substitution, units (with appropriate conversions) as well as answers for all calculations

Section presents all calculated data in organized way. May be presented in table form with title and modeling

Includes percent yield or percent error where appropriate

1. **Analysis:** If specific post lab questions and calculations are asked for, then your responses to those questions are sufficient for the analysis question. If specific questions are NOT asked for, provide response to the following questions.

**A. What was the purpose of the experiment?**

State the purpose of the experiment. Include the independent and dependent variables. State the hypothesis.

**B. What were the major findings?** (This section can be multiple paragraphs.)

* + Review the data using averages, class averages and trends in the data and/or graphs?
	+ What do these trends indicate about the chemical principles being studied?
	+ Does the data support or reject your hypothesis? (In science, we cannot **prove** hypotheses.)

**C. Explanation of results** using scientific principles, laws, theories and concepts

* + Explain the science at work behind the results.
	+ Address any lab questions that your teacher requires of you here in paragraph form.

**D. Major Sources of Error**

* + Discuss the percent error or percent yield for this experiment if applicable.
	+ Discuss whether the data was accurate (think sig. figs) and precise (within a close range).
	+ Describe at least three sources of experimental error in this lab and justify how each would affect the data. In other words what controls were missing in the experiment that, if in place would result in more accurate data.
	+ Discuss any anomalous data that appeared and give an explanation for it.
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**

 