

## Laboratory Documentation AP Chemistry

Schools often require solid documentation of your AP Chemistry lab experiences before they will grant you chemistry credit. It has been seen where students not scoring well enough on the exam to earn credit, have earned chemistry lab credit based on their lab notebooks alone. Therefore, it will be extremely important to develop a professional laboratory notebook.

1. Your laboratory section in your notebook will act as your lab notebook (separate notebook is acceptable). In this section, you will record your lab experiences in a professional, concise manner. All entries in your lab section must be in ink!
2. First, you will need to make a table of contents. The page will be labeled as such. Each time you prepare for a lab, you will place the experiment number, the title of the experiment, and the page number in the notebook on which the experiment starts in the Table of Contents. This page would be Preface I.
3. Following the table of contents will be the instruction sheet(s) for the lab, and the lab report. For each experiment, you will format your own lab reports in a particular manner (described below).
4. Unlike lab reports you may have completed in the past, AP Lab Reports will be written as you prepare for the lab, run the lab, collect data, and after the lab has been completed. All reports will be hand written on lined notebook paper, *in ink*. (No Frizzies) Use only the front side of paper. You will use as many pages as you need to complete each experiment. The lab report will be stapled, with all charts, graphs or graphics required attached to the back of each write-up. Once the report is graded, it will be replaced in the lab notebook. Be sure the next experiment follows on the next page.
5. Pre-Lab. You must prepare for each lab by inserting the following information in your notebook:
  - a. At the top of the first page of the experiment put your name and your partners' names (if applicable). Record the date on which the experiment starts, the experiment # and the title of the experiment.
  - b. The purpose of the experiment - For a well designed experiment this is a single simple sentence. Some experiments will require two or three sentences, but if you get beyond three, you have probably missed the point of the experiment.
  - c. An outline or flow chart of the procedure. Do not copy the entire handout. Phrases are acceptable. In most cases you will do the experiment from your outline or flow chart, so make sure it is complete and understandable. The procedure must state what you are physically doing in the laboratory. There are some experiments where a narrative format is acceptable. Other times, a T-format is more appropriate with the procedure on the left side and data/observations on the right. A **good** procedure can be understood and used by another person.

This information must be completed and signed (initialed) by the instructor before you may begin to work. If it is not complete, you must use lab time to do so and no additional time will be given to complete the experiment.

6. During the experiment, you will record all data and observations in your notebook. The information should be in chronological order throughout the experiment and all entries must be Clearly labeled. Do not leave large spaces between entries. If possible, do not skip lines. Calculations that are needed to complete the experiment may also be included, but do not waste laboratory time doing calculations that analyze data unless you are checking if another trial is Necessary. For combinations or repetitive trials, data tables are very appropriate.

7. Before leaving the lab you must have your book signed (initialed) again by the instructor as a statement of the veracity of the material written in the book.
8. For **quantitative experiments** the report needs a calculation's section - labeled as such. You must show a sample calculation in every instance, even for calculations done in a spreadsheet. [**Hint:** do calculations on scrap paper first!] For **qualitative experiments**, you will probably need a chemical equations section. On occasion, you will need both sections.
9. For all experiments you will have a Results section and a Summary section. The results section should include a table showing the answers to all calculations made (not data collected). The summary will vary for each experiment but will usually include a detailed discussion of the results. For example: what do the results mean, what is the significance of the results, etc. In a quantitative experiment, you will most likely attempt to analyze the experiment.
  - What factors might contribute to errors in the results of the experiment?
  - What is the effect of these factors on the results?
  - How could these errors be corrected?The summary will be the most difficult for the first few experiments. Therefore, efforts will be made to give guidance and advice before you will be held completely responsible on your grade. Failure to heed advice will eventually result in penalties. Much of the report may be done in consultation with a peer, but the summary must be your own individual work.
10. Your last entry will be your legal signature and the date the report is completed.
11. When graphs are to be done, use Excel (or an equivalent spreadsheet) and attach the graph(s) to the report.
  - a. A graph should be on a separate page from the data and fill a sheet of paper.
  - b. All graphs will be a scatter (x-y) plot with data points. When a regression line is required, lay it over the data points. If a regression line is not required, the "smooth curve" with the data points is usually appropriate. Curve fitting is usually not appropriate.
  - c. Turn the "legend" off for a single series plot.
  - d. There should be NO background shading on the graphs.
  - e. Make sure the graph has both horizontal and vertical grid lines with major and minor ticks. Appropriately scaled, the data points "fill" the entire graph.
  - f. All graphs contain an appropriate title [which tells something about what you are finding out from the graph] and each axis is identified with labels and correct units. A title simply stating the labels on each axis (i.e. distance vs. time) is NEVER acceptable.
  - g. Use Greek symbols, superscripts, and subscripts appropriately in titles and labels.

Final Note:

You will receive a final lab grade (0-50) based on your quality-of-work in the laboratory, safety in the laboratory, how prepared you seem for each lab, and how accurately you use equipment.