

## MAINTAINING A LAB NOTEBOOK

One of the purposes of a lab notebook is to allow other people to gain a clear picture of your work. Any researcher with a basic knowledge of common laboratory techniques should be able to reproduce your results from your notebook pages. We describe here guidelines for maintaining a detailed and effective notebook. A properly maintained notebook can help you with your own research (you often need to reproduce your own results) and can save you money (notebooks are used as evidence when granting patents).

A large portion of your grade will be based on a combination of your lab performance and notebook. At the beginning of every other class period, you will turn in carbon-copies of your lab notebook pages from the previous class. You and your lab partner will be on different schedules to ensure that we get pages from each group every day. We will make comments on your pages and grade them on a 1-5 scale, and your final grade will be determined by your average score and your improvement throughout the quarter.

Just because we are not collecting your notebook pages for a certain day does not mean that we do not hold you responsible for that day. Your notebook will be used during lab discussions, and we will expect it to be well maintained for these discussions.

### Guidelines:

1. Most of the writing in the notebook should be during class time *and not afterwards*. Because we will be collecting notebook pages from the previous class, you will have an opportunity to do post-lab work if necessary. This includes performing calculations or writing short (1-3 sentence) summaries or conclusions. You may also do pre-lab writing to help you prepare for the next class. Both post-lab and pre-lab writing must be clearly labeled as such.

It is not necessary to “pretty up” your notebooks for us. *If it is obvious to us that you are only writing in your notebook outside of class, we will mark down your grade.* Your notebook should be clear and organized, but it is not a lab report.

2. Include everything in your notebook. Do not use separate scraps of paper,
3. Write legibly in pen (no erasing or white-out). Draw a line through any mistakes; don't scribble them out. Cross out all empty spaces on a notebook page. If it is absolutely necessary to make a change or add a comment to a notebook page after class, clearly indicate what was added and when, and sign your name near the new section.
4. At the top of each page, write the date and title of the experiment. If you are continuing from another page, write “continued from p. #.”

At the bottom of each page, include your signature and the date. If your signature is not legible, please print your name clearly on the first page of your carbon copies before giving them to us.

5. Before starting a protocol, include a short summary of what you are trying to do and why. 1-3 sentences are usually enough.
6. Include detailed descriptions of your experimental protocols and observations. This will be the bulk of your notebook.
  - When making buffers and solutions, document how you made them, including masses, moles, volumes, concentrations, type of container, reagent company and lot number, etc.
  - When recording and analyzing data, pay attention to the significance of your numbers. For example, if you are making a salt solution and the measurement of the solution volume is limited to 2 significant digits, write the concentration as 0.55 M and not 0.5521352 M.

- Describe all equipment you are using (e.g. “Shimadzu Bio-Spec Mini spectrophotometer”).
  - When following a written protocol, you do not have to rewrite every word. It is sufficient to reference where the protocol is written (e.g. “I ran an SDS-PAGE gel using the protocol from the Chem 184 Reader, 2008 Appendix, p.6”).
  - When referring to something that you have previously written in your notebook, you can reference the previous page instead of rewriting the information (e.g. “see the description on the bottom of p.011 of this notebook”).
  - Pictures can be an effective way of recording your observations.
  - When collecting or analyzing data on a computer, print out the result and tape the data into your notebook. On the carbon copy of the page, briefly describe what is taped to the page (e.g. “Plot of absorbance at 490 nm versus time for the tyrosinase and catechol mixtures”).
  - If there are computer files associated with your data, write down the program used, the computer and directory where the file is located, and the file name.
7. Include a conclusion (2-4 sentences) at the end of each day. Possible questions to address include:
- What have you learned from the day’s experiments?
  - Was anything particularly difficult, easy, confusing, interesting, useful?
  - How did your work get you closer to your final goal?

Use this section to step back from the day’s work and look at your larger goals for the lab.

8. Be aware of the verb tense of your writing. If you are writing about a protocol that you have not done yet, use the *future tense*. If you are writing about a protocol you have just completed, use the *past tense*. Avoid the passive voice. Wording such as: “the column is equilibrated in *Loading Buffer*” leaves us confused as to whether you plan to perform this equilibration step or whether you already have.