

## How to Keep a Notebook

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One of the most useful skills you will acquire in the laboratory is the proper use of a laboratory notebook. Notebooks, or other formally kept records, are an essential tool in many careers, ranging from that of the research scientist to that of the practicing physician. The effort invested in developing good habits of notebook use will be amply repaid for students who pursue a future in the basic or applied sciences. Experience has indicated that most students develop skillful notebook use only through continued special effort—it does not come naturally. Some of the main principles of sound notebook use are outlined below.

The laboratory notebook is a permanent, documented, and primary record of laboratory observations. Therefore, your notebook will be a bound journal with pages numbered in advance and never torn out. This notebook contains double pages, so when you write, you will produce an original and a copy. You will keep the original in your book as a permanent record and turn in the copies for grading. Note that there is a periodic table at the front of the notebook. Tear at the perforation and place this underneath the page you are writing on to prevent making multiple copies on several pages. All notebook entries must be in ink and clearly dated. No entry is ever erased or obliterated by pen or “white out.” Changes are made by drawing a single line through an entry in such a way that it can still be read and placing the new entry nearby. If it is a primary datum that is changed, a brief explanation of the change should be entered. If a calculation or discussion is changed the section to be deleted is simply removed by drawing a neat “x” through it.

In view of the fact that a notebook is a primary record, data are not copied into it from other sources (such as a lab manual or a lab partner’s notebook, in a joint experiment) without clear acknowledgment of the source. Observations are never collected on note pads, filter paper, margins of the lab manual, or other temporary paper for later transfer into a notebook. It is important to use a notebook routinely as the primary receptacle of observations.

A laboratory notebook should be legible, and data in it should be readily accessible, clearly labeled with units, and grouped in a logical way. Your notebook should include enough explanatory information so that someone else with your knowledge of science could, from your notebook alone, enter the lab and repeat your work. For more detailed information about how to use your laboratory notebook, consult your lab text or your lab instructor.

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## Laboratory Procedures

- Come prepared to lab- read the handouts (if available) and any assigned reading prior to the laboratory period. Try to understand the procedure.
- Follow the procedure and note any changes in your notebook. Do not alter the experiment without first getting instructor approval!
- Think before asking. What do the instructions say? What do you think should happen? Do your observations seem reasonable?
- It's okay to observe and discuss things with your neighbors, but you must perform your own work and record **your** results.
- Work efficiently: two people can often times accomplish twice as much if they coordinate their efforts.
- Record **all** observations with as much detail as possible. **Use indelible ink.** Do not obliterate mistakes- cross out with one line. Group work may utilize a designated recorder.
- Clean-up work space: wash equipment and wipe countertop with sponge.

## Laboratory Report

- Due at the beginning of the next laboratory period.
- Each person is required to write their own report even if the lab was performed as a group.
- The report should include:
  - **Introduction:** outline the experimental goals and any pertinent background information. (2 pts.)
  - **Procedure:** brief description of procedure used (reference to handout is okay) along with any deviations. (2 pts.)
  - **Data/Observations:** data tables are best; be organized and include units! (4 pts.)
  - **Results:** this is the section of the report that is designated for summarization and explanation of the data/observations. Any mathematical manipulations of the data (calculations) should be illustrated under a sub-section entitled: Sample Calculations. Graphs and other visual aids should be utilized when appropriate for clarification. (6 pts.)
  - **Discussion:** this section includes a brief (normally one paragraph) conclusion with respect to the experimental goals and a detailed error analysis: what errors are inherent in the procedure utilized, what errors **did** you make, how could you alter the procedure to minimize both types of errors, and how did these errors affect your results/conclusions. The error analysis is extremely important and requires thought and clear, concise writing. The thoroughness of your error analysis is indicative of your understanding of the concepts and procedures underlying the experiment. (6 pts.)