

# Maintaining an Electronic Laboratory Notebook

Because each group member needs routine access to a shared lab notebook, a traditional bound notebook is, at best, cumbersome. Instead, you will maintain an electronic notebook using a shared Dropbox folder. As you work on an experiment—whether that work takes place in the lab or out of the lab—be sure that you place the following items in the experiment’s folder: a text file that documents your work; data files from the LoggerPro software used to collect data; and, any spreadsheet files or other files you create while processing your data. You are free to use Google Docs to create text files and spreadsheet files; however, you must maintain a current copy of these files in your group’s Dropbox folder.

As with any laboratory notebook, an electronic laboratory notebook must provide an accurate record of your work. At a minimum, the text file you create for this purpose must contain the following items:

- **A Statement of Purpose.** This is a brief statement of the theory or the hypothesis you will test (e.g. “The purpose of this experiment is to verify Chicken Little’s claim that ‘The sky is falling!’”) or the piece of information you will seek (e.g. “The purpose of this experiment is to determine the average number of spots on a Dalmatian.”). In addition, you may wish to summarize the expected result or to indicate how an unexpected result will lead to a different conclusion (e.g. “If we find that the egg’s density is not  $19.3 \text{ g/cm}^3$ , then we will know that the goose did not lay a golden egg.”). *Complete this section before you come to lab.*
- **A Description of Your Planning for the Experiment.** This is a summary of your group’s planning for the experiment. Use this section to document your library or internet research, and to outline the procedure you plan to follow in lab. The purpose of this section is to ensure that your time in lab is more productive. Note that this section does not contain data. Thus, you might note that you will need to obtain approximately 0.25 g of dried toadstools, but you will not record here the actual value obtained in lab (which you will enter in a later section). In addition, this section should contain a summary of how you will process your data. *Complete this section before you come to lab.*
- **A List of the Materials and Reagents Used During the Experiment.** This is a brief summary of the equipment and chemicals used during the experiment, which you may write in either a narrative form or as a list. Under the subheading of materials list the equipment used, including make and model, and its role in the experiment (e.g. “Soap bubbles were produced using B&B’s Big Bubble Blower.”) and any hardware and software used to collect and process data. Under the subheading of chemicals, list all reagents provided to you (e.g. “A stock solution of 0.10 M Hemlock and freeze-dried Newt’s Blood were provided.”), but do not list solutions prepared by you as these belong with your experimental data and results. You do not need to list commonly available lab supplies, the contents of your lab drawers or distilled water. *Complete this section during lab.*
- **A Comprehensive Record of Experimental Data.** This is the heart of your electronic laboratory notebook as it contains the data collected during the experiment. You may choose to write this as a narrative annotated with data or as a list (e.g. Trial 1..., Trial 2...). Be sure to record all relevant data in an appropriate manner: data for a single analysis is entered directly; data for a series of related analyses are best entered in a table; store LoggerPro files and spreadsheet files separately, but list the filenames in your notebook along with a brief description of the file’s contents. Clarity of presentation and good organization are important here as the quality of your written and oral reports depends on your ability to remember what you did in lab. *Complete this section as you do the experiment.*
- **An Analysis of Your Data.** In the process of preparing your group’s lab report you will need to analyze your data. For example, if you average the results of several trials to obtain a single value, then record this information in your notebook so you have a record of it (e.g. “The average for the five temperature measurements of Baby Bear’s porridge is  $48.9^\circ\text{C}$ .”). For data that is analyzed using a software program, store the resulting data file in the appropriate folder and identify its filename in this section of your notebook. Feel free to use this section to speculate on the meaning of your data. *Complete this section as you analyze your data.*

*Note: You cannot include too much detail or too much information in your electronic notebook. No one has ever had to repeat an experiment because they recorded too much information in a laboratory notebook!*