

The following **Laboratory Record Format** is the format that you will use to create your lab records (not Lab Reports, see Lab Report Section). Suggestions for this type of format were made by **Dr. Donald E. Simanek** of **Lock Haven University**. Remember the Lab Record is like a diary of your work, it will have your own style and flavour, record everything in your Record, for it is your actual link to your past data collection techniques and occurrences and experiences when in the lab.

See the two links of main page for some examples and suggestions by a University Lab TA.

## PREPARATION FOR THE LABORATORY

Read the instructions before coming to lab. If you have not received instructions at least one week before the lab period, ask your instructor to supply them. Read the relevant background material in your textbook, or in library references. Come to laboratory with a plan in mind, and at least a preliminary derivation of the error propagation equations.

## THE LABORATORY RECORD

- Scientists and engineers record laboratory data in bound notebooks with pre-numbered pages. These books serve as a permanent record of the work, and can serve as legal evidence in priority disputes. Some instructors insist that students in science laboratories keep such notebooks. Whether required or not, the use of a notebook helps you to develop good laboratory habits which will serve you well in your future career.
- Your laboratory notebook reflects your personal style, but you should write it so that a co-worker familiar with the subject of your research could understand it. Such a person may need to obtain information from your notebook. You may need to refer to the notebook at a later date, therefore do not omit any information necessary to understand what you did, or to repeat it.
- Use a bound (not a loose-leaf) notebook for the laboratory record. Make notebook entries as the experiment progresses, as a running record of the work. The notebook includes a complete history of all experiments performed, and their results.
- Graph paper pages with 1/4 inch squares facilitate making data tables and rough graphs. Don't erase anything in a laboratory notebook, and never remove pages from it.
- Line out, and annotate, mistakes.
- Use permanent ink, for better readability.
- You may abbreviate, but make all entries clear, organized and complete and neat enough for you, or someone else, to read.

### Here's a check list of items which you should record in the notebook:

1. The date and time of each new record.
2. The initials of the person making the record.
3. Descriptive headings, titles, and subtitles.
4. Lists of the equipment used (name, manufacturer, model and serial numbers), with relevant specifications.
5. Sketches of the experimental layout, circuit diagrams, etc., with all components labeled.
6. Observed data. Record data in the notebook immediately; do not recopy it from scraps of paper. Organize the data in neat tabular form, with ample space for corrections and auxiliary notes. Symbols and notation of each column heading should match that used in the equipment diagram, equations, and other references in the discussion. When possible, identify the exact instrument used. Neatly line-out incorrect data. A large amount of incorrect data may require you to line-out (or overlay with a large X) an entire table. If you feel that an 'X' across a whole page looks unsightly, use a footnote to label it as "deleted." Always record the reason for such altered entries.
7. Calculated results, prominently displayed.
8. Sample calculations. Don't include every calculation, but do include a sample of each type. If you need to do this same sort of calculation later, the sample may save you time.
9. Curves. Plot tabular data as curves whenever possible.
  - o We use the term "curve" to represent data points plotted with a smooth line drawn through them. The term "curve" applies even to straight lines.
  - o The term "plot" refers to roughly sketched curves, perhaps done on the quadrille paper of the lab notebook. The term "graph" refers to the more neatly produced and annotated curves done on genuine graph paper, or in a form suitable for publication.
  - o Important data may deserve a graph made on genuine graph paper, permanently attached to the notebook page. Avoid using tape, for it deteriorates with age. Use a thin line of glue to "tip in" such added material. Attach charts, diagrams and photographs in the same manner.
10. Graphs: All graphs (and plots) must have a descriptive title, each axis labeled with quantity, symbol, and units. Choose a scale size such that one may read values from the curves with at least the same accuracy as the accuracy of the data. Make the data points very small (some use pinpricks) and emphasize them with small, neat circles. When you show several curves on the same graph, group related data points in some way using distinctive symbols, such as circles, triangles, and squares (use a symbol template, for uniformity). Provide a key, on the graph page, to the meanings of the symbols.
11. Notes or explanations essential to proper performance of the experiment or interpretation of the results. This might include your explanation of how you overcame any difficulties encountered in the experiment.
12. A restatement of the questions posed, and your answers.

The reader won't expect the lab notebook to contain a condensed and polished report of the experiment, but will expect to find enough evidence to determine what you did, how you did it, and what results you obtained.