Guidelines for Lab Notebooks

Why Maintain A Detailed Laboratory Notebook?

Keeping a detailed laboratory notebook is good engineering practice in industry and academia: it can be used to support the validity of results reported to peers and funding resources, it can be used as evidence for proving inventor-ship or first-to-invent, and most predominately, it is detailed documentation that serves as a super reference for future work (can verify timeframe, methodology, conditions, people involved, etc.)

What Do We Put in a Lab Notebook?

General answer – anything that pertains to research, project development, or an experiment. (For this course we will concentrate more on a lab notebook for experiments) Lab notebooks include three equally important parts: (1) preparation work and ideas, (2) experimental observations, and (3) post-experiment thoughts, observations, and pre-conclusions.

Lab Notebook Format (for experiments):

1. Preparation work: This should include any work related to the experiment that is conducted before the actual lab session. Start a new section of the notebook for each lab by writing out the lab title and the purpose of the lab. All pre-lab assignments should be recorded in the notebook and you may wish to develop a list of pre-lab questions.

   **Example for Lab 1:**

   **Title:** Measuring Viscosity

   **Purpose:** The purpose of this experiment is to learn how to measure viscosity using a falling ball viscometer, a rotational viscometer, and a capillary viscometer, and to compare the techniques.

   **PreLab Exercise:** Notes On Stokes Flow, Problem 9.113.

   **PreLab Questions:** What is Stokes Flow? What is a buoyancy force?

2. Lab Work: While you are performing the experiment you need to document what you are doing. Describe the procedure, document your results and conclusions.

   **Some Guidelines:**

   - Experiments should be clearly separated in sections by new titles.
   - Entries should be permanent, complete and continuous.
     - Use a bound notebook with numbered pages – this states that the entries have not been forged or altered by replacement, deletion or insertion of pages.
     - Entries should be made consecutively. No pages or spaces on pages should be skipped. If blank pages are left on a page or pages are skipped, then a line should be drawn through them to demonstrate that the blank spaces are intentional.
     - Use ink. Do not use pencil or color coding. Write legibly. Do not erase. If changes must be made (errors corrected, etc.) the erroneous information
should be lined through, dated and signed. Reasons for alteration should also
be noted if they are not obvious.
   o Leave a few pages at the beginning of the lab notebook for an index and a
glossary defining trade names, acronyms, codes or laboratory jargon.

Procedure: Document what you did. Include a sketch of the actual setup.

Results: This section includes all data: figures, tables, calculations, etc.

   • It is better to include more (relevant) information than not enough – to err on the side
   of thoroughness and completeness. Ex: record external anomalies that might have
   affected your data.
   • Lab notebooks should contain enough information so that a technically sophisticated
   outsider will be able to understand what was done without assistance of the person
   who actually made the entries, or be able to repeat the experiment herself/himself
   without the help of the author.
   • Results should follow a consistent procedure of being promptly and accurately
   recorded. This is only reasonable since waiting a day or longer before making an
   entry diminishes its value – details and observations may be forgotten.
   • Test results obtained at a later date should be recorded on a separate page and cross
   referenced to the page containing the earlier entry.
   • Include extrinsic materials, such as raw data from recording instruments, drawings,
   photographs, charts, computer printouts, specification sheets, etc.
      o Print out all relevant data.
      o Permanently glue or tape these materials in the notebook, sign, and date.
      o The signature should cross both the attached material and the notebook page.

3. Conclusions: This section states any conclusions you have regarding data and why or why
not expected results were obtained. It can be expanded to a full report or presentation if
required. Answers or thoughts to any post-experiment questions can be recorded and
discussed here. You should record your conclusions at the end of the lab session. If you add
thoughts later be sure to cross reference them.