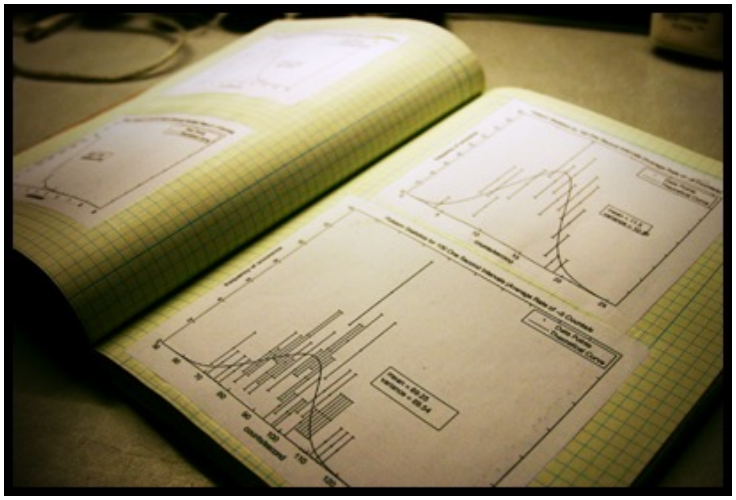

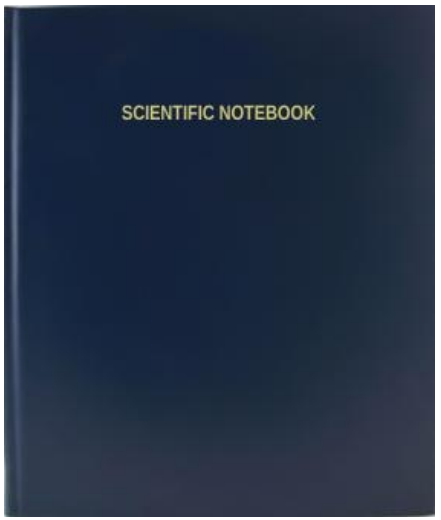

Keeping a Laboratory Notebook

Dr. Forrest

Phys 3110

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The Laboratory Notebook

The whole point of a laboratory notebook is that it should

- say exactly what was done, and when;
- make clear who did it;
- enable you or someone else to do the same thing at some future date;
- be durable and verifiable.

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Hardware

- Laboratory notebooks should be bound notebooks – you can paste worksheets in where needed.
- Writing must be done **in ink**. Black ballpoint pen is best; fountain pen inks are not as durable as ballpen inks and are more prone to fading, and do not withstand solvent spills as well as ballpen does. Blue ink fades more readily than black, and red is least fade-proof of all.
- Pencil should not be used for anything.
- You should use a straight edge to make tables and graphs more neat.

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Organization

- **Title page.** Give a page to state your name, address (you might lose the book) and a brief indication of its purpose. List the name of your lab partner.
- **Table of contents.** Give two pages to the Contents so that you can list the experiments and find them easily when needed.
- **Number the pages.** Tedious but essential. Do it when the notebook is new.
- **(Table of abbreviations.** If you use them a lot, give a table to explain them.)
- **Date each page.**
- **Title each page.**

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Organization

- **Start each new piece of work on a fresh page.**
- **Never have 2 experiments on the same page.**
- **You may use both sides of the pages in this class.**
- **No large blank spaces, over ¼ of a page. If a large section is unused, put a neat X through it.**
- **Don't leave blank space to fill in later. Keep track of it in the Table of Contents. On the later pages, you might say something like "continued from page 7".**
- **If you make a mistake, draw a single line through it. It should still be legible. Explain what the issue was.**
- **List your lab partners.**

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For Each Experiment:
Before Lab

1. **Title the Experiment, put title on every page.**
2. **Objective**

   State the purpose of the experiment along with a brief statement of basic principles involved and the method to be used. State what you are supposed to measure/find/prove.

3. **Preparatory Questions**

   Before coming to lab, answer the preparatory questions that are in your lab write up.

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Before Lab…

4. **Prelab Procedure Outline**

   Before coming to lab, summarize the procedure you will perform in a flowchart or outline.

5. **Analysis Outline**

   Before coming to lab, write in your notebook a description of the calculations that you will perform to analyze your data. This can be in the form of a sample calculation or a flowchart or outline.

Note that steps 1 through 5 will be done *before* coming to experiment.

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During Lab…

6. What you did and Data

- Explain what you did and how you did it.
- Your notebook must list your co-workers and identify who did what.
- Make diagrams of circuits and equipment setups.
- Record the name & model of the equipment used.
- Qualitative observations and one-time quantitative data are best entered in a running commentary. This commentary should be recorded during the lab, as the experiment proceeds. High prose standards are not expected.
- When appropriate put data in a table.
- All data must include units & uncertainty.
- It may be useful to make graphs during the experiment.

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- “Learn to “live” in your notebook. Write down your observations, your description of the experiment and the apparatus, ideas that come to you as you work, conclusions you arrive at, criticisms of your methods and ideas.”

- “Physics Laboratory Manual 101L, I. Mechanics, Dept. of Physics, UT Austin, pp. 3-4, 1986.

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During & After Lab…

7. Results and Discussion

- Show Calculations of quantities, precision, accuracy, and possible explanations of any obvious errors. It is often helpful to collect your results in tabular form.
- If you've done calculations or graphs on a computer, you may paste print-outs into your notebook.
- Final result must be given in notebook!
- Brief Qualitative and quantitative comments on your results.

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Graphs

- Each graph should have the experimental title
- The axes must be labeled with the quantity and by its unit
- Include error bars if you know the error limits
- Use a straight edge
- Give a clear table of the data you used to plot the graph
- Glue computer-generated graphs into the notebook

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Never:

- Tear out pages
- Use white-out.
- Forget to bring your notebook
- Keep notes on loose paper, intending to transfer it to your notebook later.

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Research Notebooks

- Probably won't have as defined a structure, but the basic elements will be present.
- Procedure: what you did
- Diagrams of apparatus/setup
- Data with units and errors
- Commentary about what you did and why you did it.
- Calculations and Results

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Homework

- Keep a “notebook” of the following task: Find the volume of your UH ID card.
- Use graph paper to simulate lab notebook pages.
- Take at least 3 measurements of every value, include the uncertainty in the measurements, and use averages of each value in the calculation. (You do not need to do error analysis; you’ll do that next week.)
- Turn in a copy of your work, you’ll need to keep a copy for next week’s homework.

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References

- http://www.rod.beavon.clara.net/lab_book.htm
- http://www.dartmouth.edu/~chemlab/info/notebooks/how_to.html
- http://otl.stanford.edu/inventors/resources/labnotebooks.html
- http://osulibrary.orst.edu/specialcollections

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