

The purpose of keeping a laboratory journal is to have a complete record of every experiment you've done in this class. If a college needs to see proof of your lab work, this is it! It's also a chance for you to do physics like a real scientist. Laboratory scientists don't turn in worksheets, after all!

There are two types of labs that we will be doing in this class:

1. Teacher Directed: These labs will have a specific set of instructions that I will ask you to follow. Your job will be to analyze the results of the experiment so we can pull the "physics stuff" out of it.
2. Student Directed: These labs are far more open-ended. You will write the procedure to answer a question. Not all procedures will be the same for each lab group.

Journal Format: All lab reporting is done in your journal. It should be constantly by your side any time you are in the lab. Often you will be asked to prepare part of your write up prior to coming to class, typically parts I-V, plus your data tables.

The front of your journal is reserved for a table of contents. Save two pages to record the title and page number of each lab. Number your pages in the bottom corner and circle the numbers. In the upper right hand corner of the first page of a lab, write your name, the date, and names of your lab partners or collaborators. You may write on the front and back of each page. Do not tear any pages out of the notebook! If an error is made, simply cross out the error and begin lower on the page or on the next page. Give your lab a title (creativity is encouraged, but make sure you have a subtitle that is descriptive of the procedure.)

Each lab report should have these components:

Heading: Your name, your lab partners, date (in the upper right hand corner)

- I. Statement of the **problem, question, or purpose.**
- II. List of necessary **equipment** and a brief description of **how it will be used.**
- III. Labeled **diagram** of equipment **set up.** Make your diagram large enough to recognize what it is.
- IV. Discussion of the **procedure**, including: necessary **background information** (the physics you're trying to find out, or the "physicsy" reasons you're doing the lab a certain way), steps taken to **reduce error**, and **safety** considerations. *This should be clear enough that anyone could read your journal and conduct the experiment as you did.*
- V. **Data** collected (typically in the form of a clear, concise table, which includes all units for measurements) and any other useful **observations.**
- VI. **Known and unknown variables, equations, constants, and calculations.** Your calculations should be clear and easy to follow.
- VII. **Graphical Analysis** of your data. Graphs should be large enough so values and specific points can be identified. Graphs should be labeled with variables and units, have a title, and have a logical scale. Graphs can be done either by hand or on a computer program such as Graphical Analysis and taped into your Journal. Graphs should include a straight best fit line, and discussion of the significance of the slope or y-intercepts, if applicable. If you have more than one graph or table, please label them clearly and refer to them in your analysis.
- VIII. The **Analysis** of your results is done independently from your lab group. That means no talking, sharing, or copying. It should be your own, unique work, just like an English paper. Your analysis should be in complete, self-inclusive sentences and include:
 - a. Calculation of percent error, where applicable
 - b. Discussion of sources of error and possible methods of reducing those errors
 - c. Answers to any Analysis or Conclusion questions in complete, self-inclusive sentences (no need to write out question AND answer, but I should know what you're talking about from what you wrote.)
 - d. Your final thoughts and conclusions on the lab, including references to data and graphs. This should be the final statement of what you learned by completing this lab (super important!!!).