

## Writing the Lab Report

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### Overall Style

Lab reports should be written in the past tense, and should avoid the use of personal pronouns like “I,” “you,” “we,” and “our.” For example, instead of writing, “I recorded 2500 data points,” phrase it this way: “Two-thousand five-hundred data points were recorded.” (If you begin a sentence with a number, spell it out.)

Everything in your report should be either a paragraph or a figure (graph, table, equation, etc.). Lists or bullet points do not belong in your report.

The report should read like a narrative, or story. Introduce and explain all figures, making sure to weave them into your narrative. Examples are given in the “experimental data” section below.

Your story is divided into distinct sections, each of which should be clearly labeled.

### Cover Page/ Abstract

If you’ve read many academic journal articles, you know the abstract is what attracts or turns you off from reading the rest of the article. The abstract should be a *concise* summary of the experiment, including snippets from each section.

That’s how this story is different from a novel. The back cover of a novel doesn’t give away the ending, but your abstract should. One main trap students fall into is that they think the abstract is meant to tantalize the reader, and so the student leaves out the conclusion. Don’t fall into that trap. Include any important results, and make sure these include at least one numerical result *complete with units!*

Even though this section appears first in the report, you will most likely write it last.

Also include on the cover page your name, the course number and section number, and the date. It doesn’t matter to me whether you use the date you completed the experiment or the report. In a journal article, the date is usually neither of these, anyway. (Often, the article will include the date of submission and date of acceptance, but the official date of the paper is when it’s published.)

### Objective(s)

*In your own words*, state the goal(s) of this experiment. If this section is more than two relatively brief sentences, it’s too long.

### Procedure

In narrative form (not a numbered or bulleted list), describe the experiment itself – what you did during the lab. *Remember to write in the past tense without personal pronouns.*

Write in enough detail that the reader (assume the reader is a classmate, even though it will really be me) would be able to repeat the experiment, but make sure the details are relevant. If a classmate could perform the experiment without a particular detail, exclude it. If a classmate couldn't perform the experiment with the level of detail you've given, go back and be more specific.

### **Experimental Data**

You'll notice that "experimental data" is a separate section from "results." This is because many times the data you collect in lab is not the data that will satisfy the objective(s) of the lab. You will have to use your experimental data (the data you collect in lab) to calculate your results (quantities or plots that specifically answer the questions raised by the experiment).

In this section and in the results section, present all data in tables or graphs. In these sections, do not hide numbers in paragraphs or set them apart with line breaks. Do not use descriptive titles at the tops of tables and figures, but label them by number in a caption below the table or figure. For example, the caption for your first figure should read something like "Figure 1. Experimental set-up. The receiver on the right was rotated  $180^\circ$ ."

Introduce each table or figure, working it into your narrative.

### **Results**

The rules here are the same as those for the "experimental data" section, but in "results" you present the data that satisfies the objective, or answers the ultimate questions of the experiment. Also present sample calculations – these are the bridge between your experimental data and your results.

### **Discussion/ Analysis**

Compare your results with your expectations. If they don't match, explain why, specifically. "Human error" is not sufficient; describe what component of human error played a role in your experiment. Was a piece of equipment difficult to hold steady? A phenomenon difficult to observe? (One nice thing about online simulations is that there are fewer unanticipated results, and there is less of a temptation to attribute unexpected results to "human error." However, be aware of sources of possible errors in the simulation.)

If the experiment did go according to plan, don't just say, "The experiment went according to plan." Describe each result, and explain why it occurred the way it did.

Refer to equations, tables, and figures by number.

### **Conclusion**

Briefly reiterate your important results (the results that satisfy the experiment's objectives) and why they're important. State what you learned, and, if appropriate, what "next steps" would be taken were you to continue studying this subject in lab.