

## NHTI Physics: Writing a lab report

Here are some important questions to keep in mind while writing your lab report. If you were to read your report in a month's time, would you be able to do the experiment and get the same result? Would your professor, colleague, or boss be able to read your report and understand precisely what you did? If short on time, could the reader decide from the abstract alone whether to read your report?

Your report should be succinct, typed, free of spelling and grammatical errors, and follow the outline given below. Include your lab section, your name, and your lab partners' names at the top of the report.

### The parts of a lab report

#### Title

Accurately and concisely describe the experiment you conducted.

For example, the title "Measurements" conveys little information. It could be used to describe any experiment in any field of science. A title such as "Density of wood and an unknown metal" is vastly more descriptive.

#### Abstract

The abstract briefly answers the following questions: *What did you do? How did you do it? What were your results?*

Sample abstract: "The density of a wood block and metal cylinder were measured with vernier calipers and a scale. The density of wood was  $(0.630 \pm 0.032) \text{ g/cm}^3$  and the metal was found to be aluminum, with a density of  $(2.71 \pm 0.25) \text{ g/cm}^3$ ."

#### Introduction

Briefly discuss the underlying physical theory and reason for doing the experiment.

For example, if the purpose of the lab was to measure the density of wood and metal, then it is appropriate to discuss the physics of density here.

#### Procedure

List the equipment used. Sketch and label the experimental setup, that is, how the equipment is arranged to conduct the experiment.

*How did you do the experiment?* The reader should be able to replicate the experiment from what is written here. Be sure to describe in detail any changes you made to the procedure handed out in the lab worksheet.

"Data" and "Calculations" should not be included in this section.

#### Data

*What were your results?* Provide all data, both measured and calculated. The reader should be able to recalculate results from what is written in this section. Give units and indicate the appropriate number of significant figures. Show errors on all tabulated data and on your final results.

Use tables and graphs where appropriate. Tables and graphs must have titles. Label and give units to column or row headings in tables, as appropriate. Graphs must have labeled axes and units.

"Calculations" should not be included in this section.

#### Calculations

Show your calculations, including error analysis, with units and the correct number of significant figures. For similar calculations, it is sufficient to include one sample calculation in detail. Calculations may be typed or handwritten.

#### Conclusion

*Summarize your findings.* What are the sources of error? How do they affect your results? *Are your results reasonable?* Do they agree with published values and/or match your theoretical predictions? Did you encounter any surprises while performing the lab? Were there any notable difficulties? How could your experimental results be improved?

#### References

If material from the physics literature was used in the preparation of your lab report it should be cited here.