

Writing a Science Lab Report

Purpose of a Lab Report

A lab report communicates your experimental results to other people. The quality of your written report will often determine how your experiment will be evaluated (Simanek, 1999). A lab report also demonstrates that you understand the concepts and principles that underlie your lab results (Handbook: Laboratory reports, 2007).

Before you get started

One of the most important steps is to follow closely the instructions given by your lab instructor or demonstrator. Key verbs such as compare, analyze, describe, explain, and evaluate are clues to what needs to be included in your report. To understand the kind of response required in your lab report, consult the handout Verbs used in Essay Questions

<http://umanitoba.ca/student/u1/lac/media/Verbs-Used-in-Essay-Questions-06.pdf> Keeping organized, coherent, and logical notes and observations right from the start can help you produce a clear and organized report.

Elements of a Lab Report

Refer to your lab manual to find out which elements are required for your report. Individual disciplines dictate which elements to include, but professors may also have varying expectations, so be sure to follow your lab manual. Some lab manuals have examples for students to follow. Templates outlined in lab manuals may be used as marking rubrics for grading lab reports. Required elements of a report may include:

- the names of all group members
- date
- title of the experiment
- abstract
- introduction
- the purpose of the experiment
- a hypothesis
- research questions
- materials/supplies
- methods/procedures
- results
- analysis/discussion
- conclusion
- a reference list

Language

Instructors vary in their expectations for the use of different elements of language in lab reports such as case and tense.

Case

Your instructor may want you to avoid using first person pronouns such as “I” and use only third person language such as “the author”. Third person narrative is usually preferred in scientific writing. Consider the following sentence with the same meaning but different voice:

E.g. 1st person active voice

I calculated the value of the standard deviation to one significant figure.

E.g. 3rd person active voice:

The author calculated the value of the standard deviation to one significant figure.

E.g. 3rd person passive voice:

The value of the standard deviation was calculated to one significant figure.

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Tense

Different tenses may be used in different elements of a lab report. For example, use the future tense in the introduction: "This study will explore the possible errors present in simple measurements," and past tense in the discussion and results sections: "The same methodology was applied to the each of the tables indicated (A, B, and C). "The lab manual will have this information for you if it is critical to the assignment.

Lab Reports and Academic Integrity

It is the responsibility of students to be aware of the rules regarding academic integrity. Dishonesty could include fabricating lab results, using others' ideas without referencing, or working in groups with members who are not contributing equally. Promote academic honesty by asking your TA or lab demonstrator to sign your data and by reading and following the regulations governing academic integrity in the current version of the University of Manitoba calendar.

The UM Faculty of Science has produced a thorough and interesting webpage entitled Academic Dishonesty Guidelines and Penalties <http://umanitoba.ca/faculties/science/student/webdisciplinedocuments.html>. Test your knowledge of plagiarism and different cases of academic dishonesty outlining exactly why they were seen as problematic using the online quiz.

Checklist for Editing a Lab Report

- Have you consulted the lab manual for the appropriate format to use to report each section?
- Did you label everything including the raw data, tables, figures, axes, and graphs?
- Did you show all your calculations and outline all the steps and formulae that you followed to arrive at your results?
- Did you use appropriate equation symbols? (If you use Microsoft Word, these are found in the Microsoft Equation Editor feature located on Insert > Object > Microsoft Equation.)
- Did you add the chemical structure along with the name of a chemical unknown or a symbol indicating the direction of a vector?
- Did you check for redundant information or recopying of lab manual information?
- Have you reported all relevant data?
- Did you cite all your sources, including your text and lab manual, if applicable?

Resources

These reference books can answer questions on how to write lab reports if your instructor has not specified expectations.

McMillan, V. (2001). *Writing papers in the biological sciences* (2nd ed.). Boston: Bedford Books.

Day, R. A. (1998). *How to write and publish a scientific paper* (5th ed.). Oryx Press: Phoenix & New York.

References

Handbook: Laboratory reports. Retrieved January 16, 2007, from University of Toronto, Engineering Communication Centre Web site: <http://www.ecf.utoronto.ca/~writing/handbook-lab.html#Abstract>

Hester, J. (2006). *Lab report template*. Retrieved March 2, 2007, from Clemson University, 223 Physics Lab Web site: <http://phoenix.phys.clemson.edu/labs/223/sample/sampletemplate.doc>

Simanek, D.E. (1999). *Laboratory records and reports*. Retrieved January 18, 2007, from Lock Haven University of Pennsylvania, Physics department Web site: <http://www.lhup.edu/~dsimanek/reports.htm>