

How to Write a Lab Report

Results from our experiments do not have much use unless we communicate them to our fellow scientists. This communication will be part of your lab experience. For many of the experiments you will be asked to write up a lab report. The purpose is not to provide you with meaningless busy work or another means by which to grade you (although they will be graded). Rather, the point of the lab report is to give you training in the art of scientific writing. For each report, we will provide you with feedback designed to improve your future writing.

In writing the lab report, you will need to communicate concisely the rationale for the experiment, a description of the methods, materials, and results, and provide an interpretation of the results. The lab report will follow the style of the Publication Manual of the American Psychological Association. It will consist of the following sections:

1. Title
2. Author and Affiliation
3. Abstract
4. Introduction
5. Methods
6. Results
7. Discussion
8. References

Title, Author and Affiliation

On the cover page, you will give the title of the report and the author (you) and affiliation (M.I.T.). The title should briefly convey the specific subject of the report.

Abstract

The abstract begins on a new page. It is a concise summary of the report, about 100 words in length. It should summarize the rationale, methods, the results and your interpretation.

Introduction

The introduction should briefly summarize (1-2 pages) the specific research area. Include a description of the relevant background literature. Then, you should identify the particular question(s) that was addressed in the experiment. Identify the independent variables (what was manipulated) and the dependent variables (what was measured) and state the hypotheses tested (the expected results).

Method

In this section, provide enough details for someone else to replicate your experiment. Descriptions of methods that are not specific to the experiment are not necessary. For example, there is no need to explain what an oscilloscope is or how to operate an audio amplifier. You can assume some familiarity on the part of the reader with the tools of the trade. The methods section is broken down into sub-headings.

Animals In this section you mention the type of animal used, the number and approximate weights.

Surgical procedures Any surgical procedures should be described including method of anesthesia.

Procedure This section should provide an accurate, chronological account of the procedures of the experiment. It should resemble the procedure section of the laboratory handout.

Results

The results summarize the findings of the experiment. It is often helpful to use the “inverse pyramid” style. That is, you begin a paragraph or section by stating the general finding (e.g., “The frog optic tectum contains a complete map of the frog’s visual field”), before going on to provide the detailed results that support that conclusion. You should present data summaries, not every data point. Figures should be numbered consecutively and include a caption that describes the axes of the graph, and the units of measurements. Any statistical analyses should include the test that was performed and the p values.

Discussion

You should briefly describe the general results and relate them to the existing literature, noting any similarities or differences. Comment on the significance of your data and relate them to the “big picture”. If there were any problems in conducting the experiment, they should be discussed along with any possible solutions.

References

Any literature cited in the report should be listed here. In the main body of the report, literature papers are cited with the authors name and year of the publication. If there are only two authors both are listed; if there are more than two authors use the first author’s name and then “et al.” (e.g. Dobbs and Stang, 1996; Dobbs et al., 1996).

This section begins on a new page and the full references are listed in alphabetical order using the following format.

Journal article:

Miller, E.K., Erickson, C.A., & Desimone, R. (1996). Neural mechanisms of visual working memory in prefrontal cortex of the macaque. *Journal of Neuroscience*, 16, 5154-5167.

Book chapter:

Desimone, R., Miller, E.K., Chelazzi, L., & Lueschow, A. (1995). Multiple memory systems in the visual cortex. In M. Gazzaniga (Ed.), *The Cognitive Neurosciences*. (pp. 475-486). Cambridge: MIT Press.

Whole book:

Baddeley, A. (1986). *Working Memory*. Oxford: Clarendon Press.