

LABORATORY REPORTS

This handout is available in an alternative format on request

Science students often have to write laboratory reports regarding the experiments they perform. The lab report is both a tool to help students make sense of their results and to communicate those results to other scientists in the field. This handout describes the generally agreed upon format for consistency between scientists. However, ensure you follow any specific instructions from your instructor or TA.

Title Page: Generally, this page consists of an informative title, the names and student numbers of all lab partners, the name of the professor, course code, and date.

Abstract: The goal of the abstract is to concisely communicate a summary of your experiment. It should give the reader an idea of the objective, procedure, and significance of your experiment. Follow your instructor's guidelines for length; however, most are limited to one paragraph of 100-200 words. A good method of summarizing your report is to have one sentence dedicated to each of these sections: introduction, methods and materials, results, and discussion.

Introduction: The introduction traces the background concerning your particular experiment while acknowledging the gaps in knowledge. This will provide the context of your experiment – describe how the present study will try to address those gaps. This is a good place to include in-text citations of secondary sources. State your hypothesis and any predictions based on it.

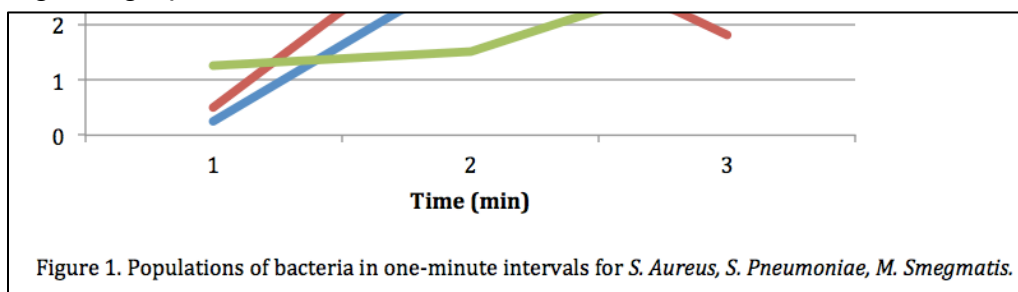
Example: The purpose of this experiment is to determine whether magnetic fields influence the direction of plant growth. It is hypothesized that magnetic fields exert force on the growth of *Arabidopsis* stem and influence the direction of growth.

Methods and Materials: The purpose of the Methods and Materials section is to give enough information to allow someone else to replicate the experiment. This section consists of either a list or paragraph of all the apparatus used and steps taken. Be comprehensive and precise in your descriptions.

Results: The results section presents your actual findings without analyzing or interpreting them. Describe your results in paragraph form and include relevant tables, figures, and graphs. Calculations can be written in full once, and then displayed in a table for all others. Reference your figures and tables with captions. Captions are written above tables:

Mass (g)	Length (cm)	Tension (N)
11	7	5

and below figures/graphs:



Discussion: The purpose of the discussion is to state the implications of the results of the experiment. You should refer back to your hypothesis and predictions and state if they were proven. Interpret your data from the results section and include references to other research for comparison. Try to answer the following questions:

- Did you get the expected results? What were the expected results? What could account for discrepancies between the actual and theoretical values?
- Are your results supported by similar experiments?
- Does the experimental design have any limitations? What are its strengths?
- What sources of error or difficulty did you encounter during the experiment? How might these have affected your results and how can they be avoided in the future?

Provide a conclusion for stimulating further thought on the topic and suggest areas for future research.

References: Always make sure to cite your sources. The precise format of citation may vary from discipline to discipline, so refer to specific instructions. For example, APA citations are commonly used in physics while biology uses CSE style citations. In-text citations should be used where appropriate.

Appendix: This section is not always required. Appendices are for information that would otherwise be too detailed to include in either the Methods and Materials or the Results sections. If you include appendices, they must be directly referred to in your lab report (e.g. “See Appendix A for calculations of bacterial generation times”). Title each appendix and label each figure so readers can understand the purpose of including it in your report.

Suggestions for Writing Your Report: While the above demonstrates the order in which your lab report must be presented, it is not the easiest order in which to write it. Instead, the best practice is to:

1. Start with what is fresh in your mind after completing the lab – the Materials and Methods.
2. Move on to the Results section as the presentation of data comes naturally with the procedures already written out.
3. The Discussion should be written next, while the logical bridge between the Results and Discussion is still strong.
4. Afterwards, write the Introduction.
5. Leave the Abstract for last. This way you can summarize the primary objective, methodology used, and significant findings, all of which you have just written in the other sections.

If you have remaining questions (e.g. Can I write in first person? Use passive voice? Should Figure/Table captions be written in full sentences?), the best sources to turn to for answers are peer-reviewed journal articles in your field.

For further information, visit The Writing Centre website for a Lab Report Checklist, a handout on Writing in the Sciences, Citation Guides and much more:
www.utoronto.ca/twc/handouts-and-online-resources-writing