



Lab Report

This packet details the steps necessary to produce a lab report that may be required for work in various disciplines, including biology, psychology and computer science. This packet is not intended to replace instructor guidelines and should not be used in that manner. The packet's intended use is as a supplement to classroom instruction on assembling a lab report. Therefore, it contains only general information that must be tailored to fit specific guidelines as required by your discipline and by your instructor.

This packet is subdivided into six sections:

I. General Information

States what a lab report is and what purpose it serves.

II. Process

Gives step-by-step instructions on how to get started on your lab report.

III. Format and Outline

Provides descriptions of the most common format used in contemporary reports.

IV. Notes About Tables, Graphs and Illustrations

Gives brief definitions and tips on how to use them effectively in your lab report.

V. Checklist

Allows appraisal of your completed report and assures that it follows all necessary guidelines.

VI. Resources

Lists helpful resources used to compile this packet so that you may obtain further information on this topic.

★ General Information ★

Definition: A lab report is written to describe an experiment that a student performed or a process that a student has observed. Usually the lab report will be tailored to a specific audience, which may include the student's professor and/or peers. A typical lab report will contain a great deal of experimental information and data, so the key is presenting the procedure, results and conclusions in a way that is well organized and easy to understand for the intended audience.

A lab report examines your work in relation to the work of others in the same field, so your writing may also mention the results and conclusions of other researchers and scientists. Make a clear differentiation between your results and those obtained from other sources. Remember that the original source must be cited each time.

A lab report should examine: (1) the purpose of the experiment, (2) the procedures of the experiment, (3) the expected results of the experiment, (4) the actual results of the experiment, and (5) any conclusions drawn from experimental findings.



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Purpose: The lab report is used by scientists and students to communicate, explain and discuss their findings with others in the field and to establish these findings as sound and valid contributions to the field.

REVIEW

1. Explain the importance of determining the appropriate audience in a lab report.
Who are possible audiences for your report?

★ Process ★

1. Conduct appropriate research using scholarly sources.
2. Perform or observe the experiment.
3. Take precise and legible notes for the report.
4. Determine who the primary audience(s) for the lab report is (are).
5. Plan how you will tailor your lab report to meet the needs of the audience(s).
6. Determine what format and contents are expected by your instructor
7. Construct the materials and methods section from your lab notes.
8. Base the results section upon your findings.
9. Center the discussion section around the significance of these results.
10. Write the conclusion and introduction.
11. Summarize the main points of your report in the abstract.
12. Assemble a references page.
13. Complete the final draft of the lab report.
14. Check over the final draft for grammar and punctuation errors.
15. Use the checklist provided here to make sure that all parts of the lab report are addressed.



REVIEW

1. What do you consider to be the most crucial step(s) in the process of your lab report?
Why? Justify your response(s).



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★ Format ★

The format for a scientific lab report will most likely vary from instructor to instructor. What follows is a basic format that can be used as a guide when composing a lab report. A lab report usually consists of the following parts:

- Title Page
- Abstract
- Introduction
- Materials and Methods
- Results
- Discussion
- Conclusion
- References

Usually it is acceptable to use the words “I” and “we” in a lab report as long as statements of feeling or emotion are omitted.

Format Outline

I. Title Page gives the name of the experiment, your name and the names of other lab partners, the date, and other information as required by the instructor. The title page is a separate page.

II. Abstract gives a brief summary of the paper in a concise paragraph of 100-200 words. Remember that the abstract does not tell about the actual experiment, but **summarizes the report itself**. The abstract should be written last. In a scientific lab report, the abstract is generally one paragraph long, and this paragraph addresses five questions about the report. Usually each of these questions will be discussed in one sentence:

- Why the experiment is being conducted/what problem is being studied?
- What were the most important steps done to solve the problem?
- What were the most important results that were obtained?
- What do these results mean in the future?

III. Introduction presents the background information, statement of the objective and results to provide readers with a clear picture of the experiment. The introduction also provides the reader with an overview of the information, organized sequentially, as it is discussed in the remainder of the report.

a. Background information emphasizes the recent developments that have been made which make this lab experiment necessary or important. Significant material for the introduction may be found in the textbook or lab manual that you are using, so sometimes a careful paraphrase of the text will help build the background section.

b. Objective statement gives the hypothesis and purpose for the lab report, clearly communicates the subject of the report, and familiarizes readers with the experiment.

c. Summary provides a brief outline of the report and identifies the independent and dependent variables involved.

d. Results reveals to readers what to expect later on in the report.

*Remember that step-by-step instructions are not discussed in the introduction.

IV. Materials and Methods is constructed from complete lab notes that feature data, observations, calculations and any necessary tables, graphs or illustrations. When composing



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the first draft of a lab report, the materials and methods section is usually written first because it is the section that the rest of the paper is based on.

a. Materials section consists of a simple list of the materials used to conduct the experiment. If necessary, the materials section may be subdivided into two separated sections entitled *subjects* (animals or people used in the experiment) and *apparatus* (equipment used in the experiment).

b. Methods section describes the experiment in complete sentences with enough detail so that a colleague could repeat it in its entirety exactly as you have conducted it here. Avoid including information that is not pertinent to the experiment itself.

Keep in mind that not all instructors prefer the materials to be listed in a separate list. Some instructors may prefer that the materials list be omitted and that the materials simply be mentioned in detail throughout the methods section.

The materials and methods section is written in past tense using either active (*We dissected the frog.*) or passive (*The frog was dissected.*) voice. The choice of voice may also depend upon the preferences of your instructor – while passive voice is a more natural approach to reporting facts, active voice lends a more personal feeling to the report.

V. Results presents a clear summary of data to the reader in a logical order.

The results section will include all pertinent experimental data that was gathered during the procedure and that was used to draw final conclusions relating to the experiment. The results section will not attempt to describe the methods (materials and methods section) or interpret the data (discussion section).

a. Explanation of results highlights important findings that led to your conclusion, but does not discuss the conclusion at this point. All information is explained in clear paragraph form first.

b. Figures, graphs or tables display the results in a way that is easy for the reader to comprehend and internalize. These visuals are generally used to summarize data.

VI. Discussion section reports, interprets, analyzes and discusses the significance of the experiment and results. This section is usually written after the results section and is often considered the most important part of the report.

a. Review explains the expected findings and why these types of results were anticipated.

b. Comparison measures and relates your actual results and conclusions against the expected findings.

c. Support states whether your results backed your hypothesis and the degree to which they supported (or did not support) it. This section addresses the question of why your hypothesis was (or was not) supported.

d. Conclusions expresses what conclusions can be drawn from the findings and results of the experiment.

e. Constructive criticism addresses areas of concern in the experiment in a positive manner and offers suggestions for future research.



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VII. Conclusion summarizes the results and conclusions of the experiment briefly and mentions some of your personal conceptions about the contribution of the experiment to the field and future study in the discipline.

a. Summary explains the outline of the report and its final conclusions.

b. Outlook wraps up the lab report by addressing the question of where future research should begin and what researchers should explore. Tie this information in with your experiment and/or findings.

VIII. Reference Citations gives credit to sources that were used when assembling the report and provides enough information for anyone reading the report to go back and locate these sources. Always list sources in alphabetical order according to the last name of the author. Consult your instructor about the appropriate format for the references section.

REVIEW

1. List the eight sections of a lab report. What section should be written first? What section is considered the most important part of the lab report?

★ Notes About Tables, Graphs and Illustrations ★

In scientific writing, the most common area to find graphs, tables and illustrations will be in the results section of a lab report because these types of visuals effectively help the reader to understand the experiment's procedure and results. First, we will explain the differences among the three visuals.

Tables – used to summarize, compare or present numerical data; data organized in matrix form.

Graphs – used to highlight trends and patterns; data arranged along an x-axis and y-axis.

Illustrations – used to depict, illustrate or highlight structural aspects; data presented in the form of line drawings, diagrams or computer-generated designs.

When using tables, graphs or illustrations in your lab report, be sure to

- Select a table, graph or illustration that clearly presents data for readers in the best possible way.
- Place a descriptive title above tables and below graphs and illustrations.
- Present each table, graph or illustration as independent; readers should be able to understand the information presented without referring to the text.
- Refer to tables, graphs and illustrations in the text and place them as near as possible to their area in the text.

★ A Lab Report Checklist: ★ Did I ?

- Follow my instructor's guidelines for the lab report
- Establish my audience clearly
- Choose a clear and appropriate title



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- State and answer the main question presented by the lab
- Describe the experiment in enough detail to be replicated – *exactly*
- Document all aspects of the experiment that might have influenced results
- List all procedures specifically
- Record all measurements with proper units
- Show any required calculations
- Summarize gathered data effectively
- Organize data into tables, graphs and illustrations (when necessary)
- Assign titles to all tables, graphs and illustrations
- Number equations, tables, graphs and illustrations separately and consecutively
- Use the past tense when describing methods and results
- Use the present tense when stating my conclusions
- Include endnotes, rather than footnotes, for clarification
- Cite all references in uniform documentation style

★ Resources ★

GBS Physics Staff. (1998). *Glenbrook South year-end physics projects: Lab report guidelines*. Retrieved June 20, 2002 from <http://www.glenbrook.k12.il.us/gbssci/phys/projects/yep/report.html>

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University of Washington: Psychology Writing Center. (2000). *Writing an APA lab report*. Retrieved June 20, 2002 from <http://depts.washington.edu/psywc/handouts/labrep.html>

*In traditional APA style, this section would be entitled "References" and would be listed on a separate page double-spaced. Due to space constraints in this packet, it has been formatted differently.

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