

## Lab Report Writing Conventions

Lab Reports are widely used in scientific studies across numerous disciplines, including chemistry, biology, and engineering. Though exact formats and terminology may differ between disciplines, lab reports share certain similarities regardless of subject. These include preparation, tense, and organizational structure.

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### Preparation

Writing a great lab report begins during the lab itself. Take detailed notes on data and measurements and observe the reactions during the experiment. Record exact measurements. Use complete sentences and be as descriptive and clear as possible to detail the experimental process and the sensory experiences during the lab. Taking good notes during the lab will make your lab report much easier.

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### Third-Person Past-Passive Tense

Most writing encourages active voice. However, lab reports are written in third person past-passive voice. This means you should not use the subjects “I,” “We,” “You,” or the pronouns “We,” “they,” “she,” or “he” in your reports. Likewise, all experimental actions should be described in the past tense, although lab equipment, theories, and the report itself should be referred to in the present tense.

<u>First-Person Past-Active:</u>  We injected ten specimens of <i>Rana pipiens</i> with 1.0 ml. of a 10% JCI solution.	<u>Third-Person Past-Passive:</u>  Ten specimens of <i>Rana pipiens</i> were injected with 1.0 ml. of a 10% JCI solution.
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By changing the sentence from active voice in the first-person, “We injected,” to the passive voice “Ten species...were injected,” the first person “we” was no longer necessary. Usually, past passive sentences can be constructed by taking the verb of the active sentence, such as “injected,” and adding “was” or “were” in front.

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### Lab Report Structure

Although the labels for certain sections of the lab report may be different between disciplines, all lab reports follow a basic structure. Usually, lab reports are written in complete sentences using proper attributions in APA format. As such, they begin with a title/cover page and follow this structure, clearly labelling all parts:

- a. Title Page.** Your title page should contain the name of the experiment, any names of lab partners, and the date. Titles should be straightforward and less than ten words (i.e., Not “Lab #4” but “Lab #4: Sample Analysis using the Debye-Sherrer Method”). List in the center of your title page.
- b. Introduction.** Your introduction is a short paragraph stating the objective of the experiment and providing the reader with all necessary background. This background includes all relevant theories, previous research, or formulas the reader needs to know. It should end with your hypothesis. (Ensure you are writing in complete sentences using the third-person past-passive.)

- c. Hypothesis.** The hypothesis is a statement, not a question, explaining the suppositions and outcome of the experiment. It does not have to be written as an “If...then...” statement, although it should reference the expected outcomes. Ex: “Specifically, we will test whether injecting frogs with JCl results in the frog’s ability to jump further than those not injected with JCl.”
- d. Materials.** If deemed necessary by your professor, list all materials which you used to complete the lab. Be as comprehensive as possible, listing both the types of materials as well as any necessary measurements. Ex: if you used water as a solvent you should list it as “Water, 400ml.”
- e. Experimental Procedure/Methods/Methodology.** This section can have multiple names; use the term preferred in your discipline. Regardless of name, it should be written in a chronological narrative, explaining exactly what procedural steps you followed with short, clear descriptions of each action. Be as detailed as possible without distracting from the section’s purpose. If you had to collect samples yourself, include where and how you collected them and what you collected. If you used pre-prepared samples, include that information as well. You should also note any deviations from the published procedure. When writing a lab report you must keep in mind that all experiments should be able to be reproduced, so include as much information as necessary to be able to reproduce the exact methods you used.
- f. Data Analysis/Results.** This section can have several names. Regardless of the name, all collected data and calculated results should be presented in tables, graphs, or lists. All columns should be labelled with the units appropriate to the identity of the measurement or calculation. (I.e., water should be labelled by liters not grams, unless otherwise stated why.) Graphs should be plotted in Excel and properly labelled. There should also be clear descriptions of qualitative observations. Do not include any raw data.
- g. Calculations.** All calculations, when necessary, should be separated from the data table and descriptively labelled using actual data with appropriately-labelled units. Show the sequence of the calculation in chronological order.
- h. Discussion.** Often, discussion is considered the most important part of a lab report as it demonstrates competency of the experimental objective and the implications of the results. You should explain and describe the experiment, including key data and calculated results. This is also the opportunity to analyze and interpret the data your experiment produced, addressing any potential errors and explaining how the conclusion is derived with reference to your hypothesis and the expected results. As such, you should compare expected results with those obtained, explain your results in terms of theoretical issues, relate results to your experimental objective(s), compare your results to similar investigations, and analyze the strengths and limitations of your experimental design.
- i. Conclusion.** In the conclusions, follow through on your Results and Discussion to revisit your hypothesis to state what you know for sure after completing the lab. If you received unexpected results, mention how you might change your experimental procedure in the next attempt.
- j. References.** Your references should be listed in APA format. Check with your professor to determine whether they prefer References on a separate page or directly after your Conclusion.

This is the basic structure of a lab report. However, this structure can alter depending on discipline, so check with your professor on the correct format before turning in a lab report the first time.

(Notes adapted from Writing Center Workshop: CHM 221 Science Writing and Lab Reports)