

Guidelines for Writing Lab Reports

For each laboratory experiment conducted in Chem 101 laboratory class you will be required to submit a lab report describing the experiment, summarizing your observations, and explaining your conclusions or judgments about the meaning of what you observed. Lab reports allow others to learn the results of scientific investigations. Scientists are investigators who "try out" ideas. They conduct experiments in order to test or prove ideas, and they share the results of their experiments in papers and written reports. In this laboratory course you will be conducting experiments, observing processes, recording data, and formulating conclusions. The lab report you submit will summarize your findings for the instructor.

The lab report must be stapled to your data sheet and submitted to your laboratory professor when handing in your laboratory results. Below are some general guidelines for preparing and writing your lab report.

General Format of lab reports:

Lab reports must be typed. It is at the discretion of the laboratory instructor if they accept handwritten documents. **The lab report is not to exceed two single sided typed pages.** You will not be graded by the number of pages you submit, but the concise and accurate content of your report. If you need more space than provided in the lab report sheet, copy the headings to a regular word document and print that out as your report.

Lab reports contain the following sections:

- 1. Title of Experiment**
- 2. Introduction** (*briefly describe the purpose of the laboratory and learning objectives*)
- 3. Procedure** (*Summarize the procedures used in the experiment. DO NOT copy what is in your lab manual word for word*)
- 4. Results** (*State what you observed from doing the experiment. This information is from your datasheet*)
- 5. Discussion or Conclusions** (*explain what you observed in the experiment. are your findings in agreement with what you expected?*)
- 6. Your Signature** (*Your signature indicates that your lab report represents your own work. Excluding shared data, the information, thoughts, and ideas are your own.*)

Key to writing the lab report:

When preparing your lab reports, think of the *person reading your report* as an educated person who is interested in learning about your experiment, but who knows less about this subject than yourself. You take the role of expert; you are in charge of efficient, accurate communication of facts and ideas.

Evaluation of lab reports:

Your lab instructor will read your lab reports, comment on them, and grade them. He or

she judges how well you communicate necessary background information as well as the processes and results of the experiment itself. Your instructor also observes how carefully you follow the format for lab reports described in these instructions. **The data sheets and questions assigned to each laboratory are part of your lab report and must be stapled to the lab report document.** Make sure you understand what the criteria on the data sheet mean and what parts of the lab report they apply to.

More information about the sections of the lab report:

Title: This is the title of the experiment being conducted each week.

Introduction: The text of the report begins with an introduction. In general terms, tell the reader what you intend to do and why you intend to do it. Include all phases of the experiment. Emphasize any unusual or critical conditions. Point out exactly what it is you are trying to do. Make sure the reader understands the purpose of the experiment. What you are attempting to test or prove or investigate should be clear to the reader. If necessary, include general information that explains the importance of the experiment and why you are doing it. You can use the guiding questions after each experiment to help you organize your thoughts, as well as notes from your textbook and lecture.

Procedure: In this part of the report, you summarize for the reader what experimental methods you will be using in the laboratory. DO NOT copy a step-by-step account of the actual experiment. You need to describe your procedures in such a way that others could read your lab report, follow your lab procedure, and clearly understand what techniques, equipment, procedures, etc you used in the experiment. If you deviate from the protocol in your lab manual indicate it in this section. The procedure section of your lab report should be usable as a set of directions for other scientists.

Results: In this section you summarize the outcome of your experiments for your reader. This section will consist primarily of data (facts and figures) that you gathered in the course of the experiment and marked down on your data sheet. For this section in one or two sentences briefly describe to the reader what is detailed in the data sheet. Data must be presented in such a way that they are easy to read. You must organize or assemble and label the data for the reader. Although tables and figures are labeled on the page with descriptive titles, they are identified in the written body of your report by number rather than name. When you discuss tables and figures in the text of this section, you mention Table 1, Table 2, Figure 1, and so on.

Discussion/Conclusions: The discussion/conclusions section of your report is the most important one for you and your reader. In this section of the report, you interpret the results of your experiment for the reader. You explain what the results mean, how you know what they mean, and why you can make these claims-that is, you will discuss how the experimental evidence supports your discussion. You will also mention any weaknesses or problems in the plan of the experiment or methods you used. You

demonstrate not only how successful your experiment was but also how well you understood the experiment. The discussion section can be difficult to write, but you will learn more about your experiment and yourself as an investigator as you write it. Make sure your stated conclusions clearly match the actual outcome of your experiment.

Helpful steps for preparing your discussion/conclusions section:

1. Write out your ideas and goals again. What were your questions? Look over the tables, figures, and general information you compiled for the *Results* section. What did your experiments show?
2. List any weaknesses or problems you discovered in the experimental design or procedures.
3. Tell the reader how these problems may have affected the results of your experiment.
4. What did you do? Write down the specific data that led you to any conclusions you have come to.
5. What did you see? What observations did you make.
6. What can you claim from the results of your experiments? How do you know this? Can you defend your claims? Does the experimental evidence back up your claims?
7. Write down what you know about the principles of chemistry involved in your experiment. How do the results of your investigation fit with the chemical concepts that you have learned? Identify the sources of your information at this point.

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A Word About Style: The style used in scientific reports is quite different from that required for an English paper. It is important that you understand and get used to using different writing styles appropriately. As you are writing your lab report, pay close attention to your style. In scientific papers, facts and interpretation of facts are what count, so the depersonalized writing known as "scientific" or "academic" is most appropriate to your lab report. For scientific writing follow these criteria:

- *Use the past tense.* You are writing about the experiment you have already completed- not one that you are now doing.

- *Use the third person and passive voice.* In a sense, you are telling a story; in another sense, you are providing directions. Rather than telling a story or writing a recipe, you must describe what you did. At the same time, keep the personal element out of the report. For example,

Write: The solution was filtered.

Not: I (we) filtered the solution.

Not: Filter the solution.