

NAME:

HONORS CHEMISTRY

SECTION:

Writing Laboratory Reports

Scientific work has little value unless the information is made public, so that other scientists can verify and expand on the experiments to learn more about the topic. This is done by publishing the work in the form of a written article in a scientific journal. Prominent chemistry journals include Science, Nature, Journal of the American Chemical Society, and Proceedings of the National Academy of Science, and many others. Therefore, when we do a lab, we too will “publish” them in the form of formal laboratory reports.

Labs are graded on a 100 point scale. Lab reports MUST include the following information, which are assigned point values as follows:

- An introduction to the experiment (15 pts)
In this section of the lab report, scientists state the purpose or goals of their experiment, and give a detailed discussion of the background needed to understand the results. This section needs to present the background information, previous research, and/or formulas that the reader needs to understand and solve the problem. The introduction must be written using complete sentences, using your own words (i.e., do not copy directly from the lab handout, textbook or lab partner). In some cases, the introduction will also include proposing the hypothesis to be tested in the experiment. If a hypothesis is required, it must be written as an “If...then...” statement. For some labs, you will be provided with a list of key terms/concepts to be included.
- The names of all your group members (5 pts)
Scientists give credit to their collaborators when the work is published. Therefore this list should be complete—use first and last names, spelled correctly. Also, include each group member’s role.
- A list of the materials used in your experiment (5 pts)
Scientific publications always include lists of the reagents and the equipment used, so that other scientists trying to repeat or extend the experiments can carry them out under similar conditions. You need to include all reagents used, as well as the lab equipment used. As an option, you may include a drawing or photograph of your setup.
- A step by step procedure for your experiment (14 pts)
Scientists include a description of the actual procedure used in their reports, so that other scientists can replicate the experiment if needed. You should include a numbered list, with the steps that you actually performed in the correct sequence, described in your own words (not copied from your lab partner). The procedure should include enough detail so that you could give your procedure to a classmate and he/she could correctly carry it out. It is not acceptable to either copy the procedure word for word from the lab handout. You do not need to include safety equipment (goggles, aprons) in your procedure. The procedure must be written in passive voice and past tense (see the course website for more information).
- All of the data collected for your experiment, presented in an appropriate format such as a table or graph (18 pts)
Scientists are careful to include the relevant data in their publications, so that other scientists can reinterpret the data themselves. Since there is limited room in journals, the data must be presented as concisely as possible. Summarize the data in the form of tables or graphs. Each table or graph must have a descriptive title. You need to prepare your data tables in your lab notebook before doing the experiment (this way you’ll have a better chance of collecting all the data you need!). Report the correct metric units for all measurements. If calculations are required, state the formulas used and show sample calculations. Make sure all your work is shown and the rules for significant figures are followed for measurements and calculations.

- Answers to the Analyze and Apply questions, in complete sentences (25 pts)
 Scientists include a discussion of the significance of the work and applications to different areas. This is your opportunity to show me (your instructor) your understanding of the concepts and to extend them to other situations. Show me what you can do! Answers must be written in grammatically correct English. If the question is a math-based problem, show all your work and include all relevant formulas, significant figures, etc.

- A conclusion, summarizing the main results and indicating any changes you would make to the experiment if you were to repeat it (10 pts)
 - Restate your results—be quantitative.
 - Discuss experimental and/or procedural sources of error
 - What portions of the lab should you do differently or redesign? Why?
 - What portions of the lab should you repeat? Why?
 - Describe how these sources of error affected your quantitative results. Did they make your results too big? Too small? Why?

This must be written in paragraph form, using grammatically correct English. This is not a place to give your personal opinion about the enjoyment value of the lab—it should be a critical assessment of the results of the experiment. Never include “human error” or mistakes in calculations as a source of error in the conclusion.

- Literature Cited (2 pts)
 If you used websites, textbooks, database articles or other reliable sources to complete your lab report, list the references accurately in AMA format. If you did not refer to any outside sources, it is acceptable to write “No sources cited.”

- Presentation (6 pts)
 - Correct spelling throughout (or minor errors that do not detract from overall readability)
 - Correct use of grammar—complete sentences, appropriate punctuation, etc.
 - Report sections are in correct order
 - Typed/word processed
 - Overall effort to be neat—report is turned in with “final draft quality”