

Chemistry Lab Report Format

It is important that you understand the purpose of the lab, how a problem can be tested, and how to record and interpret results.

Laboratory exercises are not optional. If a student misses a lab, she will be required to make up the lab at the teacher's convenience.

Scientific papers are written in an objective, technical form using the passive past tense. The information is communicated in a clear and concise manner, without using phrases that convey feelings about the experiment. With the exception of calculations, formal lab reports are typed.

***Title/Date:** List the name of experiment, your name, and the dates of the experiment.

***Date:** List the date of the report.

(List your partners' names.)

***Purpose:** Write one or two complete sentences that describe the objectives, or the reasons, for completing the lab.

***Background Information:** Present at least a paragraph of information that demonstrates your understanding of the chemistry concepts pertaining to this lab.

Give the background for the experiment. Describe what you already know from reading in your text or other literature or the handout for your experiment. In a sentence or two, describe/explain what you're going to try to find out.

***Hypothesis:** State a hypothesis clearly stated in terms of independent and dependent variables. (This only needs to be a couple of concise sentences.)

The independent variable is the one that you alter throughout your experiment. For an example, if you investigate the effect of temperature on yeast fermentation, then the different temperatures that you use are the independent variable.

The dependent variable is the variable that you measure. Using the yeast example, the dependent variable would be the amount of CO₂ produced by the yeast (this shows how well the fermentation is going).

The controlled variables are the ones that you try to keep constant throughout your experiment so that they do not affect your experiment. If investigating the effect of temperature in yeast fermentation, the controlled variables would be the amount of yeast and water, the time for fermentation, etc.

***List of Materials:** Include a list of materials needed to complete the experiment.

Give a list of all the equipment used in the experiment. Give the size of beakers/measuring cylinders, etc, used, give the names of any chemicals that are used in the experiment.

You can use a diagram (picture) to show the experimental set up if you find it necessary.

***Procedure:** If you are expected to design your own procedure, you must write the directions for the lab in a numbered list. Write them in a manner that other chemistry students would be able to follow them, as if you were giving instructions for someone else to do the experiment. If a numbered procedure is already provided, write a procedure summary in paragraph form.

***Safety Considerations:** List applicable safety rules to consider in this experiment. Include special handling and disposal instructions.

***Data/Data Table:** Include tables with all the information that was recorded throughout the experiment. Tables should be easy to read and include appropriate headings and units.

Also write how you made sure that the sufficient relevant data was recorded. Describe the method for data collection, i.e. if you had several trials, if you used controls, methods of measurements, if your calculations are correct, etc. Include how you used the independent, dependent, and control variables in the experiment.

Error analysis should also be completed whenever you have this information.

Observations: Record the observations made during the lab.

These are often as important and valuable as any numerical data.

Results: For repetitive problems, provide one sample calculation with appropriate units for each type of calculation. List the results of the calculations with units. In some cases, it may be convenient to record the results as another column on the data table. Percent error should be calculated in this section. For all calculations, the equation must be explained in words first before the numbers are used in an equation. Calculations may be hand written in ink.

For example:

$$\begin{aligned} \text{Mass of substance} &= \text{mass of substance and beaker} - \text{mass of beaker} \\ 24 \text{ g} &= 63 \text{ g} - 39 \text{ g} \end{aligned}$$

$$\begin{aligned} \text{Volume of object} &= \text{Volume of water and object} - \text{volume of water only} \\ 2.0 \text{ mL} &= 14.3 \text{ mL} - 12.3 \text{ mL} \end{aligned}$$

$$\begin{aligned} \text{Density} &= \frac{\text{mass}}{\text{Volume}} \\ &= \frac{24 \text{ g}}{2.0 \text{ mL}} \\ &= 12 \text{ g/mL} \end{aligned}$$

Graphs: Data should be graphed with maximum use of the paper, labels on both axes with units, a title, and a best-fit line or curve through the data points. Make sure you use the right kind of graph for the data/experiment. Not all activities will require a graph.

Questions: Rewrite the analysis/conclusion questions from the lab sheet and then answer each question.

Conclusion: State the results of the experiment. Compare the results with standard values (include previously calculated percent error value from the results section) and then state whether the results were too high or too low. Suggest two sources of error related to YOUR data that would have caused these experimental results. Hypothesize why the errors occurred and what might be changed to avoid these errors.

If your results do not support your original hypothesis, propose a new hypothesis.

In the conclusion you should discuss the results you obtained in relation with your hypothesis. Write a conclusion based on an interpretation of the gathered results.

Compare your results with literature values if possible.

Discussion: Write a five to six sentences that include the following: Restate the original objectives of the lab and explain if they were achieved. Restate the results of the experiment. Describe any additional areas of study that could be done as a result of performing this lab. (i.e. If this lab were done again, what changes would be made? Are there any new questions that were raised by the results of the lab? What should you study next?)

References: If your research was based on someone else's work or if you cited facts that require documentation, then you should list these references. You do not have to cite any information given to you by your teacher.

LAB REPORTS ARE DUE 2 CLASS DAYS FROM THE DATE OF THE CONCLUSION OF THE LAB. For example, if a lab is started on a Monday, completed on Wednesday, the lab report is due the following Tuesday. Exceptions to this policy will be announced at the onset of the lab procedure. Lab reports may be turned in early. Late reports will lose a letter grade/class day.

*** items that should be prepared before the lab is performed**

August, 2011