Writing a Formal Report

General Instructions

The formal lab report should be written in your own words and should describe concisely the purpose of the lab, what you did in the laboratory, and what your results and conclusions were. Extensive copying of the laboratory handout signifies a lack of originality and will be graded as such. Extensive description of the minute details of the laboratory procedure is also unoriginal as well as boring. Please avoid both of these tempting writing techniques in your laboratory report. Two to four double-spaced typewritten pages (Times New Roman font in 12 pt) should be sufficient length for the laboratory report. The report should be written in past tense and passive voice (except the introduction). Your instructor will give you a list of three "post-lab' questions at the start of the laboratory period. The answers to these questions must appear in the appropriate section in your report. Do not confine your report to answering these questions alone. You will turn in the completed data sheet for the lab along with your formal report. Your grade for the formal lab will consist of points from your data sheet results, points for you answers to the "post-lab" questions, and points for overall style and content.

Report Format

To help both the writer and the reader organize their understanding of the topics of the report, scientists have agreed to use a six-part format when writing their lab reports. The six parts are, in their order of appearance:

1. Title: This is simply the name of the experiment. For our purposes this will be a separate page and also include your name, your partners name (if applicable), class and section number, and date the experiment was performed.
2. Abstract: This is a very brief (2-3 sentences) statement that tells what was done, the main techniques used, and the major results obtained.
3. Introduction: In this section the theory on which the experiment was developed is described. This is an important section, because it shows the reader that the experiment was thought out on scientific principles, and was not simply a collection of random observations or guesswork.
4. Experimental Procedure: This section outlines what you actually did in the experiment (note: this may differ from the procedure given in the lab handout!!) Describe what you did in sufficient detail that another person with at least your level of expertise in the lab could read the report and duplicate the experiment.
5. Results and Discussion: This section showcases your raw data, observations, and calculated results. Limit your observations to complete sentences about what you actually saw, heard, smelled, or felt while you performed the experiment. Numerical data should be in table form whenever possible, and should always include units and the correct number of significant figures. The discussion should include sample calculations written out for each different calculated quantity and it should include information on any special or unusual circumstances associated with the data collection, such as high or low room temperature, and unexpected odor given off during a reaction, or the presence of a visible contaminant in a beaker of solution.

6. Conclusion: In this section you will discuss what you learned from the experiment. You will essentially be answering the following question. "Did the experiment verify the theory presented in the introduction? If not, why not?" If possible discuss sources of error that lower the quality of the results, such as weighing errors or failure to account for temperature effects. Suggestions for improving the quality of the results, such as modifications to the experimental procedure, should be described in this section, along with reasons why you think the suggestions could lead to better results. This section should not introduce any new material; instead it should be a summary of the key points in the report.

Grading for Style and Content

The style and content of your laboratory report will be graded in three categories (1) spelling, grammar, and usage, (2) originality, and (3) organization. The following is expected of a satisfactory performance in each category:

1. Spelling, Grammar, and Usage: Spelling and grammatical rules are generally followed; any mistakes that occur do not interfere with the comprehension of your report. Sentences are constructed to convey meaning clearly and unambiguously. There are no incomplete or run-on sentences. The report should be written in past tense and passive voice (except the introduction).
2. Originality: The experiment has been described in the student's own words, not copied from the lab handout. Understanding of the experimental procedure is shown by including details that are not in the laboratory handout and by identifying possible sources of error in the experiment. An understanding of the scientific principles involved in the experiment is shown by stating how those principles apply to the experiment.
3. Organization: The report shows a clear progression from each section to the next. The report is organized into paragraphs with obvious headings at the beginning of each section. Conclusions follow logically from experimental results.

Examples of past tense and passive voice

1. The density of carbon tetrachloride at 25% was determined by weighing a known volume of carbon tetrachloride on an analytical balance. From the data collected, the density was calculated to be 1.60 g/mL.
2. The purpose of this experiment was to separate and identify mixtures of dyes found in commercial drink mixes into their constituent components.
3. A piece of paper, approximately 10 x 15 cm in dimension was obtained from the chemistry stockroom. A horizontal pencil line was made on the long edge of the paper, approximately 1 cm from the bottom.