Laboratory Reports

The importance of lab reports:
- Persuade others to accept or reject hypotheses by presenting data and interpretations
- Detail data, procedures, and outcomes for future researchers
- Become part of the accepted body of scientific knowledge when published unless later disproved
- Provide an archival record for reference and document a current situation for future comparison

Format
When you come to the lab you should have prepared the following in your notebook: Title, Abstract, and Materials and Methods. You should use your own words and do not copy from the lab experiments given to you. Be prepared for the lab!

You lab reports should include all of the following:

Title:
- Reflect the factual content with less than ten words in a straightforward manner

Abstract:
Summarize in a concise paragraph the purpose of the report, data presented, and major conclusions in about 100 - 200 words.

Introduction:
- Define the subject of the report: "Why was this study performed?"
- Provide background information and relevant studies: "What knowledge already exists about this subject?"
- Outline scientific purpose(s) and/or objective(s): "What are the specific hypotheses and the experimental design for investigation?"

Materials and Methods:
- When procedures from a lab book or another report are followed exactly, simply cite the work and note that details can be found there. Only report any deviations from the proscribed laboratory procedure.

Results:
Data
All data should be displayed in a tabular form. In the spreadsheet create an area that only contains the data to the proper number of significant digits. Also make sure the units are given.

Calculations
All numbers derived from the data are results. This information should be in a separate table. Again watch for significant digits and units.

This unit is the spreadsheet and the formula spreadsheet and example of calculations.
The excel formula sheet has to be turned in! Also show by hand one set of sample calculations

Discussion:
- Concentrate on general trends and differences and not on trivial details.
- Summarize the data from the experiments with discussing their implications
- Organize data into tables, figures, graphs, photographs, etc. Data in a table should not be duplicated in a graph or figure
- Title all figures and tables; include a legend explaining symbols, abbreviations, or special methods
- Number figures and tables separately and refer to them in the text by their number, i.e.
  1. Figure 1 shows that the activity....
  2. The activity decreases after five minutes (fig. 1)
Conclusions

- Interpret the data; do not restate the results
- Relate results to existing theory and knowledge
- Explain the logic that allows you to accept or reject your original hypotheses
- Speculate as necessary but identify it as such
- Include suggestions for improving your techniques or design, or clarify areas of doubt for further research

Literature cited

- Cite only references in your report and not a general bibliography on the topic
- Alphabetize by last name of the author
- Follow the recommended format for citations (APA style). Look at http://www.apastyle.org/elecgeneral.html
- Also look at the style in which literature is cited in the Journal of Chemical Education

General style

- Strive for logic and precision and avoid ambiguity, especially with pronouns and sequences
- Keep your writing impersonal; avoid the use of the first person (i.e. I or we)
- Use the past tense and be consistent within the report
  note: "data" is plural and "datum" is singular; species is singular and plural
- Italicize all scientific names (genus and species)
- Use the metric system of measurement and abbreviate measurements without periods (i.e. cm kg). Spell out all numbers beginning sentences or less than 10 (i.e. "two explanations of six factors").
- Write numbers as numerals when greater than ten (i.e. 156) or associated with measurements (i.e. 6 mm or 2 g)
- Have a neutral person review and critique your report before submission
- Number the pages of the report