Lab Notebook Policy and Format for Lab Reports

What lab reports and scientific papers do:

- **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:

The typical lab report includes: title, abstract, background, procedure, data and calculations, discussion and conclusions, references and literature cited.

Title:

- Reflect the factual content with less than ten words in a straightforward manner
- Use keywords researchers and search engines on the Internet will recognize

Abstract:

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

Background:

- 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?"

Procedure:

- List materials used, how were they used, and where and when was the work done (especially important in field studies)
- Describe special pieces of equipment and the general theory of the analyses or assays used
- Provide enough detail for the reader to understand the experiment without overwhelming him/her. When procedures from a lab book or another report are followed exactly, simply cite the work and note that details can be found there

Data and Calculations:

- Concentrate on general trends and differences and not on trivial details.
- Summarize the data from the experiments without 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)

Discussion and 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

References and Literature Cited (not usually required in your lab reports)

- Cite only references in your paper and not a general bibliography on the topic
- Alphabetize by last name of the author
- Follow the recommended format for citations

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

Experiment 1 Zymurgy: Beer Brewing

Abstract

An experiment that reviews stoichiometry and gas laws from Chem V01A in a different and fun method. At the end of approximately 10 days of fermentation, the resulting product was bottled and saved for posterity. Given its density and color, it was probably suitable for human consumption.

Background

Please see pages 1-1 to 1-2 of the lab manual.

Procedure

Please see pages 1-3 to 1-4 of the lab manual.

Data and Calculations

Data Table 1

Mass of 5.00 mL of wort + small beaker	37.2672 g
Mass of empty small beaker	32.2457 g
Volume of wort	5.00 mL

Calculated density of wort

$$\frac{5.01215\ \text{g}}{5.00\ \text{mL}} = 1.00\ \text{g/mL}$$

Discussion and Conclusions

During the initial heating process, there was a small boil over which resulted in about 10 mls of solution lost. When this was mentioned to the instructor and she said that the experiment should be continued without starting over. The heat of the Bunsen burner was turned down and no more accidents occurred.

The color of the beer was relatively lighter than the solutions made by other students. This is probably why its density was so close to pure water. There was probably a greater proportion of water to alcohol than the other, darker products.

Post-Lab Questions