

EXPERIMENT TITLE
AUTHOR(S)
DUE DATE

TEAM MEMBERS: (names)
LABWORK: (hours)
CALCULATIONS: (hours)
WRITING: (hours)
TOTAL TIME SPENT: (hours)

REPORT RECEIVED BY: _____ DATE: _____ TIME: _____

FORMATTING: Your document should have 1 inch margins all around, and the line spacing should be 1.5. Font size should be 12 point Times or Times New Roman. Section headings should be in **bold**. Figures call-outs should be in **bold**, e.g. **Figure 1**, etc. Same for **Tables**. Charts or scatter plots should follow the template given, and should be standard at 6.5 inches in width, with text wrapping set to top and bottom. Paste them as picture objects and not as embedded office objects. **The final draft should be in black.**

1.) Introduction and Background: [1-2 Pages]

A technical memo is shorter than the reports that you have been writing, and is designed to convey the maximum amount of information in the shortest amount of space. In your professional life, you will write many such documents. In the case of a technical memo, you can assume that the reader already has a decent understanding of what the fundamentals of your topic are, and the introduction is serving as a specific description of what you did (**what were the objectives of your experiments**) as well as the basic procedures you employed. (**How did you carry out your experiments?**) You do not need to include a broad description of the technical theory behind the experiment (your boss presumably knows this – he/she is your boss after all!), nor do you need to include the broader context of the experiment (e.g. distillation is awesome because of x,y,z). The introduction should focus on what your objectives were and how you met them. In some circles, this is referred to as an “extended abstract”.

Example:

In this experiment we carried out a fractional distillation of Component A and Component B using the Really Big Distillation Column. The goal of this experiment was to determine the effect of varying reflux rate, feed composition, and the weather on the quality of the separation between components A and B. Reflux rates were varied between zero and a billion gallons per year. Compositions were varied between 0% and 100% of component B in 5% increments, and the weather was varied using a McFly-Brown Weather Modulator 2265 in continuous mode. Experimental data was compared both to hand calculations based on the Burkey-Anastasio method, as well as to model ASPEN data. Based on the theory, it was expected that...(etc.)

2.) Experimental Methods and Analysis: [1/2 Page – Diagram in the Appendix]

The methods section here does not need to be a detailed operator-quality instruction list for running the experiment. Take a few sentences and describe the equipment used in the experiment and what type of data was obtained.

Example:

Distillation of components A and B was carried out in the Really Big Column. The feed consisted of X% A and (1-X)% B, and was fed at a rate of Z gallons per minute. Samples were taken at every stage, and subjected to GC analysis using a Farnsworth 2000 Gas Chromatograph. Areas of the GC peaks were calibrated using standard solutions, to which the column compositions were compared... (etc.)

3.) Results and Discussion: [3-4 Pages]

This is the main body of the report, where you discuss the major findings from your experiment. Data that you take will often be presented in the form of figures or tables, which you must then explain fully in the body of the text and provide your interpretation of what the data means.

Figures should always be called out in the body of the text in boldface. For example, **Figure 1**.

Figures should always be accompanied by a relevant caption that summarizes the discussion of the figure's contents. Similarly, tables should also be called out in the body of the text, also in boldface. **Table 1** is an example.

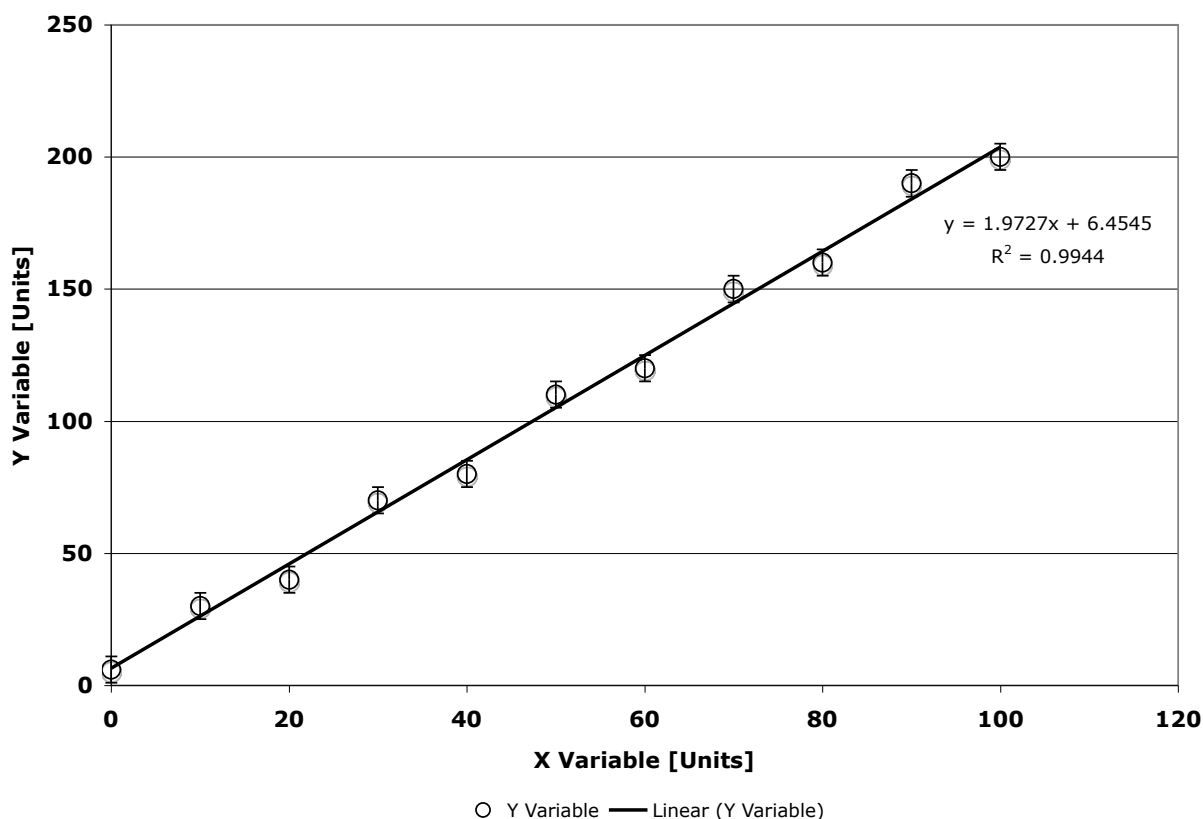


Figure 1: Y variable plotted as a function of X. Note the inclusion of a linear regression of the data, as well as the inclusion of error bars. In general avoid the use of color in graphs, in case the document is photocopied. All graphs should be 6.5 inches in width. Fonts are 12 pt, and bold, for easy readability. Figure captions can be single-spaced.

Table 1: Example of how to structure data in a table.

Column 1	Column 2	Column 3	Column 4	Column 5
[Units]	[Units]	[Units]	[Units]	[Units]
1.0	1.0	1.0	1.0	1.0
2.0	2.0	2.0	2.0	2.0
3.0	3.0	3.0	3.0	3.0
4.0	4.0	4.0	4.0	4.0
5.0	5.0	5.0	5.0	5.0

The challenge of writing a good technical memo is to learn to summarize and report your results for maximum impact in the shortest amount of space. Students are often thrilled at small page limits, but in many cases, it is more difficult to write concisely and well than it is to write a longer document and pad it with unnecessary data and meaningless sentences that don't contribute to the technical content. You will need to decide on your one or two most relevant results, what they mean, and present that in a concise fashion. Do not try to include all of your raw data, and do not include derivations (unless you are reporting something new or novel, in which case include it in the appendix). In a technical memo, it is generally advisable to discuss the meaning or the implications of the results immediately after presenting them.

Example:

Figure X shows the effect of weather on the separation of A and B. As shown, sunny conditions resulted in 10% more A in the distillate than under rainy conditions. Foggy conditions showed the opposite trend, with 10% less A in the distillate. Based on theory, this was expected, as A is more rain-sensitive than B. (etc.)

Conclusions and Recommendations: [1-2 Pages]

A technical memo should end with the conclusions that you have drawn regarding your experiment, in the context of what you expected per your introduction. The introduction should tell the reader what to expect, the results section should tell them what you did and what the results were, and the conclusions should tie those things together in a coherent way.

Recommendations here are also appropriate, and in the context of this class, should focus on potential improvements to the lab that may be of benefit to the next lab group performing the experiment.

Example:

In agreement with the theory, it was shown that sunny weather results in improved separation between A and B, showing that A is indeed impacted by the weather. To maximize separation, future groups should avoid rainy weather during their experiments. Additionally, it may be beneficial to conduct the experiment at varying ambient humidities to attempt to quantify this effect...(etc.)

Appendix: [No page limit – don't abuse]

As described, the appendix contains anything that is not appropriate for the main body of the report. At a minimum, it must contain a photocopy or scan of your original data from the experiment (signed and dated of course by the TA or instructor), the Materials Safety Data Sheets for any chemicals your experiment involved, and any calibration curves that you generated during the course of running the experiment. Do not assume that the reader will read the appendix to find out crucial information! i.e. don't use it to try and stretch out the page limit.

References: (Not counted in page limit)

This is an extremely important section of the document. Any and all references or sources you use in the text should be listed here, in the order that they appear in the text itself. In-text references should be numbered sequentially from the beginning of the documents, and set off in bold brackets at the end of the sentence that is being referenced. As an example, the end of this sentence contains a reference. [1]

All such references would then be collected and spelled out explicitly in this, the references section of the document. You will be expected to follow the ACS style guide for the inclusion of all reference types.

<http://www.lib.berkeley.edu/CHEM/acsstyle.html>

[1] Author, A.A.; Author, B.B., *Book Title*, Edition; Publisher: Place of Publication, Year; Pagination.