

How to ACE the Formal Report

A “formal” report is required for the last experiment that you select from experiments 4–9. Here we want to describe the format, and give some details that you must attend to if you want to ace the formal report.

The formal report should describe the experiment and the results in a clear and concise manner, so that a physicist with no prior knowledge of the experiment can understand what you did and what you “discovered.” Such reports are the primary method by which scientific knowledge is disseminated; but writing a readable report requires considerable effort (as you will notice) and practice (that's the idea here).

Here, the body of the report should not exceed **five** pages of double-spaced typewritten text. Handwritten reports **are not** acceptable. Note that Greek symbols and equations may be added by hand, but keep them neat. Graphs, diagrams, and data tables should be individually labelled (e.g. Figure 1, Table 1); they may be on separate pages, and are not part of the 5 page limit.

The report should include the following parts:

1. Title page:
 - a. The title of the experiment
 - b. Your name and institution (e.g. Revelle College, UCSD)
 - c. The date
 - d. A succinct, well-written abstract. (You might want to consult a research journal in the library to get an idea about how to write an abstract.) In general, the abstract briefly states what you did, succinctly summarizes principal results, and mentions the work's significance, if any. **Do not** exceed 150 words.

2. Introduction:

Here you write an overall description of the experiment. Be sure the description includes the experiment's principal objectives.

3. Theory:

Briefly review the theory behind the experiment and include the theory's numerical predictions. The measurement results will be compared to the predictions of the theory.

4. Experiment:

Describe the experimental apparatus and the measurement procedure. Use diagrams to make this section absolutely clear. Neatly hand-drawn diagrams are as acceptable as (and easier than) computer-generated diagrams. The reader should be able to clearly and quickly understand your procedure and the tools (apparatus) you assembled to accomplish your objectives.

5. Results:

This section can be divided into two parts:

- a. Presentation of Raw Data. Use tables, graphs, etc. and pay attention to organization and clarity. You have already mastered this in your brief reports so just keep up the good work.
- b. Analysis of Raw Data.

Here is the place to convert the raw data into final results. Example calculations of relevant Error Analysis are performed as required. Use tables and graphs to maximize clarity and brevity. Don't forget units!

6. Discussion of Results and Conclusion:

Summarize the results in a brief quantitative discussion of their agreement (or disagreement) with theoretically predicted values or other accepted values. Do the “d, Δ , t” analysis that you have already mastered. Avoid repeating what you may have already stated in the Results section.