

LOG BOOK

The purpose of the logbook is to record daily progress of experimental and other pertinent information related to the experiment. It should contain sufficient information and commentary to enable reproduction of the experimental results at some future date. The logbook can be used as evidence to establish patent rights for a new discovery. It may be needed to protect the researcher and to establish legal liability in a lawsuit. In some laboratories, the logbook must be signed by someone who witnessed and understood the experiment.

The logbook must be bound so as not to lose any relevant information. No pages are to be removed or added unless clearly noted.

The logbook should be brought to each laboratory period or meeting session in case some information is needed and/or is to be added. All entries should be dated, entrant name indicated, printed, neat, logical, in ink (to preserve longevity), entered at the time the event took place, and original. Any pages that are left intentionally blank, including the back sides, should be marked as "Blank." If any material written in the logbook is to be ignored, i.e., bad data, the material should be neatly crossed out and never erased or torn out. The logbook is the working record of the experiment and recopying of information into the logbook after the laboratory period is not desired. Corrections and crossed out material are normal, and a logbook that appears perfect may be suspect. Items such as computer generated listings and plots that cannot be conveniently placed in the logbook should be neatly and securely placed in a notebook or 3-ring binder.

The logbook is to be turned in Thursdays as indicated. It will be graded and then returned during the following lab session.

Log Book Guidelines

The Log Book must accurately record the laboratory experiment. All handwriting must be entered in ink, and must be **clear and legible**. Unclear or illegible work will not be graded. The readability of the Log Book will be improved if greater spacing is utilized in the written material.

Any material that is affixed to the Log Book (e.g. figures, charts, etc.) must be securely taped into the Log Book (tape at least opposite sides). After inserting material in this manner, the owner of the Log Book must sign his/her name such that part of the signature is on the attachment and part of it is on the original Log Book page. This ensures that nothing is added to/removed from the Log Book at a later date.

At the end of each lab session, everyone *must* have the lab TA sign his/her Log Book.

Format

HEADING (TITLE)

Date:

Experiment Number:

Group, Team Members; Supervisor:

Temperature, Barometer Reading, Humidity:

When a workstation is continued from a previous lab period, indicate this. Include the major heading that is being continued.

OBJECTIVES

Provide a brief summary of the objectives (no more than two or three sentences or several bullets) of the experiment. Think about specific physical behaviors you seek to observe and quantify. Do not include educational objectives, such as “learn more about heat transfer” or “understand mass-spring-damper systems,” etc.

PLANNED PROCEDURE

Do not copy the procedure from the Lab Manual. Try to summarize using only several sentences or bullets.

- *Measure the voltage produced by a power supply using a DMM.*
- *Record 10 trials and calculate uncertainty... etc.*

This is a pre-meditated "plan of attack" that is completed prior to starting the experiment. It should include all aspects of the lab, from beginning to end. Modifications to this procedure are made in the “Actual Procedure and Findings” section, which is completed during the experiment.

EQUIPMENT LIST

A table or list of all the equipment needed to carry out the experiment.

<i>Oscilloscope</i>	<i>Model: Tektronix TDS 1002</i>	<i>S/N: C038204</i>
<i>Digital Multimeter</i>	<i>Model: HP 34401A</i>	<i>S/N: US36079920</i>
<i>Power Supply</i>	<i>Model: 6612C</i>	<i>S/N: 453746064</i>
<i>Function Generator</i>	<i>Model: HP 33120A</i>	<i>S/N: US36017794</i>

ACTUAL PROCEDURE AND FINDINGS

The Lab Manual and experiment handouts do not provide a complete description of the procedure you might perform. Present here what your actual procedure was and what you found out in the process. This should be detailed! You do not need to include things like "Turn on power supply," but it should include enough information so that anyone with your background could repeat the lab using only your logbook.

A schematic diagram of the experimental setup for each workstation is required for all experiments. Be sure to label all components of the diagram. Use descriptive titles for figures (and tables). Figure captions go below the figure; table headings go above the table.

As you perform the experimental procedure you will have "Findings". The "Actual Procedure and Findings" may include subheadings such as "Experimental Data", "Data Reduction", "Procedure Modifications", etc. Computer printed tables or figures can be taped into the Log Book. Please do not use staples.

Calculations for data reduction should be explained in this section and the references that are utilized to obtain physical properties, theoretical models, etc., need to be cited. The Findings section (as well as the Conclusions) should be written in a technical manner. Avoid the use of subjective/qualitative words like "good" when describing the experimental results, unless numerical values are included that quantify the meaning of "good." The Findings section is important and merits substantial effort. As an example, discussion of the heated water workstation of Exp. No. 1d can compare the calculated energy which is required to heat the water compared to the measured value, and give possible reasons for the differences observed. Data Reduction should include sample calculations along with the data. Additional information regarding the procedure can be added including a step-by-step procedure and equipment settings.

Ask yourself whether or not you or someone else with a similar background could repeat the experiment at a later date using just your Log Book.

RESULTS

This section includes plots, tables, etc. exhibiting the raw data obtained in lab. Plots and tables should be clear and highlight the interesting aspects of the lab. Plot axes should be scaled so that the data are clearly displayed within their range of interest. Figure captions are placed below the figure; table headings are placed above the table. You may include the raw data itself when it is reasonable to do so. However, large amounts of raw data should be kept in a separate binder or folder rather than taped into the logbook.

ANALYSIS AND DISCUSSION

Analysis includes calculations performed using the raw or reduced data. The Discussion includes detailed explanations of the physics involved, along with any unexpected data or trends observed, etc. This section should explain and quantify the natural phenomena that drive the behaviors you observed.

CONCLUSIONS AND RECOMMENDATIONS

The Conclusions section should summarize the main points of the lab and should not introduce any new concepts that have not been discussed in a previous section. It should briefly outline how the results fit within the context of the objectives set out at the beginning of the experiment. The Conclusions section should state whether the objective of the experiment was achieved, and prove that the purpose of the experiment was understood.

The experimenter should also include any recommendations for future experimenters. Please remember that recommendations are not complaints, but rather they are professional, specific suggestions for changes you would make in the future if the experiment were repeated.