

GENERAL PHYSICS LAB

PHYSICS 152R 1106

Spring -2012

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Website of lab manual: www.unr.edu/physics

Format of Lab reports and grading 2011

Name:

Lab Partners Name:

Lab Section:

Date of Experiment:

Title of the Experiment

(1 point for having a title)

Abstract (5): A concise statement (a paragraph or two) that summarizes the objective, in your own words, and states the numerical results of the experiment, worth a total of 5 points.

1 point for having an abstract

2 points for summarizing objectives

2 points summarizing results

Theory (10): Summarize in your own words, the theory of the physics involved in the experiment. Also present the working equations, units and a schematic of the experimental apparatus. The theory sections should also outline the procedures used in the lab, worth a total of 10 points.

3 points for outlining procedures

2 points for outlining theory

2 points for diagramming setup

- 1 points for stating proper units
- 1 points for expressing relevant equations
- 1 points for defining and explaining relevant terms

Data (8): An orderly display of the data, preferably in tabular form. You must including the original data sheet signed by the TA. All entries should be clearly identified and include their proper units, worth a total of 8 points.

- 2 points for a data section
- 2 points for original data sheet (signed by instructor).
- 2 points for proper/clear labeling of data
- 2 points for proper units of data

Analysis (14/lab dependent): Must clearly show the computations used to reduce the data. First write the relevant equations then give a sample calculation. Be sure to include proper units and use the correct number of significant figures.

- 2 points for having an analysis section
- 2 points for displaying relevant formula
- 2 points for sample computation
- 2 points for proper units
- 2 points for significant figures
- Graphs: 2 points proper units
- 2 points labeling axis

Results and conclusion (12):

A brief Summary of your results, stating the determined value or law, along with its numerical uncertainty. Use proper units and significant figures. For example, the experimental value for “g” was found to be:

$$\text{Acceleration of gravity } g = (9.8 \pm 0.2) \text{ m/s}^2$$

Frequently you will want to compare your result (F) with an accepted value (F₀).

A good quantity to compute in this case is the “percent discrepancy” or the “Percent error” which is defined as:

$$\text{Percent - Discrepancy} = \frac{|F - F_0|}{F_0} \times 100\%$$

If you are comparing two values of “F” found in different ways (F₁ and F₂) find the “percent difference” given by:

$$\text{Percent - Difference} = \frac{|F_1 - F_2|}{F_M} \times 100\%$$

Where F_M is the mean of F_1 and F_2 . Round off percent errors and differences to two significant figures. Discuss what you found and compare with what you had expected to find. Discuss any discrepancies. One may suggest ways in which to improve the experiment or reduce errors. Some labs may include questions, worth a total of 12 points.

2 points for having a results section

2 points stating determined value

2 points for stating uncertainty

2 points for having a discussion section

2 points for summarizing experiment and results

2 points for each question answered correctly

Grade = (total points earned / total point available) X 100

How to Keep a Lab Notebook

A lab notebook is the way real scientists keep track of their work. It may seem tedious or even unnecessary to you, but it is an important part of any lab experience. The notebook should be complete enough that you could refer back to it in a few years and repeat the experiments.

General Guidelines:

1. The Notebook must be **permanently bound**: no loose-leaf or spiral notebooks.
2. Handwriting must be legible. Your TA will not grade materials that he or she cannot easily read. All notes should be taken in pen with the exception of colored drawings that may be done with pencils. Errors should be crossed through with a single line, not erased or obliterated.
3. All information in the notebook must be handwritten or represent actual results, such as Photographs. Do not place any photocopied material into your notebook unless Specifically directed to do so.
4. Everything you do in the laboratory should be recorded in your lab notebooks, including notes, drawings, data, speculations, etc. Everything from your initial strategy through Planning, execution and interpretation and should be in your notebook.
5. Keep all of your lab-related notes, including lab lecture notes, in one notebook. Keep a separate binder for the lab manual and lab handouts.
6. Keep in mind that reports and presentations will be prepared from the notebook. You should have much more information recorded in your notebook than you can or should put on a poster or into a presentation.

The notebook should include:

1. The first three pages reserved for a table of contents.
2. Notes from lab lectures, discussions and your own research.
3. Answers to assigned questions.
4. Prelab Section for experiments:

Title of experiment and **date**.

The **Objective(s)** of the lab: what you are trying to do and why you are trying to do it.

The **Procedure** in flow chart or outline form. This should not be an exact copy of the lab manual instructions, but reworked in a manner easy for you to follow.

5. Any **deviations** from your written procedure. This includes changes both intentional and accidental.
6. **Observations**: everything that happens during your experiment that may have a bearing on the outcome or interpretation of the experiment (this includes color, precipitate, time, temperature, etc).
7. **Data**: raw and calculated. Use complete sentences, tables and graphs where appropriate. Show sample calculations with steps and units.
8. **Discussion**: Interpret your results. Refer back to your predictions. Draw **conclusions** about experiment. Make suggestions for further experiments or refinements to the procedure.