

Name (lab partners)
Date(s) and period data was collected
Course title

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pts

Title of Formal Lab Report

(Your title should indicate the problem presented to the group and the solution attempted.)

Abstract This is a concise summary of the entire report. It includes an introduction, problem statement, procedures, results, and conclusion. An abstract should not exceed 150 words.

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Background Research This section describes similar past experiments, defines important terms, explains calculations, and explains the concepts involved in the investigation. Answers to research plan questions are to be included in this section.

Problem State the problem in the form of an accurate and specific question. The problem question includes the independent and dependent variable.

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Hypothesis What was hypothesis for your investigation? This is your prediction as to the answer of your problem question.

Experimental Design Describe the details of the experimental design your group created to attempt to meet the desired outcome of the laboratory investigation. Include the materials needed, procedure, and explanation of why those materials and that procedure were chosen to complete the investigation. The explanation must include a description of the physical meaning of each measurement described and how that measurement will help meet the desired outcome of the investigation. This is to be written in sufficient detail that another student can pick up the report and repeat the entire procedure exactly. A detailed sketch of the apparatus used in the investigation will be included in this section. The sketch can be hand prepared or created with a drawing program.

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Experimental Data, Observations, and Results Include a clearly labeled table of all of your experimental data, observations, and results with appropriate units. If available include results from other groups and be sure to give credit to those who collected the data.

Data Analysis Describe the data and how you completed each calculation. Show all your work, tables, and graphs in this section including unit conversions. Explain why you completed each calculation based on your understanding of the physical meaning of each piece of data. Carefully and accurately label all graphs and charts. Summarize your experimental results if appropriate.

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Discussion What are some sources of error? How could you have minimized your experimental error? Did the data and results yield a clear trend, or was the range of error too large to allow you to draw a clear conclusion? Experimental error is inherent in all investigations, it is not the same as mistakes such as human error.

Conclusion Refer to your original problem question and hypothesis. State the relationship between the independent and dependent variable as supported by your data. What do the results of your investigation tell you? Remember to use appropriate scientific terminology and support your conclusion with your data. What is the physical meaning of your results? Was your hypothesis correct? Why or why not? Summarize and evaluate your experimental design and comment on its effectiveness and success.

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Questions for Further Research State three questions for further research that were raised by your experimental results. Suggest experimental investigations that can be completed to answer each of your questions. Write the questions accurately and concisely indicating the dependent and independent variable in each.

Application of Experimental Results to Practical Situations How can the results of your investigation be applied to two different practical situations? Describe each of these situations in a few sentences that clearly illustrate the direct connection between your results and the application you choose.

Bibliography Use properly formatted citations for any references you used in the preparation of your report.

Mechanics The report is to be written clearly and concisely using the data that you collected reported honestly. If you choose to share data with another group give credit to those who collected the data and complete your own analysis. The report should be clear of spelling mistakes, typographical errors, and grammatical errors. Use spacing, headings, and boldface font to clearly organize the report into subsections.

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