Lab Report Guidelines

The lab report serves as a record of your experiment and summarizes the findings. It should be concise and descriptive. Lab reports should be written in passive voice and in third person - not in first or second person (I,me,my,we,our, OR us.) Lab reports are to be written in Arial or Times New Roman and sized at 12 point font. There should be clear section headers (except for the Title)

Title

The title of the lab report should be phrased in the form of a question and be detailed on what is being studied. Generally, it follows the form "What is the relationship between (quantity 1) and (quantity 2)" or "How does (quantity 1) change as (quantity 2) change?"

> Ex: What is the relationship between the number of spaghetti strands in a bridge and the number of washers the bridge can withstand before breaking?

> Ex: How does a cart's position change over time as it travels down an inclined track?

Abstract

The abstract is a concise paragraph that summarizes the lab report and discusses the objectives of the study (lab purpose), what was done (methods), what was found (the relationship between studied quantities) and what was concluded (significance and units of the slope and y-intercept).

Often the abstract is the last piece of the report written as it takes pieces from the rest of the lab report.

Introduction and background

The introduction and background provides context for the lab experiment. Why are we performing this lab? What quantities did we study? How does this experiment build upon our current understandings or how is it similar or different to our previous experiments?

Experimental (Materials and Methods)

Describe, not list, the lab materials and experiment set-up including all materials in the experiment. Include specifics in how data was collected, what variables were controlled and to what degree.

Results (Data tables and Scatterplots)

Describe what data tables show and include appropriately sized data tables. In your description refer to data tables with figure numbers.

Display all collected data across trials and all manipulations of data (averaged and linearized) in organized data tables. Tables should have a header label with units. You can usually copy data tables from Google Sheets or Excel with minor editing.

Scatter plots should show the averaged raw data and the linearized scatter plot. The linearized scatter plot should clearly display the line of best fit, equation of the line and R^2 value. Include labels on the axes with the appropriate units.

The data table section should all fit on one page.

Discussion:

Recap the purpose of the study, the equation for the line of best fit and the R^2 value. What was is proportional relationship (linear, inverse, quadratic, square root, etc.) between the quantities you studied? Describe how the data was manipulated to determine the proportional relationship.

What does the slope and y-intercept represent in about the phenomena studied? In other words, DO NOT state the mathematical relationship ("slope is the change of y per change in x", "the y-intercept is when the line crosses the y-axis") but rather the what the slope and y-intercept signifies about the experiment. Describe how you made this conclusion. (i.e. the slope represents the strength of the spaghetti in terms of washers as it describes how many washers a strand of spaghetti can hold).

(Hint: often we use the units on the y and x axis)

What is the derived mathematical model and what does it describe? (Note: the mathematical model is an algebraic expression that describes the general phenomena)

What was your R^2 value and what does it mean about the data? What are some possible sources of error? (If your R^2 value is 1 it does not necessarily mean your data is "perfect") Which of the sources of error you mentioned proved to be the most significant in affecting the accuracy of the data results?

Based on the whole class lab discussion, describe similarities and differences of the data from your group to the consensus findings. What accounted for the differences in the lab data?

Based on your findings, what scenarios could be interesting to further study? (optional)