Lab Reports Requirements

a. The lab report should be written using complete sentences.
b. Spelling and grammar count.
c. The lab report should be written in the past tense.
d. Do not use the pronouns “you”, “we”, or “I”. Do not use students’ names like “Joe” or “Sue”.
e. Title each of the following sections:

Heading
a. Your name
b. Your partners’ names clearly labeled as partners
c. Date
d. Appealing title indicating what the lab is about centered on top of the page.

Question and Hypothesis
a. State question being answered by the experiment, using a complete sentence ending with a question mark.
b. The question should not have a yes or no answer
c. State the hypothesis to the question.

Materials
List all materials, equipment, and supplies used to complete lab. Be sure to include items like meters sticks, etc.

Diagrams
Sketch a single diagram showing all of the apparatus after it has been set up.

Background Information
a. First paragraph – Write down descriptions of unfamiliar lab equipment used.
b. Second paragraph – Define any physics vocabulary involved with the experiment. For example, if the lab was measuring the velocity of an object, then define what velocity is.

Procedure
a. Part One – Write down what was done to make all of the measurements. Remember to write the procedure in the past tense without using words like “you” and “I”. Make the items listed in materials section the subjects of your sentences.
b. Part Two – Write down an explanation of how the calculations were done.

Data
a. The data section should only contain values of things measured.
b. The data section should not contain values of things calculated from formulas.
c. Data should include proper units and proper number of significant digits.
d. In many labs, the students will have to determine the sufficient number of trials needed.

A general rule is to collect at least 5 trials.

Calculations and Graphs

a. The calculation section should contain values of things calculated from formulas.

b. Conversions should be shown in the calculation section using the factor label method.

c. Calculations should be done showing proper problem format:

i. Show the formula in its familiar form.
ii. Show the formula rearranged with only the unknown variable on the left side.
iii. Substitute known values with units into the rearranged formula.
iv. Write down the answer with correct units and correct # of significant digits.

d. If the same calculation needs to be done over and over, make a chart of the answers but only show one of the calculations. Label this one calculation: *Sample Calculation*.

e. Include the following when graphs are requested:

i. Title the graph (for example: Distance versus Time)
ii. Graph the independent variable on the x axis and the dependent variable on the y axis (unless told otherwise).
iii. Label each axis with variable name and unit.
iv. Draw the best fit line or curve.
v. Only use points that are directly on the best fit line or curve (whether original data points or not) to answer any questions or do any calculations.
vi. If the best fit line is a straight line, then: calculate the slope of the best fit line and write a sentence stating what the slope physically represents. For example, in some cases the slope may represent the density.

f. When appropriate, calculate percent error or percent difference:

i. When a value determined in lab is being compared to a known value then use: Percent Error = |known value – value determined in lab| ÷ known value × 100%
ii. When one value determined in the lab is being compared to a second value determined in the lab use : Percent Difference = |value #2 – value #1|÷|value #2 + value #1|×200%

Conclusion

a. Restate the hypothesis. Write “The hypothesis stated that …”
b. State whether the hypothesis was verified, nullified, or inconclusive.

*In many experiments, if the error is less than 10%, then the hypothesis would be considered verified.

Discussion

a. Part 1. Sources of error:

i. First, state the sources of error that could not be over-come. For example, the speed of the car slowly decreased due to the batteries’ charge continually decreasing.
ii. Second, state the sources of error due to difficulties getting the equipment to work perfectly and making the measurements correctly. For example, it was difficult to mark exactly where the car was after a whole number of seconds.

For either of the above, stating “incorrect measurements”, “human error”, or “miscalculations” is never acceptable.

b. Part 2. Suggestions: State specific improvements that could be made if doing the experiment over.

c. Part 3. New Questions: State new questions that could be used for a follow up lab.

d. Part 4. Recap: What were you supposed to learn from this laboratory experiment? Remember to answer without using pronouns like “you”, “we”, and “I”.