

## Formal Lab Report Guideline/2018

A 12-point readable font should be used. Each lab reports must include a heading on the top left of the first page which contains your name, the date the lab was completed, and the title of lab. The report should be single spaced with generous margins (0.75 - 1- inch). Double spacing should be used between each section. The entire report should be written in third person passive voice. The following headings should be clearly visible with the required information reflected within each category.

### PURPOSE:

State the purpose of the lab or the question being investigated. If answering a research question, it should be followed with a hypothesis and justification of that hypothesis.

### VARIABLES:

If it is a *controlled* lab, the following variables should be identified and described.

Independent: *Identify the variable being manipulated and describe how it will be manipulated.*

Dependent: *Identify the responding variable and describe how it will be measured.*

Constants: *Describe ALL OF the variables and conditions that will be held constant throughout the experiment and describe how each will be controlled.*

### MATERIALS:

Provide a list of all the equipment and chemicals used in the experiment, including the proper sizes of the glassware used, brand of instrumentation, concentration of the acid, etc. (e.g., 2, 250 mL beakers)

### METHOD:

Provide detailed, step-by-step instruction of how the experiment was performed. Write it in such a manner that another scientist could replicate the lab exactly. Remember to use third person passive voice. (e.g. "The stockings were hung by the chimney with care.") Notice this means your report does not contain pronouns and the verb is past tense because the lab has already been completed..

### DATA:

Present all data in clearly identified tables. *Both* number and title the tables. (Table 1: Raw Data) Be sure to include units (in column headings only). If the data is processed, analyze the findings underneath the table with a sentence or two. (e.g., "All trials contained similar results.")

### CALCULATIONS:

Show *only one* calculation of each type used in interpreting the results. It is necessary to show the *generic formula* for the calculation followed by a *specific example*. Reference where the values in the specific example were pulled from. (e.g., trial 1) Be sure to consider significant figures and units when processing data. Make sure the calculations are connected with enough words that the reader can follow what has been done.

## GRAPHS:

If it aids in interpretation of the data, provide a properly labeled and scaled graph. Processed data, not raw data, should be graphed. The independent variable should be on the **x**-axis and the dependent on the **y**. The proper type of graph should be chosen. For example, if both variables are continuous, a point graph should be used. A best-fit curve should be chosen over a connection of the data points.

## DISCUSSION:

Describe to the reader what the data means. This means to state your observations, then describe what these observations mean. In addition, reference your data and explain what your calculations mean. Describe to the reader how this analysis brought you to your conclusion. Use proper terminology. Show that you have a clear understanding of what occurred in the lab. This should be well-written and clear. New paragraphs should be incorporated as necessary. This is the heart of the lab and often where a good lab is distinguished from others.

## CONCLUSION:

State clearly whether or not the purpose of the experiment was achieved and/or whether or not the hypothesis was validated. (Always restate the purpose or hypothesis so the reader does not need to look back.) Briefly support this statement with specific data values such as percent yield, percent error, trial variation, or significant outcome. You may also opt to discuss extensions to the lab and suggest further areas of study. This section should not be more than a few sentences long.

## EVALUATION:

**Evaluation of Strengths:** In this section, explain how confident you feel with the outcome and support this position with a brief explanation of why. If possible, provide a statistical analysis of the accuracy of your data. (e.g., percent yield or percent error) This should be numerically supported, not opinion based.

**Evaluation of Weaknesses:** The format for this section should include at least three paragraphs. Each paragraph should include (1) possible source of error, (2) followed by how that said error could have affected the end result, and (3) what you would do in the future to avoid this stated error. (make specific suggestions—not just “do it better” or “be more careful”)

## COMMUNICATION:

The items evaluated in this section will be:

- Formatting: Is it well organized and are sections CLEARLY labeled? Did you space correctly?
  - Tense: Did you stay in 3<sup>rd</sup> person passive voice...“The stockings were hung by the chimney with care.”
  - Clarity: Are you clear and to the point?
  - Terminology: Did you use proper scientific language?
  - Spelling: Is it correct throughout? Are you only capitalizing when needed?
  - Grammar: Is it properly used?
  - Sources: Properly site all sources used *within the text* of the lab report. (For this format reference, I used a combination of AP guidelines, IB guidelines, and the Signature School Science department.)
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