

## Science Inquiry – Performance Assessment Task

### Laboratory Report Criteria

The purpose of a laboratory report is to formally summarize and communicate the results of your experiment. Your report should reflect both your understanding of the scientific principles that were investigated through the lab and your understanding of the outcomes of the lab.

**Title** – The title should reflect the purpose of the investigation.

**Part A. Introduction** – This section helps to prepare the reader to understand the relevant scientific content and reason for conducting the investigation.

#### ***Theoretical Background.***

In this section you will:

- a) Describe, in detail, the scientific principles being investigated through the experiment.
- b) Define and discuss any *relevant terms* and *scientific theories*. This is an important part of your lab report and will usually be several paragraphs long.
- c) Collect, analyze, and synthesize information from at least three credible and reliable sources.
- d) Record ALL of your sources so you can cite the research throughout the introduction and prepare a reference list at the end of the lab report.

#### ***Purpose.***

Write a brief (1 to 2 sentence) statement of the scientific principles that will be investigated through the experiment. State what you are trying to accomplish or prove in this lab. Be sure to:

- a) Clearly state the purpose of the experiment
- b) Explain, in your own words, the problem or question you are going to investigate

**Part B: Hypothesis.** Write a hypothesis that describes what you expect to find and why.

**Part C: Experimental Design.** Plan an experiment that matches the purpose of the experiment. Identify and explain the variables (dependent, independent, controls).

**Part D: Materials and Procedure.** Provide a list of all the materials and the procedures necessary to conduct the experiment.

- a) Make a list of all the materials needed for the investigation.
- b) Write specific procedures with sufficient details and exact quantities of substances so that someone else could easily replicate your experiment.
- c) Discuss the appropriate sampling and number of trials to be conducted. Include the need for any safety precautions (safety equipment and/or procedures) when conducting your experiment.

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#### **Part E: Data Collection, Calculations and Graphs**

- a) **Data collection.** Record all relevant data (qualitative and quantitative) into data tables, and indicate the number of trials performed during the experiment. Data tables should have *titles* and all columns should be *labeled*. Be sure to include *units* where necessary and watch *significant figures*.
- b) **Calculations.** Perform calculations and/or make estimates to understand your data (i.e., converting units, taking an average, etc.). Show ALL work for ALL calculations (equations should be explained in the Theoretical Background), include *units* and watch *significant figures*. Include a percent error calculation if appropriate.
- c) **Graphs.** Organize the data into graphs and/or other visual representations to illustrate the data to assist the reader's understanding. Remember to properly label everything and provide a key/legend when applicable. All graphs should have *titles* and *labeled axes with units*.

**Part F: Analysis and Interpretation of Data.** Discuss the outcomes/results of your lab. DO NOT simply restate all of your data.

- a) Summarize the information in your data tables so anyone can understand the trends or patterns observed in the data.
- b) Explain your data and draw some generalizations regarding what you saw happening in the lab.
- c) Tie your lab results to the scientific theories you presented in the introduction.
- d) Explain how the lab demonstrated the principles that were being investigated.

**Part G: Conclusions.** Review your analysis and interpretations of the data and write the conclusion section of the lab report. In the conclusion be sure to:

- a) Summarize your findings using data to support your statements.
- b) Develop a scientific explanation that is fully supported by your data and addresses your hypothesis. Make connections between your findings and the appropriate scientific content.
- c) Discuss the potential implications of your findings (applications, policy decisions, and implications of your investigation).
- d) Discuss any potential sources of error and explain how that error might be eliminated or reduced in future investigations.
- e) Identify the limitations of the findings and explain how those limitations might be addressed in future experiments.
- f) Include any new questions or unanswered questions that were generated during this study that you would like to explore in future investigations. Discuss how you might investigate your new question(s) by either modifying your investigation or developing a new design (be specific about your ideas).

**Part H: References/Bibliography.** Cite all of your references within the text and prepare a bibliography using the format selected by your teacher (e.g., APA, MLA).