

## AP Physics Student Inquiry Lab Report Format

A good lab report does more than present data; it demonstrates the writer's comprehension of the concepts behind the data. Merely recording the expected and observed results is not sufficient; you should also identify how and why differences occurred, explain how they affected your experiment, and shows your understanding of the principles the experiment was designed to examine. Bear in mind that a format, however helpful, cannot replace clear thinking and organized writing. You still need to organize your ideas carefully and express them coherently. That being said, all **formal lab reports** must be typed. However, you may leave spacing in your lab report hand written calculations, drawings, diagrams, etc.

### 1. Purpose and Assumptions [10]

State in *your own words* what the experiment was supposed to accomplish and/or what questions it was supposed to answer. You can include prior knowledge or preconceived notions you may have about the outcome of the lab. This may include predictions; however, reasoning must be explained clearly.

### 2. Method and Experimental Procedure [20]

In your own words describe what you did. Your procedure must be clear (i.e. a person who has not done the lab must be able to understand and follow it). A sketch of the lab's setup can be included in order to make it clearer to the reader what the lab looked like. The written procedure must demonstrate that you understand how the experimental data was collected. ***This section must be based on your lab notes which must include procedures and data collected.***

### 3. Experimental Data [15]

Provide your data for **each** piece of calculated data and final results in this section.

This data can often be presented in data tables. ***This section must be based on your lab notes which must include procedures and data collected.***

### 4. Analysis [40]

This is a complete analysis of the collected data. In most labs a **relationship** between pieces of data can be expressed. These relationships must be analyzed **graphically** (typically line graphs), **quantitatively** (formulas and equations), and **qualitatively** (in words).

Graphs must be clearly titled and labeled. The data graphed must be related with a **best fit line**. This line will represent a slope. The slope describes the relationship between the dependent and independent variables of data (linear, quadratic, inverse squared...).

Formulas are typically used for analysis after graphing data. Fundamental formulas used must be present and clearly labeled. Before calculating results show the algebraic steps to solve for desired quantities (it's appropriate to show work for one calculation and state that all subsequent calculations were done the same way).

The data should also be analyzed in a paragraph explaining the graphical and quantitative significance. In some labs, the analysis section includes a number of questions that need to be answered. Provide **complete** answers to each of the questions in the lab. If actual values of data are known, include the percent error in your report.

### 5. Conclusion [10]

A conclusion should summarize the purpose and analysis of the experiment. This includes a critical observation of your own methods and what you could do differently (or next time) to improve the results.

### 6. Sources of Uncertainty. [5]

What non-procedural questions arose during the scientific process? Can you explain scientifically everything you observed? **You must really be involved in the scientific process and design of the lab to answer this successfully.**

Names \_\_\_\_\_ Due Date \_\_\_\_\_

Lab \_\_\_\_\_

**AP Physics Lab Report Scoring Rubric**

Quality Rating: University level /HS level/ MS level/ Missing

<p><b>I. Purpose (10 pts)</b></p> <ul style="list-style-type: none"> <li>Purpose of the lab is stated clearly and is scientifically testable (10 pts)</li> </ul>	10	8	6	4	2	0
<p><b>II. Experimental Procedure (20 pts)</b></p> <ul style="list-style-type: none"> <li>Procedure is scientific in nature and accurate for data (10 pts)</li> <li>Procedure is clear and could be performed (5 pts)</li> <li>Lab notes are consistent with report procedure (5 pts)</li> </ul>	10	8	6	4	2	0
<ul style="list-style-type: none"> <li>Procedure is clear and could be performed (5 pts)</li> </ul>	5	4	3	2	1	0
<p><b>III. Experimental Data (15 pts)</b></p> <ul style="list-style-type: none"> <li>Data is presented in an appropriate format and easily found (10 pts)</li> <li>Lab notes are consistent with report data (5pts)</li> </ul>	10	8	6	4	2	0
<p><b>IV. Analysis (40 pts)</b></p> <ul style="list-style-type: none"> <li>Correct data is analyzed graphically with appropriately titled and labeled graph(s). This includes a line of best-fit that is appropriate to the data. (20 pts)</li> <li>Correct data is analyzed quantitatively. Formula(s) are expressed and algebra is shown. (10 pts)</li> <li>Correct data is analyzed qualitatively with a clear narrative.(10 pts)</li> </ul>	20	16	12	8	4	0
<p><b>V. Conclusion (10 pts)</b></p> <ul style="list-style-type: none"> <li>Clear summary of purpose and analysis results (5 pts)</li> <li>Critical observation of methods is objective and scientifically stated. (5pts)</li> </ul>	5	4	3	2	1	0
<p><b>VI. Sources of Uncertainty (5 pts)</b></p> <ul style="list-style-type: none"> <li>Reflection is thought provoking and genuine (5pts)</li> </ul>	5	4	3	2	1	0

\*This rubric will not perfectly represent all labs we do. Many labs will not require all of this information. Those situations will be noted to the student.

Total \_\_\_\_\_

Final Grade \_\_\_\_\_