

Scoring Rubric for PHY 302 Lab Reports

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Dimension	Unacceptable (no credit)	Emerging (partial credit)	Accomplished (full credit)
Format <i>Max. 2 points</i>	Does not include name of submitter or lab partner(s); missing other identifying information; not stapled; disorganized.	Includes name of submitter but not those of lab partners(s); missing title, date, and/section information; somewhat disorganized; not stapled.	Includes name of submitter and lab partners; lab number and title, date, time, and section of lab indicated; neat, organized, and stapled.
Purpose Statement <i>Max. 1 point</i>	The purpose statement is missing, incomplete, vague or imprecise; merely a copy of the goal given in lab guidelines; no reference is made to either the research question or the variables analyzed.	The purpose statement is merely a paraphrase of that found in the lab guidelines; essentially incomplete; fails to clearly reference research question and/or does not reference pertinent variables.	The purpose statement provides clear and concise information about the goal of the lab investigation, including reference to lab questions and both independent and dependent variables.
Apparatus Description <i>Max. 2 points</i>	No or poor description of laboratory apparatus used in the investigation and independent and dependent variables not clearly identified in the diagram.	Inadequate description of laboratory apparatus used in the investigation or independent and dependent variables not clearly or inaccurately identified in the diagram.	Contains a detailed, computer-generated diagram to illustrate the configuration of the apparatus, including independent and dependent variables that are correctly identified.
Procedure <i>Max. 5 points</i>	Does not provide a systematic step-by-step overview of the procedure followed and/or fails to identify and name all pertinent experimental variables; inadequately and/or incorrectly describes how the pertinent variables are managed.	Provides poor or incomplete overview of procedure and/or fails to identify and name all pertinent experimental variables; inadequately or incorrectly describes how the independent and extraneous variables are managed.	Provides detailed and complete step-by-step overview of procedure and identifies and names all pertinent independent and dependent experimental variables; accurately describes how the independent and extraneous variables are managed.
Data Tables <i>Max. 3 points</i>	Data not included or insufficient data presented inconsistently and/or consist of fewer trials and a narrower range of data than judgment by an expert would indicate necessary; units for physical measurements (kg, m, s, etc.) in a data table not specified in column heading; values obtained by way of mathematical manipulations or interpretations included in this section of the report. Fails to summarize the data.	Includes the original data sets that consists only of those values measured directly from the experimental apparatus; data tables are neat and orderly; data insufficient to draw correct conclusion; does not include as many trials or as wide a range of data as expert judgment would indicate necessary; units for physical measurements in a data table not specified in column heading; appropriately summarizes the data.	Includes original data sets consisting only of those values measured directly from the experimental apparatus; data tables are neat and orderly with no calculations or extraneous notation; data consists of as many trials and as wide a range as expert judgment would indicate necessary; units for physical measurements in a data table are specified in column heading only; summarizes the data using appropriate procedures; variables clearly controlled.
Analysis of Data <i>Max. 5 points</i>	Analysis ignores logical order in which the experiment was performed; it is a incoherent and disordered presentation of sample calculations made as part of the experiment; shows none or only some equations employed; fails to identify all variables; some calculations carry no units throughout; reflects a poor understanding of the use of significant digits; a linear regression equation is	Analysis deviates from the same logical order in which the experiment was performed; it is somewhat incoherent and disordered; shows all employed equations as part of sample calculations, and identifies all variables; calculations carry units throughout and reflect an understanding of significant digits; if a graph is used, then a linear regression equation is given with units	Analysis uses the same logical order in which the experiment was performed; it is a coherent and well-ordered presentation of sample calculations made as part of the experiment; shows all employed equations as part of sample calculations, and identifies all pertinent variables; calculations carry units throughout and reflect an understanding of significant digits; if

* **Note:** In order for a lab report to receive any credit whatsoever, reports *MUST* be: the work of the individual (the team's common data sets and graphs are acceptable), typed or word processed, handed in at the beginning of the next lab session, and contain data sheet(s) and/or graph(s) that carry the official lab stamp. **Please do not ask for exceptions, as they will not be granted.**

not given with units and a physical meaning of slope and y-intercept if a graph is used.

and a physical meaning of slope and y-intercept; one or two trials completed by less than satisfactory effort made to achieve accuracy.

a graph is used, then a linear regression equation is given with units and a physical meaning of slope and y-intercept; multiple trials as appropriate.

Graphs

Max. 2 points

Creates graph by hand; graph does not fill the entire page; graph and/or axes unlabeled and/or does not include units; data connected with series of lines; graph analyzed without use of regression processes; non-linear graph(s) not linearized; graphs not interpreted; there is no mention of slope and intercept and their physical meanings if appropriate; no algebraic or physical interpretation of graph(s).

Uses graphing program to prepare graph; graph (including data) fills the entire page; landscape view; each graph and axis labeled; includes units on each of the graph's axes; regression analysis conducted, but not based on a physical model if non-linear regression is used, the graph must be linearized and slope and its physical meaning given; there is no mention of slope or intercept and physical meanings if appropriate; algebraic but no physical interpretation of graph.

Uses graphing program to prepare graph; graph (including data) fills the entire page; landscape view; each graph and axis labeled; includes units on each of the graph's axes; appropriate regression analysis based on a physical model; if non-linear regression is used, the graph must be linearized and slope and its physical meaning given; slope and intercept and their physical meanings are clearly given if appropriate; clear physical interpretation of graph including the inclusion of a physical model.

Conclusion

Max. 3 points

Purpose statement not directly addressed in conclusion; fails to state relationship between the variables identified in the purpose in a clear, concise sentence; when a mathematical expression can be derived from graphical analysis, it is missing or is provided without appropriate units and/or interpretation; fails to describe new terms that arise as a result of evaluation of data; when results differ from what is expected, no plausible explanation is provided.

Purpose statement is directly addressed in conclusion; clearly states relationship between the variables identified in the purpose in a clear, concise manner; when a mathematical expression can be derived from graphical analysis, it is provided but fails to include units; provides an algebraic rather than a physical relationship; the *meaning of the slope* and the *significance of the y-intercept* (when appropriate) are not included; fails to describe new terms that arise as a result of evaluation of data; when results differ from what is expected, a explanation is provided.

Purpose statement is directly addressed in conclusion; clearly states relationship between the variables identified in the purpose in a clear, concise manner; when an expression can be derived from graphical analysis using a physical model, it is provided using a with the appropriate units; provides a physical relationship; states the *meaning of the slope* and explains the *significance of the y-intercept* (when appropriate); describes any new terms that arise as a result of evaluation of data; when results differ from what is expected, a plausible explanation provided.

Accuracy

Max. 2 points

Work exhibits lack of care in measurement processes; overall error unacceptably large; result departed markedly from the anticipated result (as indicated by a large margin of percent error or percent difference) but no follow-up set of measurements were made to isolate and eliminate the source(s) of error; there is reason to believe that the student skewed the data so that proper experimental results or a smaller experimental error were achieved; inappropriately excludes valid data.

Work exhibits some lack of care in taking in measurements; overall error somewhat larger than expected; if a result departed markedly from the anticipated result (as indicated by a large margin of percent error or percent difference), a follow-up set of measurements were made to isolate and eliminate the source(s) of error; there is no evidence that the student skewed the data so that proper experimental results or a smaller experimental error are achieved; reports and appropriately excludes invalid data.

Work exhibits that great care was taken in all measurement processes; overall error should be relatively small throughout; if a result departed markedly from the anticipated result (as indicated by a large margin of error), a follow-up set of measurements were made to isolate and eliminate the source(s) of error; there is no evidence that the student skewed the data so that proper experimental results or a smaller experimental error are achieved; reports and appropriately excludes invalid data.

Maximum points per lab: 25. The lowest two lab report scores will be dropped. Missed labs score zero and may not be made up.

See a sample lab report that satisfied all these criteria using the hyperlink provided.