

## General and University Physics lab Report Grade Sheet

Name: \_\_\_\_\_ Score: \_\_\_\_\_

Note to the student: Each section has multiple criteria. Your score reflects an averaging of your performance in each criterion under that heading. You may have perfected one criterion, but ignored a different criterion; your grade in each section will reflect the relative importance of the combined result. Some sections may have comments to clarify your score.

### \_\_\_\_/5: Identification

- 5: Correctly identifies all experimenters, experiment, and date.
- 4-3: Incorrectly identifies experimenters, experiment, or date.
- 2-0: Does not identify experimenters, experiment, or date.

### \_\_\_\_/5: Abstract

- 5: Clearly and briefly states the principle being examined and the measurement that allows the verification of that principle. Provides quantitative support to draw a conclusion.
- 4-3: Gives long-winded, confusing, or somewhat incorrect statements of the principle being examined *and/or* the measurement allowing verification. Neglected to include a numeric result or includes an irrelevant result.
- 2-0: Does not identify either the principle or the measurement (or both). Does not include any numeric result.

### \_\_\_\_/10: Equipment / Apparatus

- 10: Includes a clear drawing of that equipment which colleague may not be able to envision, a complete list of equipment used (including appropriate unique identification), and a description of how it fits together with labels that can easily be referenced from the Procedure Section.
- 9-8: Includes a drawing of equipment and a complete list of equipment used (including unique identification where appropriate).
- 7-6: Includes an incorrect drawing, list of equipment used.
- 5-0: No drawing, incomplete list of unspecified equipment.

### \_\_\_\_/15: Theory

- 15: After clearly stating the objectives, the author concisely explains those ideas relevant to the experiment at a level understandable to other students in the class, naturally introduces necessary equations at the relevant point of the explanation, identifying the variables and showing how they relate to the theory and to the experiment. New terms are defined and models are concisely explained. Explanation leads naturally to what will be measured (as detailed by the Procedure), calculated, and compared (as detailed in the Analysis) in order to draw a conclusion about the validity of the theory.
- 14-13: After clearly stating the objectives, the author explains those ideas related to the experiment at a level understandable to other students in the class, introduces necessary equations, identifying the variables and showing how

they relate to the theory and to the experiment. New terms are defined and models are explained. Explanation leads naturally to what will be measured (as detailed by the Procedure), calculated, and compared (as detailed in the Analysis) in order to draw a conclusion about the validity of the theory.

- 12-10: After stating the objectives, the author explains ideas related to the experiment at a reasonable level, introduces equations, and identifies the variables. New terms and models are used in the correct context. Explanation mentions what will be measured, calculated, and compared.
- 9-7: After attempting to state the objectives, the author attempts to explain ideas somewhat related to the experiment, introduces equations, and identifies some of the variables. New terms and models are mentioned. Explanation mentions what will be measured, calculated, and compared.
- 6-2: Without stating the objectives, the author attempts to explain ideas possibly related to the experiment, writes down equations, and mentions variables. New terms and models are obviously misunderstood.
- 1-0: Without stating the objectives, the author does not attempt to explain any ideas remotely related to the experiment, write down equations, nor mention variables. Common English terms are defined incorrectly.

### \_\_\_\_/15: Procedure / Method / Techniques

- 15-14: Presents a clear, easily visualized picture of the steps involved, understandable to a typical colleague, explicit enough to reproduce the experiment without being tediously long. References the Apparatus Section as appropriate, uses the Theory Section to justify the important steps, and (if appropriate) indicates steps that require exceptional care.
- 13-11: Presents a clear, understandable picture of the steps involved, explicit enough to reproduce the experiment without being tediously long. References the Apparatus Section and the Theory Section. Indicates steps that require exceptional care.
- 10-8: Presents a possibly misleading picture of the steps involved, explicit enough to figure out the procedure. Possibly references the Apparatus Section and/or the Theory Section. Possibly indicates steps that require care.
- 7-2: Lists most of the steps involved. Neglects references to the Apparatus Section *and/or* the Theory Section. Possibly indicates steps where an error was made. Lists data with description.
- 1-0: References lab partner's report for the details.

### \_\_\_\_/10: Data

- 10: Data table is organized and sorted to show interesting patterns, includes column headings with variables and units and lists uncertainties. Calculated data are distinguished from measured data. The section makes it obvious how the calculated data and the uncertainties were found. Graphs have axes labeled with variable name (and unit is given in parentheses) in a location that will not be hidden by a stapler. Data points are clearly displayed on a graph that is appropriately-sized. A trendline is drawn (if appropriate); the equation of the trendline (slope and intercept) is given.

- 9-8: Data table shows interesting patterns and includes column headings with variables, units, and uncertainties. Calculated data are distinguished from measured data. Some calculations are done. Graphs have axes labeled in a location that will not be hidden by a stapler. Data points are clearly displayed on a graph that is appropriately-sized. A trendline is drawn (if appropriate); the equation of the trendline (slope and intercept) is given.
- 7-6: Data table may include column headings with variables, units, and/or uncertainties. Calculated data may be mixed with measured data. A calculation is shown. Graph axes are vaguely labeled. Graph is appropriately sized, but data points may be too small. A trendline is drawn (if appropriate); the equation of the trendline (slope and intercept) is given.
- 5-2: Data are written down without variable names, units, and/or uncertainties. Calculated data may be mixed with measured data. No calculations are shown. Graph axes are not labeled. Graph is too small and data points cannot be distinguished from stray marks. The trendline and/or the equation of the trendline (slope and intercept) are missing.
- 1-0: Data? I was supposed to include *numbers*? A graph is missing or drawn by a squirrel.

### \_\_\_\_\_/15: Analysis

- 15: Patterns in the data are made explicit and related to predicted expectations based on the theory. The author comments on the shape of the graph(s) and how that shape expresses the theoretical relationship. Comparable numbers are put in the same units and compared with %-difference or %-error (as appropriate) as well as a comment about overlapping uncertainties. Sources of uncertainty are tied to the values of uncertainty and the author considers what would happen to the results and the uncertainties if one or more measurements had given a larger or smaller result. Analysis implies the conclusions in a logical progression.
- 14-13: Patterns in the data are made explicit and related to predicted expectations based on the theory. The author comments on the shape of the graph(s). Comparable numbers are put in the same units and compared with %-difference or %-error (as appropriate). Sources of uncertainty are tied to the values of uncertainty. Analysis implies the conclusions in a logical progression.
- 12-10: Patterns in the data are made explicit. The author comments on the shape of the graph(s). Comparable numbers are compared with %.difference or %error (inappropriately). Sources of uncertainty are mentioned. Analysis leads the reader close to the conclusion.
- 9-7: Patterns in the data are mentioned, possibly with inconsistencies. The author comments on the graph(s). Comparable numbers are compared. Some source of uncertainty is vaguely mentioned. Conclusion is drawn.
- 6-2: There is a somewhat vague reference to the data and the graph. An important number is mentioned. An attempt is made to transition to the conclusion.
- 1-0: Essentially comparable to "Our data is good and consistent with the theory."

### \_\_\_\_\_/15: Conclusion

- 15: The brief discussion mentions which results could justify the theory, mentions what those results (with uncertainties) are, and compares them to what the theory says they should be. If multiple aspects of the analysis support (or detract from) the theory, then each is systematically addressed, clearly indicating the validity or invalidity of the theory. Finally, an overall conclusion is drawn indicating the general validity of the theory based on the analyzed data.
- 14-13: The discussion mentions results (with uncertainties) that could justify the theory and compares them to what the theory says they should be. If multiple aspects of the analysis support (or detract from) the theory, then some of these are addressed, indicating the validity or invalidity of the theory. Finally, an overall conclusion is drawn indicating the general validity of the theory based on the analyzed data.
- 12-10: The discussion mentions results (with uncertainties) and compares them to other quantities. If multiple aspects of the analysis support (or detract from) the theory, then at least one of these is addressed. An overall conclusion is drawn.
- 9-7: The discussion mentions results (possibly without uncertainties) and relates them vaguely to the theory. A possibly incorrect conclusion is drawn.
- 6-2: No results are mentioned and the conclusion seems unrelated to the important point of the exercise.
- 1-0: The author draws a conclusion about the ease of the experiment, their ability to make a measurement, or the friendliness of their lab partner.

### \_\_\_\_\_/10: Layout, Organization, Mechanics, Grammar, and Spelling

- 10-9: The pre-lab activity (if any) was completed on time. Report was organized into proper sections with ideas clearly expressed, including paragraphs for new ideas; referenced other sections, data tables, or graphs where appropriate; contained sentence structure that enhanced the explanation; was obviously proof-read; and retained few, if any, typographical errors.
- 8-7: The pre-lab activity (if any) was completed on time. Report was organized into proper sections; referenced other sections, data tables, or graphs; was probably proof-read; and retained a few typographical errors.
- 6-5: The pre-lab activity (if any) was completed late. Report was generally organized into proper sections; had some relation to other sections, data tables, or graphs; and retained several typographical errors.
- 4-3: The pre-lab activity (if any) was completed late. Report had sections; was probably not proof-read; and had many typographical errors.
- 2-1: The pre-lab activity (if any) was completed late. Report was not sectioned and mixed information that should be separated; was obviously not proof-read; and had many typographical errors that interfered with the clarity of the paper.
- 0: The pre-lab activity (if any) was completed late. Report written in an obscure version of Medieval English and even then has misspellings. There is a drool stain blurring half of at least one collection of words that seems to be posing as a sentence.