

Helpful Grading Guidelines for Physical Science Lab Reports

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Beginning high school physical science teachers and junior college professors teaching introductory physical science courses sometimes may feel a little doubtful about grading lab reports, especially for experiments not listed in the lab book. This might create confusion as to what is expected out of the students. Grading guidelines can help the students and the teachers to make the learning process simple and effective.

The general lab report format, followed in most lab books, include title, introduction, objectives, apparatus, procedure, data sheet with calculation steps (if calculations are involved), and questions (or discussion) permeating to the data collected/calculations done. Format for experiments not listed in the lab book can be modified depending on the type of experiments. Some important points for physical science reports to be considered are mentioned below.

Lab report represents scientific reporting and should be treated as such. Emphasis on units in recording data and calculations is very crucial. Discussion of results, which is normally missing in most lab book listed experiments, can help students learn how to report scientific data. Many lab book listed experiments do require students to answer specific questions related to the experimental data. In any situation, different sections of the lab report excluding apparatus and data sheet, should be written in full sentences. It can help the writing skills. Interpretation of numerical data to be included in Discussion section can engage students seriously can help them in critical analysis and critical thinking. There is a value in numbers and discussion should revolve around the numbers and not beating about the bush. Wherever it is possible graphing should be done. If a picture is worth thousand words (as per old adage), sometimes a graph can be worth a whole book, especially in a large set of data. Many times, a clear and distinct trend can be easily traced if data is graphed. Discussion of results is required for all experiments, listed or not listed in the lab book.

In my lab reports I do emphasize on initialed data sheet. Before the student leaves the lab after finishing experiment I want to look at what the student/group has done. This is an interaction with students on one to one basis. Attachment of this initialed data sheet is a requirement of the lab report that helps me keep track of students in large classes, who did the lab and who did not.

Here are some guidelines for grading lab reports. These can be used as a resource and should be conveyed to students early so they know what is expected out of them. It should also provide an explanation for the grade they got for their lab reports.

Score Requirements

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| 90 | Lab Report written in standard format* should include: name, date of and experiment, all data collected and recorded correctly, initialed data sheet, above calculations done correctly given with right units, and a brief description of values calculated for various measurements (as per stated objectives) in the Results and Discussion section along with analysis and interpretation of data in relation to the standard (if it exists) for accuracy and precision**, a list of possible sources of error for each determined component, how these error sources affected the results of the experiment, and any suggestions for improvement of experimental technique or approach with present set up. |
| 80-89 | Lab Report written in standard format* should include: name, date of experiment, all data collected and recorded correctly, initialed data sheet, calculations done correctly given with right units, and a brief description of values calculated for various measurements (as per stated objectives) in the Results and Discussion section along with analysis and interpretation of data in relation to the |

standard (if it exists) for accuracy and precision**, a list of possible sources of error for each determined component, and how these error sources affected the results of the experiment.

- 70-79 Lab Report written in standard format* should include: name, date of experiment, all data collected and recorded correctly, initialed data sheet, calculations done correctly given with right units, and a brief description of values calculated for various measurements (as per stated objectives) in the Results and Discussion section along with analysis/interpretation of data in relation to standard (if it exists) for accuracy/precision**, mention of some sources of error and how these error sources affected the results.
- 60-69 Lab Report written in standard format* should include: name, date of experiment, all data collected and recorded correctly, initialed data sheet, calculations done correctly given with units, and a brief description of values calculated for various measurements (as per stated objectives) in the Results and Discussion section along with information on accuracy/precision of data in relation to standard (if it exists).
- Below 60 Lab Report not written in standard format* and or lacking initialed data sheet, or otherwise incomplete.

* Standard format for experiments unlisted in Lab Book consists of title, introduction, objectives, apparatus/equipment list, procedure, table of observations and calculations, and results and discussion. Standard format for experiments listed in the Lab Book would contain appropriate sheets from the book (up to table of observations and calculations) plus your write up on section of results and discussion.

** wherever possible, relations should be shown with neatly drawn graphs.

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