Lab Reports

Articles or lab reports persuade others to accept or reject hypotheses by presenting data and interpretations. They detail data, procedures, and outcomes for future researchers. This allows new research to become part of the accepted body of scientific knowledge when published. The advice below is intended for a generic lab assignment. You may find that some suggestions are not applicable for a given assignment and should be viewed accordingly.

Getting Started

- Discuss and Determine the Problem

  Discuss with your teacher, classmates or parents what the math problem or math issue might be that you are writing about. This will enable you to get started on your report. Make a list of the various subjects or you might write a paragraph about what you are writing about. The problem that you come up with could be anything from "How to Solve a Multiplication Problem" to "Strategies for Teaching Math To Students." You will need to narrow your problem to one concrete sentence or idea, so that you can write a report about it.

- Research Steps and Processes

  Research online or in mathematics books in the library the steps and processes that are going to be needed to solve the problem you have determined is at the root of your report. You might be able to use your own math book. Your teacher might have other suggestions for your research, such a talking to someone with a degree in math, or reading printed materials. Do the math required or figure out how to do the process you have to describe. This might mean you read books about the subject, practice the steps, or do experiments to come up with the best solution to the math problems.

- Write Out Steps

  Write out the steps in your report as you would write any other report, using complete sentences and words. Don't use abbreviations and use the same number rules you use when writing for another class. For example, write out numbers from one to nine and use figures for numbers above 10. Write the steps in paragraph form, and only use bullet points if you have a list that you need to discuss within the report. Be sure that you have a conclusion at the end of your report in which you tie together all of the aspects you have talked about. Relate it to your beginning question.

Format

Your lab report includes: title, abstract, introduction, materials and methods, results, discussion, references and literature cited (where applicable).

I. A Title
   For example: Lab 1 - No Cause for Celebration

II. An introduction
   State the purpose of your report and give a brief explanation of the contents.

III. Materials and Methods
   On occasion your lab may require outside materials. In these cases, list materials used, how were they used, and where and when was the work done (important in field studies). Describe special pieces of equipment and the general theory/theorems used. Provide enough detail for the reader to understand the experiment without overwhelming him/her.

IV. Results
   Concentrate on general trends and differences and not on trivial details. Summarize the results without discussing their implications. Organize data into tables, figures, graphs, photographs, etc. Data in a

table should not be duplicated in a graph or figure. Make sure all figures, charts, tables, etc. are clearly marked and referenced in your results.

V. Discussion
Interpret the results, but do not restate them. This is where you can relate results to existing theory and knowledge. Reflect on the process and include suggestions for improving your techniques or design. You can include questions that arose during the project or (in experimental labs) explain the logic that allows you to accept or reject your original hypotheses.

VI. References
Cite only references in your paper and not a general bibliography on the topic. Alphabetize by last name of the author and follow the recommended format for citations.

Grading Rubric

	Communication	**Process & Strategies**	**Accuracy**	**Understanding**
4	Communicates clearly and effectively. Responses contain sophisticated use of terminology and/or mathematical notation.	Responses are complete and well-reasoned with supporting evidence, where appropriate. Uses compelling mathematical arguments to support responses. Includes clear diagrams, charts, or figures, when needed. Methods are clearly described and carried out.	All computations are correct. Necessary work is shown and clear.	Finds all necessary parts of the problem and shows clear understanding. Uses critical thinking and demonstrates understanding by drawing sound conclusions or extending the problem. Asks appropriate questions.
3	Communicates clearly and appropriately using mathematical terminology and symbols.	Responses are mostly complete and well-reasoned, but missing supporting evidence. Uses mathematical concepts to support answers. Includes diagrams, charts, or figures when needed.	Most computations are correct. Most of the work is shown and clear.	Shows good understanding of the problem. Appropriately addresses most (but not all) aspects of the task using mathematically sound procedures.
2	Communication is unclear or ambiguous. Adequate use of mathematical terminology and symbols; may contain minor flaws.	Responses are largely incomplete, but contain meaningful arguments that need further development. May address some elements of the task correctly, but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete.	Computations were attempted, but most were not correct. Student understands what to do, but has trouble carrying it through.	Demonstrates only a limited understanding of the mathematical concepts and/or procedures in the task. Minimal attempts at making mathematical connections.
1	Poor communication with consistently inappropriate use of mathematical terminology and/or symbols.	Fails to document strategic thinking or reasoning. Does not make an argument.	Computations were incorrect or not relevant.	Some elements may contain correct mathematical procedures, but holistically they are not sufficient to demonstrate even a limited understanding of the mathematical concepts embodied in the task.