Formal Lab Report

Title/Date/Author – this is self explanatory, but you should choose the title carefully as you want it to provide the audience with information on what the experiment was all about.

Abstract – this is a BRIEF description of the entire experiment. If this is more than ½ a page, you have done too much. The abstract should contain the research question so that the audience knows exactly what the lab is all about. It should summarize the results and what you conclude. In short the abstract is a summary of the lab located at the beginning of the report.
Remember that the research question includes what is being tested, how it is being tested and specifics on details.

Introduction/Background – this section of the report where you describe why you are doing the experiment. What is the significance of the experiment to the surrounding world? What are other people saying on the subject? Why should you run this experiment? Why should your audience read it? Etc. In order to complete this section properly you will need to do some research and find recent (within 5 years) magazine, journal, news, etc. articles that support your project. You will need to site your sources for this section of the lab.

Objectives/Hypothesis – here you will simply bullet 2-3 points that you hope to accomplish with the lab. What are you goals in the end? Some references and lab reports will include here what you think will be the end result in the form of a prediction (hypothesis) with supporting information.

Materials – simply list out the materials that you have used for the construction and implementation of the experiment you have performed.

Procedure – a step by step explanation of exactly what was done. This needs to be clear and include many details. In short, anyone wishing to repeat your experiment should be able to do so from your procedure.

Data – data should be in table format, if you have created graphs, organized charts or anything else you should include them here.

Analysis – this is the most important part of the report as it focuses on your data. It is an explanation of how you performed your calculations, how you read the charts or how you interpret the graphs that you have provided. There should be an explanation of every number you have reported in your data by showing at least one sample calculation for each type of calculation performed. If you report on an average there needs to be an explanation on how you calculated that average and what it means for your experiment.
At this point in the report you should also explain any errors that could have thrown off the experiment causing undesired results and offer solutions on fixing those errors in future experiments. DO NOT simple claim there was “human error” and leave it at that. There needs to be specific error points and solutions on how to fix them. EVERY EXPERIMENT has room for improvement and you cannot ignore this.

Incorrect examples of errors students have reported in the past include "I measured wrong;" "I could have calculated incorrectly;" I used the wrong measuring devise;" etc. The response to this every time will be "why did you not go back and re-measure?" DO NOT report human error. When you use "human error" you are saying that "this experiment was not important enough to me to take seriously and check myself, so go ahead and destroy my grade teacher as you look it over." Instead report DESIGN error.

Tips for analysis section

- Do NOT report something simply because it is what the textbook reads; make sure that what you write is appropriate to the experiment at hand.
- In the Error analysis, do not speculate about errors with statements like, "This could have happened" and leave it at that, you need to support your theories on errors with evidence/observations from the lab. "This one plant seemed to be in the dark more because of its location near the window, it did not grow as tall as the others with the same experimental test solutions, and it may have been the difference in sunlight." The previous statement is an example of an experimental error that can be supported with observations.
- Do NOT use the words "prove" or "disprove" as science is filled with uncertainty. Instead, use the words "support" or "not support".

Conclusion – this part of the report is the APPLICATION stage as you will simply summarize some of the key points and expand on concepts. A good plan for this section is to go back to your objectives and hypothesis. Did you accomplish what you set out to do? If so, how could your data is applied to future experiments or broader concepts? If you did not accomplish your objectives, you should still offer something you have learned and apply it to broader concepts.

Bibliography – here you will simply indicate at least 2-3 sources that where used in the background research. The sources should include the author of the source, the title, the publisher, and the publication date.

Rubric for report

Unacceptable	Developing	Accomplished
The report is poorly written, not typed, skips some of the components listed above or is unclear.	The report is type written, includes all of the components listed above, but does not include error analysis, suggested improvements, applications, or background resources.	The report is type written, clear, includes all of the components above, has a bibliography for information found in the background, analyzes errors, offers suggested improvements, and has a well written conclusion.

Hints for formal writing:

- Choose a voice. The passive voice used to be common practice in science reporting, but in recent years it is becoming more commonplace to use the first person. Either is acceptable, but under no circumstance should you start reporting in one voice and then switch to another. Choose one and be consistent throughout the report. Along the same lines, do not use first person, "I" and then mid-way through switch to first person plural, "we" or "our". BE CONSISTANT.
- Do not use contractions. Words like “didn’t” or “aren’t” should not be in your report. You must use the full version, “did not” or “are not”. Never use contractions in formal writing.