

Lab reports will include the following sections. This format is typical of a research paper and is intended to provide you with some experience in technical writing.

1. Title - something descriptive - if the title does not interest a prospective reader they may never bother to read your brilliant report.
2. Name and Date
3. Abstract - This should be about 200 words. It is a brief but complete summary of the most important aspects of your work and should include important numerical results. It is basically a separate document and does not replace any section of the report. Your boss's impression of your work will probably be based totally on the abstract.
4. Introduction - Why did you do this work? Why should the reader care that you did? Are there some interesting applications that are relevant? You should include a review of any relevant papers which have been published on the topic.
5. Theory - Brief review of any relevant old theories. Complete discussion of any new extensions to the theory that you are making. Now you are the author so you can skip lines of "obvious" mathematical steps.
6. Experimental Method - How did you do the experiment? What equipment was used? A diagram of the experimental arrangement may be useful. Specific values of some voltages, currents, distances, may be worth reporting if changing them would change your results.
7. Data and calculations - Present the data (often in graphical form) and show what you did with it to reach some conclusions. (This may refer back to the "theory" section). Include a discussion of experimental error.
8. Results - State the results of your measurements. How sure are you of the value? (How much error?) How does it compare with what you expected or what others have measured? [Sometimes it is easier to combine the data and results sections into one section.]
9. Conclusions or Summary - State the conclusions of your work. If this was already done in the results section then briefly summarize the key points of your work. Feel free to speculate about the causes of effects you observed.
10. Acknowledgements - If you received any special assistance or advice from anyone that significantly contributed to the work you should acknowledge their assistance (or at least their existence).
11. References - List the references which you cited in the paper. Most references come up in the introduction or theory sections or when you compare to others' results. I do expect you to visit the library and include references either directly discussing the theory of the experiment or giving applications of the concepts involved in the experiment.

General comments on lab reports: Do not reproduce the manual or describe the software in the report. You can assume that anyone else will have access to the manuals and to the software. If you want to, you could include this information in an appendix - but that is not necessary. Watch what you say! Be clear and specific:

"measured the sample" - with a ruler?! What does this mean?

"took a spectrum of the sample" - What kind of a spectrum?

"produced a number vs. energy spectrum of the sample" - Number of what? energy of what?

"produced an Auger electron spectrum of the number of secondary electrons vs. their kinetic energy for the sample"