Lab Report Skills by Sections

Writing the Sections of your Report
Scientific and technical reports have fairly standard sections. Some reports contain the full set of sections while others a subset. You will need to check with your tutor the sections he/she wants you to include in your reports. This guide gives you some idea of what needs to be included in a selection of the sections.

The Summary/Abstract
Always write the abstract/summary last, even though it is placed at the beginning of your article or report.

Summary
This is a paragraph or two giving a clear statement of the purpose of your report/paper, your main findings and conclusions. Note the confidence you have in your findings and any reservations. Information should be in the same order as the report, but you should not make any cross reference to the body of the report. Remember you read the title and summary/abstract of a paper/report in order to see if it is of interest to you. You do not want to read the whole paper and then find out it was not relevant.

Abstract
An abstract is also the summary of an article in a published journal. The abstract will be published with and separate from the body of the article. So, it can be read without access to the article (e.g. on remote databases and abstract journals). Therefore, it must give you enough information to make a decision on whether you should read the whole article. An abstract is usually about 250 words.

The Introduction
This section sets the scene and contextualises your work by giving the necessary background. This is your shop window (along with the abstract if you write one) so it is important to write clearly and interestingly. This should explain why you are carrying out this investigation and who else has done similar work.

The writing here should be engaging, simple, clear and relatively non-technical.

CHECKLIST FOR YOUR INTRODUCTION: This is not a complete list - check with your tutor.

- A paragraph discussing the topic of your investigation, state any assumptions your work was built on.
- Some information on any previous work in the field relating to your topic
  - key findings from other researchers and/or
  - approaches to tackling this issue
- State your hypothesis, if you have carried out experiment or a clear statement of a problem you are trying to solve.
- Cite any references you use in your text and include in your reference list at the end of your report.
NOTE: You may want to have a literature review section on its own. Ask your tutor what he or she wants.

The Methods Section
This section should be written clearly enough so that the reader could repeat your experiment if he or she wanted to do so. This will also help the reader understand how your data was obtained. Your sentences should be simple and clear. You need to write in the past tense and use the passive. When you use the passive, you concentrate on what you DID and underplay WHO did it. This gives your report a sense of objectivity, which is essential in technical writing.

CHECKLIST FOR THE METHODS SECTION

- List the equipment used (add diagram if important).
- State any conditions of your investigation.
- State the purity and structure of the materials used if important to your investigation.
- State exactly what you did.
- Describe the techniques used.
- Use standard abbreviations for names of things.

The Results & Analysis Section
Here you will present your main findings (adjusted and analysed) and identify important trends or information. This section will be full of tables and graphs that will depict all your significant results. Make sure your graphs and tables are well laid out and accurately labelled (informative title, labelled axes, legend - when appropriate, units used, and numerical values along the x-axis). Always refer to numbers and quantitative measures if possible. You will need some text so that the reader can easily interpret your figures and identify your variables. However, your comments should be short, clear and precise.

Check out: $X$ is quite a lot larger than $Y$ | $X$ is 6% larger than $Y$.

CHECKLIST FOR THE RESULTS SECTION

- Identify key data that relates to your hypothesis.
- Analyse and summarise this data.
- Present your data in clear graphs or tables.
- Briefly comment on the results to help the reader understand your data.
- Add key calculations as appropriate.
- Raw data should be in an appendix - if required.

The Discussion
Before you start this section, get your story straight. What do you want to say about your findings? Here you need to link your results with your introduction to form a critical view of your work. It is important that your writing here is evaluative, this is the most important section. You need to convey to the reader what your results and findings mean.

CHECKLIST FOR THE DISCUSSION

- Re-state your purpose and hypothesis (if appropriate).
- Interpret your data and comment on your findings.
• Re-state key elements of your experimental design/method in relation to results (experimental error/tolerances).
• Comment on your confidence regarding the validity and reliability of your findings as a result of your design.
• Be quantitative whenever possible.
• Be objective and avoid vague general statements, such as, “I felt it was quite successful”!
• Comment on your results in relation to others – expected or unexpected.
• Cite others’ work as appropriate.
• Summarise and critically evaluate your research design and findings.

The Conclusion
You may include the conclusion in your discussion. Check with your tutor what is needed for your assignment. If you do include this section, you may want to move your critical comments about your research design into this section and then talk about how you could improve it in the future.

CHECKLIST FOR THE CONCLUSION

• Briefly state what you found.
• Support this statement with key findings.
• Comment on how future research could develop this topic.

The Appendices
Typically these include the following – put them in separately labelled appendices.
• Raw data (as necessary).
• Calculations.
• Pertinent detailed graphical information such as NMR, graphical output from tests etc.
• Any detailed information about the apparatus/equipment as is necessary.

Finally, Formatting your Work
It is important to get into the habit of writing professional looking documents and give your hard work a good showcase.

Check:
• Format you may be expected to use.
• Font and point size are consistent.
• Margins are what they should be.
• Headings (use different style across different levels of headings, but be consistent).
• Citations and referencing formats that you have to use.

The document should be easy to navigate and this helps with:
• Clearly laid out title and your name.
• Table of contents (if your document is short this may not be necessary).
• Numbered sections with titles.
• Clearly labelled tables and figures (select an appropriate font for these). Where necessary refer to them as figure xxx: title or table xxx: title.