

# WRITING A LABORATORY REPORT

## The Structure of a Laboratory Report

Scientific reports have a formal structure. Laboratory reports written by undergraduates share the same format as scientific reports written by academics for publication. Individual scientists perform experiments to test hypotheses. The researcher then reports the results in an attempt to persuade others to accept or reject their conclusions. The laboratory report and the scientific paper are the vehicle of persuasion. Scientific reports usually have the following structure:

- **Title.** The title should be less than ten words, should be straightforward and should reflect the content of the work.
- **Abstract.** This should be a summary of the aim of the work, the main results obtained and the conclusions. It should be concise - typically 100 - 200 words – and written to allow a casual reader to judge whether or not to read the entire report. Although the first section of the report, it is usually the last to be written.
- **Introduction.** This provides the context for the report and includes an outline of the reason for the study, the existing knowledge about the subject and the purpose of the work. It should give the reader sufficient background to understand the rest of the report and should point the reader to texts and references containing more detail on this theory. It should define any abbreviations or special terms that are not in common usage.
- **Method.** This explains the techniques and procedures used and should provide sufficient information for another researcher to replicate the work. Where the procedure from a laboratory handbook or paper is followed, it is sufficient to simply cite the work (for example, “The method in the laboratory handbook on page XX was followed”), noting only any alterations that were used.
- **Results.** This summarises the data from the experiments *without discussing their implications*. Commonly, results are organised into tables and figures. Data presented in graphs should not be duplicated in tables. All figures and tables should be numbered and each should be referred to in the text using these numbers. They should be clearly titled and labelled. They should be readable and presented in a simple style. Detailed calculations should *not* be included in this section (see Appendices). This is commonly the first section to be written.
- **Discussion.** This section explains what the results mean and whether they are consistent with the aim of the work. Where problems were encountered, possible sources of error and suggestions for improvements should be included. Where the results contrast with those expected, careful speculation of their meaning is appropriate.
- **Conclusions.** In this section, the main results and their significance are *briefly* restated.
- **References.** This provides a list of sources used in performing the experiment and writing the report, using an appropriate referencing style (see below).

- **Appendices.** This section is usually not required but is used to show detailed, multistep calculations and large tables which the authors consider of peripheral interest.

## Referencing

There are many different styles used for referencing, depending on the discipline and the publisher. In any report, a simple and consistent style should be used which will make it as easy as possible for the reader to locate the resource for themselves.

- **Books.** The reference should include the authors, book title, publisher and their location and year of publication. Where a particular chapter or set of pages has been used, these should be indicated. For example,

Blackman, A., Bottle, S., Schmid, S., Mocerino, M. and Wille, U., *Chemistry*, Wiley, Australia, 2008, Chapter 8.

*First Year Chemistry Laboratory Handbook*, The University of Sydney, Australia, 2009.

- **Web references.** These are acceptable and should include the page and site title, the URL and the date the page was accessed (since webpages are constantly being updated). For example,

Chemical Safety Data: Aspirin, Physical and Theoretical Chemistry Laboratory,  
<http://cartwright.chem.ox.ac.uk/hsci/chemicals/aspirin.html>, accessed 10/04/09.

- **Articles.** Journal and magazine articles should include the author(s), journal title and volume, issue and page numbers. The article title can also be included. For example,

Norrby, L.J., *Why is Mercury a Liquid?*, Journal of Chemical Education, Vol. 68, No. 2, Page 110.

For more information on referencing, see [elearning.library.usyd.edu.au/learn/referencing](http://elearning.library.usyd.edu.au/learn/referencing)

## General Comments on Style: Dos and Don'ts

- Write in complete, grammatically correct sentences. Sentences should include a subject and a verb. Try to use short sentences by breaking long sentences in two.
- Be concise. Do not waffle. Make the report as short as possible.
- Use the past tense and third person if possible. Avoid using "I" or "we".
- Avoid contractions (isn't, doesn't, it's etc) and slang. The full form (is not, does not, it is etc) is expected in formal reports.
- In general, numbers should be written as numerals (10 *not* ten). Only spell numbers beginning sentences.
- All measurements should include units. Whenever reporting measurements, there must be a space between the number and its unit (10 m *not* 10m) and a space between the parts of a compound unit (10 kJ mol<sup>-1</sup> *not* 10 kJmol<sup>-1</sup>).
- Remove hyperlinks from web references.
- Read your report after writing it. Edit it. Look for spelling mistakes and ambiguity. Make it easy to read by simplifying complicated sentences.