



# Practical reports

The purpose of practicals or experiments is to have you explore certain aspects of the professional practice of your subject. This may involve you in:

- reading published information
- carrying out the experiment/gathering data
- collecting and organising data from the experiment and the published information
- interpreting the results
- communicating the findings by writing laboratory practical reports

Through this exploration you develop:

- techniques in collecting, organising, analysing and reporting data
- skills in the use of equipment
- judgement about the procedure and the results of the experiment
- insights into the relationship between theory and practice
- familiarity with how engineers and scientists work and report professionally on their work

## What is the structure of practical reports?

Each subject area has its own requirements for the format and content of practical reports. Check your assignment guidelines carefully and, if necessary, talk to your lecturer to ensure that you meet these guidelines. In general, a practical report comprises various sections, each containing specific information, as summarised in the following table:

Section of your report	What each section tells your reader
Cover page	identifying information
Synopsis/Abstract	main ideas in summary form
Aim and Introduction	what you investigated and why
Method	techniques you used
Results	what you found out
Discussion	what the results mean and how they relate to theory
Conclusion	summary of findings related to the aim
Appendix	detailed information referred to in the report
References	source(s) of published information used in the report

## Synopsis (or Abstract)

A **Synopsis** or **Abstract**, is a summary of what has been included in the report and helps the reader quickly identify what its purpose is.

## Aim and Introduction

The **Aim** of the practical may be part of the Introduction, or it may be required as a separate section. In the Aim you briefly state the purpose and scope of the practical, but you do not include detailed information about the method used. In the **Introduction** you state what you investigated and give background information, including any relevant equations. You may include a brief reference to relevant theory and practice and predict the likely outcome of the practical. You may refer to published material. Sometimes in the Introduction you include a **hypothesis** which is a prediction about results, using the information available at the time.

## Methods

In the **Methods** you set out the procedure you followed during the practical, specifying the materials and equipment you used and what you did with them. To carry out the practical you were probably given a set of detailed instructions in a laboratory manual or handout. They would have included directions such as “Using the digital top pan balance, weigh a definite volume (100 mL) of planting mix into weighing boats”. You will be expected to incorporate these directions into the report in one of four ways. Do only **ONE** of the following:

- Attach the instruction sheet to the report
- Refer to the instructions
- Rewrite the instructions into a brief account of what you did
- Rewrite the instructions into a detailed account which could be used to repeat your investigation

You should always record any variations from a standard procedure, and may find it useful to include labelled diagrams to summarise the Method you used.

## Results

In the Results you describe your findings and observations. Present your results logically and concisely without interpretation or comment. In this section you may present appropriate raw data, calculate results from raw data, present derived results in tables and/or graphs as appropriate, or write a brief description of these results.

### Raw data

- You organise your raw data into a clear, systematic format which could be a table or illustrations such as photographs and maps. If you have a large number of measurements or recordings put them in the Appendix and include a summary of them in the Results.

### Calculations

- You may be required to include formula(s) and details of calculations to show clearly how you arrived at your final results. Explain the meaning of each symbol.

### Tables and graphs

- Where appropriate, use tables and graphs to present your results. Number tables and graphs in order, give each a title and include headings and units. If graphing results, the choice of graph - e.g., a histogram or line graph - will be determined by the type of data. If you have more than one set of results, plotting them on the same graph allows for comparison. Label axes on graphs and plot clearly, using a set of symbols.

### Written descriptions

If providing written descriptions in your Results section, summarise in words the key findings from your calculations. Where tables and graphs have been used, refer to them and the results they contain.

## **Discussion and/or Conclusion: what the results mean and how they relate to the theory**

The **Discussion** and/or **Conclusion** is the key part of your report. It shows that you understand the practical and that you can critically evaluate your results. You should interpret your results by relating back to the Aim and indicating how well the aim has been achieved. In the discussion do not repeat your results by explain what they show and what they mean, what is important about your results and why. Questions may be provided in your **Laboratory Manual** to indicate what points you need to discuss.

In the **Discussion** you should do the following:

- Relate your results to the current knowledge and practice outlined in the Introduction to show that you understand the theoretical basis of the experiment. Where relevant, compare your findings with previous studies, commenting on similarities and differences. You may refer to the relevant literature.
- Comment on any unexpected results or outcomes.
- Acknowledge any problems, limitations, inconsistencies or errors in results and suggest probable reasons. Sometimes a detailed 'error analysis' is required.
- Suggest further investigations or extensions of your experiment, if appropriate.

The **Conclusion** may be part of the Discussion or may be required as a separate section. In the Conclusion you summarise your findings as they relate to the stated aim of the practical.

## **Appendix: detailed information referred to in the report**

Use the Appendix to provide extra supporting information relating to your practical, such as:

- detailed or repetitive raw data
- charts, diagrams, computer programs
- sample calculations

Number appendices Appendix 1, Appendix 2, etc. and refer to them in your report.

## **References: source(s) of published information used in the report**

List your references under the heading References.

Order alphabetically according to the first author's surname listed in each reference.

Include a hanging indent from the second line onwards for each reference.

Include full bibliographic details (author, year of publications, title and further publication details)

Check your format (e.g., spacing, use of punctuation, capitalisation, font style, etc.) by referring to the APA style guide. Different types of sources have specific formatting requirements.

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