Sections of a Science Laboratory Report

Title, abstract, introduction, materials and methods, results, discussion, acknowledgements, references, appendix

TITLE

Write a short title (In bold UPPER CASE) that specifies the nature of the project. A report title should be concise (key words only) and informative and should include the Latin species name (in italics) and/or higher taxonomic category if appropriate.

Your Name:
Practical Group:
Demonstrator:

ABSTRACT

This is a very short summary of the report which includes a general statement describing the overall aim of the investigation, alternate hypothesis(es) to be tested (if required), and a concise and correct summary of the major findings. If a hypothesis is required, include whether the hypothesis was supported or rejected.

Marks awarded for a concise and correct summary of the investigation with overall aim and findings spelt out clearly.

Marks deducted if anything is missing or reported incorrectly.

INTRODUCTION

This section introduces the specific problem addressed in the investigation, providing the context in which it fits. It is a step-by-step, logical argument to arrive at a reason for your investigation. It starts with general information and becomes more specific. The introduction includes a short background to current knowledge of the topic or problem under investigation which integrates ideas from different sources and explains why it is important to investigate (i.e. its significance). Information about specimens under study may also be included. The introduction finishes with a clear statement of the aim(s) and (if required) alternate hypothesis(es).

You must use references to provide information in your introduction. Thus, you MUST include in-text references for all information / ideas that you have cited from other sources and list these in the reference list at the end of your report (see Chapter 5 for referencing guidelines).

Marks awarded for inclusion of the above points, in a coherent and cohesive (i.e. well linked) piece of writing which includes a variety of relevant references.
**MATERIALS AND METHODS**

This section describes the procedures and materials used in the experiment. It should be written so that a peer could read it and reproduce what you did. It can include details about experimental procedures, apparatus, study sites, data collection, reagents used, analytical procedures and statistical techniques (if relevant). Combine the materials and methods; do not write them separately. Words are not counted towards the total word count but you MUST be concise. This section should be written in the past tense, following a scientific style using appropriate scientific terminology and well-structured sentences (rather than lists or dot points).

**Marks awarded** for a concise, accurate and logically ordered description that could be followed by a peer.

**Marks deducted** for inaccurate or missing details and/or irrelevant information.

**RESULTS**

The results section contains a clear and accurate presentation of your data. It is important to provide a written description of your results before presenting your results quantitatively in tables or figures (graphs, charts, diagrams). You must also report the results of any statistical tests used to analyse your data.

The results section contains:

- **Descriptive text.** This should go above the relevant figure or table (e.g. figure 2 below shows...) and should describe trends or significant features in your data using appropriate scientific terminology (e.g. “the majority of seeds germinated within ten days of planting” or “the temperature rose steadily for the first 10 minutes and then remained constant.”). You must not discuss the data, i.e. do not give reasons for your results. This comes in the discussion section.

- **Reporting results of statistical tests.** If you used statistical tests to analyse your data, you must report the type of test used, its calculated statistic, the degrees of freedom and the probability value. Often this is all placed in the parentheses after a statement on the significance of a particular result.

examples:

1. **Basic statement (bare minimum):** Abundance of the sea star *Patiriella exigua* differed significantly between sites (t-test, t=0.165, d.f.=19, p<0.05).
2. **Basic statement plus biological meaning of statistical result (good response):** Abundance of the sea star *Patiriella exigua* differed significantly between sites (t-test, t=0.165, d.f.=19, p<0.05). Abundance of sea stars was greater at Altona than Queenscliff (Figure 1).

3. **Most concise (best response):** Abundance of the sea star *Patiriella exigua* was significantly greater at Altona than Queenscliff (t-test, t=0.165, d.f.=19, p<0.05) (Figure 1).

**Tables and/or figures.** Do not display the same data in both a table and a figure. Label each figure and table with a caption which tells the reader what is being shown. Tables should be labelled above and figures should be labelled below. Include units where appropriate.

For example:

Table 1. Mean (+ standard deviation) contraction rate of the dorsal blood vessel of the earthworm *Lumbricus* sp. at different temperatures.

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Mean contraction rate (min⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1.6 ± 1.5</td>
</tr>
<tr>
<td>20</td>
<td>10.9 ± 3.1</td>
</tr>
</tbody>
</table>

Words in the results section are not counted in the total word count but you MUST be concise.

**Marks awarded** for a clear and correct display of results incorporating the above features as appropriate.

**Marks deducted** if figures and tables contain no legend, contain no units, or are not described in separate text.

**DISCUSSION**

In the discussion, explain what your results mean by analysing them and assessing their significance. The structure of the discussion is the reverse of the introduction. It starts with specific information about your results and then becomes more general. It usually has four main components.

1. An accurate statement of your main findings (without repeating a detailed presentation of results) including whether or not your hypothesis(es) was/were supported (if relevant). You may give an indication of which data tells you this.
2. An explanation of what your results mean and a comparison with other published sources of information (i.e. books, journal articles etc.)
3. Any methodological issues that may have influenced your results and suggestions for improvement
4. What can or should be done next to further our understanding of the problem. For example, “Future studies could investigate...”
Your discussion should be clearly and concisely written with logical flow of the ideas presented.

**Marks awarded** for a clear, correct, in-depth analysis of your results, with statements supported by references or logical reasoning.

**Marks deducted** if there is little or no analysis of results, or references are not used.

**ACKNOWLEDGEMENTS**

It is important to acknowledge the assistance of others when writing a laboratory report. People to thank in the acknowledgements may include members of your team or group, people who provided specimens, anyone who proofread your work, or anyone who gave feedback or critical comments.

**REFERENCES**

This section lists the collection of journal articles, books, web pages, lab manuals and handbooks that you have cited in your report (in alphabetical order of the authors’ surnames). The types of references permitted for each report may differ between subjects so check your lab manual or with your demonstrator. See chapter 5 for how to format a reference list in APA style.

**APPENDIX**

Any data that is too bulky to include in the results section should go in the appendix. You may need to check with your demonstrator about which data needs to go in the appendix. Details of statistical calculations (if relevant) should also go in the appendix. Statistical analyses usually include null hypothesis (H₀), alternative hypothesis (H₁), calculations and conclusion (was the alternative hypothesis supported?). There is no need to double space the appendix.