Lab Report – IMRaD Style - Quick Guide

This style is commonly used for lab reports in the sciences, engineering, and the computer sciences. The purpose is to describe the results of an experiment you have performed and what you found.

The IMRaD name refers to the four main paper sections which are: Introduction, Methods, Results, and Discussion.

<table>
<thead>
<tr>
<th>Main Section</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Provide background and reason for the study. Finish by stating your aims and hypotheses.</td>
</tr>
<tr>
<td>Methods</td>
<td>Explain the study design, materials and analyses used. What was done and Why.</td>
</tr>
<tr>
<td>Results &amp; Discussion</td>
<td>Explain what was found. Includes text, tables, and figures. Summarise and discuss your major findings. Compare / contrast your findings to other’s studies, discuss, and discuss implications</td>
</tr>
</tbody>
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How to Write the Sections of the Report:

Title
Tell the reader the topic of the report in one concise statement.

Abstract
For lab reports an abstract is generally not included. Check if your lecturer would like you to include one or not. Provide a brief overall synopsis of your report (usually about 250 words). Start with 1-2 sentences on the introductory reason for your work, then summarise the key methods and results, followed by the implications of your findings. Most of the abstract is about your key results. The abstract should crystalise your take home message.

Introduction & Aims
Write in present tense. Explain why you are doing the study. Introduce any key background information including theories, or other studies that are important to your topic. Present arguments for why this study is needed by explaining what is already known on the topic and what the gaps in knowledge still are. These gaps will justify why your particular aims are relevant and timely. Tell the reader what your study is going to be about and why it is relevant (i.e. because you will address something that is not yet known). Define any key terms or definitions for the reader. Be specific and clear.

Your Aims is usually the last paragraph of the introduction. State clearly and simply the overall goal of your study. Then provide the specific questions and hypotheses that you will test.

Methods
Write in past tense, as you are explaining what occurred. Tell the reader exactly what you did and briefly, why you used that method. Ideally, another scientist reading your paper should be able to replicate your study from the methods section. Include information about the population you studied, the sampling and analytical methods, and the statistical analyses used.
Results
Write in past tense. Present what you found in detail and explain the patterns observed. Include written text, and also tables and figures. Table and figures should collate raw data in a concise, informative manner. Do not list raw data. Do not explain the results here, only present and DESCRIBE them. Follow correct formatting when labelling tables and figures; table titles go above the title and figure captions go beneath the figure. Make reference to your tables and figures in the text body BEFORE the table or figure is presented. Include the results of your statistical analyses. Maintain use of good paragraph and sentence structure.

Discussion & Conclusion
Write in present, past, and future tense as appropriate. Start with an interpretation of the results. What do they mean? Describe the key findings from your results and interpretation in relation to your aims. Discuss whether your interpretations support or refute your hypothesis. In the proceeding paragraphs, discuss the reasons for your findings, especially the main findings. Compare and contrast your findings with other studies (e.g. those mentioned in your introduction). Present the strengths and weaknesses of your study including limitations. Discuss the implications of your work (i.e. what does it mean for the field of science & real world) Suggest further research opportunities. Make a final summary and conclusion.

Helpful Tip: It is usually easiest to write the Methods and Results sections first, followed by the Discussion and Introduction. Title & Abstract should be written last.

Use the checklist below to edit your work.
<table>
<thead>
<tr>
<th>Section</th>
<th>Purpose</th>
<th>Verb Tense</th>
<th>Include in this Section</th>
</tr>
</thead>
</table>
| **Title** | Short accurate description of the main outcome or implication of the experiment | Present | ☐ One short sentence that clearly states the experiment or the main result of the report  
☐ Use keywords drawn from the body of the report |
| **Abstract** | A synopsis of the report | Present and Past | ☐ A brief but clear snapshot description of the report: its purpose, main finding, and implications |
| **Introduction** | Provides rationale for the study  
Places the research in context  
States specific objectives of the research | Present – when referring to established knowledge in the literature  
Past – when stating what was done and what was found | ☐ Nature and scope of problem studied  
☐ Justification for the study  
☐ Gaps in knowledge identified  
☐ Short review of relevant literature  
☐ The overall aim of your study  
☐ Specific objectives & hypotheses |
| **Methods** | Describes what was done step by step  
Justifies / explains why particular methods were used  
Describes how data is analysed (i.e. statistics) | Simple past - refers to work done | ☐ Describe location of study and nature of the population (e.g. study site and species)  
☐ Description of procedures (what was done) following the same order as the specific objectives  
☐ Explains and justifies what statistical analyses are conducted |
| **Results** | Describe the outcomes of your research  
Places the data, the facts (what you found, calculated, discovered, observed)  
Outline the key findings | Simple past - refers to what was found, observed. | ☐ The results found  
☐ Your observations during experiments/field work  
☐ Results of any calculations you performed  
☐ Do not include any discussion of results in this section, only descriptions |
| **Discussion** | Summarises the key findings and presents a take home message  
Discusses the possible reasons for the findings  
Puts your results in context of previous research  
Suggests future research | Present – when referring to results in this study  
Past – when referring to other research conducted  
Future – when referring to possible future studies | ☐ Interpretation of the results: trends, relationships, generalizations shown by the results  
☐ Use the findings to address the aims of the study; do they support or refute the hypothesis?  
☐ Discusses any major exceptions (outlying data) and why it occurred / what it means  
☐ How your results agree or disagree with other studies (and why)  
☐ Implications of your work to the understanding of the broad topic  
☐ Suggests what research is needed next (as a follow up on your results) |
| **Conclusions** | Clearly state your overall finding/s and their implications | Present - emphasis on what should now be accepted established knowledge | ☐ Refer back to your Aims; use keywords from the Aims and Introduction  
☐ Implications: outline the significance of your results and applications arising from them |