

# How to Write a Scientific Report

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# Outline

- Structure of a Scientific Report
- Contents of Each Section
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- Grammar Rules  
Tense, Active or Passive Voice, Writing style, Unit, etc.
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# 1. Structure of a Scientific Report

- A recommended order of a scientific report is as follows:

1) Title	2) Abstract	3) Introduction	4) Data
5) Methods	6) Results	7) Discussion	8) Conclusions
9) Action Plan	10) References		

- A recommended order of writing: First, Methods, and then, Data, Results, Discussion, Conclusions, Introduction, and finally, Title and Abstract.

# 2. Contents of Each Section

## 2.1. Title

1. Title should be stated the content of a report clearly and concisely.
2. Use keywords effectively to distinguish from other papers.
3. The first word of the title “The” can be omitted

## 2.2. Abstract

1. The most important points of a paper should be summarized clearly and concisely.
2. Abstract should contain the following contents:
  - the background and purpose of the research,
  - methods and data
  - main results,
  - conclusions and future prospects
3. Do not cite tables, figures or references in the Abstract.
4. After the contents of Abstract, write a maximum of 5 keywords.
5. Abstract usually uses the past tense. The concept of the report uses the present tense.

## 2. Contents of Each Section

### 2.3. Introduction

1. Introduction provides the objectives and background of the research.
2. A common structure is:
  - importance of the topic
  - brief introduction of previous research related to your research
  - identification of unanswered question(s)
  - your approach to find the answers and/or the findings
3. Introduction usually uses the present tense. The present tense expresses the research information that is always or still true. The present perfect tense is also used referring to previous research.

# 2. Contents of Each Section

## 2.4. Data

1. Data which is used for the experiment or analysis is also presented.
2. Necessary and Prominent data presentation is essential for a scientific report.
3. Figures or tables in data should be numbered and presented sequentially and use present tense.

## 2.5. Methods

1. The Methods section gives details of the experiment, the basic theory, numerical method, and method of analysis to gain credibility for the research results.
2. Sufficient detail should be provided so that the work can be reproduced and evaluated by others.
3. Flow chart can be used, if necessary.
4. The model you use for the research should be introduced.
5. Methods usually use the past tense to describe simply what was done.
6. Past passive voice is often used in the methods. Past active voice is also recommended to use in the Methods section. Check which voice is often used in the scientific writing in your research fields and follow it.

## 2. Contents of Each Section

### 2.6. Results

1. Results present to report your findings of the experiments or the analyses.
2. Important data should be presented using figures and tables efficiently.
3. Detailed data should be included in Appendices.
4. Results should be written concise and clear.
5. Results usually use the past tense: either active or passive voice. Results indicate what was done and found. Present tense is used in figures, tables and graphs.

### 2.7. Discussion

1. The Discussion section summarizes the meaning and validity of the analysis results. It should specify the relation between other research results and the issues regards to the analysis. Future research possibilities and practical applications should also be discussed in this section.
2. Past tense is usually used to state the results. Present tense is used to summarize findings.

# 2. Contents of Each Section

## 2.8. Conclusions

1. Conclusion is the final section to present the main research results and future directions.
2. A common structure of conclusions:
  - summarizing main results
  - implications of the results
  - limitations of your study and future work
3. Both of present and past tenses are used in combination.

## 2.9. Action plan

1. Future plan and applications of your research are described in the section.
2. Present tense is usually used.

## 2.10. Appendices

Additional detailed information other than the main text and figures should be put.



## 2. Contents of Each Section

### 2.11. References

1. Every reference cited in the paper should be put in the reference list.
2. All information in the reference list must be accurate.
3. Functions of references are:
  - to give credit to the work of others
  - to add credibility to your study by introducing sources of information
  - to show a relation between your work and previous work,
  - to provide readers with information for their further study








### 2.12. Acknowledgments

Your gratitude should be expressed to those who provide help for the research (e.g. advisors, instructors, lecturers, and other individuals as well as organizations).

# 3. Figure Caption

Figure should be able to stand with its caption. A figure caption should include the followings:

1. A brief title
2. Description of figures
3. Explanations of all symbols, lines, notation, and abbreviations
4. Name of symbols and lines

 : open circle	 : closed (solid) circle
 : open square	 : open triangle
 : solid line	
 : dashed line	
 : dotted line	

5. Possibly method used or essential details

# 4. Equations

- It is recommended to use italic for variables and bold for vectors and matrices. All parameters in equations should be defined in the text when these parameters appear first time.

# 5. Tense

## 5.1. Present Tense

The present tense is used to describe a fact which is always true, general rules, conditions to be set, etc.

## 5.2. Past Tense

The past tense is used to indicate an action or situation which was made or occurred at a specific point in past times. The result of the action or situation no longer continues at present.

## 5.3. Present Perfect Tense

The present perfect is the tense used in the case an action occurred at a specific point in past times but the result of the action continues to the present.

## 5.4. Future Tense

The future tense is used to refer to the time to come after the report is written.

# 5. Tense

## 5.5. Tense used in an Abstract

Either the present tense or the past tense can be used to describe what you did in the research, however, once you decide the tense it should be consistently used. Consult with your adviser as to how to use the tense.

(Note) By using the present tense, the abstract can be made more dynamic although the author writes about the work of the past in the research. For this purpose, actions taken in the research are described in the present tense even in Introduction, Method and Results in many cases. The past tense is normally used for Conclusion.

## 6. Active Sentence or Passive Sentence

1. Active voice is used for a sentence which emphasizes the one who does the action. Using Active voice is recommended since it is more concise and makes the number of word fewer.  
**Example)** It was found  $\Rightarrow$  We found
2. When the subject is an author, either “I” or “we” can be used.
3. Passive voice is used when steps or methods are more important than the doer. For example, in the Method section, the passive voice is more useful.

# 7. How to Write a Paragraph

1. A paragraph is a unit to explain one topic (main issue) and it usually consists of more than two sentences. It is better that each paragraph has a topic sentence (showing main idea) at first and then the rest is used for the explanation (supporting content) which supports the main idea.
2. Between paragraphs, use a transition word to link them.
3. It is not desirable that you use more than two topics in one paragraph.

# 8. Academic Writing Style

1. Avoid using informal phrases
2. Avoid contractions

## Example)

don't ⇒ do not

isn't ⇒ is not

can't ⇒ cannot (can not)

And ⇒ Moreover, Further, Furthermore, In addition,

But ⇒ However, Nevertheless, On the other hand

So ⇒ Therefore, Hence

## British English or American English

Use either of them and use it consistently.



# 10. Unit & 11. Mistakes

## 10. Unit

Use SI unit in the entire text, figures, and table

In particular, use small letter “s” on “sec”, use “m / s” instead of “kine”.

A space is put between numbers and units.

Example) 0.5Hz  $\Rightarrow$  0.5 Hz

## 11. Mistakes

earthquake

“earthquake” is a countable noun.

earthquake  $\Rightarrow$  an earthquake or earthquakes

2011 Tohoku-oki earthquake  $\Rightarrow$  the 2011 Tohoku-oki earthquake

Do a spellcheck of your report on your PC.

# 12. Others

1. Write clear and concise sentences. Avoid writing long sentences over several lines.
2. Do not repeat the same explanation in the same section.
3. Avoid writing something that is not directly related to the purpose of the report. If it is necessary to write, put it in Appendices.
4. There is no need for a Master report to have many pages. Even though there are many pages, the report is given low marks when there are unnecessary descriptions or charts, or many errors in English. Even though the pages are few (e.g. 20 to 25 pages in total), it is given high marks when a very important result is reported with proper logic.

# Useful books

- How to Write and Publish a Scientific Paper 6th edition, Robert A. Day and Barbara Gastel, Cambridge University Press, 2006
- English for Writing Research Papers, Adrian Wallwork, Springer, 2011
- Scientific Writing and Communication: Papers, Proposals, and Presentations, Angelika H. Hofmann, Oxford Univ Press, 2013
- Writing Scientific Research Articles: Strategy and Steps”, Margaret Cargill, Patrick O'Connor, Wiley-Blackwell; 2nd ed., 2013
- Science Research Writing: A Guide for Non-Native Speakers of English, Hilary Glasman-deal, Icp, 2009
- Report, paper, presentation - to science in English: Active English for Science, University of Tokyo Faculty of Arts program ALESS, University of Tokyo Press, 2012

# Plagiarism

**Plagiarism is strongly prohibited on a scientific paper.**

## Note

1. When you paraphrase or summarize another's sentences, write the whole sentences in your own words and site the source. If you paraphrase not the whole but only a part, then it is considered as plagiarism.
2. Use quotation marks when you quote directly from another's words.
3. Even though what you quote is "general scientific knowledge", it is recommended to give credit, just in case.