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A Guide to Writing Successful Scientific Reports

This brief guide is intended to help you improve the quality of your written reports **or** prepare scientific manuscripts if you never had a chance to write science.

Writing a scientific report is the crown of a particular project. It is important to:

- Plan carefully how you are going to write and illustrate the report, allowing enough time for unforeseen circumstances. **It will always take you much longer than you think it will!**
- Consider who the readers will be (e.g. tutor, external examiner, employer, family, friends, etc.). What is the reader expecting to learn? What level of scientific terminology will he/she understand?
- Think about the title and purpose of the report. How specific or how detailed should it be?
- Think carefully about the length. Is there a specified word limit?

The purpose of any written communication is to share knowledge and information as well as to communicate your own and others' research. The report should therefore be clear, logical and factual. The language should be accurate and concise. The use of grammar as well as the sentence structure must be correct. It is furthermore very important to properly and appropriately cite references in order to acknowledge your sources and give credit where it is due.

THE ABC OF REPORT WRITING

- **A**ccuracy
- **B**revity
- **C**larity

The easier your report is to read, the more effective it is!

KEY STAGES IN SCIENTIFIC WRITING

1) Define the purpose, title and readership of the report.
2) Design a suitable structure with appropriate headings and sub-headings.
3) Gather all the relevant material (e.g. books, articles, information from websites; your own field notes) and note down the main points under the appropriate headings and subheadings; try to avoid information overload; be ruthless – reject anything which is not necessary for the main purpose of the report.
4) Think about appropriate diagrams to illustrate the text; prepare draft versions of these before starting to write – it is much easier to write figure-supported text.
5) Write a rough first draft as quickly as possible directly on your computer/tablet
6) Write the final version, carefully checking all facts, citations and references, figures, etc.
   - make sure that the text flows smoothly
   - check that you have used paragraphs appropriately
   - check for spelling mistakes using the spell-checker
   - check that you have used correct grammar and punctuation
   - make sure that your subheadings agree with the Table of Contents
   - read it through carefully to ensure that everything you have written is relevant.
   - Write an ABSTRACT or EXECUTIVE SUMMARY; this should be done last and should summarize the main issues and conclusions of the report.
   - Get a friend or colleague to countercheck the report to see how clear and comprehensible it is.

CHOOSING A SUITABLE FORMAT FOR THE STRUCTURE

TITLE
The title reflects clearly and with little words the content of the report. The title page includes the name and address of the author, the date and, for a formal business report, the name of the person or group to whom the report is addressed.

ABSTRACT OR SUMMARY
This is a miniature version of the report. It should be short: 100-200 words are usually sufficient.

TABLE OF CONTENTS
This table indicates on which page a particular topic (heading or subheading) may be found. Microsoft Word has a tool to create a professionally laid out list of contents for you.

INTRODUCTION
A brief introductory section should outline the purpose of the report.

MAIN TEXT
The main part of the report should be divided into sections using appropriate subheadings. These will vary depending upon the nature of the report. Use different text styles for different levels of heading: e.g.

1. GEOLOGICAL HISTORY OF THE AREA
1.1 Basement gneiss
1.2 Cambrian quartzite
1.2.1 Evidence for current directions

CONCLUSIONS
These should be short, to the point, and must reflect back on the contents of the main body of the report.

ACKNOWLEDGEMENTS
Thank the people who have helped you e.g. project partners, tutors, people who have provided data or help with sample collection/preparation etc.

REFERENCE LIST
The complete reference to any published work cited in the text must be given in alphabetical order in a separate section, at the end of the report. There are many different ways of formatting references. One possible style is given below. You should look at a range of scientific journals (e.g. Geology, Nature, Journal of the Geological Society) for alternative ways of doing this. End-Note is an efficient tool that automatically generates in-text references and Bibliography.

APPENDICES
These should be used to present detailed information that might otherwise distract from the main flow of the report. Examples of appendices might include lengthy tables of data, detailed sample or technical descriptions, stratigraphic logs etc.

DOES THE APPEARANCE OF A REPORT MATTER?
YES it does!

FONTS
Experiment with the range of options in word processors for selecting the font of the text.
- First decide on an appropriate typeface for your own “house-style” – simplicity is recommended. Times (or Times Roman) is one of the most common fonts used.
- Next decide on the appearance of your different levels of headings and sub-headings (examples are given above).

FONT SIZE
Experiment with changing the font size. This report is mainly printed in 10 point text. This may be too small if you select Times as your main font.

SHOULD I JUSTIFY THE TEXT?
In general, text which is both left and right justified (aligned to both left and right hand margins) looks neater than text which is only left justified.

LINE SPACING
Single spaced text typically looks better than 1.5 times or double spaced text. However, the Bachelor Thesis should be double-spaced.

HOW TO AVOID MAKING MISTAKES
SPELLING: If you are not particularly good at spelling use a DICTIONARY or the Spell-check and Thesaurus functions of the word processor. Use a Geological Dictionary to check the correct spelling of technical terms.

WRITING STYLE
You should always write formal reports in the third person: e.g.
Samples were collected from key stratigraphic sections in the NE part of the area **versus**
I collected samples from key stratigraphic sections in the NE part of my area

HOW IMPORTANT ARE FIGURES?
Figures are extremely important in any scientific report. They may take the form of graphs, field sketches, field photographs, stratigraphic logs, sketch maps etc. Develop your skills in using graphics software (e.g. Corel Draw, Adobe Illustrator) as soon as possible so that you can produce professional-looking reports. Each diagram should have its own detailed caption and should be referred to as Fig. 1 or Figure 1 (Fig. 2 and so on) in sequence in the text. You should not refer to Fig. 3 before Fig. 2 etc. Photographs may be referred to as Figures.

CORRECT USE OF PHOTOGRAPHS
Photographs are extremely useful in illustrating field relationships in geological reports. Photographs should be carefully selected to illustrate a particular point and should always have a scale (e.g. hammer, coin, or ruler) and, if necessary, orientation. Digital cameras now make it extremely easy to incorporate photographs into reports; alternatively prints can be scanned and imported in the report document. Avoid too many photographs – this can make the report look like a photo album. Once you have got the hang of using graphics software it is very easy to annotate digital photographs and label key features, highlight stratigraphic contacts etc.

REFERENCES
There are many different ways of formatting references in the REFERENCE LIST. The following are some examples based on the style used by the Geological Society of London in its publications.

BRABB, E. E., PAMPEYAN, E. H. & BONILLA, M. G. (1972) Landslide Susceptibility in San Mateo County, California. United States Geological Survey Miscellaneous Field Studies Map MF-310.

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GIBSON, S. A. (1988) The geochemistry, mineralogy and petrology of the Trotternish Sill Complex, northern Skye, Scotland. PhD thesis, Kingston Polytechnic.

HARPER, D. A. T. & RYAN, P. D. (1990) Towards a statistical system for palaeontologists. Journal of the Geological Society, London, 147, 935-948.

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THIRLWALL, M. F. & JONES, N. W. (1983) Isotope geochemistry and contamination mechanics of Tertiary lavas from Skye, Northwest Scotland. In: Hawkesworth, C. J. & Norry, M. J. (eds) Continental Basalts and Mantle Xenoliths. Shiva, Nantwich, 186-208.

WORTHINGTON, P. F. (1990) Sediment cyclicity from well logs. In: Hurst, A., Lovell, M. A. & Morton, A. C. (eds) Geological Applications of Wireline Logs. Geological Society, London, Special Publications, 48, 123-132.

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