Writing a scientific paper

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Lectures

Introduction:

- Brief History of Science and Scientific Writing

Scientific writing:

- Structure and content of a paper
- Writing and revising a scientific paper
- The peer-review process

Effective Scientific writing:

- How to write more effectively

Activities

- Read and discuss recent scientific articles
- Write a short article

Presentations and articles will be available at http://stockage.univ-brest.fr/~gula/SE/

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Writing a Scientific report

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Scientific report

Scientific report : it is « **an extended scientific article** » though not exactly

The similarity is in the structure :

- the introduction must introduce the context, report the state of the art, identify the new question(s) and propose a method and a plan
- The core of the report must describe in details the methodology and the main results, with figures and tables
- The conclusion must recall the main findings, relate them to the original questions and identify the limits of this study or future paths of research on these questions

Scientific report

The difference with a journal article lies in the fact that

- you have **much more space** in a report,
- you can address a **wider audience**

Therefore you can provide **more details on the context and method** and you do not have to refer to previous work to avoid these details

You can insert **more figures and tables**, and perhaps also **more tentative ideas or paths of research** in a report.

Scientific report

You expect the report to be well organized and concise enough so that you can easily find a piece of information

But you also want to find details about specific subjects

–> *keep a balance between details and conciseness*

The introduction

- Its form and length will depend on the nature of the report
- For a technical report, recall the need for the study and the present state of knowledge (brief)
- For a scientific report, the state of the art will be much more detailed and will lead to the scientific question(s) to be addressed in the report
- As in a paper, the introduction needs to introduce the rest of the writing (plan)

The core of the report

- Will address the questions separately
- Each section addresses one question or one part of a question
- Each subsection addresses one part of the answer to the question
- Each paragraph addresses one idea
- Transitions between paragraphs are welcome (the author knows what comes next, the reader doesn't)

The core of the report

- Needs many illustrations (not limited as in a paper)
- Can include references to previous work with the aim of supporting or criticizing previous results
- A summary of the main results at the end of each long section is welcome
- Series of figures or proofs/detailed calculations should be put in appendix (except if these latter constitute the main results of the work).

The core of the report

- The presentation will differ if the work is a technical report/ users' manual, a data report, or a scientific report
- Technical reports, users' manuals : the reader expects to find many details on each subject covered
- Data report : where were the data collected, how, with which accuracy, how were the data processed, how were they qualified, what is their final accuracy, how do they compare with previous data ?

The conclusion

- Needs to underline the major points of the work with their relative importance
- Needs to show how the original questions were answered, and what is left unanswered, or less accurately determined
- Can provide new directions for further research

Scientific report

Make it clear what is yours:

- If you use a result, observation or generalisation that is not your own, you must state where in the scientific literature that result is reported.
- The only exceptions are cases where every researcher in the field already knows it -- *dynamics equations need not be followed by a citation of Newton.*
- Which parts of the report are descriptions of previous knowledge and which parts are your additions to that knowledge should be obvious to the reader.

Scientific report

Make it clear what is yours:

- If you are writing in the passive voice, you must be more careful about attribution than if you are writing in the active voice:
  - *"The sample was prepared by heating yttrium..."* does not make it clear whether you did this or not.
  - *"I prepared the sample..."* is clear.

Homework

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For next lecture (Oct. 1st):

- Read: **Eva's report**

  We will discuss it collectively

- Start to think about your article:
  - Find a subject (you can use results from your Master's thesis).
  - Select a few figures (1<#<4) and write the main ideas (don't bother with style , just write down your ideas).
  - Think about the take-home messages