Outline

- Principles of good scientific writing
- Proper references
- Authorship
- Plagiarism
- Peer review
Good scientific writing - 1

- be concise and precise
  - keep your audience in mind!
  - eschew long Introductions
  - leave out unnecessary detail and avoid jargon
  - do not be wordy and avoid subjective criteria

- structure your article well
  - put your measurement or calculation in context
  - motivate it
  - describe methods sufficiently well that the results can be checked, but do not describe methods that are known
  - present the results
  - draw your conclusions and discuss as appropriate
  - brief synopsis at the end
Making an outline before you begin.

Tips:
- If you can delete a word and lose nothing in content, then delete it.
- Get rid of phrases you would never say:
  - “In this Letter, we … “
  - “In order to facilitate the reduction of the systematic uncertainty …. “
- Make the paper as brief as possible, and not longer.
- “Uncertainty” is not “error”
- Pay attention to tenses:
  - The W mass is 80.4 GeV.
  - We obtained a value of 80.4 for the W mass.
- Spelling errors are intolerable!

Don’t be impressive – be clear and accessible!

http://course1.winona.edu/mdelong/EcoLab/21_Suggestions.html
http://classweb.gmu.edu/biologyresources/writingguide/ScientificPaper.htm
use good English! 
- even if it is your native tongue...
- when in doubt, ask an experienced writer
- conventions vary from journal to journal
  - British vs. American English
  - hyphenation, capitalization, passive vs. active voice, etc.

impose high standards on yourself
- Good writing is re-writing.

Consider forming a student team to review each other’s drafts.
Proper references are an essential part of being a scientist!

This is a subtle & sticky point and the source of much anger, frustration and enmity.

Your own future will depend on other scientists citing your own work.

Don’t make enemies by ignoring other scientists’ work!
Referencing - 2

- You should cite a work if:
  - your result depends on results from that work
  - your result should be compared or contrasted with results from that work
  - you use methods described in that work
  - that work reports an analysis or calculation very similar to yours, and appears almost at the same time.

- Cite all relevant works, not just a representative subset.

- When in doubt, ask yourself: If I were the author of that other work, would I expect to be cited?

Authorship - traditional

- Authors should have made a real contribution to the results reported in the paper.
- Key contributor(s) usually comes first.
- Often the leader of a group comes last.
- Someone with whom you had interesting and relevant discussions should be acknowledged but not included as an author.
- (Also remember to acknowledge the source of funding for the project.)
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“No, it’s my wife’s turn to be the first author on your paper.”

5-Nov-2012
Authorship – large collaborations

- Very large collaborations (> 50 scientists) have different rules about authorship.
- The success of the experiment is ensured only if all members of the collaboration make their contributions.
  - design, construction, commissioning & maintenance of the apparatus
  - calibrations, offline reconstruction & detailed simulations
  - general analysis tools shared by all
  - interdependent measurements (background vs. signal)
- All contributions need to be acknowledged, so all members of the collaboration are included on the authors list.
- To avoid endless struggle about the relative importance of contributions, authors are usually listed in alphabetical order.
Very large collaborations (> 20 scientists) have different rules about authorship. The success of the experiment is ensured only if all members of the collaboration do contribute.

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Plagiarism is unethical scientific conduct and is unacceptable in each and every instance. It amounts to stealing. Strict guidelines and laws in Europe, the Americas and in Japan. Most universities and research institutions will immediately expel anyone found to have plagiarized the works of others (or even himself). Sometimes a scientists’ Ph.D. is revoked. bad bad bad
Several forms of plagiarism

- outright lifting of sentences and paragraphs
- paraphrasing extensive passages
- repeating a line of argument or logic, or a series of linked ideas, without attribution
- using pictures, drawings, etc. without permission
- using computer codes without acknowledgement
- self-plagiarism: publishing the same text, ideas, results more than once

a terrible way to end a promising career…

When in doubt, check with an experienced colleague.
A vital function scientists perform is the review of others’ work.

Without this system, most scientific fields would break down (functionally speaking).

Work is sent by a journal editor to you to review confidentially. You send back your evaluation which helps the editor to decide whether to accept the paper or not.

Individuals get a reputation for being good or not-so-good referees.
Refereeing - 2

- obvious pitfalls
  - a referee could steal the idea of a paper
  - he could suppress (i.e., recommend rejection by the journal) a paper if it competes with his own work.
  - he could express overly harsh criticisms of competing methods, analysis, results, etc.
  - he could make only a superficial reading of a paper and overlook serious deficiencies, thereby compromising the reputation of the journal and allowing a flawed paper to be taken seriously by the community.
  - If he is slow to do his duty, a good paper could languish.
  - If he gets too involved in rewriting the paper or suggesting changes to the method, he plays the wrong role.

- a time consuming but very important **duty**.

5-Nov-2012
Final words

- From the American Physical Society:

Each physicist is a citizen of the community of science. Each shares responsibility for the welfare of this community. Science is best advanced when there is mutual trust, based upon honest behavior, throughout the community. Acts of deception, or any other acts that deliberately compromise the advancement of science, are unacceptable. Honesty must be regarded as the cornerstone of ethics in science. Professional integrity in the formulation, conduct, and reporting of physics activities reflects not only on the reputations of individual physicists and their organizations, but also on the image and credibility of the physics profession as perceived by scientific colleagues, government and the public. It is important that the tradition of ethical behavior be carefully maintained and transmitted with enthusiasm to future generations.

http://www.aps.org/policy/statements/02_2.cfm

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credits

- http://www.thewritersworkshop.net/classes_fiction.htm
- http://hsc.usf.edu/publichealth/email/etatt2.htm
- http://www.wikipedia.org/
- http://www.thecreativepenn.com/