Scientific Writing

ACS Style Guide – Janet Dodd (2nd or 3rd edition)
ACS Online Reference Style Guidelines
http://pubs.acs.org/books/references.shtml
ACS Scientific Writing Resources on the Web:
http://www.chemistry.org/portal/a/c/s/1/acsdisplay.html?id=e5cada7e8b6b11d5f7eb3fb9e800100

How to Write and Publish a Scientific Paper by Robert A. Day
Introduction to Journal-Style Scientific Writing
http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWgeneral.html

On being a scientist: responsible conduct in research
Committee on Science, Engineering, and Public Policy
http://books.nap.edu/openbook.php?isbn=0309051967

On Writing Well: An Informal Guide To Writing Nonfiction by William Zinsser
Style: Toward Clarity And Grace by Joseph M. Williams

Writing Guidelines for Engineering and Science Students
http://www.writing.eng.vt.edu/

The Craft of Scientific Writing by Michael Alley
A scientific paper should:
• Present the facts in an unbiased manner
• Be clear: concise and complete
• Use facts to make statements
• Be complete enough that other scientists can repeat your work (research papers)

A scientific paper should not:
• Be haphazard, jumbled and illogical
• Be used as your own personal soapbox
• Reach conclusions not based on evidence reported
• Be for insiders only

A Scientific Review Paper

A good review paper should:
• Bring together published material for the purpose of:
  • Evaluation
  • Discussion
  • Dissemination
  • Tutorial
• Present pertinent facts about the subject
• Be up to date about the progress in the area
• Give some conjecture about the future of the area

Do not present experimental results
Anatomy of a Scientific Paper

• Title
• Abstract
• Introduction
• Background (Introduction and Background often together)
• Current Research (Results in research paper)
• Future Directions (Discussion in research paper)
• Summary and Conclusions
• References (Bibliography)

Organization of a Scientific Paper

• Title
  • Clear definition of what you are talking about
• Abstract
  • Write after the paper is fully written
  • Summary of what the paper is about
• Introduction
  • Very brief, general discussion of the area
• Background
  • General information about the field
  • Bring the reader up to the level necessary to understand the current research section
  • 5-10 papers
• **Current Research**
  • Review the current literature in the area
  • Organize with sections
  • Gives reader a sense of where things are right now

• **Future Trends**
  • Where will the field go?
  • You can be more speculative with this section

• **Conclusion**
  • Short, not a copy and paste of the current research

• **Bibliography**
  • Organized and formatted correctly

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**Title**

• The *fewest* words possible that cover the purpose of the paper
  
  • *A. Einstein, "Everything should be made as simple as possible, but not simpler."*

• NVR. U. ABBRVS. In a TTL. Like OMG. WTF. BBQ.
• Include technique or method (Research Paper)
• Include author’s name and affiliation (University of North Florida)
Abstract

- A short paragraph which summarizes the paper
- A good abstract contains:
  - A concise statement that describes the purpose of the paper
  - Includes results and conclusion (specific but not detailed)
  - Is written last
  - Does not include anything that is not in the paper
- For reviews, perhaps include limited citation sources and the scope of the review

Introduction

- Should be a clear statement of the study’s objective
- You are introducing the topic:
  - State the relevance of the topic
  - Give the purpose of the paper
  - Include breadth of the coverage
- Mention previous reviews in the same area
Background

• Define and explain the terms, concepts, and theories necessary to understand the paper
• Be as short and complete as possible
• The background has two purposes:
  • To set up the context for the discussion in the body of the paper
  • Allow a scientist to become familiar with the theoretical groundwork of the subject

Current Research (Results)

• Use sub-titles to organize the material
• Use introductory sentences to keep the reader focused
• Present material in a logical fashion
• Provide details as needed
• Add in comparison and contrast information (if appropriate for paper)
Future Directions

• Summarize the current direction of the area chosen
• Discuss problems, challenges, and obstacles future research faces
• Predict (based on information) where you think this area of research is headed (or where you think it should be headed)
• Be realistic:
  • We will not all be living on Mars in twenty years
  • Almost everyone does have a computer today

Summary and Conclusions

• Short and sweet (pontification is prohibited)
• Remember your stated objective!
• Summarize the paper (look at your abstract) and state your conclusions
• Don’t try to sell your conclusions (the reader has reached their conclusions based on the facts you presented). Incredible claims require incredible proof!
• Try to anticipate and respond to potential questions
References

There are three major styles

• **Name and year**
  - These references are planed at the end of the sentence in parentheses (Einstein, 1955)
  - Index is then alphabetical, using years as secondary

• **Italic number in line**
  - Place number in parentheses or brackets at the end of the sentence (34) or [34]
  - Index is in the order of appearance

• **Superscript numbers**
  - These numbers appear at the end of a line after the period.\(^34\)
  - Index is in the order of appearance

Be complete, correct, and consistent

Acknowledgements

• You did not just win an Oscar (forget about friends and family)
• You may wish to thank
  - Proofreaders
  - Mentors
  - Colleagues who helped
  - Information source?
  - Institution
Writing Style

• Use short sentences
• Be unambiguous
• Primarily passive voice
  • use active if it is less wordy
• Primarily past tense
  • use present tense in results, discussions, conclusions if appropriate
• Avoid first person singular/plural wherever possible
  • don’t confuse the sentence
• Be gender neutral

Other thoughts

• Do a spell check! (even if it may be tedious)
• Don’t talk down to the reader
• Avoid blather (BS)
• Do not plagiarize
  • taking parts of sentences or complete sentences directly from papers
  • use quotes if necessary and cite work. (use very sparingly)
• Have someone else critically read the paper
Proofreading

• Content, grammar, spelling, format
• Use proofreading marks
• Check for words like from(form), there (their)
• Capitalization
• Read a sentence and identify if it says what you meant it to say
• Spell check! (It’s free)

Plagiarism

PLAGIARISM: Intentionally or knowingly presenting the work of another as one’s own (i.e., without proper acknowledgment of the source). The sole exception to the requirement of acknowledging sources is when the ideas, information, etc. are common knowledge.*

* http://www.unf.edu/registrar/forms/misconduct_policy.pdf