

Scientific Writing for Scientists

Definition of genre

Scientific writing frames a problem in the context of current work in the field and explicates the author(s)'s research using a format that is easy to skim for major findings and conclusions. Examples of scientific writing include articles for peer reviewed journals, grant proposals, and theses/dissertations in the sciences. Related genres include [Laboratory Reports](#), [Research and Grant Proposals](#), and [Literature Reviews](#).

Format

Scientific writing usually follows a standard formal structure, frequently abbreviated IMRD (for Introduction-Methods-Results-Discussion):

- *Abstract*: A brief summary of the other sections, typically 100-200 words. Includes motivation, question, hypothesis, method, and major conclusions. (See our [Abstract](#) guide for more detail.)
- *Introduction*: Motivation for the research, literature review of previous relevant studies (background), question(s) addressed by the present research, and hypotheses to be tested.
- *Materials and Methods*: Summary of the technical information necessary to repeat the experiments. Includes experimental design, materials, and protocols.
- *Results*: An objective review of the experimental results. In other words, what happened when the methods were performed? Frequently includes figures/tables/etc. to present the data.
- *Discussion/Conclusions* (sometimes included at the end of Results section): addresses the question: "do the results support the hypothesis?" Evaluates the strengths and weaknesses of the experiment, summarizes the implications of the results, and proposes further research that might clarify or supplement the findings.
- *Works cited*: APA format is acceptable in most classroom settings. Every journal has its own formatting style; refer to specific journals for models.

Actions to take

- Choose a concise, clear, and precise style.
- Favor active voice. Many students and some faculty believe that passive voice is the only mode for a scientific paper. This attitude, thankfully, is changing. Current editors encourage the use of active voice when appropriate. (Note that active constructions are

often possible without necessarily resorting to the increasingly accepted pronouns “I/we.”) To encourage a tone of objectivity, personal pronouns should not dominate the writing.

- Use present tense for established fact (e.g. previously published in a peer reviewed journal) and past tense for the work and findings you are presenting. For example, the statement, “Sea urchin embryos disassociate under low salt conditions (McClay 1978),” would be appropriate in an introduction; whereas the statement, “The embryos disassociated when placed in the chamber. This could be due to low salt conditions (McClay 1978),” would be appropriate in your discussion section.
- Include captions, and refer to the figures in your narrative text. Figures don’t speak for themselves.
- Cite your sources. Each fact presented that is not common knowledge must be easily traceable. When several experiments support a claim, cite all of them so the degree of experimental support for that claim is apparent.

Helpful Links

<http://www.dickinson.edu/departments/biol/BioWritingGuide/biogdline.html>

From the Dickinson College Biology Department, this website offers a detailed guide to scientific writing.

<http://www.chem.duke.edu/undergraduate/major/communication/sciwrite.html>

An annotated summary of internet sources on scientific writing courtesy of the Duke University Chemistry Department.

<http://www.nature.com/nature/>

The peer reviewed journal *Nature* is known for its extremely brief research reports (“Brief Communications”) as well as longer pieces. Look here for high quality, super-concise scientific writing.