

◆ Writing a Journal Article, Dissertation, or Research-Grant Proposal: Steps for Graduate Students and Others

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Editor's Note: How to prepare a piece of scientific writing often baffles graduate students and other beginning researchers. Three tables in *How to Teach Scientific Communication* by F Peter Woodford (Reston, VA: Council of Biology Editors; in press) offer clarification by listing steps for writing journal articles, dissertations, and grant proposals. Lightly

adapted versions of those tables appear below; the text of the book elaborates on the steps listed, which are largely parallel for the 3 writing tasks. Readers might find these lists helpful not only in teaching students but also in providing informal guidance to authors.

Author F Peter Woodford, a former president of CBE, has been active in scientific

research, editing, and administration. His many publications include *Scientific Writing for Graduate Students* (CBE, 1968), of which *How to Teach Scientific Communication* is a rewritten and updated version.



Writing a Good Journal Article

1. Ask yourself whether the time is right.
2. Clarify your conclusions by preparing tables and figures, complete with titles and footnotes.
3. Decide who will be coauthors.
4. Consider the ethics of scientific publication.
5. Relate your conclusions to the existing body of knowledge.
6. Write a working title and abstract.
7. Choose the target journal and make notes on its instructions for authors.
8. Name the main sections.
9. Fill the section files with relevant brief notes in any order, to form "rag-bags".
10. Arrange the contents of rag-bags logically.
11. Complete the design and content of tables and figures.
12. Make a topic outline and consider writing a sentence outline.
13. Write the first draft continuously, collecting references as you go.
14. See whether the first draft needs major alterations.
15. Have the illustrations prepared in final form for the target journal.
16. Polish the prose.
17. Rewrite the title and abstract.
18. Request private review by 3 independent critics and your coauthors.
19. Reread the instructions for authors and make whatever adjustments are necessary.
20. Revise as many times as necessary.
21. Submit the article to the journal.
22. Analyze the editor's decision letter and respond appropriately.

Writing a Good Research Dissertation

1. Ask yourself whether the time is right.
2. Clarify your conclusions by preparing tables and figures, complete with titles and footnotes.
3. Decide who should be in the acknowledgment.
4. Take ethical matters into consideration.
5. In relating your conclusions to the existing body of knowledge, be judiciously selective.
6. Write a working title and abstract.
7. Study the awarding body's instructions for authors.
8. Set up section files for both main headings and subheadings.
9. Fill the section files with relevant brief notes in any order, to form "rag-bags".

10. Arrange the contents of the rag-bags logically.
11. Complete the design and content of tables and figures.
12. Make a topic outline and consider writing a sentence outline.
13. Write the first draft continuously, collecting references as you go.
14. See whether the first draft needs major alterations.
15. Have the illustrations prepared professionally if necessary.
16. Polish the prose and clarify the style.
17. Rewrite the title and abstract.
18. Seek private review by 3 critics if possible.
19. Reread the instructions for authors and make whatever adjustments are necessary.
20. Revise as many times as necessary.
21. Submit the dissertation to the examining body.
22. Prepare yourself thoroughly to answer examiners' questions concisely.

Writing a Successful Research-Grant Proposal*

Preparation

1. Ask yourself whether the time is right.
2. Write a working title and abstract.
3. Choose a target funding agency and make notes on its documentation.
4. Consider the ethics of applying to different agencies.
5. Decide who will be coauthors.

Writing the Research Plan

6. Relate your proposal to the existing body of knowledge.
7. Name the main sections and create section files bearing the names.
8. Fill the section files with relevant brief notes in any order, like "rag-bags".
9. Arrange the items in the rag-bags logically.
10. Make a topic outline and perhaps a sentence outline.
11. Write the first draft continuously, collecting references as you go.
12. See whether the first draft needs major alterations.
13. Polish the prose.
14. Rewrite the title and abstract.
15. Request informal, friendly review by 3 critics and your co-proposers.

Completion

16. Reread the agency's documents and make whatever adjustments are necessary.
17. Revise as many times as necessary.
18. Submit the proposal to the agency.
19. Analyze the agency's decision letter and react appropriately.

*This list was prepared with the collaboration of Maureen Goode.