MANUSCRIPT

Writing clearly is a worthwhile goal for any scientist, at least any scientist who expects to be published in a major journal.

Writing well means presenting your argument and evidence in a clear, logical, and creative way. An interesting argument hidden in flowery prose is of no use to anyone.

Clear writing takes effort. Besides requiring knowledge of basic grammar and syntax, it requires a good ear, a sense of proportion, and an ability to critique oneself.

Ultimately, anyone who wants to write clearly needs to develop a critical sense. You need to be able to judge your own writing objectively and, putting aside the brilliance of the content, honestly evaluate its ability to communicate.

Below are a few tips useful to anyone writing for scientific journals.

By critiquing your papers with the following ideas in mind, you’ll definitely sharpen your writing and improve your odds of publication.

1. Determine what you’re trying to say before writing it. Figure out precisely what you want to say. This may sound obvious, but many do not bother to do it. Knowing what you want to say beforehand maximizes the odds of producing an organized, persuasive paper.

2. Think in terms of an outline. To ensure a logical flow, start by making an outline (even if it’s in your head). Please see our newsletter “Eight Steps to Developing an Effective Outline”

3. Write direct sentences. Have only one idea or point per sentence. Keep sentences simple and short. Use two sentences rather than joining them with “and”.

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3. Write direct sentences. Have only one idea or point per sentence. Keep sentences simple and short. Use two sentences rather than joining them with “and”.
4. **Be brief.** Conciseness is important in writing research papers. Learn to look for long phrases that can be shortened.

5. **Organize your thoughts.** Be sure that every paragraph has a clear topic sentence and that the paragraph content supports the topic. Remember, the goal is to report your findings and conclusions clearly, with as few words as necessary.

6. **Substitute action verbs for "to be".** "To be" is an important verb, but it weakens the text when used excessively. For example, think about changing "is a summary of" to "summarizes".

7. **Be sparing with adjectives & adverbs.** Try to remove unspecific modifiers such as "very," "extremely," and "highly". When you do use modifiers, make them as specific as possible. For example, try changing "a very good response" to "the expected response".

8. **Be as precise as possible.** Avoid phrases such as "a number of" and "a quantity of". If you can, replace these with a word such as "many," "few," or "some," or, even better, the actual number.

9. **Avoid unnecessary constructions and prepositions.** Phrases such as "It is clear that" and "The fact is that" are empty verbiage. Assuming you believe what you are about to say, just say it.

   The same is true for prepositional phrases such as "In order to" or "In an attempt to." "In order to understand this reactions, we . . . " is better said as "To understand this reaction, we. . . ."

10. **Look for omissions.** Did you forget an essential sentence or two in your conclusion that explains your thought processes to someone who doesn’t think about these issues every day?

11. **Look for repetitions.** When you see the same word used repeatedly, consider using synonyms. Although repeating a word or phrase is sometimes effective rhetorically, it can also make your sentence structure clumsy.

12. **Write as you speak.** Wherever possible, use words you ordinarily speak and hear. If you can't hear yourself saying it, then don't see yourself writing it.

13. **Leave it alone for a while.** Of course, there’s not always time, but do this whenever you can. You will be surprised how many flaws will appear in your manuscript when you put it aside for a while.

14. **Edit, edit, edit.**

   For more detailed information regarding writing a manuscript for publication, please review some of our other articles at [http://www.sfedit.net/newsletters.htm](http://www.sfedit.net/newsletters.htm). These articles approach such subjects as Writing the First Draft, Writing Effective Results, Methods and Materials, Discussions, Selecting a Journal, Responding to Reviewers,
Eight Steps to Developing an Effective Manuscript Outline

Preparing an outline is the most important step in the process of producing a manuscript for publication in a journal. The outline bears roughly the same relation to the final manuscript as an architectural blueprint does to a finished house.

Its purpose is to divide the writing of the entire paper into a number of smaller tasks.

A good outline will organize the various topics and arguments in logical form. By ordering the topics you will identify, before writing the manuscript, any gaps that might exist.

There is no single best way to prepare a scientific manuscript, except as determined by the individual writer and the circumstances. You should know your own style of writing best. Whatever you decide to do, you should follow at least these steps before beginning to write your manuscript.

Remember, at this stage, you are only constructing an outline. You are not writing; you just need to put down some notes to guide your thinking.

1. Develop a central message of the manuscript

Prepare a central message sentence (20-25 words). If you were asked to summarize your paper in one sentence, what would you say? Everything in the manuscript will be written to support this central message.

2. Define the materials and methods
Briefly state the population in which you worked, the sampling method you employed, the materials you used, and most importantly, the methods you used to carry out the study.

3. **Summarize the question(s) and problem(s)**

What was known before you started the study? What answers were needed to address the problem(s)? List the key points pertaining to the question(s) and problem(s). What did you do to answer the question(s)?

4. **Define the principal findings and results**

Your central message sentence probably encapsulates the most important findings. There may be others that you feel ought to be included. List these in note form. Don't worry about the order or about how many you put down.

5. **Describe the conclusions and implications**

Make brief notes on each of the implications that arise from your study. What are the principal conclusions of your findings? What is new in your work and why does it matter? What are the limitations and the implications of your results? Are there any changes in practice, approaches or techniques that you would recommend?

6. **Organize and group related ideas together**

List each key point separately. Key points can be arranged chronologically, by order of importance or by some other pattern. The organizing scheme should be clear and well structured. You can use a cluster map, an issue tree, numbering, or some other organizational structure.

Identify the important details, describe the principal findings, and provide your analysis and conclusions that contribute to each key point.
7. Identify the references that pertain to each key point

8. Develop the introduction

Before beginning on the introduction, read through the notes you have made so far in your outline. Read them through and see whether there is a coherent and cohesive story and a unifying theme that runs through the outline.

Your introduction outline should start with the main message, describe what the purpose or objective of your study was, how you went about doing the study, what you found and what are the implications of what you found.

Twelve Steps to Developing an Effective First Draft of your Manuscript

San Francisco Edit
www.sfedit.net

You should now have detailed notes you can use to write your draft paper. If you don’t have one already, it may help to prepare an outline for each section which includes a number of major headings, sub-headings and paragraphs covering different points. If you need help in preparing an outline see our article Eight Steps to Developing an Effective Manuscript Outline at www.sfedit.net/newsletters.html. At this point you will need to convert your notes and outline into narrative form.

Some people recommend that you begin with the Introduction and continue in order through each section of the paper to help ensure flow. Others suggest that you begin with the easiest sections, which are usually the Methods and Results, followed by the Discussion, Conclusion, Introduction, References and Title, leaving the Abstract until the end. The main thing is to begin writing and begin filling up the blank screen or piece of paper.

1. Consolidate all the information. Ensure you have everything you need to write efficiently, i.e., all data, references, drafts of tables and figures, etc.

2. Target a journal. Determine the journal to which you plan to submit your manuscript and write your manuscript according to the focus of the targeted journal. The focus may be clearly stated within the journal or may be determined by examining several recent issues of the targeted journal.
3. **Start writing.** When writing the first draft, the goal is to put something down on paper, so it does not matter if sentences are incomplete and the grammar incorrect, provided that the main points and ideas have been captured. Write when your energy is high, not when you are tired. Try to find a time and place where you can think and write without distractions.

4. **Write quickly.** Don't worry about words, spelling or punctuation at all at this stage, just ideas. Keep going. Leave gaps if necessary. Try to write quickly, to keep the flow going. Use abbreviations and leave space for words that do not come to mind immediately.

5. **Write in your own voice.** Expressing yourself in your own way will help you to say what you mean more precisely. It will be easier for your reader if they can “hear” your voice.

6. **Write without editing.** Don't try to get it right the first time. Resist the temptation to edit as you go. Otherwise, you will tend to get stuck and waste time. If you try to write and edit at the same time, you will do neither well.

7. **Keep to the plan of your outline.** Use the headings from your outline to focus what you want to say. If you find yourself wandering from the point, stop and move on to the next topic in the outline.

8. **Write the paper in parts.** Don't attempt to write the whole manuscript at once, instead, treat each section as a mini essay. Look at your notes, think about the goal of that particular section and what you want to accomplish and say.

9. **Put the first draft aside.** Put aside your first draft for at least one day. The idea of waiting a day or more is to allow you to "be" another person. It is difficult to proofread and edit your own work; a day or more between creation and critique helps.

10. **Revise it.** Revise it and be prepared to do this several times until you feel it is not possible to improve it further. The objective is to look at your work not as its author, but as a respectful but stern critic. Does each sentence make sense? In your longer sentences, can you keep track of the subject at hand? Do your longer paragraphs follow a single idea, or can they be broken into smaller paragraphs? These are some of the questions you should ask yourself.

11. **Revise for clarity and brevity.** Revise sentences and paragraphs with special attention to clearness. For maximum readability, most sentences should be about 15-20 words. For a scientific article, paragraphs of about 150 words in length are considered optimal. Avoid using unnecessary words.

12. **Be consistent.** Often a manuscript has more than one author and therefore the writing may be shared. However, the style needs to be consistent throughout. The first author must go through the entire manuscript and make any necessary editorial changes before submitting the manuscript to the journal.
Ten Steps to Writing an Effective Introduction

San Francisco Edit
www.sfedit.net

The purpose of the Introduction is to stimulate the reader's interest and to provide pertinent background information necessary to understand the rest of the paper. You must summarize the problem to be addressed, give background on the subject, discuss previous research on the topic, and explain exactly what the paper will address, why, and how. Besides motivating a reader to read your manuscript and to care about your results, the Introduction is useful also to the journal's reviewers and editors in judging the importance of your manuscript.

An Introduction is usually 300 to 500 words, but may be more, depending on the journal and the topic. Therefore, the Introduction needs to be very concise, well structured, and inclusive of all the information needed to follow the development of your findings.

Some people recommend that the Introduction be the first section written when writing a manuscript. If you need help beginning, please read our article Twelve Steps in Developing an Effective First Draft at http://www.sfedit.net/newsletters.htm.

Below are the steps in developing an effective Introduction. However, since every journal is different, it is important that you look at papers in your targeted journal to determine whether they use all of these steps. For example, some journals do not include conclusions in the Introduction.

1. Begin the Introduction by providing a concise background account of the problem studied.

2. State the objective of the investigation. Your research objective is the most important part of the introduction.

3. Establish the significance of your work: Why was there a need to conduct the study?
4. Introduce the reader to the pertinent literature. Do not give a full history of the topic. Only quote previous work having direct bearing on the present problem.

5. Clearly state your hypothesis, the variables investigated, and concisely summarize the methods used.

6. Define any abbreviations or specialized terms.

7. Provide a concise discussion of the results and findings of other studies so the reader understands the big picture.

8. Describe some of the major findings presented in your manuscript and explain how they contribute to the larger field of research.

9. State the principal conclusions derived from your results.

10. Identify any questions left unanswered and any new questions generated by your study.

Other points to consider when writing your Introduction:

1. Be aware of who will be reading your manuscript and make sure the Introduction is directed to that audience.

2. Move from general to specific: from the problem in the real world to the literature to your research.

3. Write in the present tense except for what you did or found, which should be in the past tense.
4. Be concise.

Ten Steps to Writing an Effective Abstract

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An abstract is a condensed version of the manuscript, which highlights the major points covered, concisely describes its content and scope, and reviews its material in abbreviated form. It is usually the first section read and sets the tone of the paper for the reviewer. It must be concise and easy to read and must cover the important points of the paper.

Many publications have a required style for abstracts; the "Guidelines for Authors" provided by the publisher will provide specific instructions. Stay within the publisher’s guidelines, or your manuscript might be rejected.

Writing an abstract involves summarizing a whole manuscript and providing as much new information as possible. The best way to write an effective abstract is to start with a draft of the complete manuscript and follow these 10 steps:

1. Identify the major objectives and conclusions.
2. Identify phrases with keywords in the methods section.
3. Identify the major results from the discussion or results section.
4. Assemble the above information into a single paragraph.
5. State your hypothesis or method used in the first sentence.
6. Omit background information, literature review, and detailed description of methods.
7. Remove extra words and phrases.
8. Revise the paragraph so that the abstract conveys only the essential information.
9. Check to see if it meets the guidelines of the targeted journal.
10. Give the abstract to a colleague (preferably one who is not familiar with your work) and ask him/her whether it makes sense.

Writing an effective abstract will improve the chances of your manuscript being accepted, encourage people to read it, and increase its impact.

A number of studies have indicated that a badly written manuscript with poor use of English, even with good science, has less chance of being accepted and published.
It is important to prepare your manuscript properly, part of which is to follow the journal's guidelines. Using a checklist helps to ensure acceptance of your manuscript by the journal.

Almost all journals have their guidelines on their website as well as publish their guidelines quarterly or in every issue. Guidelines are subject to change, so be sure you have the most recent guidelines. Below is a general checklist to assist you in ensuring your manuscript meets all the journal's requirements. Every journal is different and not all journals will require all of the items listed. Depending upon the journal you are targeting, you might want to add specific items to this list.

**Cover Letter**

- Determine whether a cover letter is needed
- Address the correct editor according to the manuscript subject
- Use the correct address
- Review what is required in the cover letter

**General**

- Determine the article type you are submitting
- Use the correct font type and size
- Adjust the line spacing (single or double spacing)
- Check the format for section headings
- Put the sections in the correct order
- Check the word length limits
- Use line numbering, if required
- Use page numbers, if required
- Adjust the margin size
- Confirm that the nomenclature is correct
- Check spelling
- Determine whether the Results and Discussion are separate sections or included together in one section

**Title Page**

- Verify the allowed Title length
- Determine whether a running or short title is needed
- Check whether Keywords are needed
- Confirm whether a List of Abbreviations is needed
- Ensure that all authors are listed
- Make sure the author's names and address are in the correct format
- Include all corresponding author information

**Abstract**

- Confirm the word limit
- Determine whether a structured or unstructured abstract is needed
References

- Confirm that the in-text citation format is correct
- Verify that all references cited in the text are included in the Reference List
- Make sure that all references in the Reference List are cited in the text
- Determine whether the references are formatted correctly
- Check the accuracy of the references

Tables and Figures

- Ensure that the in-text mention of figures and tables is formatted correctly
- Determine whether the Tables and Figures are located in the correct location
- Verify that the correct fonts and font size are used in the tables and figures
- Confirm numbering format for tables and figures (Roman or Arabic)
- Ensure that the size of figures and tables are correct
- Check that the correct file format is used (pdf, jpeg, gif, etc.)
- Determine the type of list for table titles and figure legends
- Make sure that all tables and figures are mentioned in the text
- Determine whether vertical lines are allowed in tables

Other

- Determine whether a conflict of interest statement is needed
- Check to see whether funding sources are required
- For medical manuscripts: Include an ethical and patient approval statement

For more detailed information regarding writing manuscripts for publication, please review some of our other articles at http://www.sfedit.net/newsletters.htm. These articles approach such subjects as Writing the First Draft, Writing Effective Results, Methods and Materials, Discussions, Selecting a Journal, Responding to Reviewers, etc.

Stephen King (Sic!) “On Writing” is also recommended reading “A memoir of the craft”

All the best

Eric