

Scientific Writing

The Computer Science Perspective

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Make every possible effort to improve your writing.

Papers are the longest lasting artifacts that a scientist produces.

You want your papers to be read, but you cannot expect the reader to make an effort that you, as the writer, are not willing to make.

Part A: Principles of composition

Part B: How to organize a paper

Strunk and White: The Elements of Style
Elementary Principles of Composition

1. Choose a suitable design and hold to it.

Planning must be a deliberate prelude to writing.

Start from a skeleton:
definitions, theorems, results, examples, etc.
Then fill in the text.

2. Make the paragraph the unit of composition.

Begin each paragraph with a sentence that suggests the topic of the paragraph.

Deliberately choose the order of sentences within a paragraph, and the order of paragraphs within a section.

3. Write with nouns and verbs,
not with adjectives and adverbs.

Select your nouns and verbs carefully.
No spicy adjective can save a bland noun.

Use a thesaurus.

4. Omit needless words.

A sentence should contain no unnecessary words,
a paragraph no unnecessary sentences,
a section no unnecessary paragraphs.

the fact that I had arrived

my arrival

Avoid the use of qualifiers.

We should all try to do a *little* better, we should all be very watchful of this rule, for it is a *rather* important one and we are *quite* sure to violate it now and then.

5. Use definite, specific, concrete language.

Prefer the specific to the general,
the definite to the vague,
the concrete to the abstract.
Commit, don't hesitate.

*A period of unfavorable
weather set in.*

*It rained every day
for a week.*

This is perhaps the most important rule to keep the attention
of the reader.

6. Use the active voice.

Active voice is more direct, more vigorous, and more concise.

*There were a great number of
dead leaves lying on the ground.*

*The ground was covered
by dead leaves.*

*Dead leaves
covered the ground.*

In scientific writing use “we” to mean “the writer(s) and the reader together.”

Put statements in positive form.

He was not very often on time.

He usually came late.

7. Be clear.

When you become hopelessly mired in a sentence, start fresh. Usually what is wrong is that the construction has become too involved and the sentence needs to be broken apart.

Never take shortcuts at the cost of clarity.
Never use undefined abbreviations.

Avoid ambiguous pronouns (*this, it*).

8. Keep related words together.

The relative pronoun should come immediately after its antecedent.

Modifiers should come next to the word they modify.

*There was a stir in the audience
that suggested disapproval.*

*A stir that suggested disapproval
swept the audience.*

He only found two mistakes.

He found only two mistakes.

Relative pronouns: “that” is restrictive, “which” is not.

9. Introduce names for clarity and emphasis.

Everything - conditions, ideas, relationships - can be named.
Referring to a concept by name increases precision
(and saves space).

10. Be consistent with designators.

Always use the same word(s) to refer to the same thing.
Variation confuses the reader.

Express parallel ideas in similar form.
The likeness of form helps the reader to recognize the
likeness of content and function.

*Formerly, science was taught by the
textbook method, while now the
laboratory method is employed.*

*Formerly, science was taught by the
textbook method; now it is taught by
the laboratory method.*

11. Keep to one use of tenses.

Avoid forward references.

Previews and summaries are useful only if they are more than lists or repetitions.

12. Place yourself in the background.

Draw the reader's attention to the substance of the writing, rather than to the temper of the writer.

Clearly separate fact from opinion.

13. Do not overwrite.

Prefer the standard to the offbeat, the simple to the pretentious.
Ornate language is hard to digest and nauseating.

Avoid fancy words and clichés.

Use foreign languages and figures of speech sparingly.

Do not be tempted by the cute.

Use *italics* and exclamation marks infrequently and judiciously.

14. Do not overstate.

When you overstate, the reader will be instantly on guard, and everything that has preceded your overstatement as well as everything that follows it will be suspect in his mind.

A single carefree superlative has the power to destroy, for the reader, the object of the writer's enthusiasm.

15. Some common errors of English usage:

In a series of three or more terms , use a comma after each term except the last.

Enclose parenthetical expressions between commas or dashes.

Join independent clauses by semicolons.

Put periods and commas inside quotation marks even if they are not part of the quote.

Hyphenate words that combine to form a compound adjective.

Spell out numbers up to ten, except in dates and serial numbers.

Never start a sentence with a digit or symbol.

Avoid colloquialisms (*don't*).

16. Revise and rewrite, again and again.

A pencil is the most useful tool for shortening.
For rearranging a text, scissors should be brought into play.

Do not be afraid to throw away what you have written.

Homework 1:

Choose a text you have written, between 500 and 1000 words.

Go through it paragraph by paragraph, sentence by sentence, word by word, and apply all 16 principles of composition.

What is the percentage of words saved?

Peyton-Jones: How to write a great research paper

