

Writing in English for non-native speakers

Style

1. Each sentence should make a clear statement or ask a clear question. Avoid vague statements and give specific examples. *Bad: To overcome the present limitations of soccer balls, one can modify the ball surface in several ways: ... Better: Traditional soccer balls flutter when shot at high velocity. Simple modifications of the ball surface stabilize the flight trajectories: ...*

2. Each paragraph should address one topic or question. The topic should be introduced in the first sentence of the paragraph. *E.g.: The articles in English are a, an, and the. In some cases, no article is necessary. The correct article use is difficult for English learners whose own language does not have articles, such as Japanese or Korean. Fortunately, a few simple rules can help to identify the correct article for every case. ...*

3. Write short and descriptive sentences. Never hide the subject of your sentence and stick to subject-predicate-object sentences whenever possible. Use precise language and avoid vague terms. *Bad: To be able to compare the capabilities of the device to measure the photo-electron spectra of high kinetic energy particles, a simulation of the ionization of Xenon with a photon energy of 1200 eV is done. Better: A simulation modeled the energy resolution of our spectrometer under realistic experimental conditions. We simulated the ionization of xenon with 1200 eV photons.*

4. Use active tense and strong subjects + verbs

Bad: To compare the capabilities of the spectrometer, a simulation is done. Better: A simulation modeled the capabilities of the spectrometer.

5. Remove unnecessary words and qualifiers

George Orwell: "If it is possible to cut out a word, always cut it out."

Much better to ~~be able to~~ describe the ~~fundamental~~-importance in a ~~brief~~ summary.

6. Stay positive (use passive tense and negative statements only when necessary)

Bad: Apart from fluoride, CTTS states are not accessible. Better: CTTS states are only accessible in fluorides. Bad: We show that also for fluoride, the excitation of the CTTS state does not play a role. Better: We show that excitation of the CTTS state is negligible even for fluorides.

7. Be precise and specific

Bad: spectrometer capability; better: energy resolution of the spectrometer.

Bad: High-energy radiation interacts with large molecules. Bad: 860 keV photons ionize 60 MDa proteins.

Structure

Abstract (Write this at last): The abstract should accurately reflect the content of the paper.

Introduction: Define the question you will address in the text. Explain what has been done to address similar questions before (literature). Why is this question relevant or interesting?

Experimental (Write this first): Describe the experiment. A skilled reader should be able to reproduce your work based on the information you give -- write no more and no less. Use past tense.

Results (write this after the Experimental section): Describe all relevant experimental results. If multiple experiments are presented, then clarify the differences between them. Describe the analysis of the data.

Discussion: Discuss how (or whether) the results answer your scientific question. Refer to the literature to show whether your results agree, disagree, or complement published work.

Figures: The font in a figure must be larger than 11 pt. font (compare scaled figures to the text). Use only dark colors to allow grayscale reproduction. Check the clarity and legibility of your figures.

Grammar:

8. Check your subjects and verbs

The verb must stand in proper relation to the Subject (singular/plural, context).

Repeller and extractor needs to be biased. (Two subjects); To shorten the flight tube enhances the spectrometer. --> A shorter flight tube enhances the spectrometer. (Missing subject)

9. Check the articles

"a" (also: "one"): Indefinite article. Always use when referring to one object that the reader does not yet know about.

"the" (also: "that", "this", "my", ...): Definite article. Always use when referring to one or multiple objects that the reader already knows about.

"" (no article): Indefinite quantity of an object that the reader did not yet know about.

E.g.: I teach in a University. (You didn't know about it yet.) The University is new. (I talk about the same University, so you already know about it.) I like a University. (Now I talk about a different University that you don't know about.) That University is in Germany. (I now refer to that last University, not to the one mentioned farther above.) Universities are cool. (I make a general statement about all Universities.) I teach chemistry. (There isn't "one" chemistry.) I go to University. I come from University. (I now refer to a place and I can omit "the"/"a". But to be safe you can always use "the"/"a".) Bikes are fast. (General statement about bikes.) The bike is fast. (I expect that you know which bike I talk about.)

10. Put the commas

Comma rules: <http://bit.ly/wVhzAq> (Capital Community College) <http://bit.ly/wZfWau> (Purdue U.)

Put a comma after: *However, ... (Introductory word); As last step, ... (Introductory element); Compared to the last election, ... (Introductory clause); I am here, you are there. (Independent clauses).*

11. Use Dictionaries and Spellcheckers

Dictionaries: www.merriam-webster.com (US-English), [Oxford dictionary](http://www.oxforddictionaries.com) (British-English)

12. Further reading

The ACS Style Guide (<http://bit.ly/xF7to8>); AIP Style Manual (<http://bit.ly/AdYsAC>); APS 'Mechanics of Style' (<http://bit.ly/xjjdts>); From Research to Manuscript: A Guide to Scientific Writing (Michael Jay Katz); [The Economist Style Guide](http://www.economist.com/style); ...

Scientific honesty and correctness

Give all results with reasonable precision (significant digits) or confidence range.

Honestly describe your work and results. Others should be able to reproduce your result (including possible errors).

Compare statistical and expected errors. Compare to known/published data.

Cite other people's work correctly and credit contributions from others.

Use quotation marks if you copy text from others and clearly indicate the text source. You can be guilty of plagiarism even if you rephrase or translate a text.