Writing Pointers

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General Writing Pointers

• Don’t make the table or the figure the topic of the sentence.
  – Avoid “Figure 1 shows that…”, “Figure 2 shows that…”.
  – Instead, use an intended subject. “Hydrogen production increased with applied voltage (Figure 1).

• Don’t make the thesis or an object do things.
  – Don’t write “this thesis investigates”, “microbes have a hard time”.

• Avoid the passive voice.
  – A clear indication of passive voice is the sentence ends with the very, “…is reported”, “was determined”.

• Avoid double negatives “it is not unreasonable..”
General Writing Pointers

• Do not start sentences with “connectors”.

• You can’t begin a sentence with a number
  – Don’t write “9 mM”.
  – You have to write it out “Nine millimolar..”.
  – Better to reorganize the sentence “Buffer (9 mM)..”.

• Watch for insignificant figures
  – “231.15 ± 10.27 mW/m²” vs “230 ± 10 mW/m²”.
  – Use the SD and good judgment to round numbers.
General Writing Pointers

• Avoid useless words, particularly at the beginning of a sentence:
  – Avoid: “It is shown here that…”, “It should be noted that”, “On the other hand”

• Tighten up your writing:
  – “was found to reduce” change to “reduced”

• Minimize the use of names
  – Try not to write “Zhang et al. (2009) show that..”.
  – Make the subject of the sentence the point, not the person.

• Manuscripts: insert continuous line numbers
  – Makes it easier for reviewers
  – (Biores. Technol. makes you take them out!)
General Writing Pointers

• Be sure that the first sentence of a new paragraph does not just continue a point made in the previous paragraph.
  – Avoid the first sentence that starts “However”...

• One sentence is not a paragraph

• Avoid repeating words
  – Example: “During startup, the startup time was reduced... to improve startup”.

General Writing Pointers

• Avoid giving long lists of things that makes the reader backtrack into the sentence too connect topics and numbers.
  – In short, avoid using the word “respectively”.
  – *Avoid:* “The maximum power density in the reactor supplemented with cellulose plus enzyme, enzyme alone, and glucose was 98 ± 0.05, 114 ± 1, and 104 ± 3, respectively, all produced with 1000 Ω resistance.”
  – *Instead try this:* “The maximum power density in the reactor fed cellulose and enzyme was 98 ± 0.05 mW/m². This is similar to that obtained using only enzyme (114 ± 1 mW/m²) or with glucose (104 ± 3 mW/m²).”
  – Note the latter makes a point, while at the same time giving numbers (and units!) so they are right where they are needed.
Abstract

• Many journals have word limits
• A double spaced abstract should fit on one page, 12 point font.
• Give specific numbers if possible from your results.
• Do not put references in an Abstract.
• Usually have a concluding sentence in the abstract that summarizes the worth of the study. “These findings indicate that MFCs can be...”
Introduction

• Too many papers have overly long introductions.
• If you are writing on a specialized topic, the reader probably will already know many things you put in an Abstract... otherwise, they wouldn’t be reading your paper!
• Is your Introduction short, say 3 paragraphs?
  – P1 introduces the topic and need for the study.
  – P2 summarizes key papers and what is known about the subject.
  – P3 points out the need for the study and what will be addressed here.
Methods

• Remove as many words as possible from your Methods section, putting in critical information but not rambling on about minor details.
• Refer to past papers for methods whenever possible.
• Put methods in same order as results.
• Notation in methods section.
  – Don’t use double sub- or superscripts or long superscripts; avoid using slanty divide signs,
  – Define all variables upon first use, then just use notation.
  – Keep notation simple.
  – You don’t have to use the same notation used in your experiment: use abbreviations that the reader will understand.
    • C and M (where C and M mean something, like a material) as compared to Material 1 and Material 2, where you won’t know if it is M or R.
Results

• I like separate Results and Discussion sections, especially in a thesis.
  – *ES&T* states combined is preferred
  – *Biores. Technol.* requires combined
• Don’t put Methods in the Results section, such as equations and approaches to getting a result.
• If the Results section is separate from your Discussion section, then do not speculate or draw conclusions based on the literature in the Results section.
Results

• Do your Results (or really any section) flow in an orderly way and make the points you would like it to?

• Try reading the paper by reading only the first sentence of each paragraph.
  – Do you immediately see the main points being made? If not, your first sentence of the paragraph is not sufficiently descriptive of the paragraph topic.
Results

• Does your Results section tell a story?
• We don’t want historical dramas or a mystery, but we do want information in a useful order.
  – Start your Results section with the most important findings first
  – Follow with other information (controls, things that didn’t work out so well, etc.).
  – Your first figure/graph (if possible) is the main point (biggest finding) and subsequent graphs fill in the surrounding conditions or elaborate further on the topic.
Discussion

• Many readers will scan abstract, figures and then go right to the Discussion section.

• Start out by restating your most important finding
  – What did you conclude from all those results?
  – How does this compare to the literature?

• Continue on with main points/findings, contrasting with the literature.

• You don’t need to put in all your thoughts on the subject, and try not to speculate too much (reviewers hate that).
Figures

• Put all legends within the plot box, with no line around the legend box.
  – Either use legends or don’t; don’t mix it up within one paper.
  – Keep legends simple.
  – You only need one per figure (not in every plot if the same)

• Avoid extra “non-information”
  – Do not use grid lines, but use inside ticks (major and minor).
  – Choose colors so that the symbols, lines or bars all show well in black and white and color.
  – Do not use smoothed lines (just connect points).
  – Put line around plot (i.e. connect axes). Use error bars when applicable.
Figures

- Figure captions go below the figure, table captions above.
- Usually Tables first then figures at the end of a manuscript (although some journals specify otherwise).
- Be sure that items in figures and tables are referred to in the results section.
- Do you have a table that could be a figure?
Figures

• Create beautiful figures.
  – They provide clarity to your results, and demonstrate a professional approach and tells the reader you pay attention to details.
  – Do your figures have the right size fonts? A quick test is that if Excel chose them, they are too small!

• Reduce the figures to publication size (one column width), and you’ll see they get too small. Don’t use bold fonts (they don’t reduce well). Increase symbol sizes.
Conclusions

• Requirements on this vary
  – *ES&T* does not allow you to put in a conclusions section
  – Biores. Technol. requires them
In Summary...

• *Keep your writing concise*
• *Avoid useless words*
• *Read the first sentence of every paragraph to check on flow*
• *Make beautiful figures.*