Writing your paper

Content
Research papers are driven by research results: you are typically presenting your results to other scientists in your field. You must know what you think your results show, why they are significant, and how they fit into the published scientific literature (e.g. which work they build upon, which work they contrast with, what future directions they point in). The paper’s content must provide all of the information necessary for your readers to reach these same conclusions, including a brief literature review to motivate the work, and details on your methodology to enable others to reproduce your work.

Review papers are driven by a theme or thesis. You are typically presenting other scientists’ results to scientists who are not necessarily in your field. This information is usually organized according to some theme: a straightforward theme might be a simple chronology of a field or a presentation of what is known so far about a problem; a more complex approach might be to focus on a new method and contrast its possibilities with old approaches.

Mechanics
Before you start writing, be clear about what you want to convey. If you are working from an existing paper, edit it carefully to see whether it clearly conveys your ideas in each section and paragraph. Consider breaking it down into outline form to make sure it follows a focused logical progression.

Troubleshooting
Typical problems in technical writing include:

Lack of clarity—information not conveyed clearly
Lack of focus—information poorly organized or irrelevant
Lack of precision—information not conveyed accurately

Very many of these typical problems can be avoided by knowing what you want to say, planning the logical progression of your piece to carefully lead the reader through your information to your conclusion, eliminating unnecessary details, and using active, direct statements. If you are working from a paper you’ve written in the past, make sure you edit it carefully to eliminate these problems. Reading aloud can help you identify ambiguous or confusing statements.

Enhance Clarity

Be Focused
Even a research paper is telling a story—keep the discussion focused on the story you are telling. Help your readers understand how your points are related—use mapping words like however, because. Use clear topic sentences. Eliminate unnecessary details.

Be Precise and Engaging
Avoid ambiguity. Avoid the passive voice (except in methods sections).

A note on tense
Methods and Results sections are typically written in the past tense, since you are describing what you did and what you found. Some disciplines differ: please check the convention for your discipline by asking your mentor or by looking at a number of papers from your target journal.

Questions of Style
We recommend re-reading Strunk & White’s Elements of Style to refresh your memory on some the basics. CBE’s Scientific Style and Format is useful as a reference for layout and convention questions, and Bjorn Gustavii’s How to Write and Illustrate a Scientific Paper has excellent (and succinct) advice for those working on a research paper.

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