



WRITING AND RESEARCH Outline of a Scientific Paper





WRITING AND RESEARCH - Outline of a Scientific Paper

Overview

A scientific paper, most probably, unlike any you have ever written in the past.

These papers are very specific in format and content.

They do not hide the conclusion or build to a point.

Instead, they present the findings upfront and tell the reader what you are going to tell them in the paper.

This lesson will provide a high level outline of what a paper looks like. Other video lessons will supplement this overview with greater data.



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Overall Guidance

- Let the facts speak without embellishment
- All statements in the paper should be justified by the facts of the data
 - OR, supported by a referenced citation
- Avoid action verbs
- Write in the Third Person. It's about the data, not you.
- Do not use slang and jargon
- Spell out all acronyms and abbreviations the first time they are used in the paper unless they are common throughout the discipline
- Terms defined in the abstract should be defined independently in the main text
- The word “data” is in its very nature, plural
- Avoid single sentence paragraphs



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Content and Style of a Research Paper

The scientific community has developed a standard set of sections for a research paper, each with distinct content:

- Title
- Abstract
- Introduction
- Methods/Equipment
- Data/Results
- Discussion
- Conclusion
- Acknowledgements
- References



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Content and Style of a Research Paper

The scientific community also has expectations about the style of a research paper:

- Style is very cut and dry. There is little room for embellishing or flowery language
- The goal is clarity, not ambiguity.
- Evidence-oriented— everything that is said should be justified by evidence
- No room for frivolous opinions regarding the aesthetics of a particular object
- Focus on how the research contributes to the field
- Describe activities in the passive voice (e.g. “measurements were made...”)



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Title

Naturally, the first thing anyone is going to read of a paper is its title.

It should pique the interest of potential readers.

Strive for one phrase that captures the “one big idea” or “significant new result” of the research being reported.

The title could highlight the key points of the paper: the name of the target object, the type of measurements done, and, occasionally, the materials or institutions involved.

The title should be interesting and tell the reader exactly what to expect.

THE FIRST BROWN DWARF DISCOVERED BY THE BACKYARD WORLDS: PLANET 9
CITIZEN SCIENCE PROJECT

**Photometric Observation and Light Curve Analysis
of Binary System ER-Orionis**

**The effects of supernovae on the dynamical
evolution of binary stars and star clusters**



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Summary

Writing your paper is part of the work of your research, so while you're doing your work, don't forget that you are going to write a paper about it.

It is OK to start writing your first draft as you go along, even before the observations have been made. After all, the goals and procedures are known (and their description can be modified if needed). That way, the introduction, materials, and methods are drafted early on.

Divide sections among team members. Most researchers work in teams, and, naturally, some team members will be more gifted in writing than others.

While all of these portions of a paper may appear rather daunting to an individual student, especially in a one-semester seminar, a group of students can divide the work such that each team member only writes one or two sections.

Alternatively, some team members may concentrate on observations or analysis, while others concentrate on writing. Once all the sections have been written, the sections can be pieced together to create a unified paper.



Questions?

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