

## The Last Step of a Scientific Research (Publication)

### What is the structure of a scientific paper?

All scientific papers have the same general format. They are divided into distinct sections and each section contains a specific type of information. The number and the headings of sections may vary among journals, but for the most part a basic structure is maintained. Typically, scientific papers are comprised of the following parts:

- Title
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Acknowledgments
- Literature cited

Because scientific papers are organized in this way, a reader knows what to expect from each part of the paper, and they can quickly locate a specific type of information.

Let's examine the content in each section of a scientific paper, and discuss why each section may be useful to you as a reader.

**TITLE.** The title will help you to determine if an article is **interesting** or **relevant** for your project.

Well-written titles give a reasonably complete description of the study that was conducted, and sometimes even foreshadow the findings. Included in a title are the species studied, the kinds of experiments performed, and perhaps a brief indication of the results obtained.

---

**ABSTRACT.** Abstracts provide you with a complete, but very succinct **summary** of the paper.

An abstract contains brief statements of the purpose, methods, results, and conclusions of a study. Abstracts are often included in article databases, and are usually free to a large audience. Thus, they may be the most widely read portions of

scientific papers.

---

**INTRODUCTION.** You will find **background** information and a statement of the author's **hypothesis** in the introduction.

An introduction usually describes the theoretical background, indicates why the work is important, states a specific research question, and poses a specific hypothesis to be tested.

---

**METHODS.** The methods section will help you determine exactly **how** the authors performed the experiment.

The methods describes both specific techniques and the overall experimental strategy used by the scientists. Generally, the methods section does not need to be read in detail. Refer to this section if you have a specific question about the experimental design.

---

**RESULTS.** The results section contains the **data** collected during experimentation.

The results section is the heart of a scientific paper. In this section, much of the important information may be in the form of tables or graphs. When reading this section, do not readily accept an author's statements about the results. Rather, carefully analyze the raw data in tables and figures to draw your own conclusions.

---

**DISCUSSION.** The discussion section will explain the **authors interpret** their data and how they connect it to other work.

Authors often use the discussion to describe what their work suggests and how it relates to other studies. In this section, authors can anticipate and address any possible objections to their work. The discussion section is also a place where authors can suggest areas of improvement for future research.

---

**ACKNOWLEDGMENTS.** The acknowledgments tell you what people or institutions (in addition to the authors) **contributed** to the work.

In reading the acknowledgments, you can see what sources provided financial support for the study. You might want to know an industry group or the federal government funded the study.

---

**LITERATURE CITED.** This section provides the **sources** cited throughout the paper. This section offers information on the range of other studies cited: Does the author cite only his or her previous studies? Are both classic and modern sources influencing this work? Does the author look to the work of scientists in other disciplines? The literature cited section is also helpful for generating a list of background reading on the topic under study.

**Reference:**

[http://biology.kenyon.edu/Bio\\_InfoLit/how/page2.html](http://biology.kenyon.edu/Bio_InfoLit/how/page2.html)