

## How to Read a Scientific Research Paper

**1. Skimming.** Skim the paper quickly, noting basics like headings, figures and the like. This takes just a few minutes. You're not trying to understand it yet, but just to get an overview.

**2. Comprehension, *not in order, section by section.*** Read the paper, not precisely in order.

First read the **Title** and **Abstract**. Look at the authors, institution and journal for hints of gravitas

Then read the **Introduction**, note how the context is set. What larger question is this a part of? The author should summarize and comment on previous research, distinguish between previous research and the current study. *What is the hypothesis of the paper and the ways it will be tested?*

Skip the **Methods**, only look at these if it's necessary to understand something later.

In **Results** look first only at each figure or table, as they are the heart of most papers. A scientist will often read the figures and tables before deciding whether it is worthwhile to read the rest of the article! What does it mean to "understand" a figure? You understand a figure when you can redraw it and explain it in plain English words. If some figures are still not clear after reading their legend, read the area of the text in the Results that cite each figures to further understand it.

Read the **Discussion**. If it's long, first read the topic sentence of each paragraph to get a feel for it as a whole. Then read it in full. This should review the purpose and findings of the paper and contain the conclusions that the author would like to draw. In any case, this is where the author reflects on the work and its meaning in relation to other findings and to the field in general.

**3. Reflection and criticism.** After you understand the article and can summarize it, then you can return to broader questions and draw your own conclusions. It is very useful to keep track of your questions as you go along, returning to see whether they have been answered. Often, the simple questions may contain the seeds of very deep thoughts about the work--for example, "Why did the authors use a questionnaire at the end of the month to find out about premenstrual tension? Wouldn't subjects forget or have trouble recalling?"

*Here are some questions that may be useful:*

### **Introduction:**

What is the overall purpose of the research?

How does the research fit into the context of its field? Is it, for example, attempting to settle a controversy? show the validity of a new technique? open up a new field of inquiry?

### **Results**

What is the one major finding?

Were enough of the data presented so that you feel you can judge for yourself how it turned out?

Did you see patterns or trends in the data that the author did not mention? Were there problems?

### **Discussion**

Do you agree with the conclusions drawn from the data?

Are these conclusions over-generalized are there other factors that could have influenced, or accounted for, the results?

What further experiments would you think of, to continue the research or to answer remaining questions?