

A Strategy for Writing Up Research Results

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Get Organized: Lists, Outlines, Notecards, etc. Before starting to write the paper, take the time to think about and develop a list of points to be made in the paper. As you progress, use whichever strategy works for you to begin to order and to organize those points and ideas into sections.

A. Balanced Review of the Primary Research Literature: Do an in-depth, balanced review of the primary research literature relevant to your study questions prior to designing and carrying out the experiments. This review will help you learn what is known about the topic you are investigating and may let you avoid unnecessarily repeating work done by others. This literature will form the basis of your [Introduction](#) and [Discussion](#). Training in [on-line searches](#) is available from the Reference Librarians. Do your search early enough to take advantage of the [Interlibrary Loan System](#) if need be.

B. Write the Introduction: Once your hypothesis has been refined for testing, you will draft the [Introduction](#) to your paper. In PI courses you will bring a draft of the Introduction to lab the day of the experiment for critique by an instructor or TWA (Technical Writing Assistant).

C. Design and Conduct the Experiment: Keep careful notes on procedures used during the experiment. You should write the [Materials and Methods](#) section upon completion of the experiment.

D Analyze and Interpret the Results: Once the data are collected, you must analyze and interpret the results. Analysis will include data summaries (e.g., calculating means and variances) and statistical tests to verify conclusions. Most scientists lay out their [Tables and Figures](#) upon completion of the data analysis before writing the [Results](#) section. Write the [Table and Figure legends](#). It is good practice to note the one or two [key results](#) that each Table or Figure conveys and use this information as a basis for writing the Results section. [Sequence and number](#) the Tables and Figures in the order which best enables the reader to reach your conclusions.

E. Write the Results Section: Remember that the [Results](#) section has both [text](#) and illustrative materials ([Tables and Figures](#)). Use the text component to guide the reader through your [key results](#), i.e., those results which answer the question(s) you investigated. Each Table and Figure must be [referenced](#) in the text portion of the results, and you must tell the reader what the key result(s) is that each Table or Figure conveys.

F. Write the Discussion: Interpretation of your results includes discussing how your results modify and fit in with what we previously understood about the problem. [Review the literature](#) again at this time. After completing the experiments you will have much greater insight into the subject, and by

going through some of the literature again, information that seemed trivial before, or was overlooked, may tie something together and therefore prove very important to your own interpretation. Be sure to [cite the works](#) that you refer to.

G. Write the Abstract and Title: The [Abstract](#) is always the last section written because it is a concise summary of the entire paper and should include a clear statement of your aims, a brief description of the methods, the key findings, and your interpretation of the key results. The [Title](#) will probably be written earlier, but is often modified once the final form of the paper clearly known.

H. Self-Revise Your Paper: Most authors [revise their papers](#) *at least* 2-3x before giving it out for peer review. Go back over your paper now and [read it carefully](#); **read it aloud**. Does it say what you wanted it to say? Do any ideas, experiments, or interpretations need to be moved around within the text to enhance the logical flow of your arguments? Can you shorten long sentences to clarify them?

Can you change passive verbs to active forms? Do the [Tables and Figures](#) have sufficient information to stand alone outside the context of the paper? Use your dictionary to correct spelling and your spell checker to catch typos.

I. Peer Review: Have knowledgeable colleagues critique your paper. Use their [comments](#) to [revise your paper](#) yet again. Helpful documents:

[Making Effective Comments on Peer Reviews:](#)

<http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWcritique.html>

J. Prepare the Final Draft: Carefully proof-read your final draft to make sure its as well done as possible. Double check that you've properly cited all your sources in the [text](#) and in the [Literature Cited](#). Check the [formatting](#) one last time. The instructors LOVE to give full credit for format issues whenever possible, but will not hesitate to take points off for sloppy work.