SCIENTIFIC ARTICLE

The scientific article has developed over the past three centuries into a tool to communicate the results of scientific inquiry. The main audience for scientific articles is extremely specialized. The purpose of these articles is twofold: to present information so that it is easy to retrieve, and to present enough information that the reader can duplicate the scientific study. A standard format with six main part helps readers to find expected information and analysis:

- Title--subject and what aspect of the subject was studied.
- Abstract--summary of article: The main reason for the study, the primary results, the main conclusions
- Introduction--*why* the study was undertaken
- Methods and Materials--*how* the study was undertaken
- Results--*what* was found
- Discussion--*why* these results could be significant (what the reasons might be for the patterns found or not found)

There are many ways to approach the writing of a scientific article, and no one way is right. Many people, however, find that drafting chunks in this order works best: Results, Discussion, Introduction, Materials & Methods, Abstract, and, finally, Title.

Title

The title should be very limited and specific. Really, it should be a pithy summary of the article's main focus.

Abstract

This is a summary of your article. Generally between 50-100 words, it should state the goals, results, and the main conclusions of your study. You should list the parameters of your study (when and where was it conducted, if applicable; your sample size; the specific species, proteins, genes, etc., studied). Think of the process of writing the abstract as taking one or two sentences from each of your sections (an introductory sentence, a sentence stating the specific question addressed, a sentence listing your main techniques or procedures, two or three sentences describing your results, and one sentence describing your main conclusion).

Introduction

The introduction is where you sketch out the background of your study, including why you have investigated the question that you have and how it relates to earlier research that has been done in

the field. It may help to think of an introduction as a telescoping focus, where you begin with the broader context and gradually narrow to the specific problem addressed by the report.

Methods and Materials

In this section you describe how you performed your study. You need to provide enough information here for the reader to duplicate your experiment. However, be reasonable about who the reader is. Assume that he or she is someone familiar with the basic practices of your field.

Include in this section:

- study design: procedures should be listed and described, or the reader should be referred to papers that have already described the used procedure
- particular techniques used and why, if relevant
- modifications of any techniques; be sure to describe the modification
- specialized equipment, including brand-names
- temporal, spatial, and historical description of study area and studied population
- assumptions underlying the study
- statistical methods, including software programs

Results

This section presents the facts--what was found in the course of this investigation. Detailed data, measurements, counts, percentages, patterns--usually appear in tables, figures, and graphs, and the text of the section draws attention to the key data and relationships among data. Three rules of thumb will help you with this section:

- present results clearly and logically
- avoid excess details
- consider providing a one-sentence summary at the beginning of each paragraph if you think it will help your reader understand your data

Discussion

In this section you discuss your results. What aspect you choose to focus on depends on your results and on the main questions addressed by them. For example, if you were testing a new technique, you will want to discuss how useful this technique is: how well did it work, what are the benefits and limitations.