

WRITING A LAB REPORT FOR THE EMPIRICAL SCIENCES

The empirical sciences (Biology, Chemistry, Astronomy and the like) investigate topics by using the *scientific method* (laboratory experimentation) and many will require the writing of a *lab report*. The acronym of IMRaD is often used to indicate the common four sections of a lab report: *introduction*, *methods*, *results* and *discussion*.

The following is a general guideline. Your professor may have specific requirements for the submission of lab reports and his/her instructions should always be followed.

GENERAL FORMATTING

Follow APA guidelines for the general page appearance (font, margins, etc.).

You will be expected to use a *passive voice* in your writing; this adds a formality to the report that is expected. Writing in a *passive voice* means dropping the use of pronouns as in the samples below:

Active Voice I measured 2 grams of sodium chloride and put it into a small beaker with 20 milliliters of distilled H₂O. Then I placed the beaker over a Bunsen burner and lit the flame. I stirred the sodium chloride until it dissolved into a solution.

Passive Voice Two grams of sodium chloride were measured and placed into a small beaker with 20 milliliters of distilled H₂O. The beaker was placed over a Bunsen burner. The sodium chloride was stirred until it dissolved into a solution.

PARTS OF A LAB REPORT

Introduction One, or several, paragraphs that explain research topic: the “what” and “why” of the experiment. This usually concludes with a statement of the hypothesis. Use a passive voice here.

Methods The materials and procedures involved in the experiment. This section is often separated into “Materials” and “Procedure” as subheadings. It is a listing of all of the materials needed for the experiment and a list of the steps, in detail, of the procedure. Use a passive voice, especially in the procedure section.

Results Your data gathered during the experiment, presented in a table, chart or graph. Accuracy here is paramount! Any notes or observations made during the experiment should also be shown here. Again, use a passive voice when writing your notes and observations.

Conclusions Summarize the data, just the key information, and state if your hypothesis is accepted or rejected as a result. Indicate why the data speaks toward the acceptance or rejection of the hypothesis. Discuss any possible experimental errors that may have been made and how they might influence the results. Your conclusion will often suggest a new hypothesis to pursue and can be discussed here. Do not forget to use a passive voice in your writing here.

There are other formats for lab reports and your professor may use one or another, or even a combination of a few. Find out what sections your professor wants to see and use those in your lab report.

The first requirement of a formal report is that it has to be scrupulously neat with accurate data. If you want your peers and instructors to take your work seriously, take the time to present your results in standard form. That is, include Introduction, Methods, Results, and Discussion. Write an initial draft and be sure to review it for accuracy.

Pay attention to significant figures and be sure your graphs, tables, and figures are methodically organized. Instructors strongly advise students to bring lab reports to the Writing Center.

One note on the level of detail: you should aim for clarity and conciseness without leaving out any of the required components (Introduction, Methods, Results, and Discussion). You should make it obvious to your reader that you understand what you have done. Your level of detail means that you have explained your experiment clearly enough so that someone familiar with the chemistry and lab techniques involved could repeat the experiment. You should also concisely explain the ramifications of the results and identify further work that could be done if they are not conclusive.