

Laboratory Reports – Guidelines

Biology II Honor

Laboratory Reports: One of the best ways to improve your writing is by reading. If you have written few scientific reports or have read relatively few scientific papers, the best place to start is the primary literature. Look at several articles from current journals at the science library. Examine the papers noticing style, language, and format rather than paying close attention to content. Scientists studying ecology, evolution, and behavior often publish in journals such as *Ecology*, *Oecologia*, *Evolution*, *Behavioural Ecology*, and *Animal Behaviour*.

Here are some general rules to follow when writing lab reports for this class. Do not use direct quotes from journal articles, your text book, or your lab manual. Instead, rephrase the section into your own words, and then cite the source. For this class, your report should be double spaced with 1 to 1.25 inch margins, and the font should be 12 point. Make sure you spell check your paper. I also encourage you to have someone else read your paper for errors and constructive comments. Also if you are unsure of any of the following instructions please talk to your TF, we are here to help.

Title

Create a descriptive title that conveys the problem or hypothesis that you are testing. Do not just give your report the same title as on you lab handout.

Abstract

The abstract should be only one paragraph and outlines the points addressed in the study by summarizing each section of the paper:

What problem was addressed (introduction)?

How did you approach the problem (methods)?

What were your major findings (results)?

What were your major conclusions (discussion)?

Although this is the first section of your paper, you should write it last so you can more easily summarize the different sections. It is very important to write a concise abstract. Remember, it is only a brief picture of what you did and what you found. The abstract should be approximately 150 to 200 words in length.

Introduction

This section is used to set the stage for your experiment; therefore, it should include a statement of the problem(s), question(s), and/or hypotheses being tested. You should convince the reader that the questions you have asked are important and that the experiment was worth doing. You must place your study into the context of previously published research (background literature). Any hypotheses related to the expected observations should be stated explicitly.

The organization of this section is just as important as the content. You should start out with broad ideas (relevant theory) and then get more specific. Your hypothesis (or goals) will be at the end of the introduction.

Materials and Methods

This section is a complete description of how the experiment was designed and conducted. This section should be written in the past tense, because you will have already done the experiment. Do NOT write your methods in a list form. It should be written as a concise series of paragraphs. Your explanation of what you did should be specific enough that anyone could pick up your paper and repeat your experiment, but use common sense when deciding how much detail to include in this section. If you have used a well-established technique, you should refer the reader to a published paper, as in "reproductive condition of each bat was assessed using palpation of the abdomen and condition of the teats (Racey 1988)". If you made important modifications from a previously published technique, these modifications should be fully described. If your methods are novel, describe them completely. We are going to make the assumption that the reader is a biologist, and therefore, knows how to do things like measure and mark a certain size plot, or use equipment such as an insect net. Also, be sure to describe the method used in your data analysis (e.g. which statistical test you used).

Results

The results section includes a description of the findings of the study, but not an interpretation of the results (that is for the discussion section). In addition to writing out your results you should present your data in a graph or a table to demonstrate trends and observations that your text summarizes. You should NOT include raw data. You should use a graph OR a table for each data set, and which one you use depends on what kind of data you have. After stating your results you should refer to the figure or table. For example: "We found that the pH of stomach acid was 2.2 while the pH of blood was 7.2 (Figure 1)". The tables and figures can be put into the text where they are mentioned, or they can be on separate sheets of paper at the very end of your report. If you include the tables and/or figures in the text, place them after the paragraph that discusses them (not before) and do not split the same table or graph onto 2 separate pages. Tables and figures should have legends that describe what the data are, written in complete sentences. Table legends should be above the table and figure legends should be below the graph.

Discussion

This section is where you discuss the meaning of your observations. This is the most important section because this is where you demonstrate that you have really thought about what your results mean and compare and contrast your results with what is in the primary literature. You should start by restating your hypothesis and then stating whether or not it was supported. You should mention what sorts of trends you saw in the results and how this supported your hypothesis or not. You can mention why your experiment did or did not follow your predictions. You also need to compare your results to those of others. In other words, you may find a journal article in which they did an experiment similar to what you did. Tell us if their results were similar to yours or not and why. You also should mention any problems you had while conducting the experiment (but your focus should be interpretation of your results, do not focus your entire discussion on what may have gone wrong). How would you change the experiment to make it better, or what other experiments could be done to test your hypothesis? You should finish this section with a concluding paragraph that ties everything together.

Literature Cited

This is where you include the journal articles and books that you cited throughout your lab report. You use citations in your paper when you take an idea or fact from an article or other source and give that person(s) credit (thereby avoiding plagiarism).

For example:

The little brown bat has two foraging bouts per night (Anthony and Kunz, 1977).

OR

Anthony and Kunz (1977) found that little brown bats have two foraging bouts per night.

FOR MORE THAN TWO AUTHORS

Habitat availability and competition may be important in determining the distribution and abundance of the Indiana bat (Clark *et al.*, 1987).

Here are how the above citations would appear in your literature cited section:

Anthony, E. P., and T. H. Kunz. 1977. Foraging behavior of the little brown bat. *Journal of Mammalogy* 67:234-255.

Clark, B. K., J. B. Bowles, and B. S. Clark. 1987. Summer status of the endangered Indiana bat in Iowa. *American Midland Naturalist* 118:32-39.

Here is the general pattern:

Last name of the first author, initials, and initials, last name of next author. date of publication.
Title of article. Title of Journal, volume#:pages.

Here is the general pattern for a book:

Last name of author, initials. Date of publication. Title of book. Publisher: city.