A Guide to Writing Lab Reports

Scientific writing is essential for the dissemination of research results, and the ability to clearly convey detailed information to someone else is essential in any career. The best way to prepare for writing your lab report is to be sure you understand the experiment you are writing about. If you are not clear on the purpose or procedure of the experiment, talk to your instructor or a classmate.

Start by creating an outline for the report using the sections listed below. You don’t have to write the report in order – many people find it easier to start by writing the results section and work from there. As you are working on your report, imagine you will be giving the report to your roommate or parents – someone who was not present for the experiment. The reader should be able to understand the purpose, methods, results, and significance of the experiment just by reading the report.

Do not plagiarize! Plagiarism is using any idea, text, or information that is not your own without proper citation, thus presenting the work as if it is your own. Inappropriate use of someone else's work is plagiarism, regardless of whether or not you intend to plagiarize. Furthermore, even if you work with a partner in lab you should not both submit the exact same lab report. This is also considered plagiarism. You must write your own lab report. You are responsible for and will be held accountable for your own work. Handing in a report that is full of quoted text and citations with very little of your own writing is also not appropriate. One strategy for preparing a report in your own words is to carefully read and take notes on the topic you’re going to write about, then, without looking back at your books or notes, describe out loud the purpose of the experiment, what you did, what you observed, and what it means. Then go back and write down what you said. Where you described something that you had read elsewhere, cite the source. By explaining the report out loud without looking at notes, books, or the computer, you will be forced to put everything in your own words.

Lab reports take time and revision. Don’t wait until the night before it’s due and expect to write a quality product!

Format - Your report should include the following:

Title – The title should indicate in some detail what the report is about. Under your title include your name, your lab section, and the date.

Introduction

The introduction provides background information on the topic to be covered. Relevant vocabulary and concepts (such as those we covered in the lab introduction) should be described. Explain the purpose of the experiment, and how it is important to physiological function. You should summarize appropriate information on the topic as it is covered in your textbook. Make sure you paraphrase the information from the text by putting the information in your own words. Don’t copy (word-for-word) what is written in the textbook because that is considered plagiarism. Even after you paraphrase information from a source you must include an in-text citation for that source at the end of that sentence. If you copy a section of writing from a source word-for-word you must put that information within “quotations” and cite the reference, including the page number, immediately at the end of that sentence. [Please see example lab report at the end of this document.] At the end of the introduction, state a clear, testable hypothesis for the experiment(s) being covered.

General guidelines for “in-text” citations:

If there is only one author for the source just cite that author’s last name followed by the year of the publication. For example (McDiarmid, 2009). If there are only two authors, include the two authors last names followed by the year of publication. For example (McDiarmid and Pough, 2010).
If there are more than 2 authors (3 or even 11) you simply use last name of first author followed by et al. and then the publication year. For example (McDiarmid et al., 2013).

If you make a direct quote from a source you must put the quoted material within quotation marks, and then at the end of the sentence include the author(s) last name, publication year, and page in that publication. For example: "It is known that non-specific beta blocker drugs, such as propanolol, are known to target both B1 and B2 adrenergic receptors (Altig, 2012; Pgs 223)

Materials and Methods
Explain how you did the experiment and what materials you used. You are reporting on something that happened in the past, so write it in past tense. Explain what you did and how you did it. If the lab report is written based on class data contributed by separate groups of students you can simply explain how a group conducted the experiment, and then explain how many replicates of that experiment were performed in the lab. You can also explain if the data was summarized in Excel and analyzed a particular way (i.e. what analyses were performed on the data).

Results
The results section will include any data tables and graphs. Results section needs a written portion also. In this written portion you should report any summary data (such as class averages of data sets) and then, if the data was statistically analyzed, report the “P-values” and any significant differences found among the experimental groups. You DO NOT explain your data in the results section. You simply report numbers and differences among groups, or differences between before and after conditions. You will explain your data results in the discussion section.

Discussion
The discussion section should include the interpretation of your results. If something changed WHY did the change occur? What is the physiological basis for what you observed in the data? It is important in this section to tie together what your experimental results mean within the broader context of the physiology of the topic you were examining. You can also mention possible sources of experimental error here. Sometimes things go wrong. That’s okay. You can explain that here as well.

Literature Cited – Properly cite all literature you paraphrased or quoted from here. Below I’ve given you an example of how you would provide a literature citation of the Fox Human Physiology textbook properly. You would simply fill in the correct pages that YOU used as reference for your lab report.

Citing Physiology Text:

Don’t switch verb tense throughout the report. Spell-check. Proofread. See the attached sample report for format.
Sample Lab Report

The Effect of Parasites on Growth Rates in Tadpoles

Gregory S. Pryor

Introduction: Tadpoles serve as hosts for many different types of parasites (McDiarmid and Altig, 1999). These parasites include bacteria, protozoa, and nematodes (Pryor, 2003). These parasites could impact the health of tadpoles. For example, parasites that are located in the tadpole gut presumably feed upon the gut tissue or on undigested food within the gut (Battaglini and Boni, 1967). This, in turn, might reduce the ability of tadpoles to digest their food, or reduce the amount of nutrients available for digestion by the tadpole hosts (McDiarmid et al., 2000).

The hypothesis of this study was that parasite infection slows the growth of tadpoles. The effects of parasite infection on bullfrog tadpole (R. catesbeiana) growth rates were investigated.

Materials and Methods: Bullfrog eggs were collected from a pond on the Francis Marion University campus. The eggs were hatched in an aquarium located in the lab, and the tadpoles that hatched from these eggs were raised on a fish food diet. One group of 20 tadpoles was isolated in a separate aquarium and infected by raising them in water that was contaminated with protozoan parasites. Another group (the control group) of 20 tadpoles was isolated in a different aquarium and raised in clean water, and thus prevented from coming in contact with parasites. Every day, for two weeks, the body masses of tadpoles in each group were measured and recorded. The averages for each group were then calculated and plotted on a line graph, as described by Pryor et al. (2006).

Results: Protozoan parasite infection had a detrimental effect on growth in tadpoles (Figure 1). As days of the experiment progressed the body mass of infected tadpoles increased from an initial average of 20 mg to an average of only 35 mg, whereas uninfected tadpoles grew from an initial average of 20 mg to 92 mg of body mass in the same time. In short, tadpoles infected with parasites grew at a much slower rate than did the uninfected tadpoles over the same two week-long experimental period.

![Figure 1. Growth rates of protozoan-infected and uninfected (control) tadpoles under laboratory conditions. Average daily body masses for the 20 tadpoles in each group are presented in milligrams (mg).](image)

Discussion: The results of this study support the hypothesis that parasite infection slows down growth rates in tadpoles. However, it remains undetermined exactly why parasites have a negative effect on their tadpole
hosts. One possibility is that these parasites use nutrients that the host needs for proper growth. Another possibility is that parasites in the gut prevent a tadpole from eating as much food as an uninfected tadpole, or prevent an infected tadpole from properly digesting its food.

The results described here suggest that wild tadpoles would be at a disadvantage when they are infected with parasites. For instance, if parasite-infected tadpoles require more time to develop into frogs, they will experience prolonged exposure to aquatic predators such as fish and snakes. The infected tadpoles will also face a greater risk that the pond they live in will dry up before they can emerge as frogs.

Similar to the parasites examined in this study, other types of parasites (such as bacteria and nematodes) inhabiting the gut regions of tadpoles might also have negative effects. Parasites in other host species, such as mammals and birds, might also reduce the growth rates of those hosts. However, more studies investigating the effects of parasites on host growth rates are needed.

**Literature Cited:**

