

# Deconstructing Lab Reports

## STUDENT LEARNING OBJECTIVES

Students who successfully complete this lab activity will be able to:

- Describe the function of each section in primary literature and lab reports; and
- Compare effective and not effective ways to write each section.

## INTRODUCTION

Lab reports and primary literature (or peer-reviewed journal articles) are designed to communicate to the scientific community your own original research. Each section—Abstract, Introduction, Methods, Results, Discussion, Literature Cited, Tables/Figures—has a specific function and format, in terms of language and items to be included.

## Objective

Today's lab is designed to introduce you to these sections and act as an informal guide to help you write your natural selection lab reports.

## INSTRUCTIONS

Your instructor has made an online assignment available on Blackboard. It will involve reading an annotated journal article and answering several questions about it. This article is a valuable introduction to the style and format of the scientific literature. We will be writing several lab reports, which follow a format similar to many journal articles in the biological sciences. This assignment will help prepare you for those lab reports, which are a significant part of your overall lab grade. Please check with your lab instructor, and/or the schedule in the syllabus for the due date and time of this assignment.

## Writing the Lab Report for the Lab

The formatting information given below should be used to compose your Natural Selection lab report. You will be graded on how well you follow the format, as well as on your results and interpretations. Fold over the corner of this page, insert a post-it note, or do something else to mark this page! These instructions are also valuable for composing the other lab reports in this class as well, because we will be using the same format each time we write a lab report. Additionally, for help with the English grammar and composition portion of the lab report, you can meet with a consultant at the Noel Studio (Located in the Crabbe Library) by appointment or as a walk-in. They can help you improve the quality of your writing for this class and in other classes you might take in the future.

## General Formatting Information

Single-spaced, 12-point Times New Roman font, 1-inch margins

Title (Bold text, not italicized, not quoted, and centered within the page)

Construct an informative title that captures the essence of this lab. The title should be no more than 12 words. For example, the title "Natural selection and evolution" is not very informative. The title "The natural selection of chips over five generations with multiple colors and predators with helpers" is not only too descriptive but also confusing. Shoot for a clearly stated title that is somewhere in between not informative and too descriptive. Follow the format below.

## Informative Title That Is No More Than 12 Words in Length

### Author (Bolded, not italicized, and left justified)

Just below the title, include your name, your major's home department, and your institution of higher education. Follow the format below.

**Sarah A. Victory**, Department of Biology, Ball State University, Muncie, Indiana, 47243

### Abstract

The abstract contains several sentences that briefly summarize the research study, in our case, the lab. Below is a list of topics that should be addressed in the abstract. The order of topics is listed in the order in which they should appear in the abstract. The abstract must not exceed 300 words.

1. A brief introduction or background to the study.
2. The objective of the study.
3. A brief description of the methods.
4. One or two results that were produced from the study.
5. A conclusion to the study.
6. Describe a limitation. The limitation description ultimately leads into a suggestion for future work.

### Keywords

Just below the abstract, list five key words that are commonly used in this lab. Use the format below.

**Keywords:** List, The, Key, Words, Here, Please

**The above sections are only included on the first page of your lab report.**

### Introduction

This section clearly explains the background information related to the lab or research study (Lau et al. 2016). Lau and Braccia (2016) suggest that the information within the introduction leads from general information (e.g., broad statement on natural selection) to very specific information (e.g., the objectives of the study). Further, Wigginton (2016) suggests that the introduction should start with what the researchers know about the topic (e.g., five conditions for natural selection), and then leads to what the researcher does not know about the topic (e.g., hypothesis). You should also tell the reader why you are using the research methods you are using, besides the obvious, "Because the lab manual told me to!" In other words, give a rationale about why the methods used are a good way of tackling the research questions addressed in this report (Wigginton 2016).

The introduction is also used to answer any questions that your instructor told you to answer (Wigginton and Braccia 2016). The above suggestions really are not suggestions (Braccia 2016). Points will be deducted if your answers to the above questions are not answered within the introduction (Dodd et al. 2016).

### *Objectives and Hypothesis*

This section of the introduction is a great spot to include the objectives for this study, followed by your hypothesis or hypotheses.

### **Methods**

This section specifically outlines what your group did during the experiments. Your job is to rewrite the list of instructions to a properly constructed methods section. This section should be clear so that anyone can pick up your lab report and repeat exactly how you carried out the experiment. Do not write in directives. This section must be written in passive voice and in past tense. This section is not meant to be written in a cookbook format. What did you do? Do not tell the reader what to do.

### **Results**

This section is meant only for the results of the study. Pay special attention to how the table and figure are referenced. This section is not a space for the author to interpret the results. In other words, the author should not explain any reason for the results or make conclusions about the results. Any of these types of interpretations are specific to the next section. However, the author should indicate the direction of and whether or not the correlation is significant? Follow the example below.

The abundance of the red and orange chips significantly decreased over time (Table 1; Figure 1).

### **Discussion**

This section is where the author should discuss away (Braccia and Wigginton 2016). First, re-state the objectives of this study and your hypothesis. Then, explain whether or not the results supported your hypothesis. Finally, answer the "Follow-up" questions in this section of your lab report. Do **not** just simply answer the questions in a list format. Answer the questions using a typical paragraph format, including topic sentences, supporting sentences, and connecting sentences. Again, these suggestions are really not suggestions because Dodd et al. (2016) will deduct points if they are not clearly answered in the discussion section of the lab report.

### **Literature Cited (follow the format below for any citations)**

Last Name First Initial. Publication Year. Title. Abbreviated Journal Title: Volume #: Page Numbers.

Braccia A. 2016. Cite the literature according to the Council for Biological Editors manual 4th Edition. McGraw Hill, New York.

Braccia A, Wigginton A. 2016. Only capitalize the first word of the article title: unless the word is a Proper Noun. The Journal of Nouns. 5: 1-6.

Brooker R, Widmaier EP, Graham LE, Stiling PD. 2013. Biology 3rd Edition. McGraw Hill, New York.

Dodd L, Wigginton A, Braccia A, Lau JK. 2016. Deductions: an easy way to lost points. Deduct Evol. 1: 1-20.

Lau JK, Braccia A, Wigginton A. 2016. Note that the citations are listed alphabetically. Alphabet. 26: 1-26.

Lau JK, Braccia A. 2016. Note also the format of the in-text citation within the body of the lab reports. J In-text Citat. 7: 777-7777.

Wigginton A. 2016. Note the fine details of the literature cited section: where do commas, semicolons, dashes, and periods go? Comma Period J. 4: 5-6.

Wigginton A, Braccia A. 2016. Finally, notice how the authors, publication year, article title, journal name, journal volume, and article page numbers are formatted both within the body of the report and in the literature cited section. Evol Citat. 6000: 60-4,600,000,000.

## Table

Use this space to insert your table (results should be copied from Lab 5, page 56) at the end your lab report. The table title goes at the top of the table AND answers the questions what, who, where and when (as they relate to the study). Follow the format below. Notice the difference between this table and the table in Figure 5.17, page 58.

**TABLE 1. Insert the table title.**

| Color        | Pearson's r | Strength<br>(S, M, or W) | Direction<br>(+ or -) | P | Significant<br>(Y or N) |
|--------------|-------------|--------------------------|-----------------------|---|-------------------------|
| Black        |             |                          |                       |   |                         |
| Blue         |             |                          |                       |   |                         |
| Brown        |             |                          |                       |   |                         |
| Green        |             |                          |                       |   |                         |
| Orange       |             |                          |                       |   |                         |
| Dark Purple  |             |                          |                       |   |                         |
| Light Purple |             |                          |                       |   |                         |

**TABLE 1.** Insert the table title.

|        |
|--------|
| Red    |
| Yellow |
| White  |

## Figure

Use this space to insert your figure at the end your lab report. The figure title goes at the bottom of the figure **and** answers the questions what, who, where, and when (as they relate to the study).