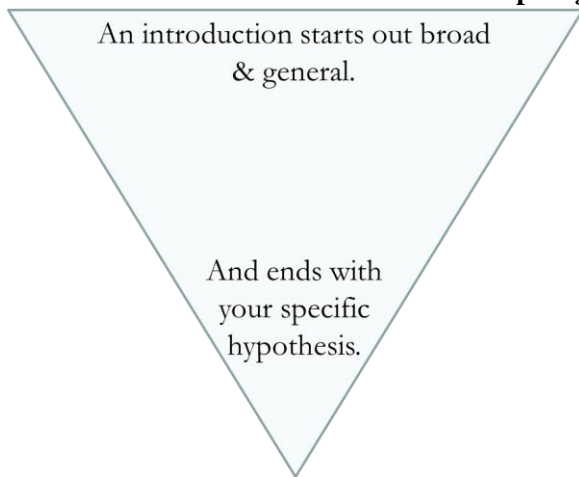


Guidelines for Lab Reports

1. Do not use a cover sheet.
2. All paragraphs and tables must be typed or word-processed. Graphs must be generated using Excel or a similar program.
3. Lab reports will contain five sections: introduction, methods, results, discussion, & references. You do not need to include an abstract.
4. **Introduction: Why you did it.** This section includes background information about the lab, the questions that you are trying to answer (what is the point of doing this experiment?), and your predictions or hypotheses. The introduction should start broad and end with your hypothesis. Describe what is known about the subject or similar subjects and cite your sources. The introduction does not contain any results. Clearly state the questions you are attempting to answer. Explain why these questions are important. End the introduction with a clear statement of your objectives or hypotheses. **This section should be at least 3-paragraphs long (and a paragraph is at least 4 sentences).**



5. **Methods: How you did it.** Describe what you did in the lab and the materials that you used. Ideally, a person who has not taken part in the lab should be able to complete the lab after reading your methods section. Do not provide a simple list of materials. Use complete sentences. Omit details such as how you labeled plants or measured out 1.0L of water. Write this section in **past** tense.

Your methods sections will contain 3 parts:

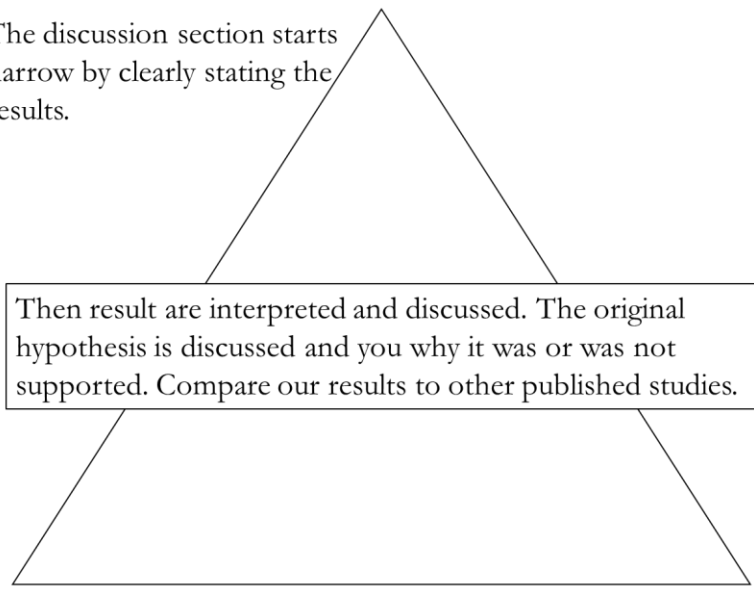
1. Study system
 - Background information on plant species
 - Background information on insect – beet armyworm (*Spodoptera exigua*)
 2. Experiment Design
 - Describe your methods.
 - What were your treatments? How many replicates per treatment?
 - How were the dependent variables measured?
 - Include enough detail so that someone could repeat the experiment.
 3. Statistics analysis: Describe the statistical analysis used.
6. **Results: What you found out.** The data you collected, typically presented in table or figure format AND a paragraph or two of text. Even though all of your data may be presented in figures or tables, you must always have some written text in the results section. The text introduces each figure or table and leads the reader through the important trends or the ‘take home message’ in each table or figure. You do not interpret the data in the results section, only present the numbers. For example ‘*There were more insect species found in creek A than creek B (Figure 1).*’, **not** ‘*There were more species of insects found in creek A than creek B (Figure 1) because creek B is near a parking lot and the runoff*

from the parking lot must be killing all the insects.’ All data comparison statements must include statistics. Your results section needs to include at least one box plot and one bar graph. All figures and tables should be correctly drawn, numbered, labeled and contain descriptive captions. Do not present the same data twice. For example, you cannot present a boxplot showing pupal mass and a bar graph showing pupal mass – that’s redundant.

- a. Number each figure in the order that they are referred to in the results section.
- b. Graphs should be large enough to be easily legible.
- c. Figures, table and graphs don’t need titles beyond Figure 1 or Table 2.
- d. Every figure or table must have a caption that is detailed enough to ‘stand alone’.
- e. Captions are explanatory paragraphs that go above tables and under figures. Include sample size in your captions.
- f. Use a bar graph when independent variables are in distinct categories (locations, etc.). Use a line graph when the independent variables are continuous (temperature, date).
- g. Use multiple graphs when providing data about two or more dependent variables (responses to treatment).
- h. Data points should be large enough to be easily legible (but not so large that it is hard to determine their values). Even if data points are connected by a line be sure that the individual points themselves are still visible.
- i. If using more than one type of data point, be sure the types are easily distinguished from one another.
- j. Label all axes and include the units of measurement.
- k. Use scales appropriate to the data. For instance, if the values range from 0 to 10, do not use a scale that ranges from 0 to 100.
- l. The independent variable (the manipulated variable; the one you controlled) should be on the x-axis (horizontal axis).
- m. The dependent variable (the response that you measured) should be on the y-axis (vertical axis).
- n. If more than one symbol is used on a figure, provide a key.
- o. Columns and rows of numerical data in tables must be labeled, including the units of the data.

7. **Discussion/conclusion: What it means.** In at least three paragraphs discuss what your results mean. Interpret your results in a broader context and compare your results to other published studies. Did your results support your original hypothesis? What are the applications of your results? What were any sources of error and how might they have affected your results? Your discussion section starts narrowly and ends broadly.

The discussion section starts narrow by clearly stating the results.



Then result are interpreted and discussed. The original hypothesis is discussed and you why it was or was not supported. Compare our results to other published studies.

The discussion section ends broadly. Typically the final paragraph restates the major conclusions and why they are important. Connections are made to the underlying principles and theory explaining the work.

8. **References:** Where you found your information. This section contains the full bibliographic citation for each source listed alphabetically by author's last name. Your lab report needs a minimum of 3 scholarly sources.

For all references and citations, we will follow the format of the journal *Ecology*.

From ESA's (Ecological Society of America) website:

The Literature Cited section of a paper may refer only to permanently archived material. If a reasonably diligent scholar 20 years in the future could not be assured of finding a particular source, it would not be acceptable as literature cited. **Because Internet sources typically have a short half-life, they may not be included in Reference sections unless there is reasonable evidence of permanency.**

In Text Citations:

Single author (Zehnder, 2007)

Two authors (Zehnder & Hunter, 2007)

Three or more authors (Zehnder et al., 2007)

References are listed in alphabetical order.

Examples:

Journal Article:

Covich, A. P., T. A. Crowl, and F. N. Scatena. 2003. Effects of extreme low flows on freshwater shrimps in a perennial tropical stream. *Freshwater Biology* **48**:1199–1206.

First author's last name, Initials, Second authors initials, Last name. Year. Article Title. Journal Title. Journal Volume Number: pages

Book:

Gordon, N. D., T. A. McMahon, B. L. Finlayson, C. J. Gippel, and R. J. Nathan. 2004. *Stream hydrology: an introduction for ecologists*. Second edition. John Wiley and Sons, West Sussex, UK.

First author's last name, Initials, Second authors initials, Last name. Year. Book Title. Edition (if applicable). Publisher, City, (State if applicable) Country.

Edited Book / Collection:

Power, M. E., M. S. Parker, and J. T. Wootton. 1996. Disturbance and food chain length in rivers. Pages 286–297 in G. A. Polis and K. O. Winemiller, editors. *Food webs: integration of patterns and dynamics*. Chapman and Hall, New York, New York, USA.

First author's last name, Initials, Second authors initials, Last name. Year. Chapter Title. Pages. In Editor name(s) editors. Book Title. Publisher, City, (State if applicable) Country.