

WRITING LAB REPORTS

Strive for conciseness. Concentrate on important matters. Keep your writing as simple and clear as possible.

TITLE

The title should state the main result as concisely as possible. Who did what to whom and where? Often a sentence works well. For example, “Sap-sucking membracids reduced the height of goldenrod stems in an old field” is more informative than “The effects of sap-sucking membracids on the height of goldenrod stems in an old field.”

INTRODUCTION

The Introduction should lead logically to the question being addressed. It can begin with broad conceptual concerns, then provide relevant background information about the study system. For example, which species are involved? Where do they live? What is the nature of their relationship? This context provides the setting for the more specific field observations or conceptual concerns that motivated the question. Why is the question interesting or important? How did you come to ask this question? The Introduction can then culminate in a clear statement of the question itself. If you have a hypothesis and predictions, you should provide the reasoning behind them, and state them explicitly.

METHODS

The Methods section should enable others to repeat your study. Generally, it should begin with the general approach (e.g., type and location of study) and then proceed in chronological order (e.g., data collection and then analysis). Where were you, what species did you use, how did you do your measurements? You should not describe data entry and graphing procedures, but you do need to describe statistical analyses (“We tested for an effect of ... on ... using an ANOVA in SPSS 7.0.”).

This section must make clear the approach used without describing unimportant details. “I sampled the goldenrod plant ≥ 50 cm tall closest to each of 10 ant mounds” is important, whereas “I measured the distance between adjacent plants with membracids by placing a meter stick on the ground and reading the units” is mostly not.

You may use first person. This will enable you to use active voice as much as possible.

RESULTS

The Results section should make quantitative statements of the main findings and cite Tables and Figures parenthetically. Statistical results are also reported parenthetically, to back up the relevant results. Results statements should report the direction and magnitude of all differences. An example follows.

Goldenrod stems with membracids were taller than stems without membracids (paired t-test: $t = 5.51$, $df = 44$, $P < 0.001$; Figure 1). Three-quarters of the stems with membracids were taller than 70 cm, whereas over half of the stems without membracids were shorter than 50 cm.

Figures are almost always preferable to Tables. To make them understandable, (a) make them neat and attractive in appearance, (b) clearly label the axes of graphs and the rows and columns of tables, (c) indicate the units of all measurements or variables (e.g. a graph axis might be “Distance between leaves (cm)”), and (d) provide an explanatory caption to accompany each figure and table (e.g., “Figure 1. The relationship between the number of ants per goldenrod plant and the distance to the nearest ant mound in an old field in central New York. The two points with asterisks are the plants inadvertently bumped as described in the text.”). Table and Figure captions must be complete enough for readers to understand them without referring to the text.

DISCUSSION

You should offer an interpretation of your results—what do they mean? Can you propose a realistic biological explanation for your results? What, if anything, can be concluded from your results? Can you answer the original question? If not, why not? How do your results fit with what is known about the topic, and what new questions do your results raise? What would you do next?

1. Use past tense.
2. A scientific paper is not a transcript of your field notes, and not a narrative of everything you did that day—only what is relevant to the study at hand.
3. The Results section consists of verbal, quantitative statements of the main results. Cite Figures and statistical results parenthetically. Do NOT use Figures as the subjects of sentences.

Goldenrod stems with membracids were 25% taller on average than stems without membracids (paired t-test: $t = 5.51$, $df = 44$, $P < 0.001$; Figure 1).
4. Statistical results appear in parentheses after the appropriate results statement. Do not explain the null and alternative hypotheses, etc.
5. The Results section should contain no interpretation, but strictly report what happened.
6. Table and Figure legends must be complete enough for readers to understand them without referring to the text. Figures do not have titles. Table captions go above the Table; Figure captions go below.
7. Don't repeat data in the text and in a Figure, or in a Figure and in a Table.
8. You can never say *significantly* unless you have done a statistical test. Even when you have done a statistical test, it is not necessary to say *significantly*.
9. Trust your data. Draw what conclusions you can from them, rather than ignoring them in favor of your preconceived ideas.
10. Any study, including all of the studies we will do, can be improved by increasing the sample size. There is no need to mention this. See #9.
11. An *experiment* involves manipulating a variable while holding others constant. If you did not manipulate the system, then you did a *study*.
12. *Affect* is a verb: 1 *affects* 2. *Effect* is usually a noun: 1 has an *effect* on 2. *Effect* can also be used as a verb with a direct object: 1 *effects* changes in 2.
13. The word *data* is plural.
14. Figures and Tables do not count in the 3-page limit. Put the Figure(s) and Figure caption(s) on a separate page at the end.
15. Double-space the entire document. Use 12-point font. Leave 1-inch margins.

For more guidance, consult:

Anderson, G. 2012. How to write a paper in scientific journal style and format.

(<http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtoc.html>)

Karban, R., M. Huntzinger and I.S. Pearse. 2014. *How To Do Ecology: A Concise Handbook*, 2nd ed. Princeton UP, Princeton, NJ.