

ZOOLOGY 430 Laboratory
Guidelines for Writing Lab Reports

All lab reports are required to be typed, and should be concise – **5 double-spaced pages** not including figures. (longer lab reports ≠ better grades). Each lab report should consist of the following sections (w/ rough page length suggestions):

1. Title & Introduction	~1pg	15%
2. Materials & Methods	< 1pg	15%
3. Results	0.5-1pg	20%
4. Discussion	1.5-2pgs	45%
5. References & Contributions		5%

Guidance	Example/ comments
Title	
Be concise (usually 10 words or less), and reflect the content/purpose of the lab	e.g., “The effect of temperature on heart rate in toads”
Introduction	
The introduction should clearly identify the main idea of the report to a scientific audience (i.e. to other scientists). <i>A. What is the physiological mechanism under study?</i>	If there are multiple mechanisms, be sure to explain the central idea (or umbrella idea), and connect the mechanisms to it. Be sure to use proper terminology & include important definitions.
<i>B. Build argument leading to hypothesis by covering the following:</i> 1. How the physiological mechanism works or might work. 2. Background on what is known already. 3. End with what is unknown to set up what you want to find out .	The hypothesis connects the data to the mechanisms. You will test the hypothesis by measuring particular variables and testing treatments, so provide sufficient detail to foreshadow why your experimental design makes sense. Avoid predictions that are unconnected to ideas. The hypothesis is a statement at the end of the intro about how the physiological mechanism might work and how you will go about testing it.
<i>C. In the concluding paragraph, include the Hypothesis. What, specifically, is being studied in the paper?</i> <i>The introduction should set up Why this experiment was performed.</i>	Short, concise, relevant! After reading the intro, the reader should have an idea about information will be gained through the experiment and why this information is important
Materials and Methods	
Briefly describe the materials and methods with enough detail that so that a scientist will fully understand the logic of the experiment and be able to replicate the data. This section should be short and include:	It should be obvious how these procedures test the hypotheses.
<i>A. The subject and sample size used in the experiment.</i>	(organism, tissue, etc.)
<i>B. A brief explanation of the main experimental procedures used in the experiment.</i> <i>Make sure that the methods clearly illustrates how the procedures relate to testing the hypotheses.</i>	It should illustrate the logic in approaching a test of the hypotheses . It is not necessary to describe standard procedures (like how to measure blood pressure) in detail. Just state which standard procedures you used and cite the lab manual for details. e.g., “Blood pressure was measured using a sphygmomanometer following standard protocols (Butler, 2018).” Do describe carefully any changes from the lab protocol, and any decisions or non-standard procedures.
<i>C. How the data were analyzed to inform the hypotheses. (i.e., What would you compare to know whether the hypothesis was or was not supported?)</i>	Describe the experimental treatments and controls and the relevant details of their implementation. “Dive responses were simulated by facial immersion in an ice bath. Blood pressure and leg volume were compared at standard intervals: resting, after immersion for XX sec., and in recovery at XX time.”

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Results	
<i>Organize your results around the experiments or the hypotheses you tested, so that the reader can clearly see whether your hypotheses were supported. Two parts:</i>	Point to specific results or trends that support or do not support each hypothesis. This section should summarize the factual findings from the experiment. It is NOT a report of the raw data, but rather the analysis of the data.
A. Verbal description of your findings. The general trends seen in the data or differences between treatment groups.	A clear and concise description of the major results of your experiment that answer your specific experimental questions.
B. Figures and/or Tables — well organized — showing the important results of the experiment (see section 7). Include: 1. Caption: A brief description of what the figure or table shows. 2. An explanation of any symbols or abbreviations. 3. Labeled axes/columns/rows.	Do not repeat information in figures AND tables. Figures can be in-text or added on at the end, individually numbered and referred to in the text by number: e.g., “Heart rate increased after 5 minutes of exercise (Fig. 1).” Readers should be able to read and understand figures without referring to the text.
Discussion	
This section should interpret the results of your experiment <i>relating them to the physiological mechanisms under study</i> . A good discussion will:	It is about finding meaning in your results and generalizing from them. Note: Here and in the introduction you want to demonstrate that you <i>understand the physiological basis of the experiment</i> you just performed.
A. Briefly summarize what the results tell us B. Explain what you learned or demonstrated about how the <u>physiological mechanism</u> works. C. Explain how your results <u>fit into the existing body of knowledge</u>.	The discussion starts from the results then dives deeper. Why did you find the results you obtained? Can you infer anything more about the relationships studied? (Optional - If anything went wrong during your experiment, mention how it may have affected your results and conclusions. Keep this very brief. After all, in science you would just redo it.)
D. Broader Significance.	Generalize - how broadly could your results apply? Are there any further questions raised by your results? Could this be important to future research?
References	
You must cite all factual statements in-text. <u>We do not require primary sources for lab reports, your textbook or lab manuals are fine.</u> We expect a properly formatted literature cited section, alphabetical by author’s last name	Formats for: A Book: Withers, P.C. (1992). Comparative Animal Physiology. Saunders College Publishing; New York. Article: Biewener, A.A. and Gillis, G.B. (1999). Dynamics of muscle function during locomotion: accommodating variable conditions. Journal of Experimental Biology. 202, 3387-3396. Lab manual: Butler, M. (2018). Animal Physiology Lab, Zoology 430 Manual: Lab #1.
Respective Contributions	
Please explain in a sentence or two what each group member contributed to the report.	