

Lab Report Style Guide

Principles of Environmental Engineering: CEE:3155

Created by Alyssa Schaeffer, Hanson Center peer tutor

Adapted from Material Science Style Guide and Professor Craig Just's Physical Lab 3 Grading Rubric

You are responsible for implementing the information in this document into the final lab report for PEnvE.

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Formatting Requirements

Style

- Divide your report into the required sections. Label each section with the titles listed under the “Sections” heading below.
 - Section titles begin at the left-hand margin.
 - Double space after the title.
- Double space the body of the paper, with 1” margins.
- Use Times New Roman, 12-point font, page #s.

Clarity

- Write a background section that a nonscientist could understand.
- Present the methods and materials in a coherent manner so that a novice researcher could replicate the experiment
- Communicate your understanding of the experiment. Contextualize the information and provide the practical significance of the conclusion.

Individual Report Writing

Although you may do the lab work with others, you must write the report on your own. You may neither copy the written work of others nor write collaboratively with others. Doing so is a form of plagiarism and may mean that you receive no credit for the lab. In addition, you may be charged with plagiarism and your instructor or the college may take further action.

For more information on avoiding plagiarism, see the following:

- [“Understanding and Avoiding Plagiarism”](#) (HCTC).
- [“Source Use and Plagiarism Policy”](#) (HCTC).
- [Student Academic Handbook](#) (University of Iowa).

Writing Guidelines

- Use complete sentences.
- Do not make bulleted lists for materials, values, equations, references, or anything else.
- For numbers that are less than zero, precede them with a 0 (e.g. 0.123). Values should only go out to two or three decimal places.
- Write in the third person. Keep your focus on the subject of the experiment rather than yourself as experimenter.

Example: “The sample vial was wiped clean and placed in the turbidimeter.”

NOT: “I wiped clean the vial and placed it in the turbidimeter.”

Verb Tense

- Attend to verb tense. Generally, when discussing what was done in the lab, use past tense. When discussing the background of the lab and your conclusions, use present tense. The discussion may include both present and past tense. Generalized discussion, such as background information, should be in present tense while details of the experiment should be in past tense.

Tense:	Section:					
	Abstract	Introduction	Methods	Results	Discussion	Conclusion
Past	X	X ¹	X	X	X ⁴	
Present		X ²			X ⁵	X
Future		X ³				

1. The “Purpose” subheading (see Introduction section below)
2. The “Background” subheading (see Introduction section below)
3. The “Hypothesis” subheading (see Introduction section below)
4. Details about the experiment specifically
5. Generalized discussion and conceptual information

Active/Passive Voice (“Active Versus Passive Voice,” 2020)

- Attend to active versus passive voice. In passive voice, the **action** is performed upon the **sentence subject**. In active voice, the **sentence subject** performs the **action**.
 Passive: **The brakes** were slammed by **her** as the car sped downhill.
 Active: **She** slammed on **the brakes** as the car sped downhill.
- In sections where active voice is required, remove “be” verbs such as “is,” “are,” “was,” and “were”.

Voice:	Section:
Active	Abstract, Introduction
Passive	Methods, Results, Discussion

Word Choice Guidelines

<i>Instead of these words/phrases:</i>	<i>Substitute:</i>
<i>Did, made, saw, etc. (weak verbs)</i>	Collected, reported, determined, created (strong verbs)
<i>Results were found</i>	Results were observed, measured, obtained, calculated
<i>A study/experiment was done</i>	A study/experiment was conducted, performed
<i>Weigh / weight was taken</i>	Weight was measured
<i>Possible</i>	Feasible
<i>Experiment (verb)</i>	Investigate

Sections

Organize your report by the following sections: Abstract, Introduction, Methods, Results, Discussion, Conclusion, References.

Abstract

The Abstract is your report in miniature. It must be placed on a separate page before the rest of the report. Though it appears first, you should write it last. Summarize the report in a paragraph that answers the following questions:

1. What purpose did the lab have?
2. What were the hypothesis and research objectives?
3. What materials did researchers use?
4. What tests did the researchers perform?
5. What result(s) did the researchers obtain?
6. What was the practical significance of the findings?

The following items are also required in the abstract:

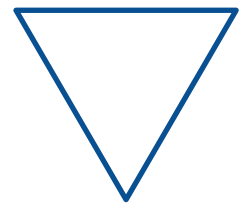
- 250-300 words
- Contains stand-alone qualities – abstract can be understood without reading the paper
- Follows the chronology of the report
- Contextualizes the experiment and the results
- Can be in first person or third person – just be consistent

Introduction

The Introduction should be broken into three smaller subheadings: Background, Purpose, and Hypothesis. Background information should be paraphrased with in-text citations.

Background

The Background should be organized like an upside-down triangle. Start broad with an explanation of why the topic is relevant. Next, discuss the topics in the experiment with enough detail for a general audience to understand. Finally, explain what variable(s) will be tested and why that variable has an effect.



Purpose

The Purpose should explain the problem that is being researched as well as the objectives of the experiment. Both scientific and educational reasons for conducting the experiment should be included.

Hypothesis

Finally, the Hypothesis should predict the specific results of the experiment.

Methods

The Methods section should describe in detail and chronological order all the necessary steps for the experiment including sampling technique(s) and the procedure for using data analysis equations. Define any materials that were used in the lab for a novice researcher to understand. Explain all calculations in detail and leave out any transition words and unnecessary details. Photos or figures may be included to assist in experiment replication (see Guidelines for tables and figures below).

Results

The Results section should summarize the major findings of the experiment using both narrative and visuals. Tables or graphs present the story of the data while the narrative describes key features and trends. Add any necessary labels in tables/figures including those for axis, data points, rows, and/or columns. Figures should also include error measurements (error bars). Use the variable form for equations with variables described after the equation appears. Avoid interpreting the data, as this will take place in the Discussion section.

Guidelines for tables and figures

- Label all graphs and figures as “Fig. [#].” Label all tables as “Table [#].” Note that graphs are not labeled “Graph.”
- Always introduce your figures or tables in the text prior to their appearance. If you include a table or figure in the body of the report, you must refer to it in the text first.
- Figure numbers and captions go under the figures. Example:

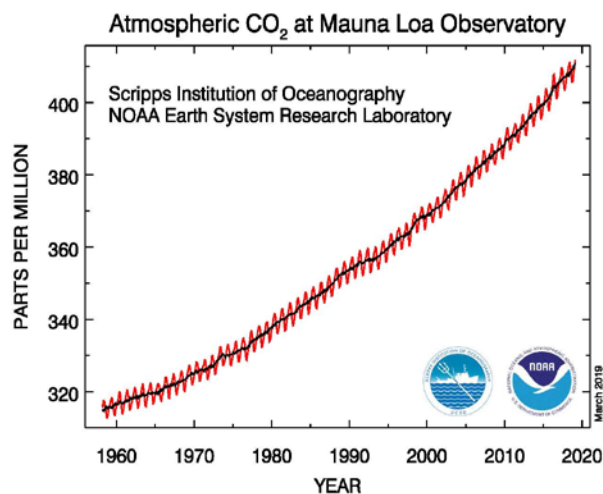


Fig. 4: Rising atmospheric CO₂ levels as seen from NOAA’s Mauna Loa Observatory (“Global carbon dioxide...,” 2019).

- Table numbers and titles go above the tables. See example Table II.
- Keep all parts of a table together on the same page.

Table II: Average pH and hardness at locations 1 and 2 in the water treatment process.

Location	pH	Hardness (mg/L)
1	6.5	180
2	9.0	120

Discussion

The Discussion should interpret the data. Clearly explain the results and answer any discussion questions. Contextualize the results and relate them back to the background and hypothesis (introduction). Explain why the results support or contradict the hypothesis. Compare and contrast the results of the lab experiment to other studies. Discuss any sources of error besides just “experimenter error.”

Conclusion

Instead of repeating information from your introduction, the conclusion should provide new perspectives on the experiment. Include a summary of the most important results and discussion points and offer a recommendation or future implications of the experiment.

References

Create your reference list in APA. Use the APA Documentation Guide, which you can retrieve online at Purdue University’s [Online Writing Lab](#). Purdue OWL’s *Citation Style Chart* may be especially helpful.

Active Versus Passive Voice. (2020). *Purdue Online Writing Lab*. Retrieved from https://owl.purdue.edu/owl/general_writing/academic_writing/active_and_passive_voice/active_versus_passive_voice.html.

Global carbon dioxide growth in 2018 reached 4th highest on record. (2019). *National Oceanic and Atmospheric Administration*. Retrieved from <https://www.noaa.gov/news/global-carbon-dioxide-growth-in-2018-reached-4th-highest-on-record>.