Lab Report Crash Course!

A more in-depth guide on common lab report mistakes and how to avoid them

Basic structure

- Title – detailed description of the report
- Introduction – background information, context, and specific point of the experiment – “What is this about? What are we figuring out?”
- Methods – description of how you conducted the experiment, ie what you did.
- Results – written-out description of what happened in the experiment + figures showing the data.
- Conclusion/Discussion – WHY these things happened + the broader context and ramifications of the results.
- Citations

Title tips to tantalize

- DO be descriptive
  - BAD TITLES: "Wolves and Coyotes", or "Experiment 1"
  - GOOD TITLE: **"Production of Hybrids between Western Gray Wolves and Western Coyotes"**
- DO be formal!!
  - BAD TITLE: "There's How Much Sugar in That?!"
  - GOOD TITLE: "An Analysis of Sugar Contents in Common U.S. Soft Drinks"
- DO NOT write a "hook" title or something like from the cover of *Cosmo*.
- DO NOT make your title a question.

Introduction to Introductions

- 1-2 paragraphs (one sentence alone is not a paragraph; 3-5 is usually okay)
- DO include background info in first paragraph.
  - What do we know about this subject already? Why is it important? (CITE YOUR SOURCES!!!!!)
- DO give basis of experiment in further paragraph(s).
  - What research has been done related to your hypothesis specifically? Is there information to back-up the reasoning behind your hypothesis?
  - What question is being asked and what do you predict will happen? (STATE YOUR HYPOTHESIS!!!). DO BE SPECIFIC.
    - **Note about hypotheses - they are PREDICTIONS, not QUESTIONS.**
    - BAD HYPOTHESIS – What will happen to my carbon dioxide output when I exercise?
    - GOOD HYPOTHESIS – Carbon dioxide output will increase with duration of exercise.

Methods – What did you do?

- DO cite the procedure in the lab manual.
- Do note any changes that were made to the procedure.
- DO use specific quantities, reagent names, and times.
- DO NOT USE BULLET POINTS (irony!)
  - DO write in paragraph form, with full sentences.
- DO NOT EVER write in the imperative or second-person, eg “Fill the test tubes with penguin vomit” or “First you mix the bleach and ammonia” (also **do not** ever mix bleach and ammonia)
  - DO write in the first or third person, eg “The test tubes were filled” or “I filled the test tubes.” Don’t slip back into second-person writing!

Results

- "What happened?"
- Should be easy! Write about what happened in general. (Don't forget this part!)
  - **DO NOT** write out ALL the results. That's what figures are for.
  - **DO** discuss the basic trends of the data.

- Then include tables and figures
  - **DO** LABEL PROPERLY!
    - Tables should have a descriptive title
    - Figures should have a description underneath
  - **DO** refer to figures in text – eg "The rats gained the most weight on an all-Chipotle diet (Table 1)."
- **Do not** write yet about WHY things happened. That's for the next section…

In conclusion, we conclusively conclude…

- "WHY did this happen?" + "What does this mean for the big picture? / Why does it matter?"
- DO state whether your hypothesis was supported or not supported based on your results.
  - DO NOT state that your hypothesis was proven true or not true (you cannot prove a hypothesis, only support it).
- DO include a paragraph about why you got the results you did.
  - What mechanisms are at work here?
- DO include reasons for error – ALWAYS!
  - Even if your experiment got awesome results, there are possibilities for error
  - What could be improved? Did you goof up? (Goofing up is totally okay! YOU ARE NOT GRADED ON WHETHER YOU GOT GOOD RESULTS!!)
  - If you didn't find the results you expected, what went wrong? What was supposed to happen AND WHY? – You ARE graded on whether you can explain your results and identify what should happen and why it should happen. Critical thinking!
- DO include how findings relate to a broader picture / why it matters.
  - Good place to use citations!! – other similar studies or findings?

Citations!

- DO use a scientific format.
- DO have a “Works Cited” section after your conclusions.
- DO NOT QUOTE
  - DO paraphrase
  - DO use in-text citations after PARAPHRASING.
    - Example: “A pH lower than 7 denotes an acidic substance (Wendeln et al., 2014).”
- **Failure to paraphrase and/or failure to cite information both IN TEXT and in the Works Cited is PLAGIARISM!**

General tips

- If an old lady chosen at random wouldn't know it, cite it.
- Start each section (other than title) with a header: "Introduction", "Methods", etc.
- Think of report in "hourglass" format:
  - Start broad – background info in introduction
  - Get more specific – introduce your experiment
  - Be very specific – methods, results
  - Get a little more broad – conclusions about why you got your results
  - End broad – conclusions about your experiment in general
- Always be as specific as you can.
- Don't panic after first lab report grade.
- When in doubt, contact TA!