Some Overarching Principles

◊ **Focus on your abstract.** One of my former professors, Dr. Kevin O’Donovan, calls the abstract “the foundation” for any lab report. It’ll be the first part of your report that anyone reads. It might well be the first part you draft. Think of it as a roadmap to the whole, not only for your reader but you too as an author: you’ll continually return to it, as you draft your report, both to make adjustments to it and to ensure you’re staying on track in the body of the report as you go.

◊ **Think ‘memo.’** Sometimes lab reports can seem like completely foreign genres. Approaching them in the same way you might a memo, in some ways, can help. In the Army, we frequently write memos to accurately, clearly, and concisely relay information—that’s what your report needs to do with your work in the lab. *(For example, with your abstract think BLUF, or “bottom-line-up-front.”)*

◊ **Pay attention to detail.** In scientific writing attention to detail is critical. It means that your work should be polished and clear—easy to interpret. With visual communication, for instance, make sure you doublecheck your figures for clarity and that you’ve labeled all quantities and units appropriately. Ensure that you’ve diligently utilized the proper documentation format as well.

Write your lab report with enough detail so that if you had to read it five years from now, you would find it interesting and useful enough that you would be able to repeat the experiment.

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Three Keys to Achieving the Proper Tone in a Lab Report

There’s no ‘I’ in lab report. In general, first-person pronouns are a no-go in lab reports, unless your instructor specifically says otherwise. This means you should entirely avoid words like “I” and “my” (or “we” and “our” if you’re working in a group). Also, you might have heard in other classes that you should write in the present tense or avoid the passive voice as much as possible. But in lab reports it’s the opposite: you’ll almost always use the past tense and you will frequently use the passive voice—that’s because the results of your lab work, rather than who performed it, are what’s most important.

Be concise. Regardless of whether you’re given a maximum word count or page limit for your report, make a conscious effort to choose your language carefully. Avoid jargon. Streamline your sentences. Your style should never obscure the most important part of your report—its substance. Lab reports are a classic case of “form follows function”: you’re trying to convey facts, data, and scientific conclusions; therefore, your language should be straightforward, clear, and distraction-free. As long as you’ve explained the necessary science, the rule of thumb for lab reports is the more concise, the better.

Keep it professional. Most professors require formal written lab reports as an exercise to improve scientific literacy as well as prepare students to read and analyze journal articles in their field. Scientific publications are extremely professional, formal documents; look at your lab reports as opportunities to rise to that level. This will impact your writing in small ways, too; for instance, avoid using contractions or abbreviations. And while you should avoid jargon, don’t hesitate to define and use important vocabulary words from class. You did the lab, so you’re the scientist! Now it’s time to write like one.

The Bottom Line: Lab reports are your opportunity to demonstrate to your instructor what you’ve learned. Carefully choose your language and apply course concepts and key vocabulary as necessary to show your mastery of the material.

Now, let’s take a look at some of these principles in action in a sample piece of writing—a paragraph from a lab report I completed for Organic Chemistry (left) with corresponding annotations that analyze the moves it makes (right).

The objectives of this lab were to prepare (E)-methyl cinnamate though a green, on-water Wittig reaction and to characterize the products using various analytical methods including chromatography and spectroscopy. This laboratory experiment was a success, as the objectives were met: (E)-methyl cinnamate was yielded and an understanding of green chemistry was established. The final percent yield of the products was 60.14%, which indicates that the product was not completely pure (E)-methyl cinnamate. Data from the analyses further support this claim, indicating the possible presence of side reactions or byproducts. This leads to the inference that the reaction either did not proceed to completion or that the aqueous layer was not separated thoroughly enough from the organic layer. As a result of this, to improve this experiment in the future, it is recommended that after refluxing, the solution should be rinsed several more times in order to ensure that the entire aqueous layer is removed. This will prevent contamination in the products, and will result in a higher percent yield.

Notice that the language here is clear and up-front. It’s useful in that it makes your audience aware, right from the start, of what you were trying to achieve in the lab. Notice, also, that you should explicitly state whether or not your experiment succeeded (and why).

The number here is given the proper significant figures (remember, these come from your measurement); also, units (percentage) are properly shown. Moreover, note how the entire name of the chemical compound is written out — no abbreviations or acronyms.

This is an example of concision in action. In just one sentence, you can deliver all of your key assumptions about the lab’s results to the audience.

Notice the care this sentence takes to stay in the third person and its use of passive voice. While it might be easier to say “we recommend...” or “in the future I should...,” “it is recommended” maintains expected scientific objectivity.