

27.2: Scientific writing

Scientific writing is important in communicating with other scientists. Think of scientific writing as a style of writing where **every word counts**. It makes for rather “dry” reading, but it is important for clearly and precisely communicating factual information. The main guidelines for scientific writing are **be concise, precise, factual, and clear**. Below are some tips to help with scientific writing:

- Avoid subjective/imprecise terms: avoid using subjective and imprecise terms, stick to factual statements and avoid opinions. Instead of saying “our calculated value of g was much greater than the expected value”, say “our calculated value of g was greater than the expected value”. Your opinion that it was “much greater” does not communicate anything and is imprecise (much greater in relation to what?).
- Definitive statements: avoid attributing definitive causes to your experimental outcomes. You can never prove a theory to be correct, so at most, your results will be consistent with a theory. For example, instead of saying “as the data exhibit, we have detected the Purple Particle”, you should state that “the data are consistent with the detection of the Purple Particle”.
- Data is the plural of datum. “This data shows” is incorrect, rather, “these data show”, or “this set of data shows”.
- Active vs. passive voice: when writing scientific papers, it is recommended to use the third person, passive voice. For example, this would mean saying “the drop time for balls at various heights was measured” rather than “we measured the drop time for balls at various heights”. However, both passive and active voices are acceptable in scientific writing, as long as it is consistent throughout the text.
- Tense. Generally, for a proposal, you would use the future tense, and you would use the past tense for reporting on your results.

emma's thoughts

Writing and editing - how can I be more concise? We’ve all felt that our writing was lacking at some point or another. Here are some general tips to avoid overall “wordiness” and to increase ease of reading when writing scientifically:

- What would you want to read? Let’s say that you wanted to know the strength of Earth’s magnetic field, and how it was found, so you decide to do a literature search. Would you choose a brief, succinct article, or a wordy Magnetic Field Manifesto?
- The kindergarten test: If you had to explain your concept to a six year old cousin, how would you break it down in a way that they could understand it? If you can’t break it down enough to explain to a six year old, perhaps you need to revisit your own understanding of the concept before writing about it scientifically.
- Avoid unnecessary adjectives: while this might be ok in a creative writing class, in scientific writing, the goal is to get your point across as succinctly as possible. Using “big” words might be ok (as long as they properly describe what you are trying to say), but it is important to communicate your message in the simplest manner.
- Think about it: every time you use a comma, dash or even an “and”, you should reconsider the brevity of your statement. In scientific writing, commas are carefully placed, and semicolons are rare.
- Cut it in half: For every word you read, think of another that you can cut. For every sentence that you read, think of three sentences that communicate the same idea. Pick the sentence that is the shortest and most concise.
- Proofread - the more, the better.

The following sections provide basic outlines for writing a proposal and a lab report, as well as rubrics for evaluating/reviewing proposals and reports. Additionally, samples of a proposal, proposal review, report, and report review for the experiment “Measuring g using a pendulum” are provided. In the sample proposal and lab report, errors are purposefully included and addressed in the reviews. It is important to entirely read the rest of this section to capture the common proposal/lab mistakes and their corresponding corrections. That is, do not take the sample proposal as a “perfect proposal”, but rather, consider it in the light of the corresponding review.

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