Writing Basics for Science Papers – Bio 141

If you remember nothing else: always short, always specific!

The Basics
- Be consistent (in terminology, in tense, in citations, etc.)
- Be precise (avoid articles – use names instead, even if it seems slightly redundant)
- Use active voice (one exception – see below)
- Use transitions!
- Be simple (no unnecessary qualifiers, no fluff, basic but clear vocabulary!). Students have a tendency to be very lofty in science papers.
  - Ex: “Based on the fact that the blue mixture became extremely warm, it is suggested that a relationship may exist in close proximity between factors A and B. This supports previously found results...” NO! SHOULD BE: “The blue mixture was warm, suggesting a relationship between A and B. This supports previous research (cite research).”
- Be simple, but don’t overgeneralize. It’s a balancing act.

Title
- As short and specific as possible
- Avoid introductory words such as “observations of...” “A study off...” etc.
  - Ex: “A Study of Evolutionary Behavior of Naked Mole Rats” should be “Evolutionary Behavior of H. Glaber”

Abstract
- One to two sentences of “big picture” and significance
- One to two sentences of research question or objectives
- One sentence of hypothesis (if applicable)
- Two to three sentences of approach to the problem (methods)
- Three to four sentences of trends seen in data (results)
- One to two sentences explaining potential next steps, failures, etc. (discussion)
- Less than 300 words (this is strict)

Introduction
- Introduces reader to the place of the current work in a wider body of scientific knowledge
- Establishes significance of current work
- NO FLUFF! Everything should be cited
- Questions to Address: What is the problem? Why is it important? What solution do you propose?
- Moves from general to specific
- Avoid using too much detail to overshadow the general function of the work
- End with hypothesis and support for hypothesis (why do you think this?)
Methods/Procedure
- Paragraph form
- Very detailed; include materials in the paragraphs (no list)
- Follows chronological order
- Past tense, passive voice acceptable
- Avoid mixing results with procedure: stick to exactly what you (the researcher) did
- Can use first person

Results/Data
- All graphs and figures should include a caption explaining the general argument being made
- Short, sweet, and specific!
- Put a space between numbers and units
- Question to address: what did you observe?
  - How to address it: briefly describe experiment and follow up with most representative results or cases
- Avoid extra words (ex: “It is shown in Table A that X corresponds to Y” should be “X corresponds to Y”)
- Note deviations! Deviations are where the best scientific discoveries come from. Students should explain these deviations to the best of their ability (environmental, chemical, atmospheric factors may be at play)

Discussion
- Discusses the results. What do they mean?
- Continually refers to results but DOES NOT REPEAT THEM!
- Summarizes the best trends presented in result section
- Describes patterns, principles and relationships, then explains how these relate to the wider body of knowledge referenced in the introduction
- Explains agreements, contradictions, and exceptions
- Describes any additional research that can be performed to clarify or support arguments
- Suggest theoretical and practical applications
- Extend findings to the big picture (returns full circle to the introduction)

Citations
- No formal way to cite scientific writing – varies among journals and professors
- The lab manual for Bio 141 gives specific format (called name-year format)
- Give the author and YEAR OF PUBLICATION in any in-paragraph citations. Do not give page number as it varies among journal editions.
  - Referred to as “name-year” method of citation if you’re googling

This is an awesome reference. I’ve used it for numerous papers:
http://www.biochem.arizona.edu/marc/Sci-Writing.pdf