Assignment 2 for First-Year Students

Deadlines:

- Topic Submission: March 19th, 2010
- Outline: April 9th, 2010
- Rough draft (optional): On or before April 23rd, 2010
- Full paper: April 30th, 2010

Topic Submission:
Submit a one- to two-paragraph description of your topic. What questions will you ask and answer? What specific information will you provide? Make sure to give the instructors some level of detail. The only requirements for the topic of your paper are 1.) it relates to chemistry or biology of an everyday activity or of everyday life and 2.) it really, truly interests you.
Start by reading science-related articles in newspapers and newsmagazines, by watching scientific programs on TV, and by paying attention to the science that happens in your everyday life. What topic catches your eye? What academic lectures (in this class and others) are the easiest for you to pay attention to? What do you wonder about? If you have trouble choosing a topic, see Dr. Lu or Lauren and we will be happy to help.

Outline:
Submit a detailed outline of your paper, including at least two peer-reviewed references.

Rough draft:
Submission to Nick Marshall of a rough draft is entirely optional. Revision is an important step in scientific writing, and so it is recommended and encouraged that you complete a rough draft and meet with Nick Marshall to revise the paper.

Full paper:
The minimum number of pages for this assignment is 10 pages. You are encouraged to observe a maximum length of 13 pages.
Use a format similar to that of Accounts of Chemical Research, using titles for each sub-section.

Abstract
State the main points of your paper in concise and formal language. This section should “stand alone”. Write your abstract carefully—when scientists are looking for interesting papers, they may only read the abstract to determine whether they should bother to read the whole article. The abstract should give a good sense of what material will be covered in the rest of the paper. Limit your abstract to no more than ¼ of a page.

Introduction
Give background information necessary to understand the rest of the paper and to place it in the context of other research. Make sure to reference literature sources for any statements you make. The introduction also serves to “sell” your paper to the reader—
here you can explain the broader interest relevant to the more specific research you describe in the paper.

**Body**

You most likely will break up the body of your text into coherent subsections (with descriptive titles – please do not use the title “Body”!), as in most *Accounts* papers. In this assignment, you will essentially be reviewing part of the literature on your subject of interest. This is the longest section of your paper. Don’t forget to reference the primary source when discussing published research!

**Conclusions**

Summarize the main points of the paper and include additional discussion about the broader relevance of the results reported. This is an excellent time to come back to anything you may have said in the introduction about the importance of the results presented. Some of you may wish to make this section into a “future directions” section, in which you describe some ideas you have about where the field is going, or some new proposed experiments. Next to the abstract, the conclusions/discussion section is the most commonly read part of scientific papers. Your reader should be able to look at this section and see the main points of the paper, with a few more “juicy” details than in the abstract.

**References**

Use a minimum of 5 references, at least three of which must be books or peer-reviewed sources of literature. If you are not familiar with the literature and library resources, talk to a librarian—they are there to help you, and are generally very good at literature research. Your references must be in *PNAS* style (see handout on references for more details).

**Figures and tables**

Good scientific writing makes generous use of figures, schemes, and tables. Use tables rather than excessive list-making in the text. Some figures that you will want to use will be fairly obvious, but do not underestimate the power of drawing a scheme or cartoon to explain a complex process. A good rule of thumb: use at least one figure or table for every two double-spaced pages.

**Some notes to you about problems of student scientific writing:**

**Repeating yourself**

Scientific writing is repetitive. The main points of your paper should be repeated in each section. Sometimes there is only one good way to state a certain principle or explain a concept. The problem for many students is that they feel re-using a word or a phrase from one section to the next is not proper. Re-using words can often clarify your point rather than bore your reader. The most important thing is to use the best word for your meaning.
Tense

When making a statement that is generally accepted and is always true, use the present tense (e.g., “The structure of DNA is that of a double helix.”). When discussing something that happened during an experiment you’re describing, use the past tense (e.g., “The double-helical structure of DNA was perturbed upon addition of cobalt.”). When mentioning work by others, use the past tense (e.g., “Watson and Crick discovered the double-helical structure of DNA”).

Pronouns

For papers reporting scientific research, it is acceptable to use the third-person voice (“The DNA was purified by gel electrophoresis”) or the first-person-plural voice (“We purified the DNA by gel electrophoresis”). It is never acceptable to use the first-person-singular voice, which includes the pronouns, “I, me, my”. For this paper, confine yourself to the third-person voice. You are not discussing your own research, so there is no need to do any reporting in the first-person voice.

Commonly, writers overuse such pronouns as “that”, “this” and “it”. These pronouns are vague. Carefully edit your paper for vague pronouns and eliminate them wherever possible. Replacing all vague pronouns can make writing sound repetitive, however, so do not feel obliged to banish “that”, “this” and “it” completely from your writing.