The author -- Take some time away from your paper and then come back to it as a reviewer. Read it aloud. How does it sound? Does one sentence flow to the next? Is there needless repetition? Do your explanations make sense? This may sound foolish, but it is a tested method. It may also help you learn to recognize your own bad writing habits.

Other students -- Since other students are your intended audience, why not test out the paper on one of them? You may want to pick someone NOT in your class, particularly if all members of the class are writing a paper on a similar topic. Your reviewer should be thanked in your *Acknowledgments* section.

The Writing Lab -- The folks in the Writing Lab are a wonderful resource. Going to the Writing Lab is not a punishment, but an opportunity. Many of your professors have used the writing lab for their own work, including this very document. Make an appointment and start writing well in advance.

The professor -- Your instructor may be willing work with you on your paper. Make an appointment well ahead of time (professors have busy schedules) and come in well prepared to discuss *specific* aspects of the paper. Don't expect your instructor to read a full draft at a moment's notice to screen for problems.

Do you get the sense that all this can't be done the night before the due date?
You got it.

Methods of evaluations of papers will vary among your professors. In **Appendix C on page 73** we show two examples of evaluation rubrics that have been used in Biology classes for evaluating scientific papers. Ask your instructor how s/he will evaluate your paper.

The Scientific Poster

What is a poster and why do you do it?

Professional scientists regularly present the results of their work at local, national, and international meetings. At most scientific meetings, posters are the primary means by which scientists exchange information about their work. The poster, although a smaller unit than the published journal article, is thus a fully professional entity, and almost always the first form in which your story is made public. It is also the most egalitarian form of presentation in that tenured researchers and students alike use it. Its principal advantage is that it promotes extensive two-way communication between the presenter and the audience. Not only are results and conclusions presented to the audience, but also the presenting scientist usually receives ideas and suggestions that help in planning future experiments.

What is a poster? A poster is a visual way of presenting scientific results. A good poster is virtually self-explanatory; it will contain the elements of a paper (Title, Abstract, Introduction, Materials and Methods, Results, Discussion, Conclusions, and References), but it is a distinct form in which different elements are emphasized. There are several examples of research posters distributed around the science building. Look them over. If you still have questions or are unclear about the elements and structure of posters, talk to your instructor.

The poster audience may be divided into three main groups. At professional meetings, Group 1 comprises those colleagues, collaborators, and students who follow work in your area of biology very closely. In Bio 150, that means the other students who have chosen to focus on topics very similar to yours. This group is familiar enough with the methods and background of your work not to find detail intimidating. At professional meetings, Group 2 includes those scientists who work in the same general area as you, but not on your particular specialty. This group is much larger than Group 1; in this course, it includes the other members of your course. At professional meetings, Group 3 would include those researchers whose work is largely unrelated to yours. In this course, it includes other students within the Science Division who may come to view your poster, as well as the very general audience likely to be present at Parents' Weekend. Keep in mind that your poster must address the needs and abilities of all three groups in order to be successful!

Contents of a Scientific Poster

Title and Author Panel

The title should be descriptive but short, in **boldface** letters 1.5 inches high. The authors' names may be somewhat smaller.

Abstract

This is a short (50-100 word) summary of your research. It should be completely self-contained (that is, independent of the rest of the poster). This is the one portion of a poster that is commonly published.

Introduction

Here you introduce the topic of the work, briefly summarize any relevant background information, including a short review of the work of other investigators, and succinctly state the objectives or hypothesis.

Methods

Unless the primary focus of the poster is the novelty of its experimental methods, this section should be kept to a minimum. There must, however, be sufficient detail to permit the reader to understand what was done and evaluate the appropriateness of the experimental design and technique.

There is some disagreement, both within biology and between biologists and chemists, over how long this section should be and what it should contain. Some alternatives:

- Include relevant methods within the text associated with figures in the Results section, and don't include a separate Materials and Methods section at all.
- Include a Materials and Methods section, but make it extremely brief and heavily larded with citations (including the lab manual); additional methodological details may be included in figure legends when necessary
- Use bulleted lists of procedures; sketches, figures, diagrams, or photos of equipment; and a listing of conditions. If detailed materials and methods are required, they may be appended in smaller type.

Check with your instructor to find out what s/he prefers.

Results

This is a **summarized** report of your observations, not your interpretation of the results. Present your results in a logical sequence, not the sequence in which they were obtained. Remember that this is primarily a visual, rather than verbal, presentation. Graphical representation of data is almost always more effective than tables or text. Use text only to explicate the figures and, if necessary, to make transitions between figures. Number all figures and tables consecutively (e.g., Fig. 1, Fig. 2, Table 1, Table 2, etc.). Raw data should be included only when <u>absolutely</u> necessary; if in doubt, ask your instructor.

Discussion

Here you analyze and discuss your findings, though less expansively than in a paper. Summaries such as numbered or bulleted items may be used. You should point out the general meaning and importance of your results, and relate them to those of other investigators (be sure to cite their work appropriately!). You should also include a description of further work that could be done in this area.

Conclusions

This includes a few brief and concise statements summarizing your work.

References

Here you should list sources that were cited in your poster.

Acknowledgments

You can acknowledge funding sources, individuals, facilities, and personal conversations that aided you in your research.

Presenting a poster

Be ready with a short oral summary of the main points of your poster. A concise synopsis of the purpose of your experiments, the results you achieved, and the conclusions you draw is very useful. Also, prepare brief explanations of the important features of each panel, particularly for those including tables or figures. This preparation will allow you to "walk through" the poster with anyone who expresses interest.

Criteria for evaluating posters.

The assessment of your posters will be based upon criteria that will vary somewhat among different courses. There are two poster evaluation forms on **page 76 of Appendix C** that give a feel for what poster evaluators are looking for. The first form, a tripartite scheme, has been used for many biology courses in the past. Parts one and two, which address the "science" of the experiment, carry more weight than part three, which addresses the aesthetics of the poster.

Appendix C contains detailed instructions for making posters in Power Point (pg 83) and important information about the Biology 150 Poster Session (pg 84).