Preparing Posters and Oral Presentations

A good scientist must also be a good writer and a good public speaker: his or her research is of no value if it cannot be effectively communicated to others. At North Central, you will have many opportunities to refine your scientific communication skills! These may range from written lab reports that only your instructor will read and in-class presentations for your peers to research presentations at scientific meetings or even published articles. The format and style for written lab reports are discussed elsewhere in this handbook (see p. 17); this section will focus on how to present your research in public.

As a biology or biochemistry student, you are required to participate in research in some form. This may mean a project lasting at most several weeks that you design for a research course, or it may mean collaborating with a faculty member at North Central or elsewhere in his or her ongoing research. A course project could be presented within the course, at the departmental seminar, at North Central's annual Rall Symposium on Undergraduate Research, or at a regional student meeting such as the βββ District Conference or the ACCA Symposium. A high-quality course project might be suitable for presentation at a national student meeting, such as the National Conference on Undergraduate Research or the βββ National Conference. A more involved collaborative research project could be presented at any of these meetings but—if it represents a genuine advance in its field—might also qualify for presentation at a national scientific meeting.

At any of these meetings, there are usually two formats for presenting research results; depending on the meeting, you may have a choice between the two or be required to use one or the other. For a *poster* presentation, you explain your work with illustrations and text assembled on a poster board. The presenter does not give a formal presentation but must be present during a specified period to summarize results and answer questions for interested readers. In a formal *oral* presentation, the presenter gives a prepared talk with slides or other visual aids and then answers questions from the audience.

Poster presentations

In planning your research poster, consider *visual impact* above all. Good posters attract a potential reader's attention from across the room. They have large, readable pictures and a bare minimum of text in print that is easily readable from several feet away.

Before starting to work on your poster, find out the size restrictions for the meeting you will be attending. Many meetings, especially student meetings, expect you to confine your data to a small, folding posterboard about 5 feet wide and 3 feet high. Other meetings, however, may allow larger displays. Then start by drawing a rough sketch to help you decide on a reasonable amount of data to present without overcrowding your poster. Too much information just makes your poster look "busy;" some blank space allows you to arrange your material so that the audience can quickly assimilate the major points.

Be sure your title is large and clearly visible. Don't forget to include your name, as well as the name of your faculty mentor and any others who worked on the project. Include an abstract on the upper left side of the poster. For many meetings, you will have to submit an abstract as part of your application to attend; the abstract on your poster should be the same as the one you submitted. Include some introductory material, but keep the text to a minimum; use illustrations and bullet points wherever possible. Use headings such as "Introduction," "Methods," "Results" and "Conclusions" to clearly identify the major parts of your presentation.

Remember that the goal of your poster is to stimulate discussion with others who attend the meeting. It is not intended to be as comprehensive as a paper or even a formal oral presentation. Include only the data that is truly necessary and present it in graphical form as much as possible. Often, you can give essential information about the methods in a figure caption and dispense with a formal Methods section. Place related items close together and then frame them with blank space. Be sure everything is easily readable from a distance.

Summarize your results and conclusions with a few brief bullet points rather than lengthy explanations in paragraph form. Figure 3 shows a possible layout.

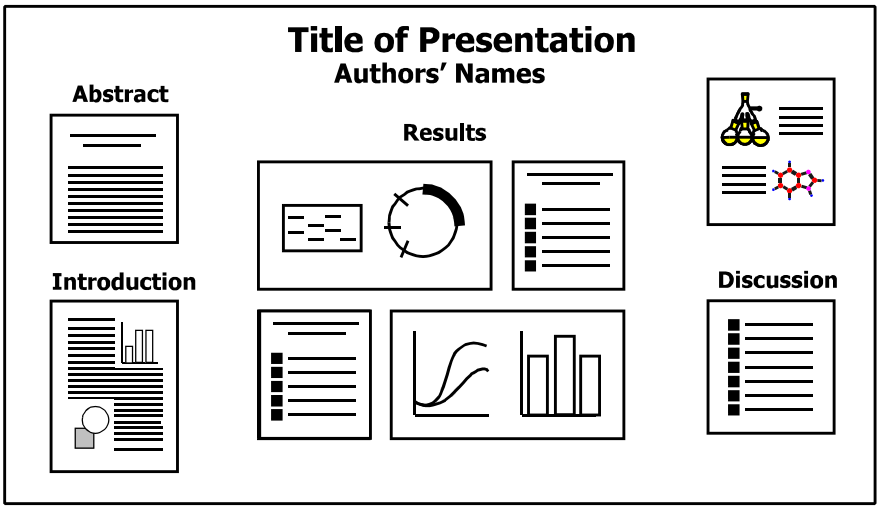


Figure 1. An example of how a research poster might look.

Take the time to make your poster a polished and professional presentation that reflects well on you, your research and North Central College. Choose colors that are attractive but not distracting; neutral colors and grays are easiest on the eye; bright colors may be eye-catching but can be difficult to read. Mount photos on contrasting colors to make them stand out. Be sure your writing is clear, concise and precise. Choose fonts and text sizes carefully, and use professional-looking headings, symbols, italics, sub- and superscripts, etc. Be certain that your graphs, tables and figures are easy to read and clearly illustrate the important points of your research. Don't expect to put the poster together at the last minute; you can expect to spend 10-20 hours or even more putting together a high-quality presentation.

If you are constructing the poster on a large piece of poster board, be sure the pieces are glued down securely—don't trust a glue stick; you may find your data crashing to the ground at an inopportune moment. Rubber cement or spray adhesives work well. If you will be tacking your poster to a bulletin board or display board, glue individual panels firmly onto heavy backing and don't forget to take pushpins or other fasteners to the meeting with you. Another alternative is to create your entire poster as a single PowerPoint slide (be sure it is sized to scale) and have it printed on a single sheet by a commercial printing service (cost is typically $30-$60).

If you are traveling to your meeting, hand-carry your poster; don't trust it in checked baggage or try to mail it ahead. Dress professionally but don't over-dress; "business casual" would be appropriate for a presenter at most scientific meetings. Think in advance about what you will say to your audience. Although you're not making a formal oral presentation, it is very common for someone to ask you to "take them through the poster," and you will certainly get questions from your audience, as well. You should be prepared to walk someone briefly (3 min.) through the main points. Listen carefully to the comments your readers make; often, they may have very valuable ideas that can help shape your future research. Ask for business cards or e-mail addresses from people who seem to have particularly interesting ideas.

Oral Presentations

As with a poster presentation, an oral research presentation should not attempt to convey every detail of your research to the audience. Instead, you want to carefully craft your presentation to catch the audience's attention, help them understand what you are doing and why it is important and get them excited about the results you're presenting and their significance and implications. Excellent visual aids are crucial to this process; without them, the audience quickly gets lost.

In an oral presentation, your main constraint is *time*. There will be a time limit on your presentation, and in many cases you will be held to it strictly. If you exceed your allotted time, your audience may feel that you do not respect the value of their time and may even become bored. If your presentation is excessively short or delivered too quickly, however, the audience will get the impression that your results are skimpy or unimportant. Most people try to say too much rather than too little, so once you have an outline of what you want to include, pare it down until you have only what you can talk about at a comfortable pace without going over the limit. Be sure to leave time at the end for questions from the audience. Needless to say, the only way to know how long your talk will run is to rehearse it, out loud and with visual aids.

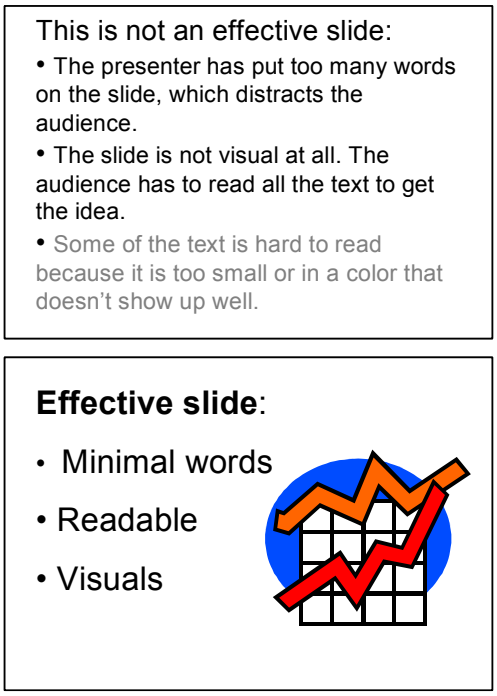


Figure 2. Effective visual aids for presentations are readable, visual, and not too wordy.

Your presentation should be as *visual* as possible (see Fig. 4). Wherever possible, show a graph, photo, diagram or other illustration rather than a wordy explanation. Wherever possible, replace paragraphs of text with short bulleted lists, replace lists of results with tables, and replace tables or text descriptions with graphs or other graphics. Include photos or diagrams to help clarify introductory material or difficult methods, as well. (Remember that PowerPoint is a *drawing* program and can be used to make effective illustrations of all kinds!) Even where they are not absolutely necessary to make a point, graphics add interest.

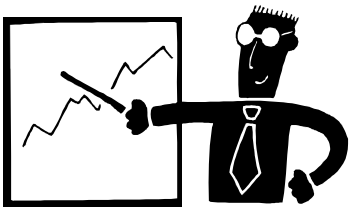
Effective visual aids could include PowerPoint presentations, 2×2 slides (the main staple of scientific research talks until computer projectors became commonplace), overheads or even a simple chalk-talk format. The key is to have pictures, drawings, graphs, tables, etc. that genuinely enhance the audience's understanding of your material. It is easy to use the built-in formatting features of PowerPoint to create a flashy presentation, but the colorful backgrounds and borders and animated effects can often distract your audience. Well-used graphic effects, clip-art, etc. can capture interest and provide some entertainment, but don't let them steal the show…remember that *science* is the main event. A well thought-out chalkboard presentation can be far superior to a multimedia event that has more dazzle than substance.

Keep text to a minimum (see Fig. 4). If your slides are wordy, your audience will be busy reading them, rather than listening to you. Worse, you yourself may be tempted to read directly from the slides! This keeps you from making eye contact with your audience and suggests to your listeners that you don't know your own material very well. Excessive reliance on notes creates the same problem. Try limiting yourself to no more than 20 words of text for each graphic, and then practice your talk until you know it so well that a brief glance at the slide will be enough to remind you of what you need to say about it. Notes are acceptable if you need them, but be sure they are brief so you won't be tempted to do more than glance at them, and be sure they're in a format that won't result in distracting paper-shuffling.

Your talk should contain plenty of introductory material. Think about what your audience needs to know in order to understand why your work was important, and then be

sure you give them that much background. It's very common to hear an oral presentation with too *little* introduction, but quite rare to hear one with too *much*! Be sure you explain all your technical terms, abbreviations, etc. and that you spend some time introducing the key concepts in detail. Use visual aids to further strengthen your introduction.

Be sure that you have a clear, thorough understanding of all aspects of the research you will present. You will embarrass yourself and your mentor if it comes across to your audience that you don't know what you're talking about, or if your understanding breaks down when someone asks an unexpected question. Don't cut corners or try to gloss over a point that you don't understand well; remember that there might be someone in the audience who understands that particular point very well and will call your bluff!



Your audience will judge not only your data but also your *delivery*! "So, then I kinda thought I'd, uh, mix somma that stuff with this other stuff, and, um, it kinda didn't work right but you can sorta see that maybe these things here are, like, y'know, those cell-things." If you hear a presentation like that, it doesn't really matter whether the presenter understands the material or how good the results are. Keep your presentation on a formal, professional level. Explain your work in your own words—not fancy-sounding language that is artificial for you—but be sure the words you use are clear, precise and scientific. Avoid slang, and be careful not to sound flippant or disrespectful. Always use good grammar. During rehearsals, pay attention to how often you say "um" or "uh" and try to eliminate those unnecessary fillers.

Remember that you're not bound by the strict formatting requirements of a journal article. In an oral presentation, you don't have to put all of the introduction at the beginning, then all of the methods, followed by all the results with separate conclusions/discussion. Structure your talk so that your audience can understand it clearly. It often works best to introduce the method used for an experiment *as* you show the data from that experiment, and then immediately follow up with the conclusions from that experiment and their significance. Remember that your audience is not as familiar with your work as you are, and they may have trouble keeping a set of data in their heads if you don't talk about the conclusions until 20 minutes later.

Make your hypotheses clear, and let your audience know *why* you thought things would come out a certain way. When presenting the results of an experiment, remind the audience why you were doing that experiment and what your hypothesis would predict about the results of that experiment. Try to use IF-THEN statements in presenting experiments: "IF the moon is actually made of green cheese, THEN my analysis of this lunar surface material should show a high lipid content." Then show the actual data and discuss whether it supports your hypothesis or leads you in a different direction.

Always treat your audience with the utmost respect, particularly when responding to questions. You might get a question that is irrelevant, confrontational, shows that the questioner wasn't listening to your presentation, or is just outright stupid…keep your composure and be respectful, no matter what. Remember that even someone who directly attacks your data is doing just that: attacking the *data*, not attacking *you* personally! If you don't know the answer, say so. If you don't understand the question, try restating it: "If I understand correctly, you're asking whether I did the appropriate control for this experiment; is that right?" Questioners will often want to make suggestions for improvement or future work; thank them for their suggestions and elaborate with any data related to their idea that you might not have presented: "That's an excellent suggestion; we did do a control that suggested that these data are valid, but your experiment would be a more direct measurement." They will also ask you if you've done something they think is important (knowing that you probably haven't, or you'd have talked about it); here, both you and the questioner can look good if you say "Our experiments so far haven't addressed that particular point, but we did do a related experiment which showed…."

Finally, even if you are very nervous, try to appear composed. Know your material so well that even a full-blown panic attack couldn't drive it out of your head. Speak slowly and clearly, look at your audience and smile. It'll all be over in just a few minutes….