Research Symposium: Seed Germination

By now, you and your teammates should be experienced enough to create a PowerPoint presentation with little instruction. Use the same instructions for effective powerpoint presentations as before (reproduced again below, for your convenience).

This time, we're not going to coach you about proper format or how to ask questions or devise hypotheses. We figure by now you are competent enough to do this on your own. Make us proud!

The Importance of Communication in Science

A scientist must be an effective communicator. All the research of a lifetime is of little use if the investigator cannot clearly explain new findings to his or her colleagues.

Anyone who has perused a scientific journal knows that these publications require authors to submit their work in a specific format so that readers know what to expect and how to find the information they seek quickly and efficiently.

Your presentation of the results of your own experiments in this laboratory should be no different. Your job is to create a streamlined, effective presentation, worthy of a scientific meeting, to present to your colleagues/classmates so that they can critique your work and help you to improve your next scientific endeavor.

Scientific papers published in journals are usually composed of a **title**, **abstract, introduction, methods, results, discussion** and **literature cited.** These same sections can be used, with some modification, in a Power Point presentation. You have freedom to be creative, but heed the warnings in this outline if you wish to create a truly professional presentation.

For this lab period, you will have approximately 90 minutes to finalize and polish a PowerPoint presentation for your class. Do this as a team. One person should not be doing all the work! You may create an outline, collect and organize text, images and find good background information between the lab exercise and the Symposium Lab, but do not finish the presentation until you come to lab.

Each team will have approximately 10 minutes to give its PowerPoint presentation (your TA will pull out the ol' shepherd's crook if you go overtime!), and then have a few minutes for questions afterwards. Every person in lab will evaluate each presentation with the scoring sheets at the end of this chapter, and turn them in to the TA.

I. Infrastructure: The Style

> Don't give PowerPoint center stage. This is the biggest mistake I see speakers make. They forget that PowerPoint is a tool designed to augment their presentation, not *be* their presentation. You are the presenter. You are the focus. Not your slides. Not your props. And not your handouts. You are in the lead role and you need to retain that role. No amount of "razzle dazzle" can overcome a weak presentation. If you don't do your job, PowerPoint can't save you. It only makes a bad presentation worse.
>
> -- Michael Hyatt, *Working Smart*

A. Background Design and Fonts

Choose a single **background**, and stick with it. Choose a single **font** and stick with it. Choose a single **color scheme** and stick with it. Constantly changing backgrounds that have nothing to do with the show's content distract from your information. A scientific presentation should have professional-looking template slides, a single font, and a constant color scheme.

Text and background should contrast strongly, creating a very readable combination. Choose not only contrasting colors, but also different *brightness* and *saturation* of those colors. Try different combinations on your roommates and teammates to get a consensus on which colors work best. Dark text on a light background is the easiest to read. Backgrounds with images or patterns usually reduce readability of text, so if you have a decorative background, make sure the pattern is only on the borders of the slide.

It's all right to modify the text format of individual slides, using bulleted lists, images, text with images, etc. But keep the infrastructure of your presentation constant so that when you have something important to say, it doesn't get lost in the "noise."

B. Text

Keep your text simple. Do not use too many words on a single screen: either of these makes it difficult for your audience to follow. Use key words and simple phrases, excluding all but the most essential information. Empty space on a slide is a *good thing*: it enhances readability. Both text and images should be large enough to read, but not so large as to give the impression that you're yelling.

Don't *ever* use ALL CAPITALS. Also, do not use Title Capitalization if it's not a title.

Wrong:
- BLACK BEANS HAVE THE HIGHEST FITNESS COEFFICIENT

Wrong:
- Black Beans Have the Highest Fitness Coefficient

Right:
- Black beans have the highest fitness coefficient

Limit punctuation. Use bullets and phrases that quickly convey your ideas.

C. Special Effects

One of the most common errors seen in PowerPoint presentations created by the inexperienced presenter is an overuse of special effects, sounds, animations, and other distracting "gadgets." Although they may be cute, such things can become tiresome and even annoying if not used judiciously.

Avoid using sound, flashy animations, text fly-ins, or "cute" effects. These may seem grand at first, but they get old quickly, only to become distracting and annoying. Humor is fine, but don't stray so far afield that your presentation seems more fit for an elementary school than a college classroom. Treat your colleagues with respect by creating a meaningful, professional presentation without trite, extraneous material.

Special effects can be informative and provide emphasis, if used properly. But use good judgment, and make sure they are related to your subject.

D. Images

Use high-quality, high-resolution images that reinforce and complement your subject. Make sure that your images retain their clarity when projected on a large screen, as they will be for your presentations in class. It's always a good idea to have a

digital camera handy (even if it's your cell phone) to record your team's activities. Photos add interest to any presentation.

E. Presentation Style

You may have used Power Point before, and it's very likely that you'll use it again. So take some time to familiarize yourself with its navigation. Learn to jump ahead or backwards without having to pass through every slide. Practice! In many cases, audiences will ask a presenter to return to a particular slide during the question-and-answer period. Be able to swiftly access the slides in question, and you will convey a professional, competent impression.

Limit the number of slides. A good rule of thumb is one slide per minute.

Rehearse with someone other than your teammates, and preferably someone who has not seen your presentation. Ask for honest feedback about colors, content, and overall efficacy of the presentation.

Don't read from your slides. Your slides are there for the audience, not you. You should already know what's on them, and be able to speak extemporaneously about your slide topic.

Don't speak to your slides. One of the most common mistakes Power Point presenters make is to face the screen as they deliver a presentation. Few things make as bad an impression. Not only can your audience not see your face, but they also usually will not be able to hear you.

Don't apologize for anything in your presentation. If a slide is hard to read or understand*, then don't use it*.

If you are not running the presentation from your own computer, download it to the projection computer's **desktop**. It will run much faster than if you try to run it from a CD or external drive.

II. Presentation: The Content

At scientific meetings, research is presented in several different formats, including poster sessions, and presented talks. The latter are almost always done using Power Point, so until a new technology comes along to replace it, that's what we'll be using. Remember that you are not presenting a corporate speech, nor an entertainment. You are presenting the results of a scientific investigation, best organized in the format generally used for scientific publications, with a few minor modifications.

A. Title

When you eventually publish your work, it is the title of your paper that will be read by the most readers, and it is the title that often will determine whether the rest of your paper will be read at all. It should describe *specifically* the content of your paper. Under the title, list the names of all authors, as well as the institutional affiliation of each. (In case you don't know, yours is the University of Miami Biology Department)

B. Abstract

Power Point presentations in scientific meetings rarely include an abstract. If you do wish to provide one, it should be a handout. But in our class, this is not necessary.

The purpose of an abstract is to allow a reader to determine, with a very quick scan, what your research is about, how you did it and what you discovered. Although the

abstract appears *first*, it is written *last*. It is generally a brief paragraph, offset from the text of a published paper, in which the investigators give a skeletal outline of the purpose (one sentence), methods, (one to two sentences), results (one to four sentences) and conclusions (one to two sentences) of their research.

C. Introduction

This section should give the *specific* background of your experiment. Because everyone in the lab cooperated to perform the natural selection demonstration, don't be surprised if all the reports have some similarity. Don't worry. Just present the best information you can to prepare your colleagues for what you intend to teach them.

When making a statement that is not common knowledge, always cite the source of your information. Do not include any methods, data, or conclusions in this section.

D. Methods

The methods section is meant to enable an interested observer to duplicate your experiment and test whether your results are reproducible. If any of your team members has a digital camera, feel free to bring it to lab and snap pictures of your experimental set up, team members at work, and other exciting things that you can include in your presentation.

1. Describe all materials and procedures used.
2. If possible, include images of materials or procedures. (If you have a digital camera, bring it to lab when you do your experiment!)
3. Don't repeat anything you've already said in the introduction
4. Explain any mathematical or statistical test(s) you will use to analyze your data
5. Do not include any data or conclusions in this section.

E. Results

Present your results as concisely as possible. If you include tables, make sure they are readable, and are not merely massive columns of illegible numbers.

Figures and Tables should be simple, high resolution and easy to read. Include a legend with each Figure and Table, and be sure to label each completely and appropriately so that your audience can read the information as you describe it. The legend of a Table should be *over* the image, whereas the legend for a Figure should be *under* the image. More detailed instructions on figure and table format can be found in the Appendix so titled in your online lab manual.

The audience should be able to figure out your data from the slides alone, even though you are also giving an oral description of the content of the slide.

Report exactly what happened in your experiment, even if it is not what you expected. You will have ample opportunity to explain deviations from the expected in the next section.

F. Discussion

This is the most important section of your presentation, and should not merely be a re-statement of your results. In your discussion, you must *analyze and explain* your results. Follow these simple guidelines.

1. Link your results to your original hypotheses.
2. Do you accept or reject your null hypotheses? Why or why not?
3. Explain your observations in specific terms. Why was one species more or less successful than the others? What physical and environmental factors are

involved? What would you predict if more generations were followed?

4. The world will not stop turning if your results are not what you expected. More important than "accurate results" (if there is such a thing) is logical explanation of your observations, especially if they are unexpected.
5. Discuss possible sources of error and how they might have affected your results.
6. Draw overall conclusions--give summary statements.

G. Acknowledgements

Most scientific research is not done in a vacuum, and if you feel that you would like to thank particular persons or entities for any assistance given during the design of your experiment, its execution, or the preparation of your presentation, then an acknowledgement slide at the end of the show is a nice way to show your appreciation.

H. Questions and Answers

Now that you have presented your work to your colleagues, it is time to receive their questions, and possibly their criticism. Open the floor to questions, and be ready to answer. Prepare yourself by reading all text references about enzymes, and also know extra information about your specific experimental variable.

If you are in the audience, be an active participant in the question-and-answer period, as this is where flaws in experimental design can be pointed out so that future experiments will be more informative.

Science works, not by supporting hypotheses, but by trying to refute and find fault with them. Do your part to Make Science Better in Your Lab today!

Even if you are using your laptop in lab, you must bring SIX hard copies of the following Critique Sheet with you to lab on Symposium Day, unless your TA tells you otherwise.

POWER POINT CRITIQUE

On a scale of 1 to 5 (circle), rate each presentation for each of the following.

Title: _____

Authors: _____

1. The presentation was well organized.
   strongly disagree 1 2 3 4 5 strongly agree
2. The presentation followed a logical progression
   strongly disagree 1 2 3 4 5 strongly agree
3. The speakers exhibited knowledge of content in presentation
   strongly disagree 1 2 3 4 5 strongly agree
4. Speakers presented adequate, accurate background information
   strongly disagree 1 2 3 4 5 strongly agree
5. Speakers stated hypotheses and predictions clearly
   strongly disagree 1 2 3 4 5 strongly agree
6. The results of the experiment supported the researchers' conclusions.
   strongly disagree 1 2 3 4 5 strongly agree
7. The speakers used accurate, up to date resources and citations
   strongly disagree 1 2 3 4 5 strongly agree
8. The presenters utilized technology appropriately for the presentation
   strongly disagree 1 2 3 4 5 strongly agree
9. Figures and Tables were well designed and used effectively.
   strongly disagree 1 2 3 4 5 strongly agree
10. The speakers spoke clearly and were easy to understand.
    strongly disagree 1 2 3 4 5 strongly agree
11. The speaker appropriately involved the audience.
    strongly disagree 1 2 3 4 5 strongly agree
12. Colleagues' questions were answered satisfactorily.
    strongly disagree 1 2 3 4 5 strongly agree
13. The presentation met my expectations.
    strongly disagree 1 2 3 4 5 strongly agree

What do you think was best about the presentation?

What changes would have made the presentation more effective?