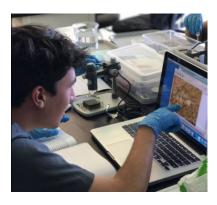# COMMUNICATING SCIENCE

Oral Presentation Guidelines

Next Generation Science Standards: Obtaining, Evaluating, and Communicating Information: Communicate scientific information (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically).

A critical part of the scientific process is being able to analyze and interpret your data, and then communicate your findings with both the scientific and public communities. After a research project, scientists work hard to publish a written report and present their experiment at a regional, national, or international conference meeting. Being able to effectively communicate research to a broad audience allows you to successfully contribute to our current understanding of the natural processes of our world. This document will provide you tips on how to effectively prepare and deliver a research presentation. Specifically, this document will address:

1. Preparing Your Presentation
2. Organizing Your Presentation
3. Delivering Your Presentation
4. Creating Your Visual Aid
5. Building Your Credibility
6. Overcoming Speech Anxiety
7. Answering Audience Questions

Preparing Your Presentation

Before you start designing your presentation, it is important to think about the following:

1. **Audience:** Who will be there? What do they know? What do they need to know? What is their attitude towards you? What is their attitude towards what you will be presenting?
2. **Format:** Why are you speaking? How long will you be speaking?
3. **Logistics:** Where will you be speaking? What is the setup of the room in which you will be speaking? What are your audiovisual needs?
4. **Purpose:** What do you want to accomplish (e.g., inform, persuade, motivate)? At the end of your presentation, what do you want the audience to think, feel, or do?

Organizing Your Presentation

Organization is a crucial element of a successful presentation. All presentations have three distinct elements: the introduction, body, and conclusion. Each element is important and serves a function. The suggested format below is recommended for a PowerPoint-type Presentation.

The Introduction (1 slide)

Listeners form their impression of a presentation early. Alert your audience to expect a quality presentation by starting off strong. Generally, effective introductions accomplish the following:

1. **Capture attention.** There are several ways to capture an audience's attention. The list to the right shares some of them.
2. **Demonstrate significance.** Tell your audience how your topic affects them. Audience members will quickly tune out and let their minds wander if you don't make your topic relevant to them.
3. **Preview main points.** Effective introductions give the listeners an idea of the upcoming main points. Include a statement such as, "in this presentation, I will discuss…"
4. **Establish credibility.** One final consideration is to establish your credibility to speak on your topic. You can do this by being well prepared, appearing confident, and telling your audience about your experience with the topic.

Various ways to capture attention:

☐ Cite a startling fact or opinion. "New scientific evidence suggests that plants appreciate human company, kind words, and classical music."
☐ Ask a question. "Have you ever wondered why some people have a green thumb, whereas others couldn't make a weed grow?"
☐ Tell an anecdote. "The other day, while walking near campus, I saw a man talking animatedly to his garden."
☐ Use a quotation. "The naturalist Max Thornton recently said, "Psychobiology has proven that plants can communicate. Now humans need to learn how to listen to them."
☐ Tell a joke. "We once worried about people who talked to plants, but that's no longer the case. Now we only worry if the plants talk back."

General tips: The "capture attention" step is always the first requirement of an introduction and the "preview main points" step is always the last requirement. It should be noted that these goals can overlap. For example, your attention strategy could also establish the significance of your topic. Lastly, your introduction should be about 10% to 15% of your total speech.

The Body (9-14 slides)

The body of your speech should mimic the structure of your research paper. Generally, the body of your presentation includes the following:

1. **Background information** (~1-2 slides). Share information relevant to understanding your research; not all audience members may be as familiar with your topic as you are.
2. **Hypothesis and/or research questions** (~1-2 slides). Define the problem you seek to address with your project. State your hypothesis and/or research questions along with any predictions you might have made.
3. **Materials and methods** (~2-3 slides). Describe the research you conducted; share the materials and methods of your study.
4. **Results** (~4-5 slides). Present the findings from your study; share your data and express them <u>visually</u> and where appropriate in graphs, tables, or figures.
5. **Discussion** (~1-2 slides). Share your analysis; discuss the results, emphasize what did and didn't work, and propose a new experiment or changes to your original experiment which may help explain the results; discuss the research questions or hypotheses generated by your observations.

General tips:

1. Stick to the given time limit! Be respectful of the other presenters and your audience by keeping your presentation to a specified length. Leave a couple minutes for questions.
2. Use words sparingly on slides. Graphs, photos, or figures are much more effective at engaging the audience than a wall of text. Use bullet points, instead of long sentences.
3. Only show data or provide background information that are relevant to your study and research questions.

The Conclusion (1 slide)

Listeners tend to remember what they hear first and last the best; therefore, you want to begin and end your presentation strongly. Ending powerfully leaves a lasting impression on your listeners. Generally, effective conclusions accomplish the following:

1. **Summarize main points.** Summarize your main findings and make concise conclusions about them. Include a few comments about your general conclusions about your results.
2. **Make a memorable finish.** You begin your speech with an attention strategy, and you should end your speech in similar fashion. A strong question, an interesting anecdote, an engaging question, and a humorous statement serve as effective attention grabbers for introductions. They serve the same purpose for effective conclusions.

General tips:

1. Don't end abruptly. Consider using signposts such as, "Finally…" or "In conclusion…" to let your audience know that you have reached the end of your speech.
2. Don't ramble. Prepare a distinct conclusion. Don't end your speech with a statement such as "Well, I guess that's about all I wanted to say…" End strong.
3. Don't introduce new points. Don't make statements such as "Oh, yes, and something I forgot to mention is…" Your conclusion should wrap up the points you already covered.
4. Don't apologize. Don't make statements such as "I'm sorry I didn't have more time to discuss my research." You will only highlight the possible weaknesses of your speech.
5. Be concise. Your conclusion should be no more than about 5% to 10% of your total speech. Don't diminish the effect of a great speech with a bloated, aimless conclusion.

Transitions

Part of effectively organizing your presentation includes using transitions. Transitions show how the introduction relates to the body of the speech, how one main point relates to the next main point, and how sub-points relate to the points they are part of. Here are a few examples:

"Like [previous point], another important consideration in [topic] is [upcoming point]."

"So far, we've discussed _____, _____, and _____. Our next points are _____, _____, and _____."

General tips: It isn't always necessary to provide a transition between every set of points. You must choose when one is necessary for your audience to follow your progression of ideas.

Delivering Your Presentation

A smooth and natural delivery is the result of extensive practice. Get to know your material until you feel comfortable with your presentation. Below are some tips for effective delivery:

Visual Elements of Delivery	Auditory Elements of Delivery
Appearance. Look professional. Audience members perceive speakers to be more credible when they look businesslike. **Movement.** Express your confidence and enthusiasm by using movement. Movement can also help you maintain contact with all members of your audience with those closest to you feeling the greatest contact. Also, use a laser or other manual pointer to guide the audience's eyes across your slides. **Posture.** Display good posture. Generally, good posture means standing with your spine relatively straight, your shoulders squared off, and your feet angled slightly out. **Facial Expression.** The expression on your face can be more meaningful to an audience than the words you say. Your facial expressions should reflect your genuine interest in your research. **Eye Contact.** Eye contact is an important element of speaker credibility. Be familiar with your speech so that you won't need to read from your notes. Practice looking at your entire audience, beginning with the middle of your audience, then looking left, then right, then to the middle again. With practice, your eye contact will become automatic.	**Volume.** Your volume should be loud enough so that your audience members can hear everything you say but not so loud that they feel you are talking to someone next door. **Rate.** Most people speak between 120 and 150 words per minute. If you talk slower than that, you may tend to bore your audience. Faster speaking rates are associated with speaker competence, but if you speak too rapidly, you could be unintelligible. **Tone.** Tone of voice can influence the mood of your audience. One study showed that people listening to a speaker deliver a message in either a happy tone or a sad tone experienced emotional contagion—they felt happy or sad depending on the speaker's tone of voice. Use a tone of voice that is appropriate to the goal of your presentation. **Pauses.** Pauses are important. They give the audience time to receive what you have said. They can also accentuate key points and give you a moment to think. **Vocal Fillers.** Vocal fillers (e.g., um, uh, ah, like, you know) are normal and audiences will not notice infrequent use. However, too many vocal fillers can diminish your credibility. Try your best to curb your usage of such fillers.

Give yourself ample time to practice. Here are a few tips for practicing your speech:

1. Present the speech to yourself. Talk through the entire speech, including your examples and forms of support. Don't skip parts by using placeholders.
2. Record the speech on your phone, and listen to it. Because we are sometimes surprised at what we sound like and how we appear, video recording has been shown to be an especially effective tool for rehearsals.
3. Present the speech in front of a small group of friends or relatives.
4. Present the speech to at least one listener in the room where you will present the final speech (or, if that room is unavailable, a similar room).

Creating Your Visual Aid

Visual aids are graphics used in a presentation to illustrate and support ideas. Visual aids can be extremely useful when you want to clarify points, describe objects, or explain procedures. Here are a few rules for using visual aids:

1. **Simplicity.** Use only key words or phrases, not sentences. Omit all nonessential details.
2. **Size.** Visual aids should be large enough for your entire audience to see them at one time but portable enough for you to get them out of the way when they no longer in use.
3. **Attractiveness.** Visual aids should be visually interesting and as neat as possible.
4. **Appropriateness.** Visuals should emphasize the point you are trying to make. Avoid using a visual aid that looks good but has only a weak connection to your point.
5. **Reliability.** Test all electronic media in advance, preferably in the presentation room.
6. **Audience.** Talk to your audience, not to your visual aid. Some speakers become so focused on their visual aid that they turn their backs to their audience. Additionally, add information that is not included on the visual; don't just be a soundtrack.

Building Your Credibility

Without credibility, you won't be able to convince your listeners that your results are worth accepting, even if your study is outstanding. Audiences form judgements about the credibility of a speaker based on their perception of the speaker's competence, character, and charisma.

Competence refers to the speaker's expertise on the topic. Sometimes this competence can come from personal experience that will lead your audience to regard you as an authority on the topic you are discussing. The other way to be seen as competent is to be well prepared for speaking. A speech that is well researched, organized, and presented will greatly increase the audience's perception of speaker competence. Remember, YOU are the expert on your project!

Character involves the audience's perception of your honesty and impartiality. You should try to find ways to talk about yourself that demonstrate your integrity. You might describe how much time you spent conducting research or demonstrate your open-mindedness by telling your audience that you changed your mind after your study.

Charisma is the audience's perception of the speaker's enthusiasm and likability. Research shows that audiences are more likely to be persuaded by a charismatic speaker than by a less charismatic one who delivers the same information. Your enthusiasm will mostly be perceived from how you deliver your remarks, not from what you say (i.e., Is your voice animated and sincere? Do your facial expression and eye contact show you care about your topic and audience?). You can boost your likability by showing that you like and respect your audience.

Overcoming Speech Anxiety

Paralyzing fear is obviously a problem, but a little nervousness can help you deliver a successful speech. Being completely calm can take away the passion needed to deliver a good speech. Use these strategies to control your anxiety, but don't try to completely eliminate it.

1. **Understand the difference between rational and irrational fears.** Some fears about speaking are rational. For example, you ought to be worried if you haven't properly prepared. But other fears aren't constructive. For example, it's not realistic to expect that you'll deliver a perfect speech, and it's not rational to think it will be a catastrophic failure.
2. **Keep a positive attitude.** Keep a positive attitude toward your audience, your speech, and yourself as a speaker. Repeating the following statements (until you believe them) can help you maintain a positive attitude: "I'm glad I have the chance to talk about this topic." "I know what I'm talking about." "I care about my audience."
3. **Use visualization.** Visualization involves countering negative thoughts with positive images of success. This technique has been used successfully with athletes. To use visualization for your presentation, imagine yourself delivering a fluent, clear, and interesting speech that engages your audience.
4. **Be prepared!** Preparation is the most important key to controlling speech anxiety. You can feel confident if you know from practice that your remarks are well organized and supported and your delivery is smooth. Work through the problems that would tend to make you nervous during the actual speech. For example, if your anxiety is based on a fear of forgetting what you are going to say, make sure that your note cards are complete and effective, and that you have practiced your speech thoroughly.

Answering Audience Questions

Your presentation might include questions from the audience. When questions arise, the following suggestions might increase your effectiveness in answering them:

1. **Listen to the substance of the question.** Don't focus on irrelevant details. If you are not sure what the substance of the question is, ask the questioner to rephrase it.
2. **Paraphrase confusing or quietly asked questions.** "If I understand your question, you are asking [phrase the question in just a few words]. Is that right?"
3. **Avoid defensive reactions to questions.** Even if the questioner seems to be calling you or your research incorrect or biased, listen to the substance of the question and not to the possible personal attack.
4. **Answer the question briefly and to the point.** Then check the questioner's comprehension of your answer by observing his/her nonverbal response or by asking, "Does that answer your question?"
5. **Don't be afraid to admit when you don't know the answer.** Tell them you will get back to them and then do.

Final Tip: Have confidence in your expertise. No one knows your study better than you!

References

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