How to give an effective ~~scientific~~ presentation: a cheat-sheet

Set the goal

Identify the key message you want your audience to take away. Make this the centrepiece of your presentation that you return to frequently.

Create the content

Before you even open PowerPoint, write/sketch out the content of your presentation. Do not worry about getting the order right just yet - focus on getting all the content down, then reorganize into a logical flow later. For example, you can use post-it notes to write down each idea and then add them to a storyboard to build the narrative.

Know your audience

Who are you presenting to? The general public, undergraduates, faculty, experts in the field? What type of presentation are you expected to give? 30 min public outreach talk, 12 min talk at a conference, 1-hr long seminar? Make sure you prepare the material and practice several times before-hand to ensure you hit the target time. Note that it is common to speed up during the actual presentation due to anxiety, so be sure to account for this when practising.

Strike the right tone

What is considered "common" knowledge depends on your audience. Experts may be annoyed if you define a term for which they are all very familiar, while a broad audience might be lost if you don't define terms for which they are unfamiliar. In general, technical jargon should be replaced with simplified terms.
Think of ways to 'level the playing field'. There might be aspects of a familiar concept that you want to highlight, so repeating information that your audience might already know is OK as long as you emphasize the importance of that information.

e.g., "Many of you might already be familiar with topic X, but as a refresher...", then briefly describe the important aspects of the topic.

Tell a story

5 key elements: plot, conflict, character, setting, resolution

Plot

Beginning (intro/hypotheses), middle (methods/results), end (discussion/conclusions).

- Guide your audience. Depending on the length of your talk, visual roadmaps or 'progress bars' can be used to identify exactly where you currently are and where you are going in the talk.
- Focus on the theme rather than the plot. While the details of the plot matter (i.e., the study system or research methods you used), the underlying theme of your research should be emphasized and repeated throughout the presentation.

Tell 'em what you're going to tell 'em; then tell 'em; then tell 'em what you told 'em.

1) Title slide (5%)
Introduce Protagonist (i.e., yourself)

2) Introduction (10-15%)
Conflict/quest

3) Methods (10-15%)
Setting

4) Results (50%)
Describe

5) Discussion (20%)
Interpret/resolve

6) Acknowledgements (5%)
Research team (i.e., quest mates)

Conflict

What is the problem/gap your research is trying to address/fill? Why should the audience care? What are the predictions you specifically want to test (i.e., What is your 'quest')?

e.g., "Theory predicts X, but in reality we see Y. I wanted to explore what factors were responsible for causing this discrepancy."

e.g., "Food shortages have been increasing in recent years due to climate change. By understanding X, we will better be able to combat food shortages in the face of climate change."

Character

You are the star of the story. The research process is your journey. You conducted the research, grappled with the data, and found meaning that you are now conveying to your audience. Humanizing your research makes it easier for your audience to connect and engage with the material. Be transparent about the 'ups and downs' of your research journey. Convey enthusiasm for your work (if you indeed feel enthusiastic).

e.g., "At first we predicted X, but we unexpectedly found Y. That's not where the story ended, however, because we ended up testing Y more vigorously, and found this really cool result...".

Setting

A picture is worth 1000 words. Be sure to take pictures of your experimental set-up, or of you conducting the research. You can also make a simple schematic of the experimental design. Be clear about what you manipulated (i.e., the independent or explanatory variable(s)) and measured (i.e., the dependent or response variable(s)).

Resolution

What's the 'moral' of the story? What did you find out? If there was one point you wanted your audience to take away, what would it be? This message should not be a surprise to anyone, given you've been repeating it throughout the talk. But now it should be more clear how your main conclusions are supported by your results, and why your findings are important.

Paint a picture

Slide design principles:

- Keep it simple. Use words sparingly to emphasize key points (e.g., hypotheses, take-home messages). Slide titles encapsulate the main message of that slide (e.g., plant yield increases with increasing CO_2) rather than being generic (e.g., Results). Pick 1-2 accent colors to emphasize text.
- Make it visible. If your audience cannot see the slides/text, might as well not have a presentation. Font size should never be smaller than 24 pts. Sans serif (e.g., Helvetica, Arial, Verdana) fonts are easier to see than serif (e.g., Times New Roman, Georgia, Garamond). Be cognizant of audience members who might be color-blind by using color-blind friendly palettes.
- Be consistent. use a common slide template (avoid the defaults in PP). For example, if using a white background in the first few slides, do not suddenly switch to blue or black.
- Layer in information. For graphs, set up the axes first. Then layer in the data. Make a clear distinction between when you are describing the data (i.e., the trend or pattern) versus what you think the data mean (i.e., interpretation).

Be yourself

Focus on communicating your ideas effectively, rather than performing.

- Slow down. Anxiety tends to speed us up, but that can make the presentation too fast to follow. It's especially important to slow down on key points, repeating them frequently throughout.
- Speak up. Not all venues have mics. Ask your audience at the beginning of your talk whether members in the back can hear AND if it's not too loud in the front. Make sure to get a clear response with a thumbs up or down, or a raise of hands. If they cannot hear you, you might as well be playing charades.
- Pause. Have some water nearby to take breaks throughout the talk during transition periods (e.g., from intro/hypothesis to methods). If you're feeling brave, include a few "blank" background slides so that the audience will focus exclusively on what you're saying. You can use this technique to emphasize/reiterate the main points. Also gives the audience some time to re-focus.
- Engage. Pretend like you're having a conversation, only it's one-way with a group of people. Making eye contact can help you assess how engaged the audience is, and whether you need to 'shake-it-up' (i.e., change tone of voice, take a break). If eye contact causes you more anxiety, glance at a spot in the back of the room (not ceiling, but eye-level). Do not face your slides constantly.
- Connect. Is there a way to connect the topic you're speaking about with interests/hobbies/values your audience might already hold?

e.g., "By a show of hands, who has eaten peas, beans, or lentils this week? Most of you. Well did you know the reason these foods are so high in protein is because of the symbiosis they share with nitrogen fixing bacteria?"

Compiled by Rebecca Batstone, drawing from my own experience and advice from peers/mentors.