How to give a scientific talk

Slides adapted from: Joerg M. Schaefer
https://cool.barnard.edu/envsci/

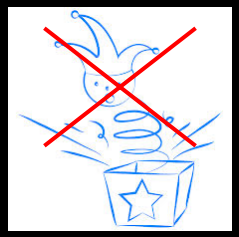
How many of you have given talks?

Why are talks (and posters) important?

- One of the main communication paths of scientific findings (besides papers)
- Interactive → you typically get direct input from you peers
- It is <u>you</u> presenting your research → authenticity

How to Give an Effective Presentation: Structure

- Basic stucture
  - Say what you are going to say
    - 1-3 main points in the introduction
  - Say it
    - Give the talk
  - Then say what you said
    - Summarize main points in the conclusion
  - Don't try to build suspense and then unveil a surprise ending



http://battellemedia.com/images/book_open.jpg

Tell a Story

- Prepare your material so that it tells a story logically
  - Subject: title, authors, acknowledgements
  - Introduction/overview
  - Method/approach
  - Results/information/analysis
  - Conclusion/summary
- Why and to whom are you giving this presentation?
  - What do you want the audience to learn?
    - Think about this as you construct your talk
    - Edit your slides -- delete what is unnecessary, distracting, confusing, off point

http://www.cgd.ucar.edu/cms/agu/scientific_talk.html

Presenting Your Methods, Data, and Results

- Methods, Instrumentation
  - For most talks, only present the minimum
- Data Tables
  - Tables are useful for a small amount of data
  - Include units
  - Indicate data source if they are not your own
  - But tables are often used badly …

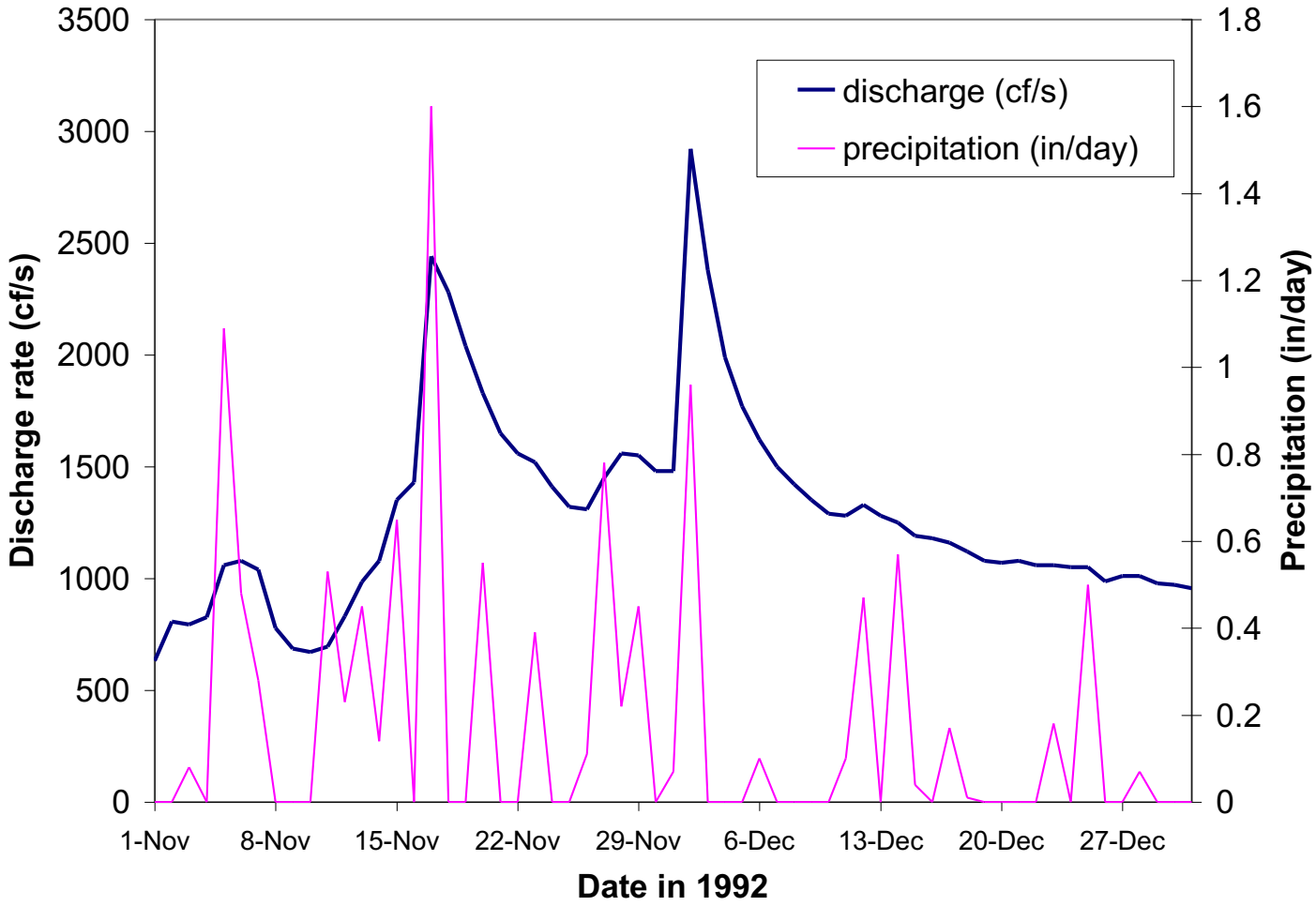
Results: Discharge & Precipitation at Esopus Creek

date	discharge (cf/s)	precipitation (in/day)
1-Nov	631	0
2-Nov	808	0
3-Nov	794	0.08
4-Nov	826	0
5-Nov	1060	1.09
6-Nov	1080	0.48
7-Nov	1040	0.28
8-Nov	779	0
9-Nov	686	0
10-Nov	670	0
11-Nov	696	0.53
12-Nov	831	0.23
13-Nov	985	0.45
14-Nov	1080	0.14
15-Nov	1350	0.65
16-Nov	1430	0
17-Nov	2440	1.6
18-Nov	2280	0
19-Nov	2040	0
20-Nov	1830	0.55
21-Nov	1650	0
22-Nov	1560	0
23-Nov	1520	0.39
24-Nov	1410	0
25-Nov	1320	0
26-Nov	1310	0.11
27-Nov	1450	0.78
28-Nov	1560	0.22
29-Nov	1550	0.45
30-Nov	1480	0

date	discharge (cf/s)	precipitation (in/day)
1-Dec	1480	0.07
2-Dec	2920	0.96
3-Dec	2380	0
4-Dec	1990	0
5-Dec	1770	0
6-Dec	1620	0.1
7-Dec	1500	0
8-Dec	1420	0
9-Dec	1350	0
10-Dec	1290	0
11-Dec	1280	0.1
12-Dec	1330	0.47
13-Dec	1280	0
14-Dec	1250	0.57
15-Dec	1190	0.04
16-Dec	1180	0
17-Dec	1160	0.17
18-Dec	1120	0.01
19-Dec	1080	0
20-Dec	1070	0
21-Dec	1080	0
22-Dec	1060	0
23-Dec	1060	0.18
24-Dec	1050	0
25-Dec	1050	0.5
26-Dec	986	0
27-Dec	1010	0
28-Dec	1010	0.07
29-Dec	977	0
30-Dec	972	0
31-Dec	957	0

Discharge of the Esopus Creek (Coldbrook, NY) and precipitation at Slide Mountain, NY (source: USGS/NCDC)

Results: Discharge & Precipitation at Esopus Creek

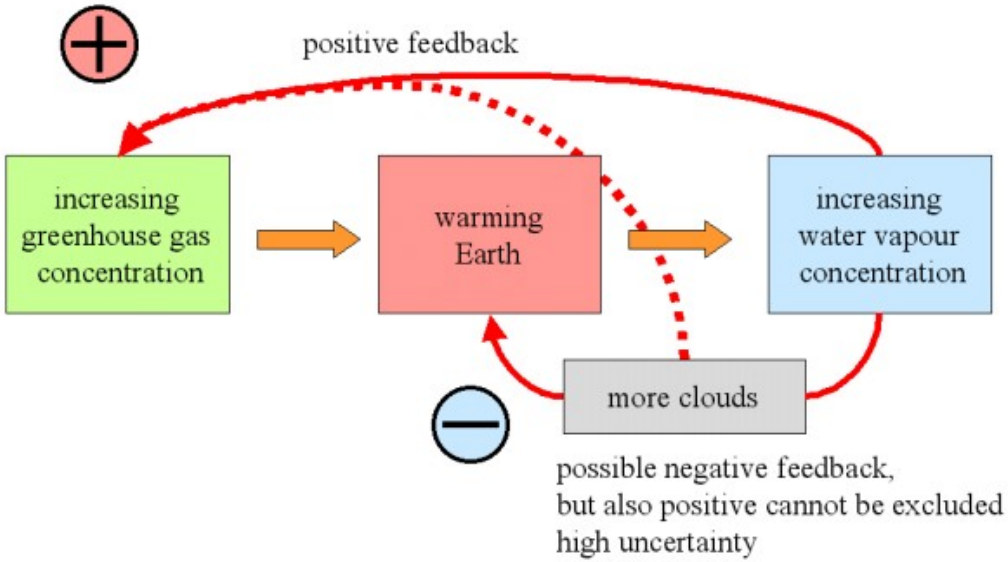


Discharge of the Esopus Creek (Coldbrook, NY) and precipitation at Slide Mountain, NY (source: USGS/NCDC)

Figures

- ‘1 figure ≈ 1000 words’
- Figures should be readable, understandable, uncluttered
- Keep figures simple, use color logically for clarification
  - Blue = cold, red = warm, dark = little, bright = a lot
  - Invisible color
  - Meaning attached to colors (color blindness is more common than you think
- Explain axes and variables
- Include reference for data and images on figure

Cartoons & Concept Maps



Graphic: ESPERE

- Create a summary cartoon, flow chart or concept map with major findings, or an illustration of the processes or problem
  - Consider showing it at the beginning and the end
- You can use web sources for figures
  - Include reference!

Preparing the Presentation

- Average not more than 1 slide per minute
- Powerpoint, Keynote, pdf are standard
  - If you use something else, be careful to check it in advance
- No sounds! Some logical animations good
- Use 3-7 bullets per page
  - Avoid writing out, and especially reading, long and complete sentences on slides because it is really boring to the audience. One sentence that states the take home message on a simple figure slide can work well though.
- Slide appearance (font, colors) should be consistent
- Speelcheck

Type size should be 18 points or larger:

18 point

20 point

24 point

28 point

36 point

AVOID USING ALL CAPITAL LETTERS BECAUSE IT' S MUCH HARDER TO READ

* References can be in 12-14 point font

http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/PresentationTipsinPowerPoint.ppt#307,6,Powerpoint basics: 1. What font to use

Color

Dark letters against a light background work

Dark letters against a light background
are best for smaller rooms, especially when the
lights are on for teaching

http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/PresentationTipsinPowerPoint.ppt#302,5,Powerpoint basics: 1. What font to use

Color

Light letters against a dark background also work

Many experts feel that a dark blue or black background works best for talks in a large room

http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/PresentationTipsinPowerPoint.ppt#302,5,Powerpoint basics: 1. What font to use

Preparing Yourself

- Immerse yourself in subject
  - Web of Science/Google it: use the latest news
- Familiar with the projection equipment, remote control …
  - Memory stick AND a laptop WITH power supply
- Print out copies of your slides (‘handouts’)
  - Annotate and use as notes
  - Review as you’re waiting
  - Reference if everything crashes, the bulb blows

www.thomas.edu/facilities/auditorium/index.htm

Rehearsing

- **Practice – actually stand up and say the words out loud**
  - Discover what you don't understand
  - Develop a natural flow and come up better with phrasings and ways to describe things – no uptalk!
  - Stay within the time limit
  - Try speaking too loud to get a feeling where the upper limit is
- **Don't over rehearse or memorize the talk**

http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/TipsforGivingaScientificPresentation.pdf

Starting

- Starting out is the hardest part of the talk
  - Memorize the first few lines …
  - *"Good evening, and thank you for inviting me to speak. My name is Mary Doe and the title of my presentation is 'Ice-free Greenland in the recent geological past?'. Before I start, let me acknowledge my key-collaborators and co-authors…..*

http://soroptimistofgreaterdavis.org/documents/images/photos/speaker.gif

http://www.fw.msu.edu/orgs/gso/documents/GSOWorkshopDocsSp2006/TipsforGivingaScientificPresentation.pdf

Eye Contact

Experienced speakers:

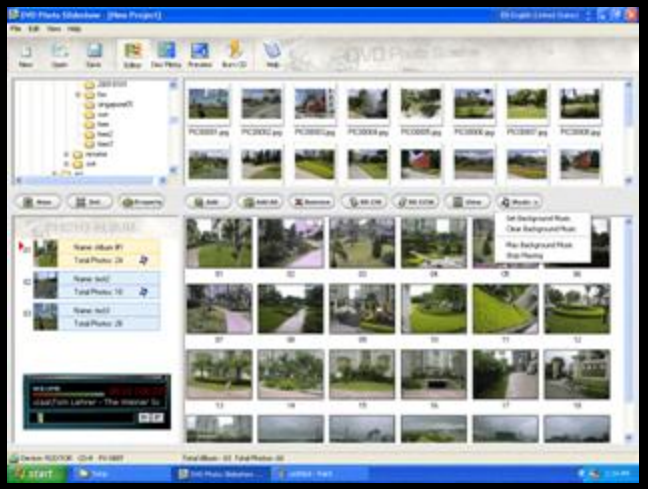
- Speak freely and look directly at audience
- Remember to roam around the room – don't lock onto 1 person!

Inexperienced speakers:

- Put outline and key points of your presentation on your slides
- This procedure helps you be more comfortable
  - You don't have to remember what to say
  - Eyes are on the slide not (always) on you
  - Key points are there in case you forget to say something and also for people who weren't listening or who are visual learners

http://www.metclubnyc.org/slide%20show.jpg

Presenting the Presentation



- Stand where the figures can be seen
- Track your talk using the monitor
  - Not the screen
- Pace yourself (but don't pace!)
  - Figure out which slide is your half-way mark and use that to check your time

http://www.dvd-photo-slideshow.com/screenshot/01.gif

Some "Don't"s

- Don't apologize or make comments about yourself
  - "I hope you're not bored"
  - "I was working on this 'til 3 am"
- Don't overuse the pointer
- Don't try to be cute and don't force being funny
- Don't forget acknowledgements, always give proper credit
  - Tip: Everyone in the audience has come to listen to your lecture with the secret hope of hearing their work mentioned

Concluding

- Announce the ending so that people are prepared
  - For example, with a slide titled "Conclusions"
  - Or by saying, "In my final slide …" or "My final point is …"
- Have only a few concluding statements
- Come back to the big picture and summarize the significance of your work in that context
  - Extend logically beyond your limited study – but don't overreach
- Open up new perspective
  - Describe future work, raise questions, potential implications

http://www.cs.aau.dk/~luca/SLIDES/howtotalk-ru.pdf

Finishing

- Think carefully about your final words and how to finish your presentation strongly
  - Don't just drift off … "I guess that's all I have to say …"
  - You may want to actually memorize your ending lines, just as you do your starting points
- Ending your talk – keep your concluding slide up (and maybe include your name on it)
  - Say "Thank You" … pause for applause … then
  - Say "Any questions?"

http://international.internet2.edu/images/CLARA-I2-MoU/i2-clara-applause.JPG

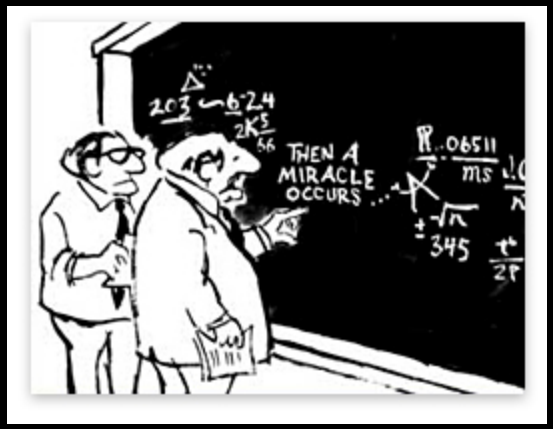
What Can Go Wrong?

www.rcpsych.ac.uk/.../ anxiety/images/grap6.jpg

- Uncertainty about material – blank out
- Important question posed that you cannot answer

- Interruptions
- Running out of slides
- Running out of time

Uncertainty About the Material



- Best is if you are sure about the material you present
  - Trim the other parts out – if possible
- If you have to address something important that you are unsure of …
  - Acknowledge the gap in your understanding
    - "I'm working on this part" or "I'm looking into it"
  - Pose the issue in the future research section at the end
  - Or raise it as a question yourself …

From *What's so Funny About Science?* by Sidney Harris (1977)

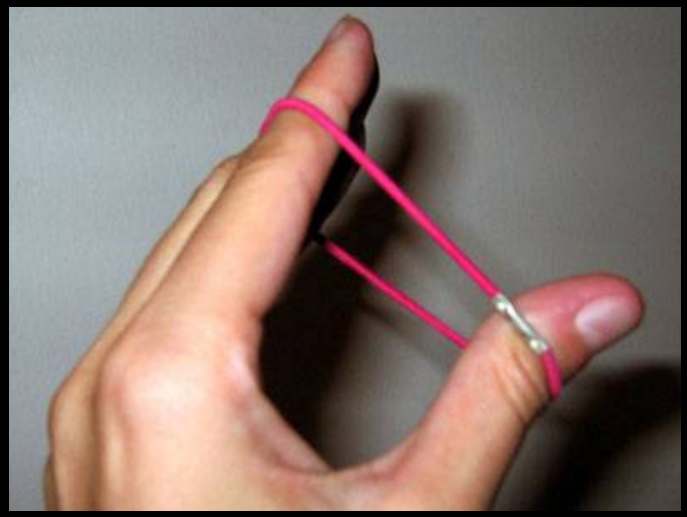
www.rscni.ac.uk/…/netmanage/networkindex.htm

Interruptions During Your Presentation

- Don't look irritated or rushed
- Answer – briefly – just enough to straighten it out
  - Then carry on with your presentation without checking back
- A question that you will answer later in your talk?
  - Say "Good point; just wait two slides"
- Requires a long answer and is not critical understanding?
  - Say "Good point; I'll come back to it at the end of the talk"

http://www.cs.aau.dk/~luca/SLIDES/howtotalk-ru.pdf

Finishing Too Fast



http://photolog.icyshard.com/archives/26things3/stretch.jpg

- Short talks are better than ones that are too long
- What to do:
  - Don't make a personal comment
    - "hum, I'm running out of slides …"
  - Stretch it a little -- see if you can think of an example, or story, to bolster your points
  - Conclude unhurriedly, summarizing your main points, but don't be repetitious

"If I had had more time, I would have written a shorter letter"
Mark Twain

Running Out of Time

- Avoid this – impolite to other speakers and the audience: if it happens …
  - Do not assume that you can carry on past your time
  - Do not skip all of your slides looking for the right one to put on next
  - Conclude – on time wherever you are in your talk -- by making your main points
    - In Powerpoint you can just type the number of your concluding slide and press Enter to skip right to it

Questions

- Questions help you in continuing your research
  - Identifies parts the audience did not understand
  - Focuses and adds dimension to your research
- You can repeat the question
  - This gives you time to think
  - The rest of the audience may not have heard the question
  - (If you heard the question incorrectly, it presents an opportunity for clarification)

http://www.erp.wisc.edu/profdev/Talkhandout05.doc
http://www.firekills.gov.uk/seniors/cool/howstart/images/howstart.gif

Preparing for Answers

- Usually you have thought more about the material than anyone else -- this puts you in a stronger position than you may think
- Keep your answers short and to the point -- don't respond with another lecture
- Anticipate typical questions and prepare for them
  - Generalizability of your findings to other times? Other places? Other conditions?
  - Methodological bias? Uncertainties? Exceptions?
- Still concerned about questions?
  - Make extra "backup" slides – perhaps on details of methodology or proof

http://www.regislasvegas.org/images/class-pic-hand-raised.jpg

Difficult Questions

- If you really don't know the answer
  - Don't feel that you have to invent an answer on the fly -- you are only human and you can't have thought of everything
  - Say "That's a good point, let's discuss it afterwards"
- If the questioner disagrees with you and it looks like there will be an argument then defuse the situation
  - "We don't agree on this point, let's go on to other questions and you and I can talk about this later"

Conclusions

- Presenting your research is critically important in advancing both your ideas and your reputation

  and giving a scientific talk might be the most personal and authentic way to do this

- Structure your content in a way that is comfortable for you

  Use your own style to your advantage!

- Think ahead about where you might encounter difficulties and figure out ways to overcome them