International Science Communication Methods

Scientific Presentation

Ralf Greve

Institute of Low Temperature Science

and

Graduate School of Environmental Science

Hokkaido University

Sapporo 2016

http://wwwice.lowtem.hokudai.ac.jp/~greve/

(Empty slide.)

Contents

Lecture:

1 Introduction
2 Preparation of presentations
3 Structuring
4 Visuals
5 Delivery
6 Posters

Contents

Group work:

Participation at an international geoscience meeting:

- Choice of topic
- Choice of title (no abstract!)
- Preparation of a (12+3)-minute talk
- Delivery of the talk

Some remarks

- Course language is *English.* がんばってください… ☺
  (By the way, it is also a foreign language for your friendly instructor!)
- *Learning by doing:* Practical work is essential.
- Therefore, please join the lectures *and* exercises.
- An English-Japanese/Japanese-English dictionary may be helpful.
- If you'd like to prepare a computer presentation for the group work, please bring a notebook computer.

Literature

- Robert R. H. Anholt:
  Dazzle 'em with Style: The Art of Oral Scientific Presentation.
  Academic Press, 2nd edition 2005, ISBN 978-0123694522.
- Michael Alley: *The Craft of Scientific Presentations.*
  Springer, 2nd edition 2013, ISBN: 978-1441982780.

Acknowledgement

Some material for this lecture was taken from

Samuel B. Silverstein: *The Art of Scientific Presentation.*
(Formerly available at http://www.physto.se/~silver/.)

1 Introduction

Misconception:
Scientific presentations should primarily present a lot of detailed information.

Inform:

Describe your work.

Show the results you obtained.

Persuade:

Is it an interesting and worthwhile question?

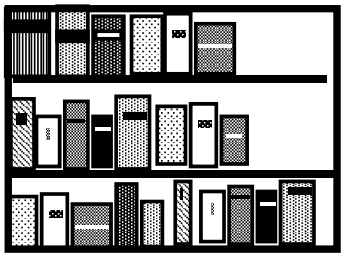
Was it a valid test?

Are the results accurate? Significant?

Fact: Presentations differ from papers in some very fundamental ways!

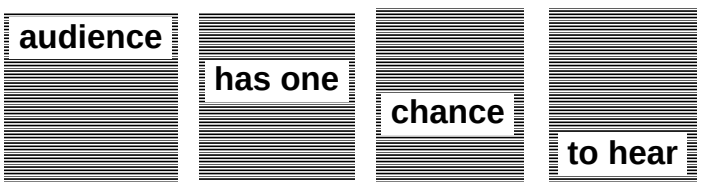
Paper (or thesis):

Reader sets own pace.
Can skip around in text.
Can look up references.



Presentation:

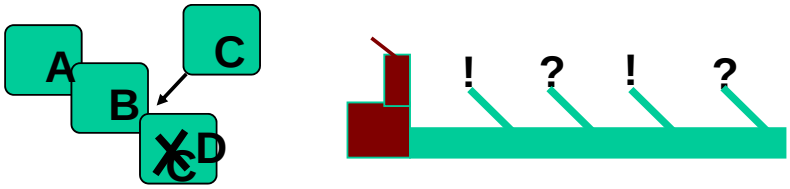
Audience has limited attention span.
Can't re-read text.



Presentations have some advantages!

Use **sights** *and* **sounds** to bring work to life!

Instantaneous **feedback**.
Can **adjust** presentation.



Warm-up exercise:

Please introduce yourself,

say something about your background, study, scientific and private interests,

tell about previous experiences with presentations.

→ Prepare a manuscript for a short speech, and deliver the speech in front of the group.

2 Preparation of presentations

For a successful presentation, a number of **questions** need to be clarified *well in advance!*

What is my message?

It is not possible to put every detail of your work during the last year(s) in a 20-minute presentation.

Therefore:

- Set clear priorities.
  What are the ***really important*** results?
- How can the work be ***described***
  (instead of being explained in every detail)?
- Which ***background information*** must be given in order to make it understandable?

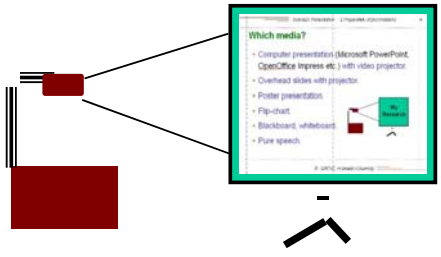
What are the basic conditions?

- Large conference / small seminar?
- What kind of audience?

  Specialists, non-specialist scientists, laypersons?
- How much time do I have?
- Are questions allowed during or after the presentation?
- What kind of technical equipment is available?

Which media?

- Computer presentation (Microsoft PowerPoint, LibreOffice Impress etc.) with video projector.
- Overhead slides with projector.
- Blackboard, whiteboard.
- Pure speech.



Computer presentation

Pro:

- Multiple use of pictures, diagrams, animations, sounds etc.
- High quality, modern appearance.
- Last-minute changes possible.
- Easy transportation.
- These days, by far the most common medium in natural sciences.

Contra:

- Very prone to technical problems.
- Darkened room required, audience may become sleepy.
- Trend to use too many slides.
- Trend to over-animate presentation.

Overhead slides [out-of-date]

Pro:

- Slides can be prepared rather easily.
- Use of pictures and diagrams possible.
- Technically quite robust.
- Slides can be used as handouts.

Contra:

- Moderate quality.
- Last-minute changes difficult.
- Darkened room required.
- Slides can fall down, can get mixed up.
- Trend to use too many slides.
- Trend to speak to the projector or the wall.

Blackboard, whiteboard

Pro:

- Limits the speed of the presentation.
- Good for developing complex maths.
- Spontaneous presentations possible.
- No technical problems.

Contra:

- Not suitable for a large audience.
- Exhausting for the speaker (speaking + writing!).
- Hand-writing may be hard to read.
- Trend to speak to the board.
- Audience must take notes → distraction.

Pure speech

Pro:

- Easy to hold eye contact.
- Manuscript can be distributed.

Contra:

- Very uncommon (except for humanities).
- No visual input for the audience → far more difficult to remember.
- Speech tends to be monotonous.
- Audience often becomes sleepy.
- Handouts need to be prepared separately.

Which questions may be posed?

- Can I anticipate (or even provoke) possible questions?
- Do I have enough background information to answer them?

  (But don't panic, you don't have to know everything.)
- Is it likely that there will be aggressive questions

  (from notoriously nasty individuals) ?

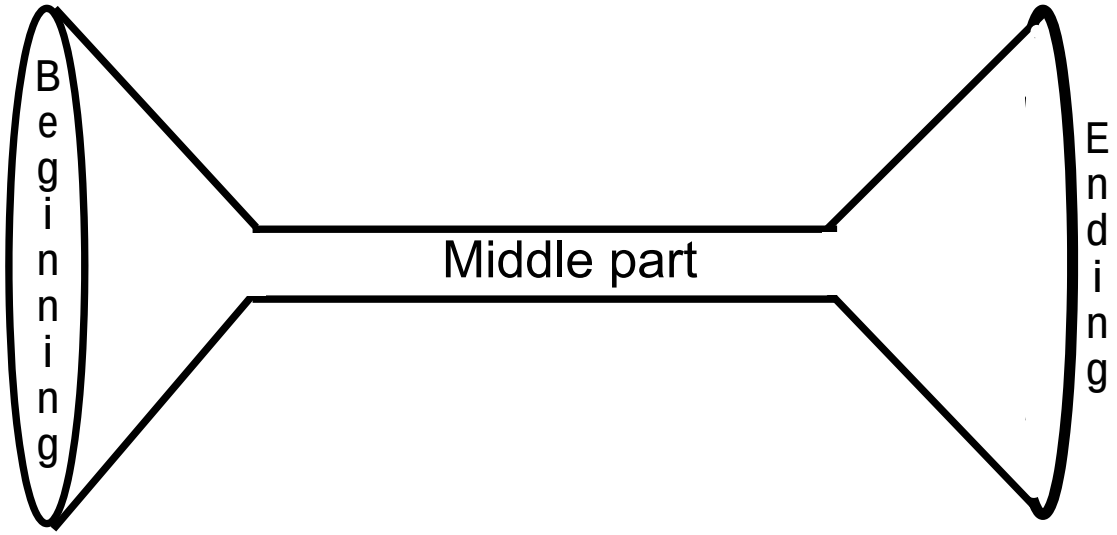
  Can I cope with such a situation?

(Empty slide.)

3 Structuring

Presentations should have a clear structure:

Concise title



Title

- Information in a nutshell.
- Brief and accurate summary of the content of the presentation.

Concise and general enough to be interesting and appealing to a large audience.

Not so general that it loses any meaning.

Bad (too general): (unless the presentation will be merely a general overview of the topic)

"The Antarctic ice sheet and climate change."

Good (informative, concise):

"Modelling volume changes of the Antarctic ice sheet during the 21st century in response to global warming."

Bad (too specific, too long):

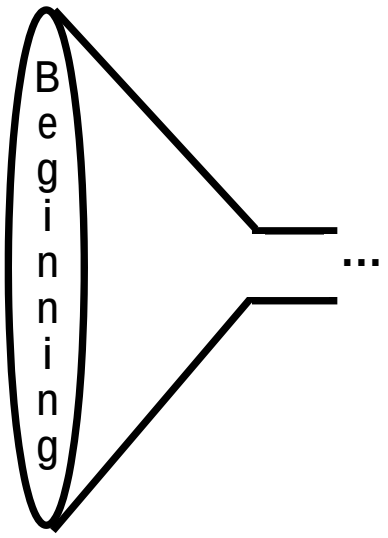
"Modelling the dynamic and thermodynamic response of the Antarctic ice sheet from 1990 until 2100 in response to the IS92 greenhouse-gas-emission scenarios of the Intergovernmental Panel on Climate Change."

Beginning

Purpose: Collect the audience, prepare it for the work you are presenting.

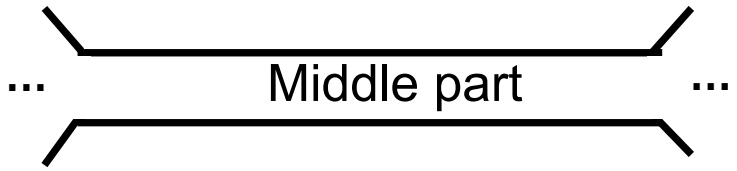
Zooming in:

- Wider context of the work.
- Importance.
- Background information.
- Perhaps historical perspective.



Middle part

- Main part of the presentation.
- Requires ~ 2/3 – 3/4 of the available time.



- **Tell a story:**
  - Logical unfolding of information.
  - Smooth transitions between different points.

Useful hints for the middle part:

- As a transition from the beginning, the basic idea of the talk may be phrased as a question.

  "Since we have realized that global warming is a reality, what will be the fate of the Antarctic ice sheet in the 21st century?"
- Don't lose your line of thought (story!). Avoid sidetracks, or keep them to the absolutely essential minimum.
- Spend more time on the important points, and less on the unimportant ones.
- Don't get lost in too many details.

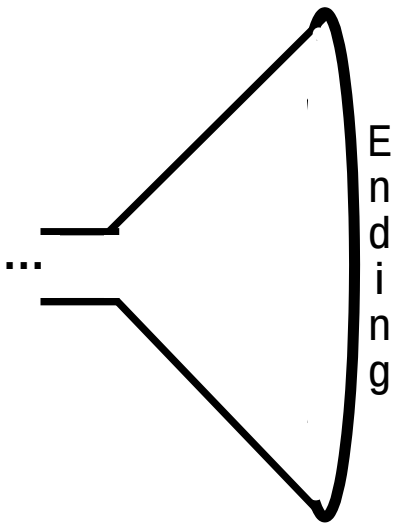
  (lengthy explanations of experimental devices, numerical methods...)

Further useful hints for the middle part:

- Give proper references to other peoples' work, figures etc.
- Handle controversy friendly and tactfully. Give objective arguments for your point of view without being offending.
- Carefully separate evidence from speculation. Recognize the limitations of your work.
- Avoid the use of jargon whenever possible.

Ending

Purpose: Release the audience, provide a take-away message.



Zooming out:

- Clearly formulated, concise conclusion.
- Summary of main results.
- Placement in the "big picture".
- Future perspective.

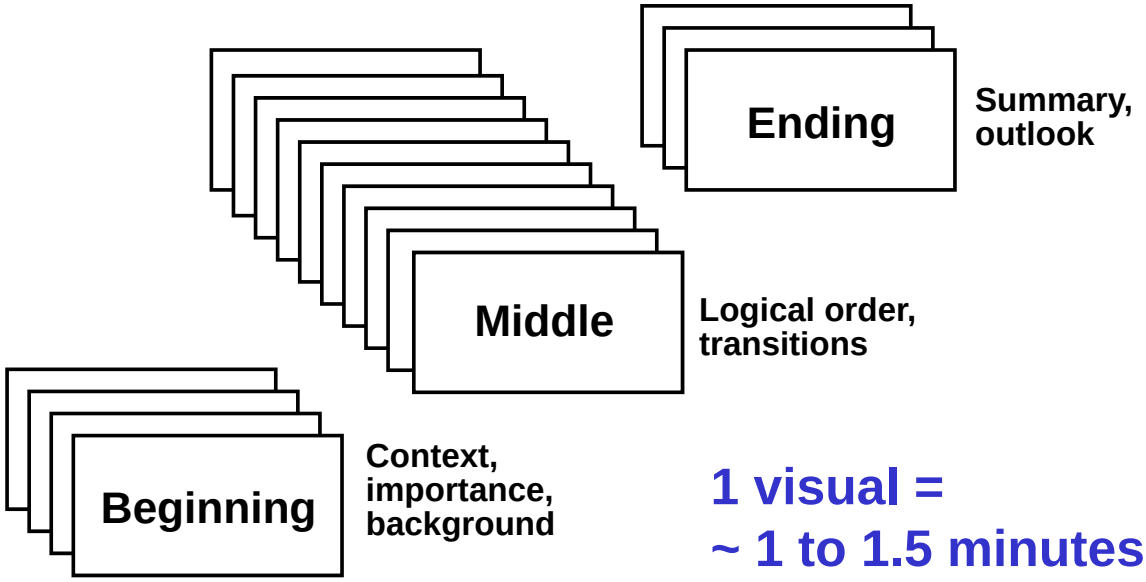
Don’t Go Overtime!

- **End your presentation in time on a clear final note.**
- **Otherwise, the attention of the audience will drop *dramatically,* and irreparable damage is done even to an excellent presentation.**

(Empty slide.)

4 Visuals

Visuals reflect the structure of the presentation.

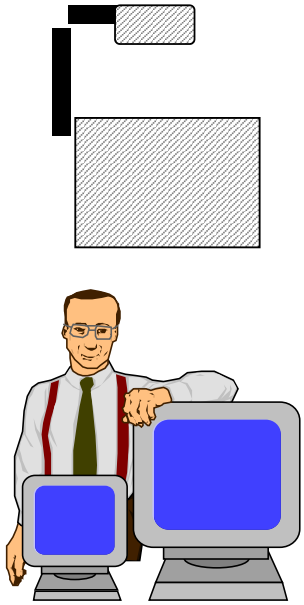


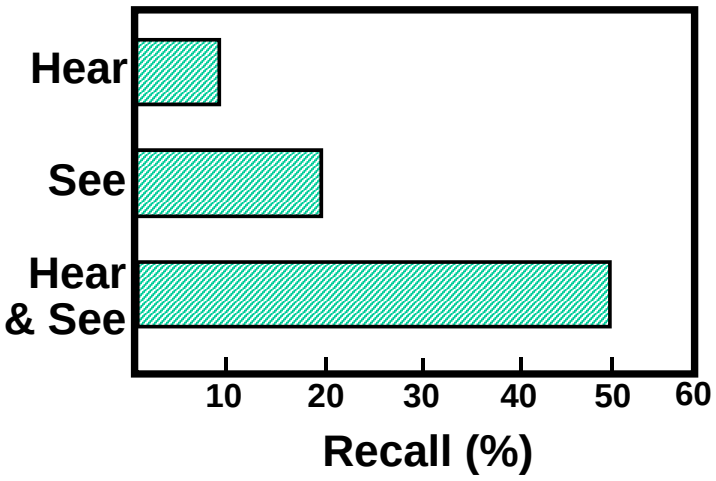
1 visual =
~ 1 to 1.5 minutes

Visuals serve the presentation in several ways

- Notes for audience during presentation.
- Notes for audience after presentation (handouts).
- Notes for speaker before and during presentation.

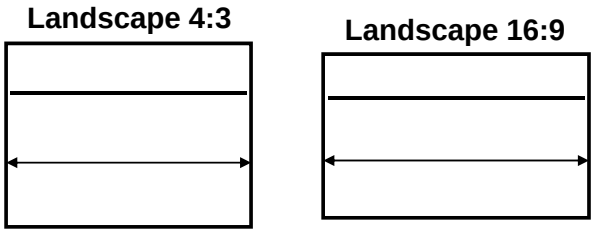
Well-designed visuals help the audience remember more of your presentation





You must make certain decisions when designing visuals

What format?



What information?

Headline/body format orients the audience

Headline

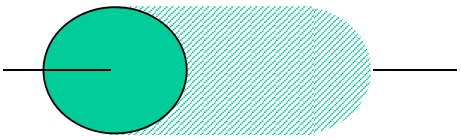
Use a headline that concisely states the idea of the visual

Body

Body supports with words

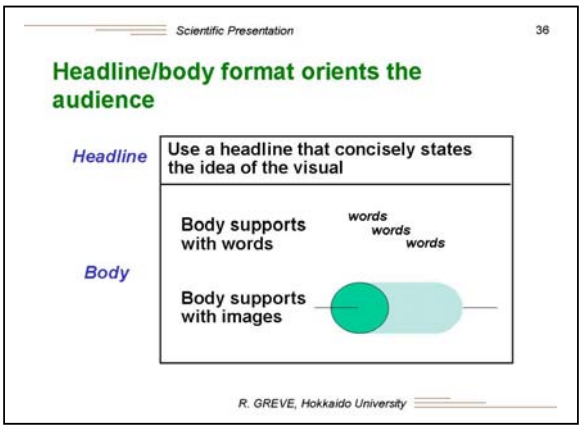
words
words
words

Body supports with images

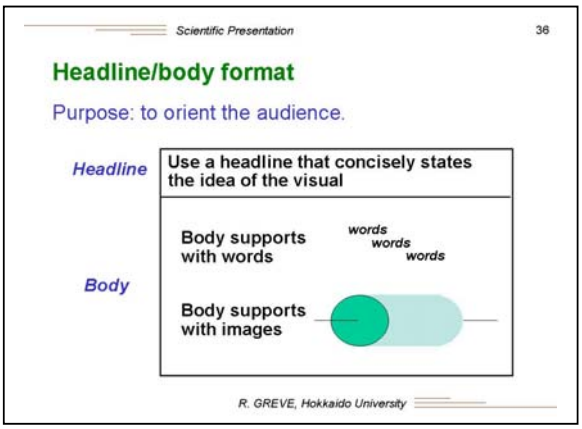


Phrase headlines vs. sentence headlines

Let's recall the previous slide:



Sentence headline (summarizes the idea of the slide).



Phrase headline (less information, informs only about the topic).

Use large, legible type

Clear typeface (sans-serif)

✓ **Arial**
MS PGothic (日本語)

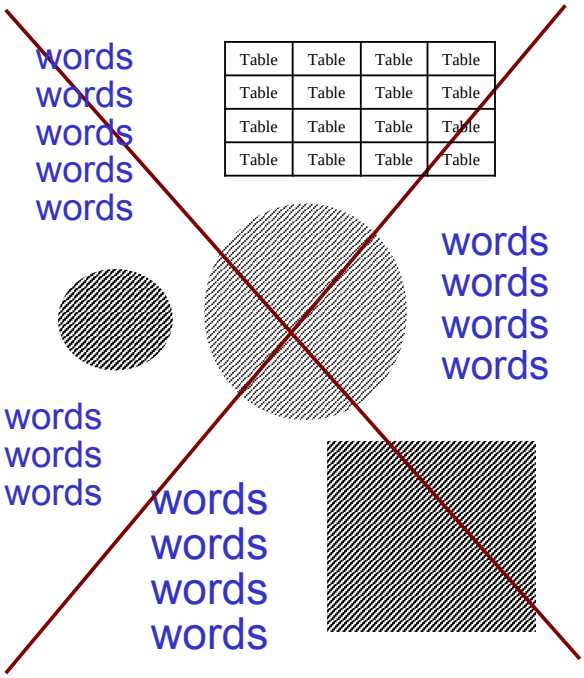
✗ **Times New Roman**
MS Mincho（日本語）

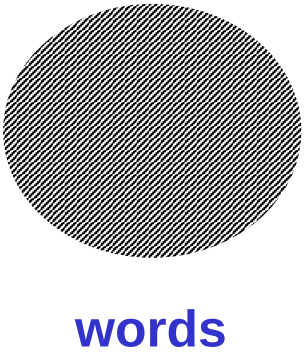
Large type size:

- **28-32 point bold for headings.**
- **(20-)22-24 point bold or normal for body text.**

16 point
18 point
20 point
24 point
28 point
32 point
36 point

Avoid clutter





words

Don’t include information the audience doesn’t need or can’t remember

Filler information

Roentgen discovered x-rays in 1895. He found that a cathode-ray tube produced fluorescence in a distant plati-num-barium-cyanide screen.

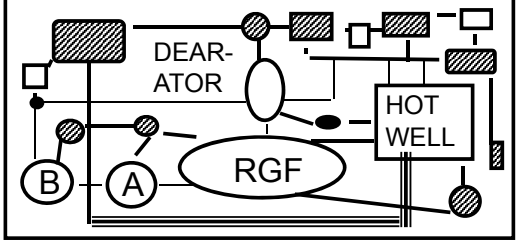
Complex maths

$$\frac{(x+2)^2 \ln x}{(x+1)^2 (x-1)^2}$$

Long lists or tables

- Corrosion
- Acid rain
- Toxic materials
- Pulsed combustion
- Energetic materials
- Pyrogenic materials
- Smog

Complex images



Keep visuals clear and simple!

- **Visuals can be an excellent support of your presentation (“hear & see”).**
- **However, if they are not easy to catch, they will draw the attention of the audience away from what you say.**

5 Delivery

The moment of truth...

Misconception:

In scientific presentations it only matters what you say, not how you say it.

Fact:

Delivery, not content, often makes the lasting impression!

- An effective delivery conveys your message to the audience.
- May make the difference whether you get a job offer, high grade for your thesis etc.

Preparation

- Be well organized.
  (Presentation file + backup (!),
  handouts, pointer, business cards, …)
- Don’t show up just two minutes before your presentation is scheduled to start!
- Familiarize yourself with the environment.
  (Conference/seminar room, audience, …)
- Familiarize yourself with the equipment.
  (Projector, computer, pointer, screen, lights, …)

How to deliver the speech

Memorize the speech	**Read from a text**
+ allows eye contact - difficult for long speeches - room for precision errors - no room for improvising	+ ensures precision - doesn’t sound natural - no room to improvise - hinders eye contact
Speak freely	**Speak from visuals/notes**
+ sounds natural - much room for error	+ insures organization + allows eye contact + allows improvising - some room for error

In any case, it is a good idea to rehearse!

My English is so poor… ☹

- Take it as a challenge! Keep on studying, practise communicating in English often.
  "Even a journey of 1000 miles begins with a single step" (Lao Zi).
- Rehearse repeatedly
  (preferably with an English-speaking friend).

In case of severe language problems:

- Try to make your slides as self-explanatory as possible.
- Memorizing the speech (partly) or reading from a text may be considered.

Wording

Prepare strong wording to emphasize important points or transitions:

- Beginnings
  - OK: "My name is _____ and I will be talking about…"
  - Better: "One question that has come up more than once during this conference is: 'Now that decadal solar variability has been identified, what are the consequences for climate change?'"
- Middles
  - "This is what I have to say about the influence of aerosols. I will now discuss…"
- Endings
  - "To conclude, the main results of my study are ..."

Voice

- Speak up and slow down!
- If possible, use a microphone.
- Articulate every word clearly (especially at the end of the sentence).
- Avoid rising intonation at the end of the sentence. (Otherwise, one has the impression of a single, endless sentence.)
- Avoid too monotonous speaking. (Changing of volume, repetition of words or phrases, pausing.)

Eye contact, gestures

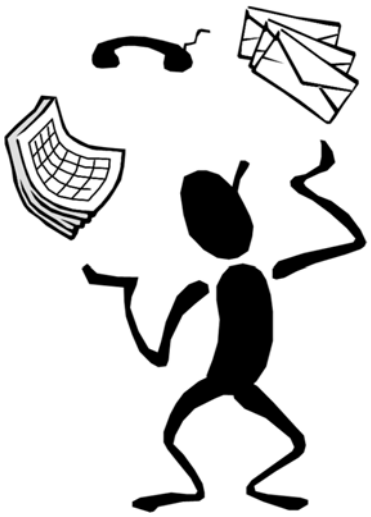
- Try to communicate with the audience (instead of just speaking in front of them).
- Keeping eye contact is essential. Involve many different listeners.

- Make positive use of your hands. (Emphasizing, voilà gesture…)

Stage presence

All the world's a stage, and all the men and women merely players.

– Shakespeare, from "As You Like It"



- Always stand upright in front of the audience.
- Don't sit or hide behind a lectern.
- Hold the pointer in the hand next to the screen.
- Change position occasionally.

Handling questions

- Perhaps repeat the question.
  (Entire audience can hear the question, gives extra time to reflect.)
- Don't rush to give an answer.
  (Allows time to reflect, shows respect to the questioner.)
- If unclear or not well understood, ask for a clarification.
- Try to give a precise, short, well-articulated answer.
- Lengthy explanations should be postponed to private discussion.

If you can't answer…

- Stay calm and openly say so. Don't try to talk around the issue. (Nobody is perfect…)
- You then may:
  - Offer to research an answer, then get back to the questioner later.
  - Suggest resources which would help the questioner to address the question him-/herself.
  - Ask for suggestions from the audience.

Dealing with aggressive questions

- Again, stay calm.
- Don't try to "fire back". Avoid an open argument.
- Possible strategies:
  - Repeat the question in your own words, phrasing it more generally and neutrally. Then give an answer.
  - Suggest a private discussion.

    "I see your point, even though I don't agree with it.
    Because this is a very complicated issue, which may lead to a long debate, it is perhaps better if you and I get together afterward to discuss it."

As a final hint, …

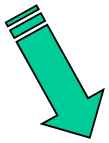
… show some **enthusiasm** about your work!

This will help you delivering a lively presentation that makes a lasting impression on the audience.

(Empty slide.)

6 Posters

- Like any scientific presentation, a poster should tell a story.

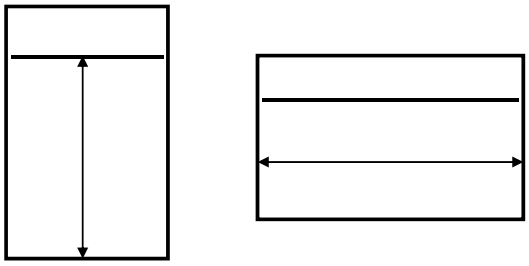


  - Brief, informative title.
  - Concise introduction.
  - Main part: logical, coherent sequence.
  - Small number of well-phrased conclusions.

Poster design

- Portrait vs. landscape?

  Depends on the available space → find out in advance!



- Clear, easy-to-read typeface (such as Arial).
- Sufficiently large type size (18 point or more).
- No disturbing background.
- Arrange sections such that the order of what to read is clear. (Best in vertical columns.)
- Aesthetic and clean overall appearance.

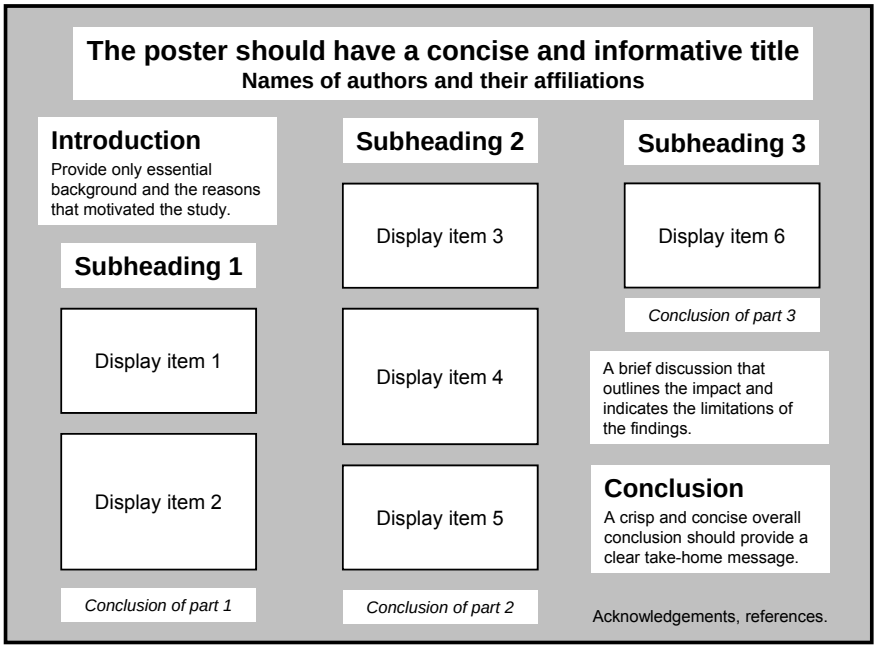
What to put on the poster? (And what not…)

- Accept the fact that a poster cannot give the same amount of information like a scientific paper or a thesis.
- If possible, use graphical representations instead of text.
- No long paragraphs of text, rather vertical lists.

Keep it user-friendly and simple!

The receptiveness of the viewers is limited, and there may be hundreds of other posters to read!

Example for a well-organized poster



Interaction with poster viewers

- Presenting author should be available at the poster at the designated time.
- Stand at the side of the poster, don't obscure the view.
- Be ready for questions or discussions without being pushy.
- Keep your explanations brief and clear.
- **Good for establishing personal relationships!**

終