Effective Scientific Presentations
The best retention occurs for presentations that are both vocal and visual.

Data from the Wharton Research Center
Research shows that the brain is good at reading, good at listening, but not doing both simultaneously.
To resolve the problem we first have to understand how the brain works.

Cognitive scientists say the mind processes information in 2 channels: verbal and visual.
The mind pays attention to only a few pieces of information in each channel.

Then it must select, organize, and integrate what's important.
To be effective, the audience must grasp the content quickly

Use short statements

Use images to increase comprehension

Use blank spaces to enhance readership

Water has special thermal properties

- It helps to control the climate on our planet
- It helps to maintain our body temperature
Too much information and distractions can confuse and annoy your listeners.

Theta oscillations in the BLA

This data is truly pioneering!!

COOL DATA!!!!
Don’t force your audience to choose between listening to you - OR reading your slides.
The slides should follow several rules

Use a sentence headline to state the slide’s purpose

MD simulations show that nitric acid readily dissociates in water

Use images to support the sentence

The OH bond breaks upon dissociation
The surface spectroscopy shows nitric acid in two different forms at a water surface.

The two HNO₃ molecules differ by the number of bonds to water.

If necessary, identify key assumption or background for audience—keep to two lines (18–24 point type)
Use typography that is quickly and easily read

Use a readable simple font (Arial, Gill Sans)

Use a high contrast between words and background

MD simulations show that nitric acid does not dissociate when on a water surface

The proton does not dissociate
Some fonts work for manuscripts but not for presentations

Times Roman Font is harder to read quickly

MD simulations show that nitric acid does not dissociate when on a water surface

The proton does not dissociate
Even italics can slow the reading and comprehension.

**MD simulations show that nitric acid does not dissociate when on a water surface.**

The proton does not dissociate.
The title slide should draw interest

Use the title slide to connect with your audience
The “outline” slide should be a visual roadmap

- Image for Topic 1
- Topic 1
- Image for Topic 2
- Topic 2
- Image for Topic 3
- Topic 3

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This presentation shows the unique structure and reactivity that is present at water surfaces:

- Hydrogen bonding at water surfaces
- Gaseous adsorption at water surfaces
- Surface acidity of HNO₃ solutions

Presentation Outline

1. Introduction
2. Background
3. Methods
   - Experimental
   - Theoretical
4. VSFS studies of water surfaces
5. Studies of how gases adsorb on a water surface
   - Room temperature studies
   - Low temperatures studies
6. Studies of nitric acid at a water surface
7. Conclusions and future studies
8. Acknowledgements
The methods slide should follow the same format

To probe the water surface we use surface vibrational sum frequency spectroscopy (VSFS)

The technique selectively probes the topmost layers of the interface

Tunable pulsed lasers probe the surface species

The resulting vibration spectrum measures surface molecules

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The most difficult part is to consider what to include and what to exclude on each slide
The summary slide headline states the most important assertion of the presentation

This sentence summarizes the most important conclusion of the presentation

Supporting point (no more than two lines)

Another supporting point (parallel to the first)

Image that supports conclusion
Don’t use long lists that limit comprehension

Summary of the This Presentation

- The amazing discovery that no one knew about
- Another remarkable discovery that you maybe knew
- A third fact that you might not have noticed
- And a fourth finding that only few people ever heard of
- Throw in a fifth discovery that I particularly like
- A sixth discovery that I didn’t have time to talk about
- And two final smaller discoveries that are also important
  - the one found in the noise
  - a second found by turning the data upside down

Avoid lists with more than four items.
The surface of water has unique properties that control its chemical properties.

- Water participates in weak H-bonding at the topmost surface layers.
- $\text{SO}_2$ adsorbs at the surface whereas $\text{CO}_2$ quickly absorbs.
- Nitric acid is a weak acid at aqueous surfaces.
Don’t read your slides!

Don’t talk to your slides!

Don’t apologize for your slides!

Keep your audience engaged
Limit the number of slides

Max: 1 slide per minute
And finally,

rehearse, rehearse and rehearse