Persuasive Scientific Presentations

Connect
Face forward
Be Visible
Gesture
Voice
The best retention occurs for presentations that are both vocal and visual.
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
- 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 controls the climate on our planet

It helps to maintain our body temperature
Too much information and distractions can confuse and annoy your listeners.

Data

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
- Use images to support the sentence

**MD simulations show that nitric acid readily dissociates in water**

The OH bond breaks upon dissociation

Molecular Bond Lengths

<table>
<thead>
<tr>
<th>Bond Length (Angstroms)</th>
<th>Timestep (fs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>1.2</td>
<td>100</td>
</tr>
<tr>
<td>1.5</td>
<td>200</td>
</tr>
<tr>
<td>1.8</td>
<td>300</td>
</tr>
<tr>
<td>2.0</td>
<td>400</td>
</tr>
<tr>
<td>2.2</td>
<td>500</td>
</tr>
<tr>
<td>2.4</td>
<td>600</td>
</tr>
<tr>
<td>2.6</td>
<td>700</td>
</tr>
<tr>
<td>2.8</td>
<td>800</td>
</tr>
</tbody>
</table>
The surface spectroscopy shows nitric acid in two different forms at a water surface.

The two \( \text{HNO}_3 \) 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

© COACH
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

© COACH
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
The focus slide should be a visual roadmap

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

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
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
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

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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

SO$_2$ adsorbs at the surface whereas CO$_2$ quickly absorbs

Nitric acid is a weak acid at aqueous surfaces
Identify and practice tactics to keep you calm
Keep your audience engaged

Don’t read your slides!
Don’t talk to your slides!
Don’t apologize for your slides!
Limit the number of slides

Max: 1 slide per minute
And finally,

rehearse, rehearse and rehearse