

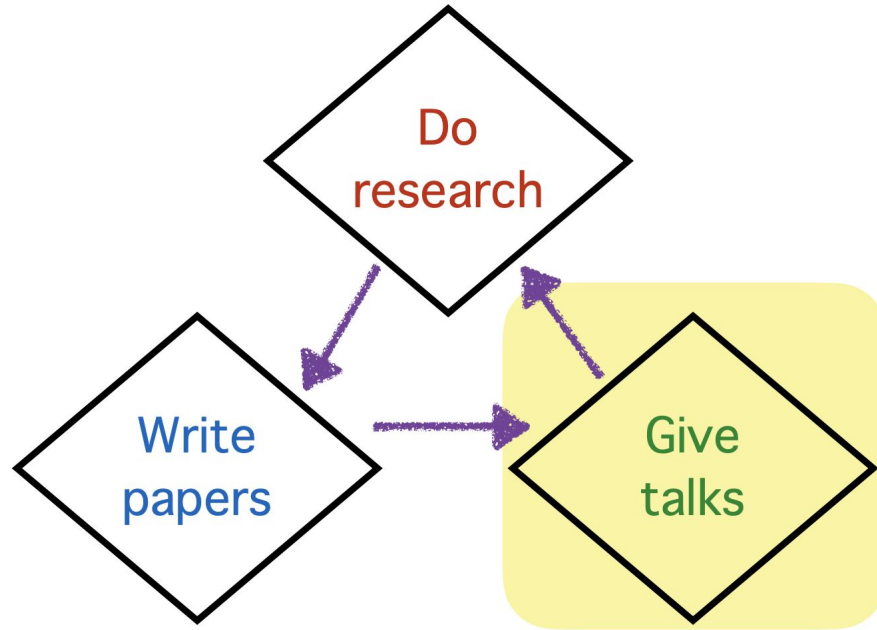
Designing Effective Presentations

Slides adapted from Bogdan Vasilescu, CMU Student Academic Success Center, Derek Dreyer, and Ranjit Jhala

No one cares about your research...

No one cares about your research...
unless you make them care.

Giving effective presentations is a critical part of our jobs as researchers.



Today we'll talk about specific things you can do to improve your presentations.

- > Design slides using the assertion evidence model

- > Tell a story: include motivation, contributions & key ideas, explanation of key idea, and conclusion

- > Structure your talk with landmarks to keep audience attention

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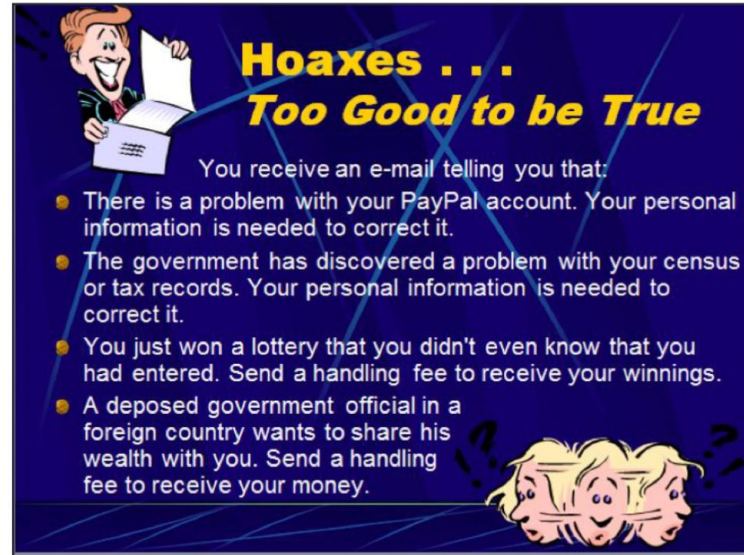
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Slides often suffer from too much text,

Serendipitous Drug Discovery

- The use of nitrous oxide and ether as narcotic gases in surgery resulted from the observation that people who inhaled these chemicals [in parties] did not experience any pain after injury.
- The vasodilatory activity of amyl nitrite and nitroglycerin was discovered by chemists who developed strong headaches after inhaling or ingesting minor amounts.
- A wrong working hypothesis on chloral hydrate, which was supposed to degrade metabolically to narcotic chloroform, led to its application as a strong sedative (in reality, the metabolite trichloroethanol is the active form). Similarly, urethane was supposed to release ethanol but is a hypnotic by itself.
- Acetylsalicylic acid was thought to be just a better tolerable prodrug of salicylic acid, but turned out to have a unique mechanism.
- Phenolphthalein was considered as a useful dye for cheap wines; after a heroic self-experiment, a pharmacologist experienced its drastic diarrhoic activity.
- Warfarin was used a rat poison.

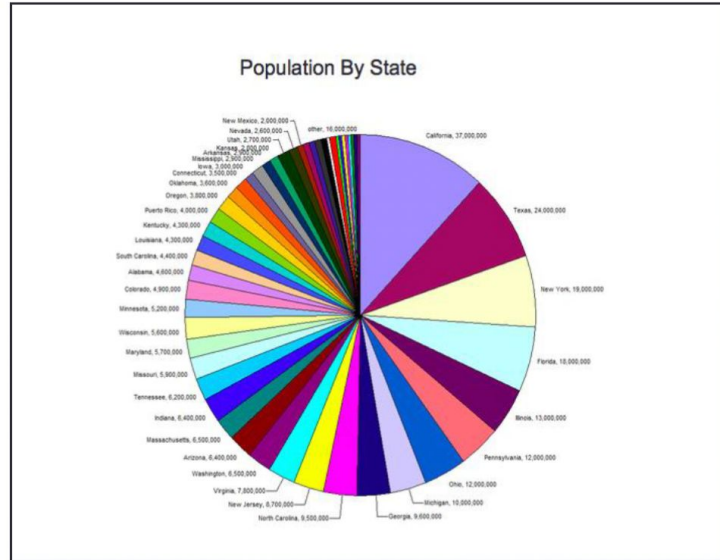
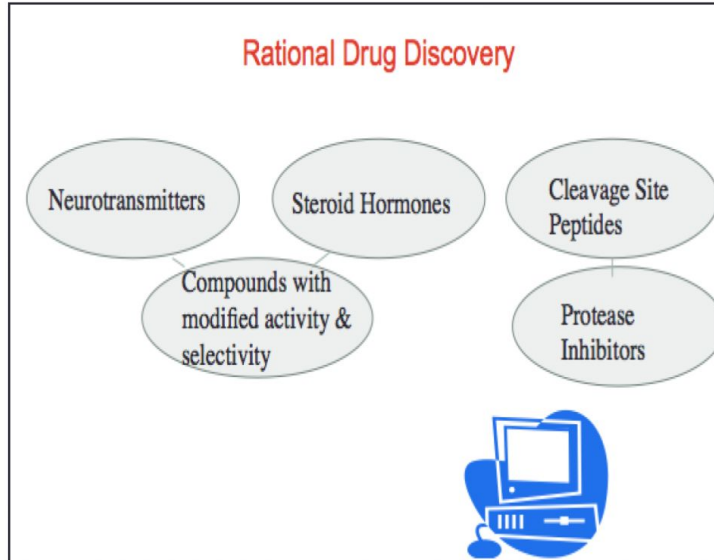


Hoaxes . . .
Too Good to be True

You receive an e-mail telling you that:

- There is a problem with your PayPal account. Your personal information is needed to correct it.
- The government has discovered a problem with your census or tax records. Your personal information is needed to correct it.
- You just won a lottery that you didn't even know that you had entered. Send a handling fee to receive your winnings.
- A deposed government official in a foreign country wants to share his wealth with you. Send a handling fee to receive your money.

confusing or unnecessary visuals,



or, the primary culprit, fragmented bulleted lists with phrasal headings.

Mineral Economics

- Free Market:
 - Plentiful mineral resource
 - cheap
 - supply exceeds demand
 - Resource becomes scarce
 - price increases
 - Demand exceeds supply

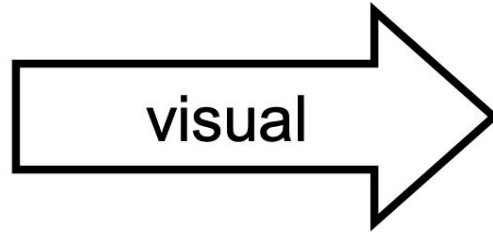
Digital Acquisition System

- Accelerometer outputs an analog voltage
- Hardware converts analog signal to digital
- Computer samples a number of points
- Data is exported to popular applications
 - o Microsoft Excel
 - o Matlab

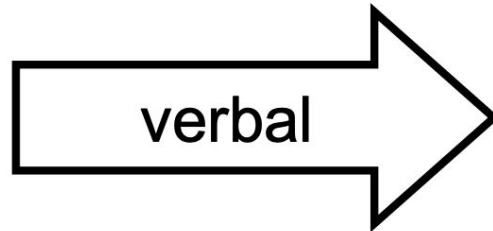
Verbal Narration and Text On Screen

- While speaker talks with text heavy screen
- Physically and cognitively unable to simultaneously process verbal narration and text on screen
- Two inputs separate inputs in brain
- Option 1: Will toggle back and forth
- Option 2: Will be listening and not truly comprehending text
- Option 3: Will be reading text and zoning out speaker
- Since which option you chose

Cognitive scientists say the mind processes information in 2 channels (dual channel)

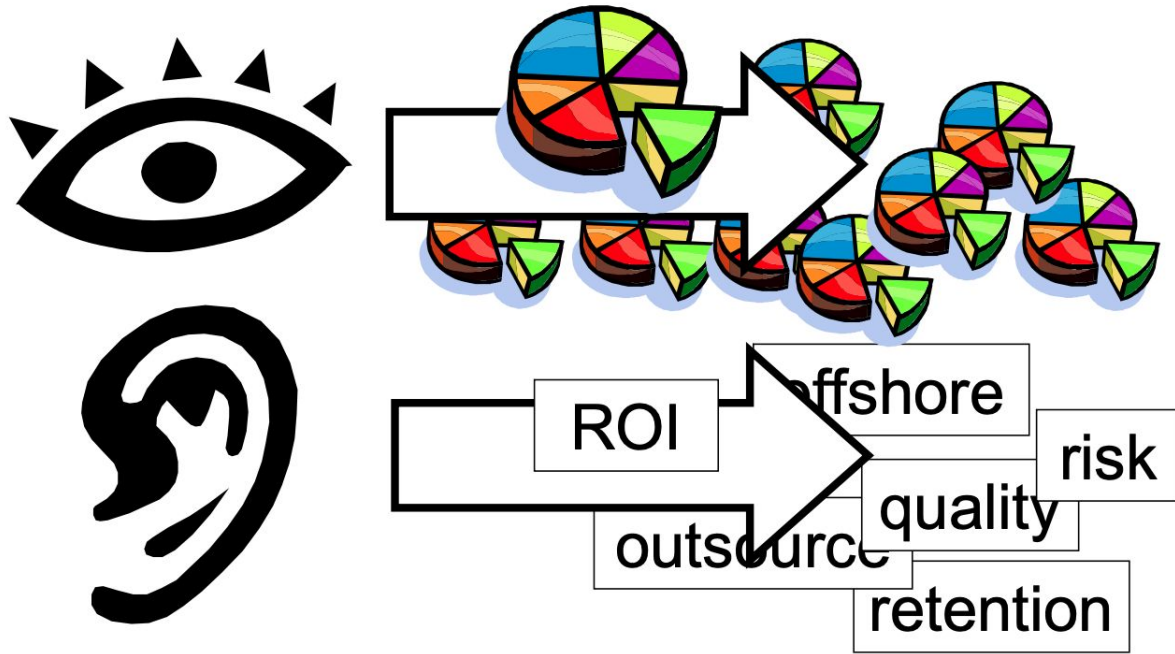


Processes illustrations, animations, video, or on-screen text



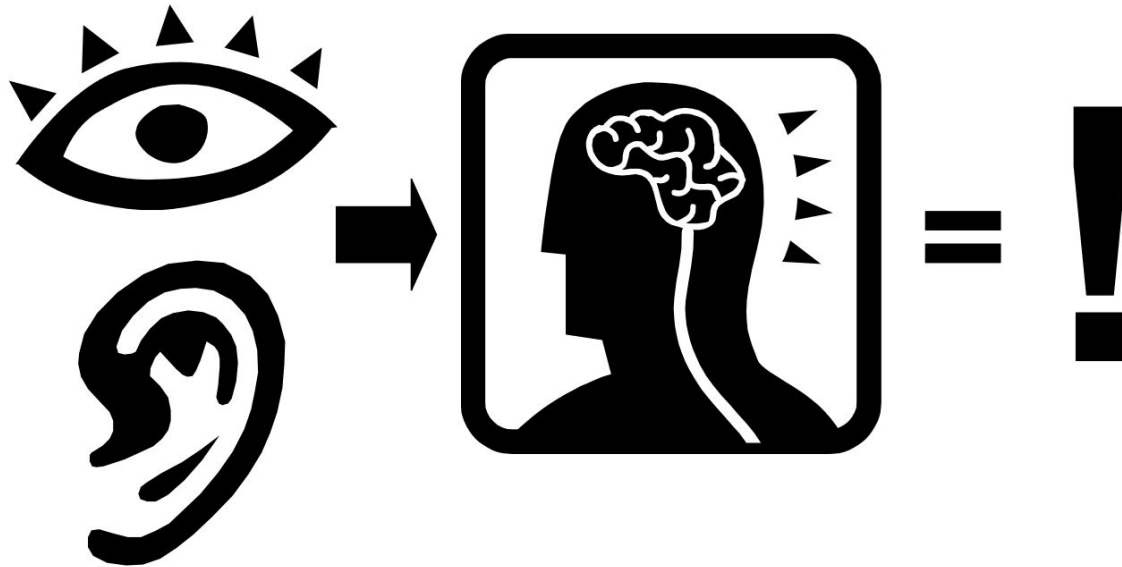
Processes narration or nonverbal sounds

The mind pays attention to only a few pieces of information in each channel



Limited capacity

The mind needs space to select, organize & integrate what's important between these two channels



Active processing

Our understanding of the way the mind works has three implications for PowerPoint:

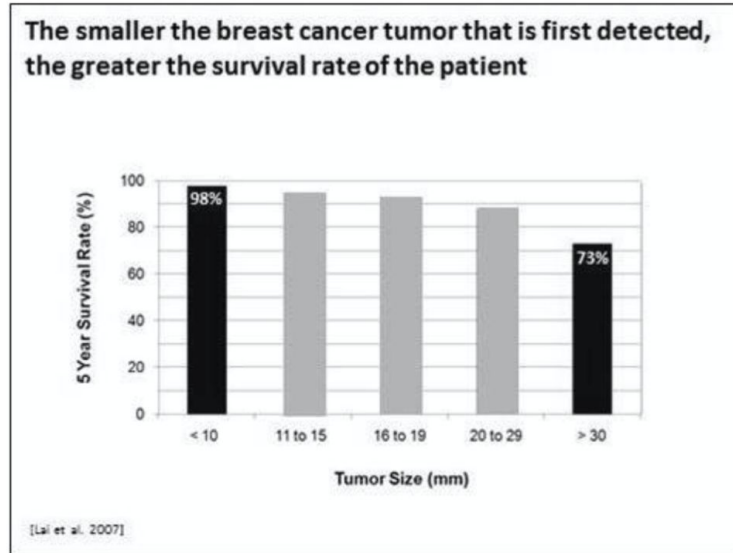
1. PowerPoint presentations should use both visual and verbal forms of presentation;
2. Filling the slides with information will easily overload people's cognitive systems;
3. The presentations should help learners to select, organize, and integrate presented information.

The following set of research-based techniques take these implications into account, and can help reduce cognitive load in PowerPoint

The assertion evidence model consists of two parts:

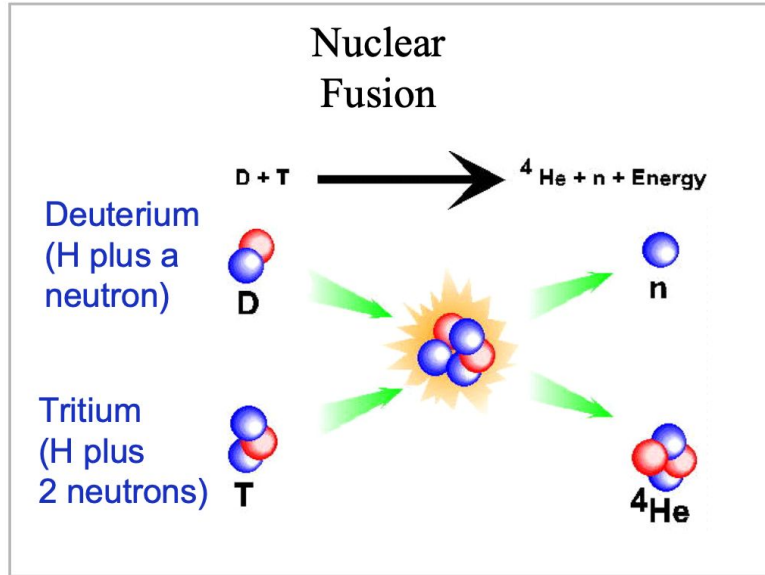
1. Main message

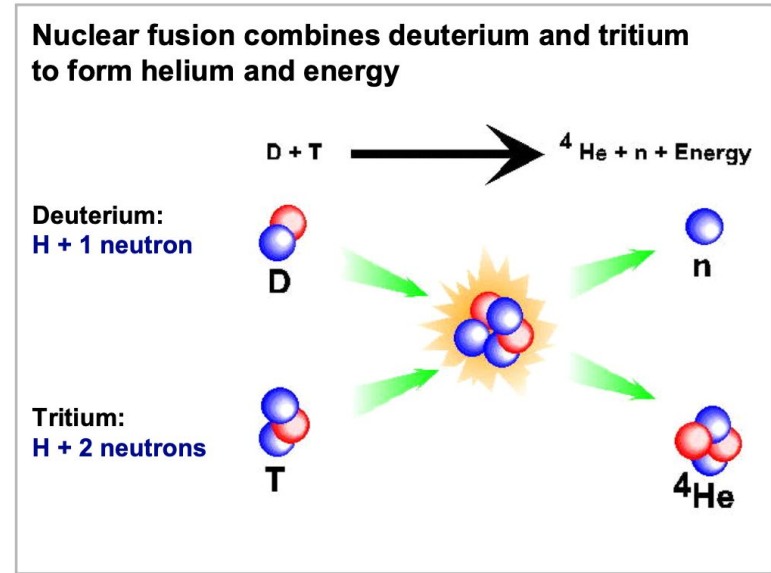
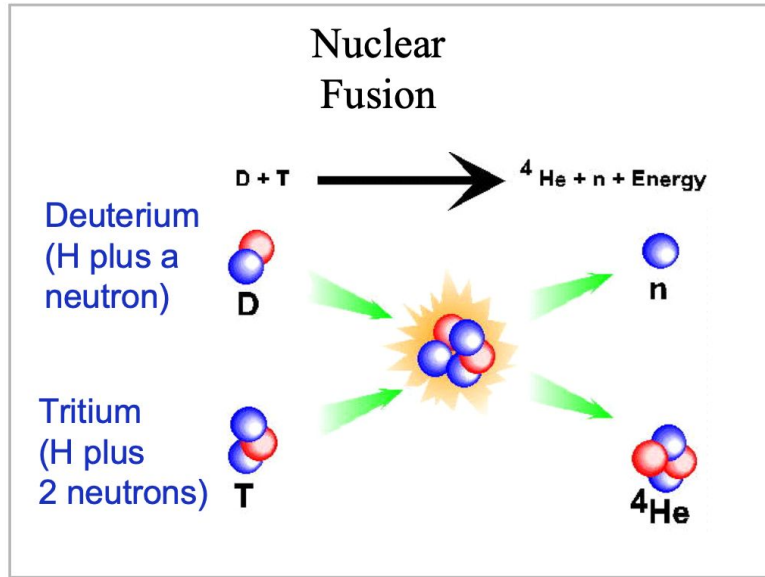
2. Visual evidence



Model coined and tested by Dr. Michael Alley*

The assertion evidence model clearly presents the “bottom-line” of each slide.



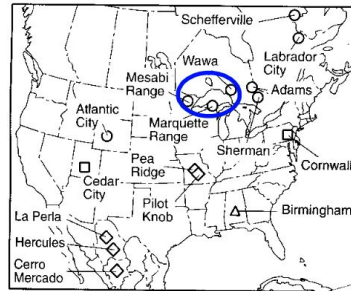


The assertion evidence model let's you give more detail without confusing the audience about the main idea.

Iron

- An abundant metal, makes up 5.6% of earth's crust
- Properties:
 - shaped, sharpened, welded
 - strong, durable
- Accounts for >95% of metals used
- Iron ores discovered in 1844 in Michigan's Upper Peninsula
- Soon found other ores in upper Wisconsin and Minnesota

Iron Ore Distribution



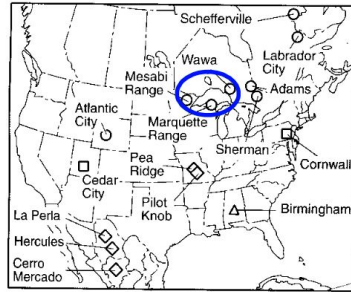
Kesler 1994

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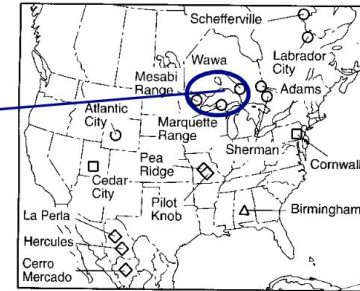
Iron ores make up 5.6% of the earth's crust and account for 95% of the metals used



Is strong and durable

Can be shaped, sharpened, and welded

Iron Ore Distribution



[Kesler 1994]

Digital Acquisition System

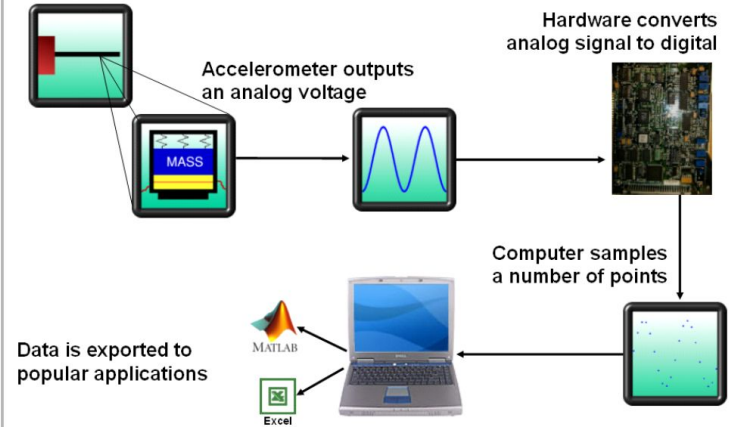
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Digital data acquisition changes the data's form



The assertion-evidence model is model, not a rule!
Sometimes you may want to break away from the model.

Agenda

- Homework 1 Logistics
- Designing effective presentations
- Summary

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- > **Tell a story: include motivation, contributions & key ideas, explanation of key idea, and conclusion**

- > Structure your talk with landmarks to keep audience attention

The assertion evidence model allows you to break up your story into digestible bites, 1 main point per slide.

Microsoft PowerPoint - [atkinson_mayer_powerpoint_3_15_04.ppt]

File Edit View Insert Format Tools Slide Show Window Help Adobe PDF

Type a question for help

66%

Notes... Transition Design New Slide

1 2 3 4 5

6 7 8 9 10

11 12 13 14 15

Slide Sorter blank

Slide 1: 12345
Five ways to reduce PowerPoint overload
by Cliff Atkinson and Richard C. Mayer

Slide 2: PowerPoint overload is a common problem in many organizations

Slide 3: This problem stands in the way of effective strategy, sales and learning

Slide 4: Fortunately, there is research that presents a pathway for solutions

Slide 5: To solve the problem we have to understand how the mind works

Slide 6: Cognitive scientists say the mind processes information in 2 channels

Slide 7: The mind pays attention to only a few pieces of information in each channel

Slide 8: The mind needs space to select, organize & integrate what's important

Slide 9: Five research-based techniques can help you reduce the PowerPoint load

Slide 10: 1. Write a clear headline that explains the main idea of every slide

Slide 11: 2. Break up your story into digestible bites in the Slide Sorter view

Slide 12: 3. Reduce visual load by moving text off-screen and narrating the content

Slide 13: 4. Use visuals with your words, instead of words alone

Slide 14: 5. Rigorously remove every element that does not support the main idea

Slide 15: For more resources, visit Sociable Media or refer to Rich's research

Tip: Outline a **story** with one sentence per slide, then design slides.



Example structure of a 20 min talk

- **Motivation** (~6 minutes)
 - What problem are you solving and why?
- **Contributions & key idea** (~3 minutes)
 - What did you actually do, and what is the key idea behind your solution?
- **Explanation of key idea** (~9 minutes)
- **Conclusion** (~2 minutes)

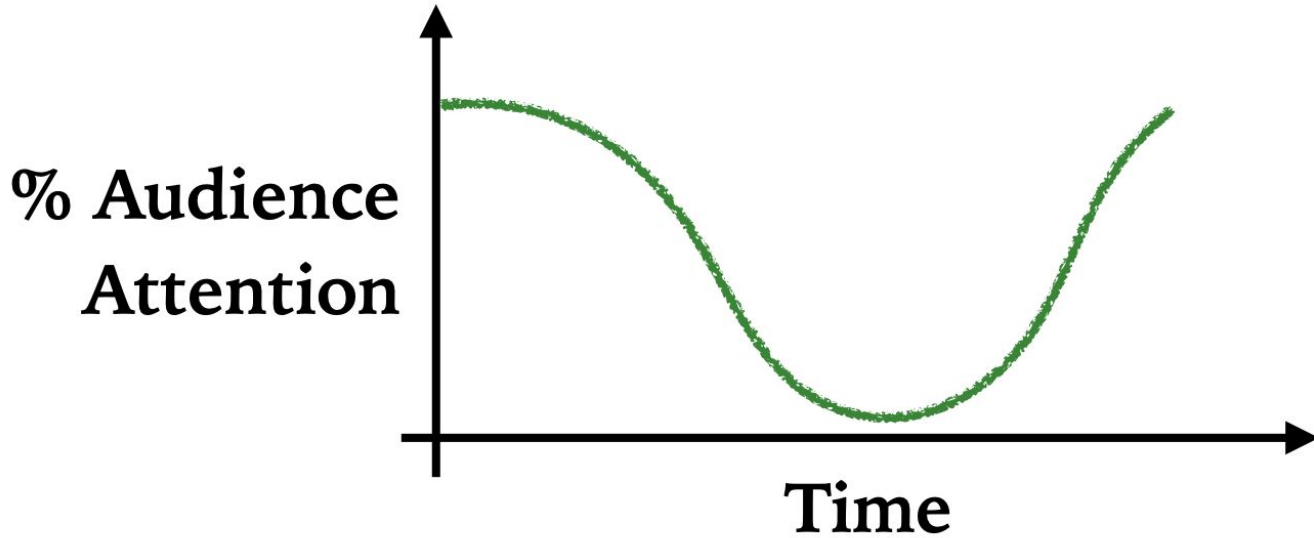
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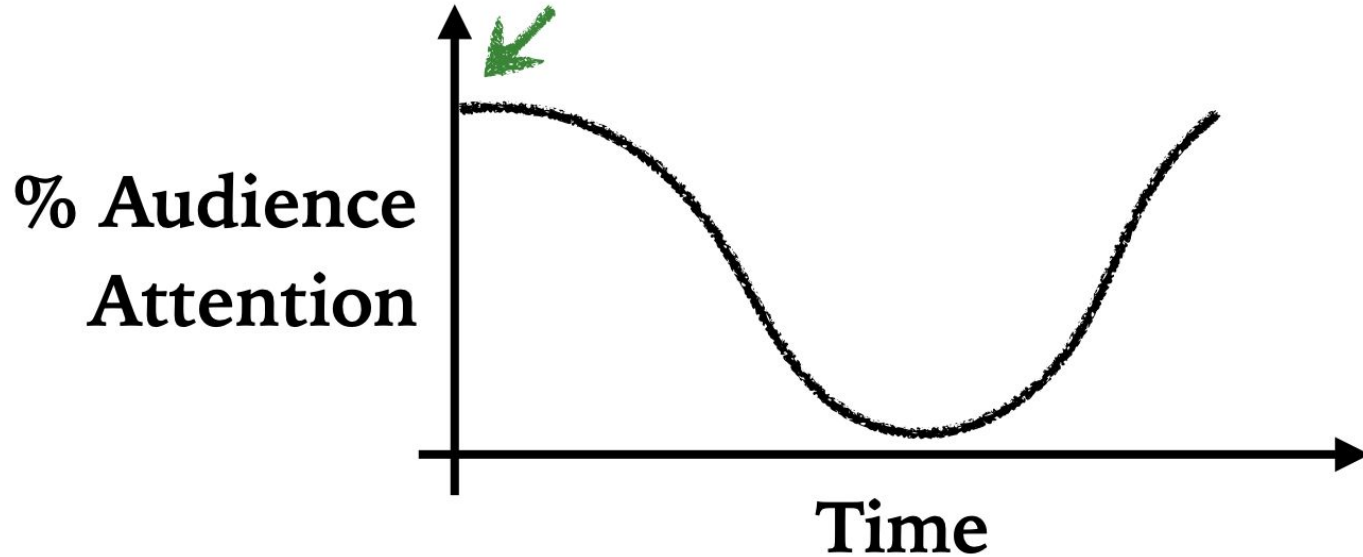
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Audience is most engaged at the beginning and at the end of your talk.

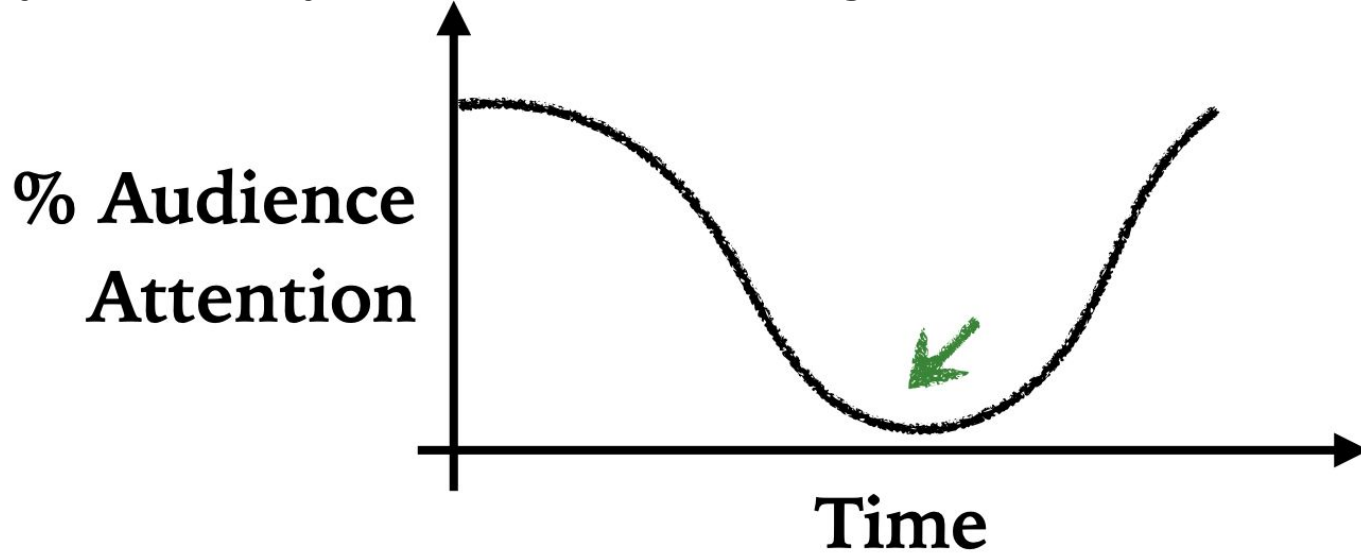


Adding landmarks along the way engages audience when they are likely to zone out and get bored.



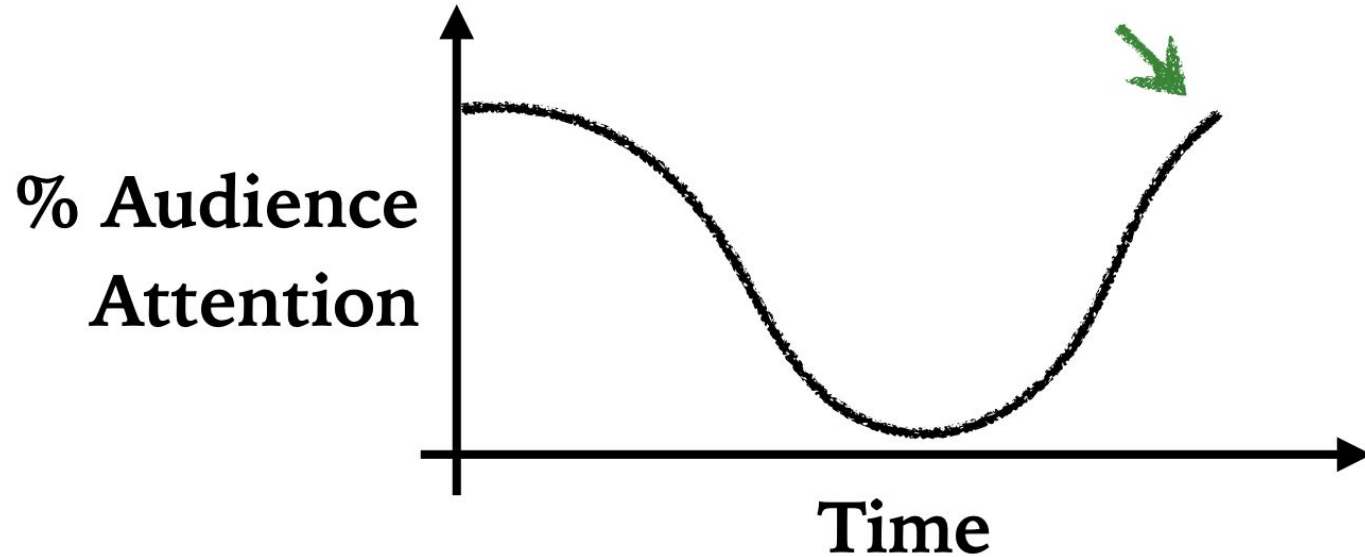
Start at high-level motivation

Adding landmarks along the way engages audience when they are likely to zone out and get bored.



Gradually introduce technical details

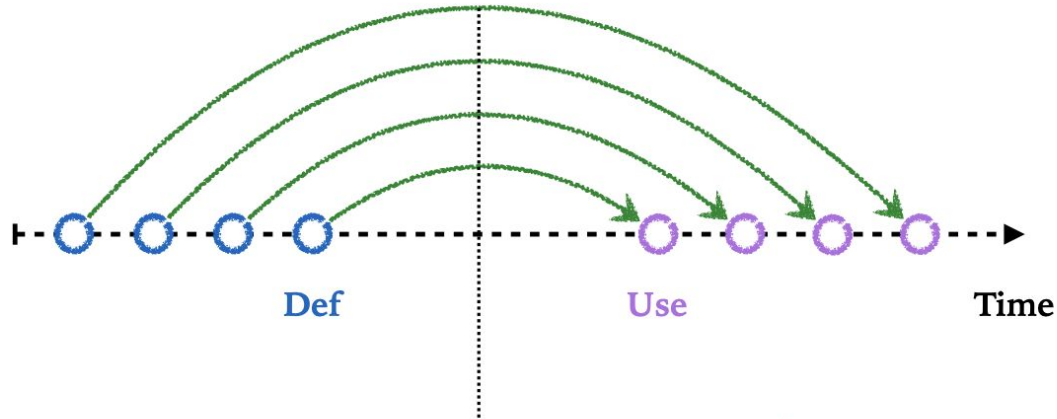
Adding landmarks along the way engages audience when they are likely to zone out and get bored.



End with high-level summary & consequences

Poorly designed landmarks requires audience to remember information from 10 slides ago.

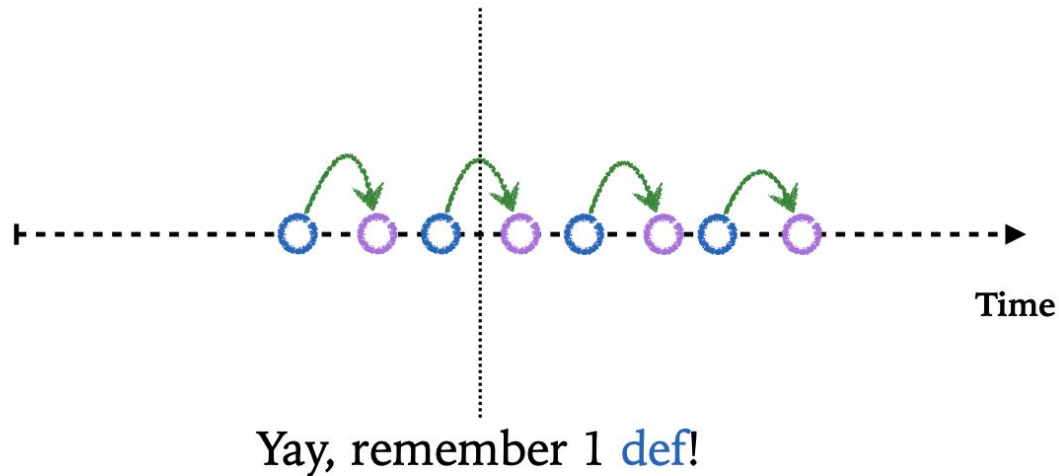
Definition before use



Yikes, must remember four defs!

Well designed landmarks carefully introduces definitions and then use.

Definition before use



Summary:

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Additional Resources

CMU SASC -- Communication Support website - FULL of handouts for you to explore

<https://www.cmu.edu/student-success/other-resources/handouts/comm-supp-pdfs/designing-powerpoint-slides.pdf>

<https://www.cmu.edu/student-success/other-resources/handouts/index.html>

Designing Effective Powerpoints (gcccmu YouTube channel):

<https://www.youtube.com/watch?v=kbdO7adBRFE>