Designing Effective Science Presentations

Narrative, Visual Aids, and Delivery Skills

SfN Society for Neuroscience

There are three elements of a scientific presentation

Society for Neuroscience

Best piece of advice in science communication

Know your audience

Before planning your presentation, you should clearly define:

- **Who is your target audience?**
- **How do you want to impact your audience?**
- **What will you need to do to help your audience understand and appreciate your talk?**

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The three elements of a scientific presentation

1. **Structure/narrative**
2. Visual aids (slides)
3. Delivery of the presentation

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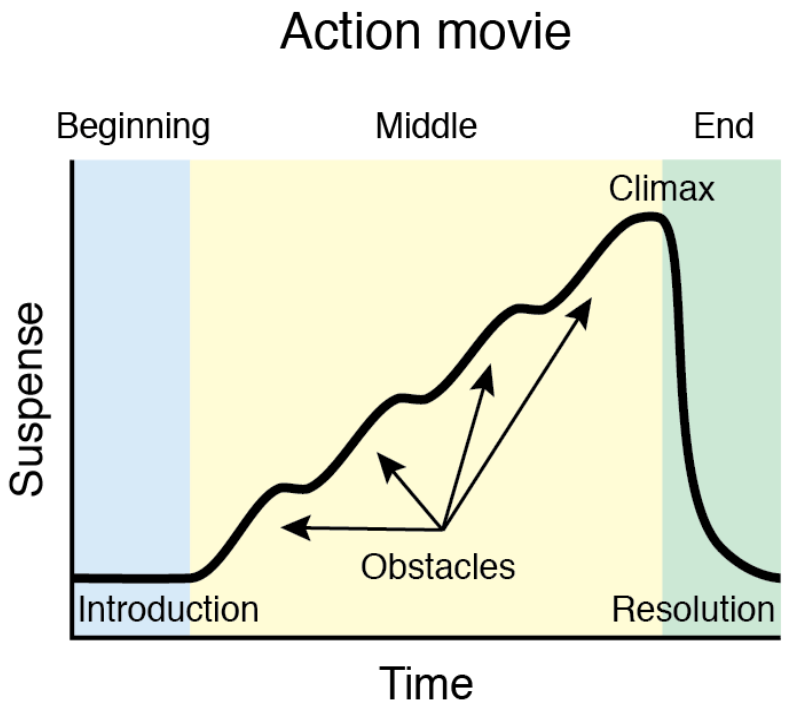
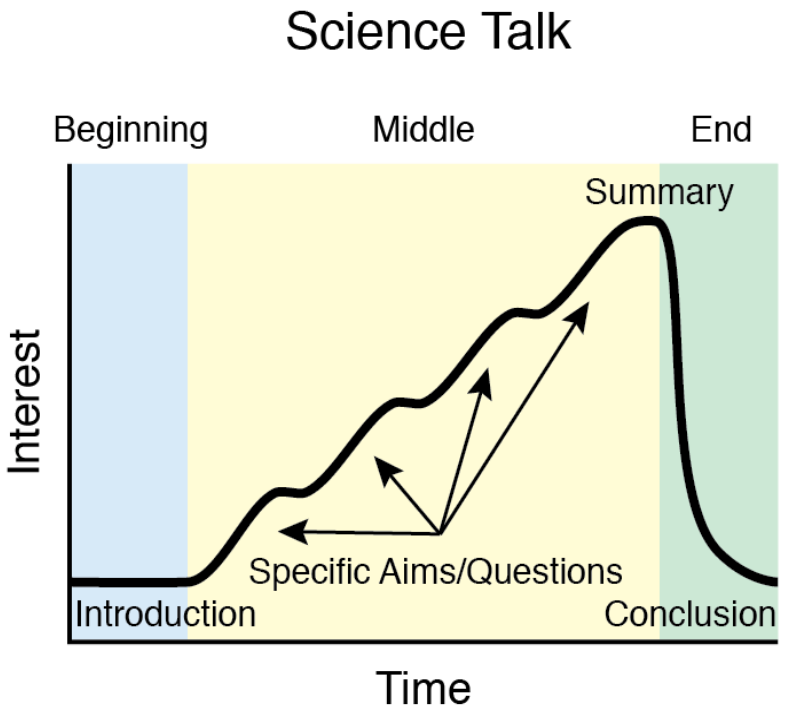
A good science talk is a good science story

A good scientific talk is just like any other good story, with a beginning, middle, and end





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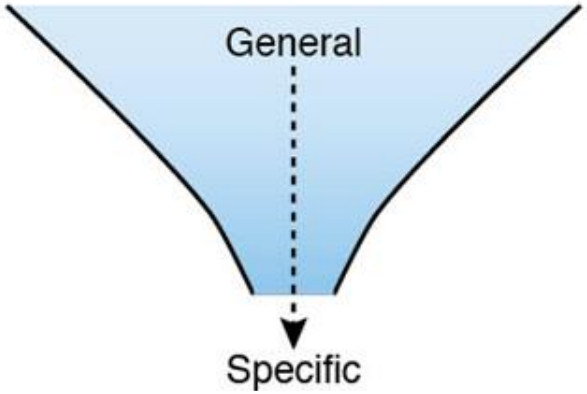
Start your talk with the big picture



General

Specific

What are the molecular mechanisms behind the aging process?

In sexual animals that don't self-replicate, telomere shortening correlates with cell senescence.

Is telomere maintenance different in sexual animals and asexual animals that do self-replicate?

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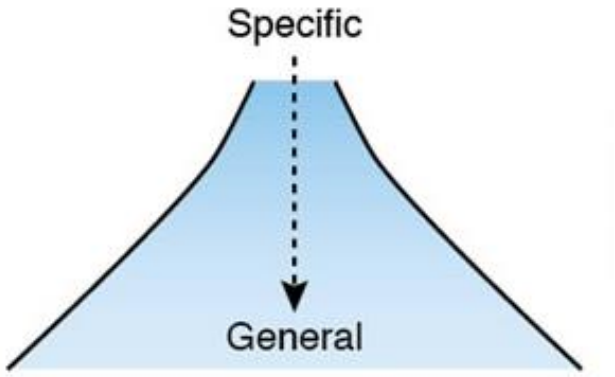
End your talk with the big picture



We showed how ATP binding triggers activation of a P2X receptor.

This mechanism explains many experimental findings and provides insight for the future design of antagonists.

Our methods can be universally applied to other ion channels involved in various physiological processes.

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Inform your audience why they should care

- Explain how your research may inform the treatment or etiology of a medical disorder
- Describe how your research topic fascinated you as a kid
- Convey the applicability of your research to real-world challenges
- Explain that an aspect of the universe seems strange and mysterious, but the work you are describing is revealing a newfound understanding

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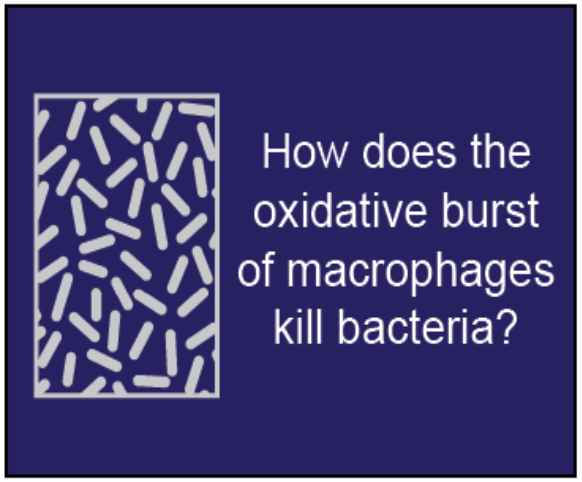
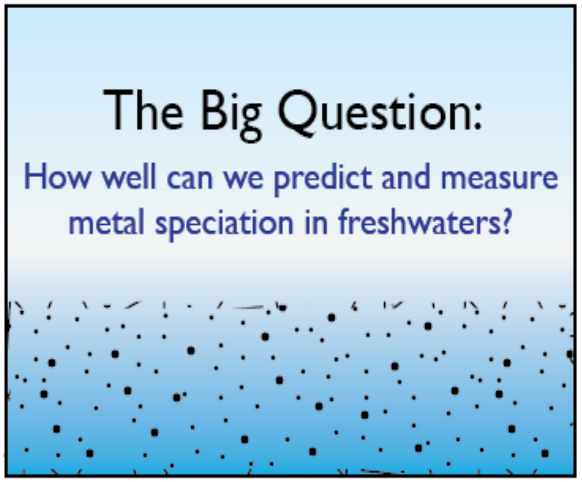
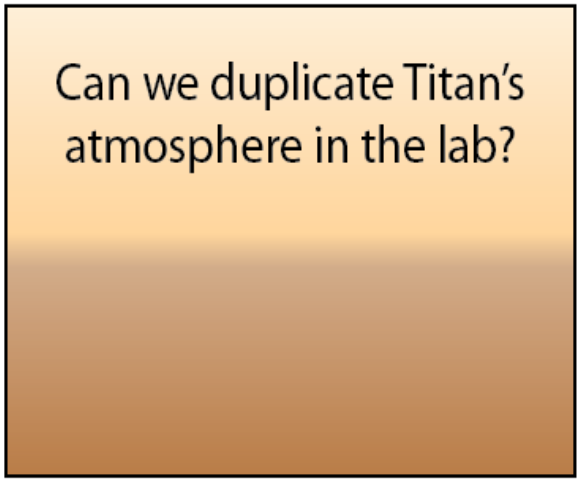
Immediately state your question/goal







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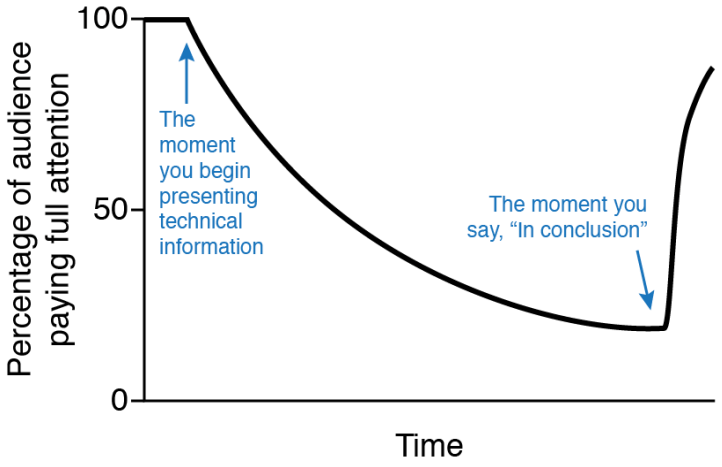
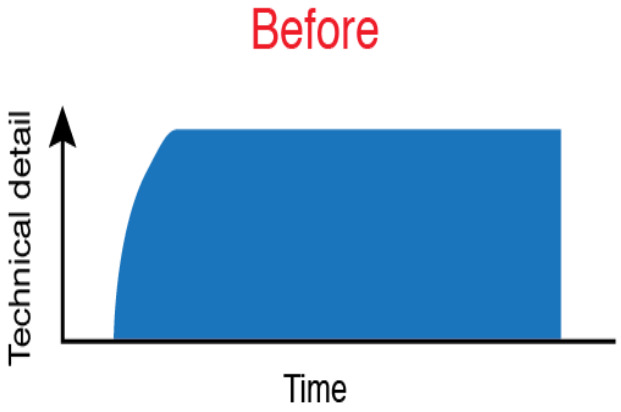
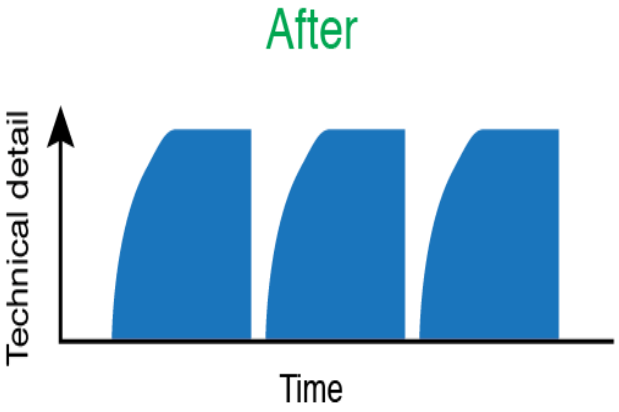
Break up detailed information into chunks

The percentage of your audience paying attention will steadily decrease over time



Occasionally "come up for air," during your presentation summarizing what you have said and asking if there are any questions





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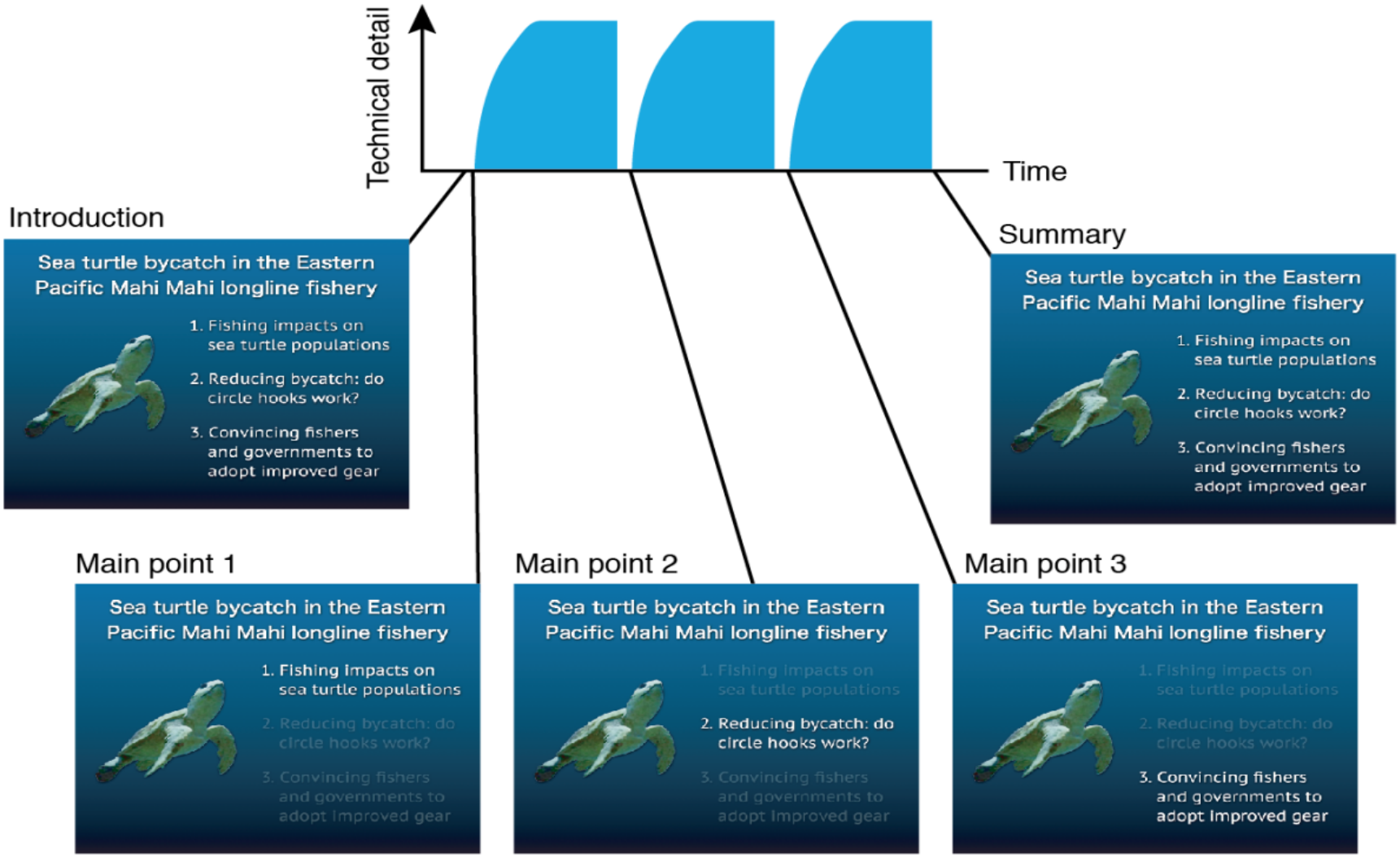
Unite sections of a talk using a “home slide”



Tell a story for each result

For every result (e.g. graph, table, chart), narrate a brief rationale, statement of methods, explanation, and conclusion, like the examples below:

"Next, we wondered whether FOXO3 directly binds to the NPY promoter. To test this hypothesis, we used a chromatin immunoprecipitation assay. This assay involves using an antibody to bind to and purify a protein of interest (in this case, FOXO3), then uses PCR techniques to amplify any DNA that is bound to the protein. We found that the NPY promoter was indeed bound to FOXO3, supporting our hypothesis that FOXO3 binds and interacts with the NPY promoter."

"Now that we know that FOXO3 binds to the NPY promoter, we wanted to determine whether FOXO3 could directly activate transcription of the NPY gene. To test this hypothesis, we used a luciferase assay. This assay is used to determine whether a transcription factor (in this case, FOXO3), activates transcription of a gene by using a bright yellow luciferase gene reporter. We found an increase in luciferase expression in conditions when FOXO3 was present compared to conditions when FOXO3 was absent , supporting our hypothesis that FOXO3 directly activates NPY transcription."

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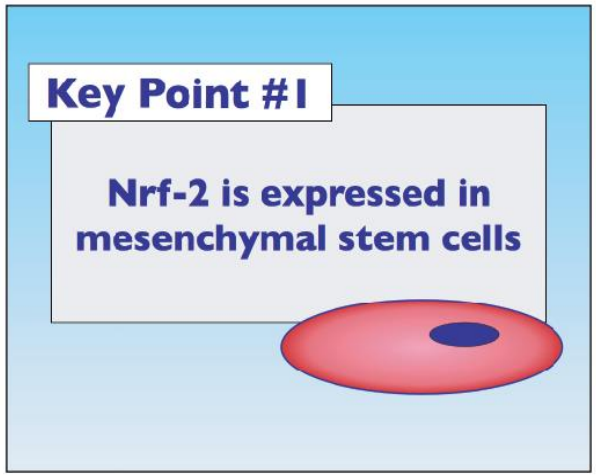
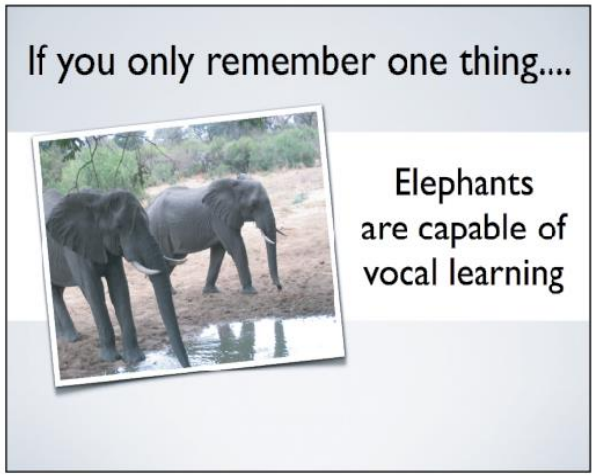
Deliberately emphasize 1-3 take-home messages





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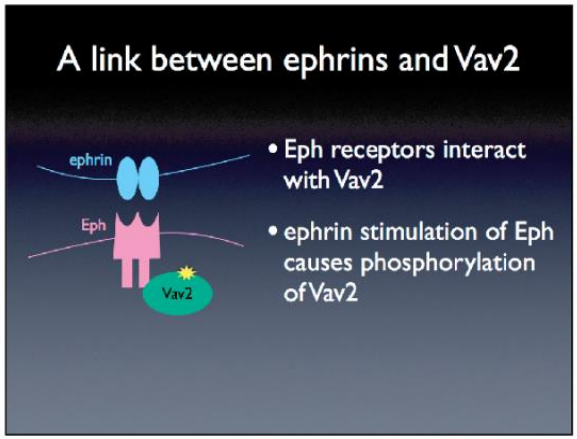
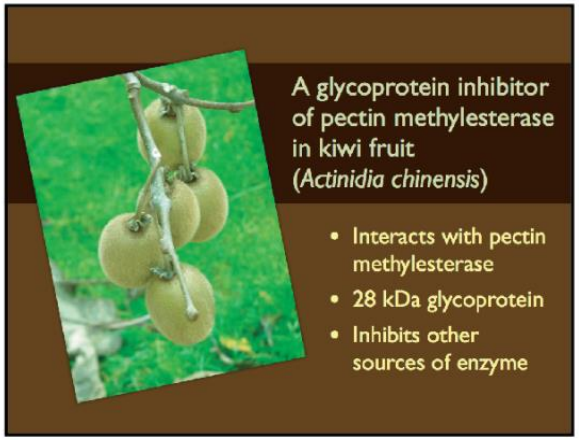
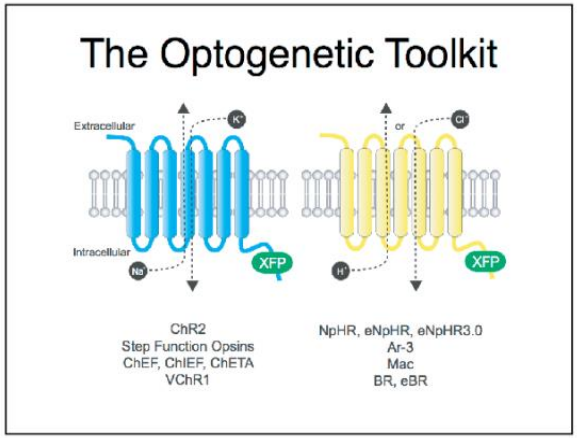
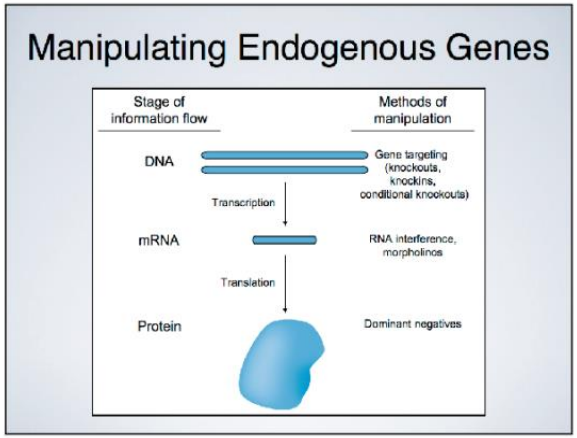
End your talk with a summary diagram









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The three elements of a scientific presentation

1. Structure/narrative

2. **Visual aids (slides)**

3. Delivery of the presentation

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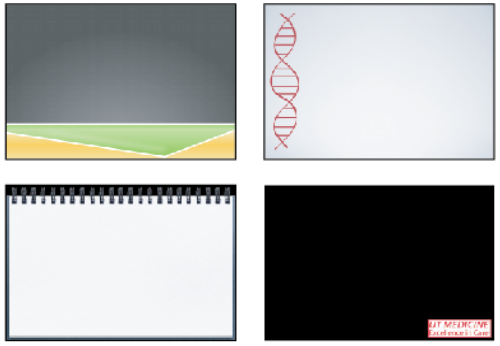
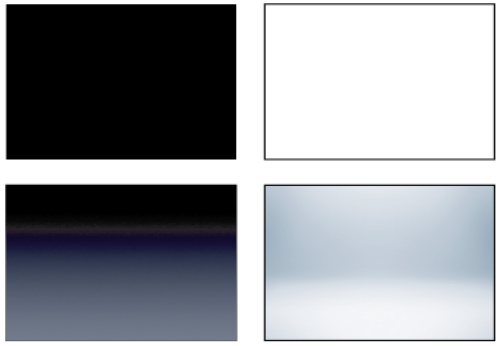
Choose slide backgrounds to optimize foreground content

Before



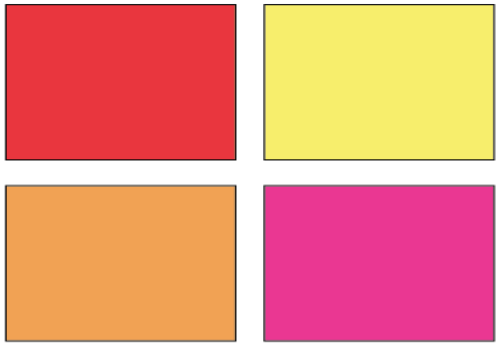
Slides with busy backgrounds reduce the amount of space you have for your own visual elements.

After



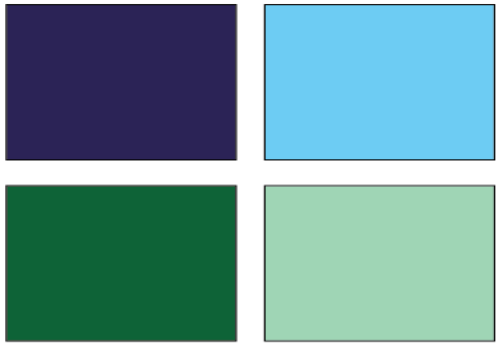
Slides with clear backgrounds allow you to fill the entire space with your own content.

Before



Backgrounds composed of warm, bright colors can be too intense on the eye.

After



Backgrounds composed of cool tints or shades are comfortable to look at for long time periods.

- Use backgrounds that lack visual content
- Use a white slide background in a relatively small room (such as a small classroom)
- Use a black slide background in a relatively large room (such as a large lecture room or presentation hall)

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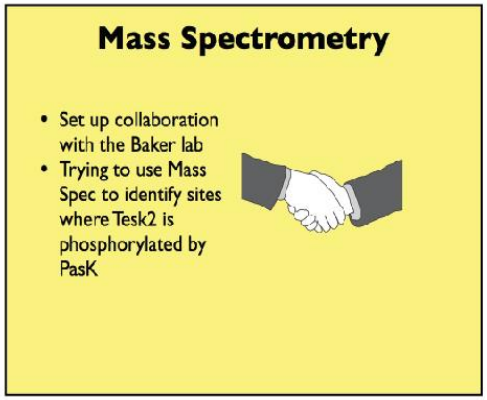
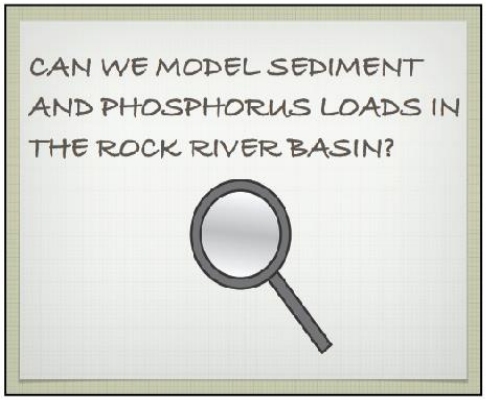
Add design instead of decoration

X





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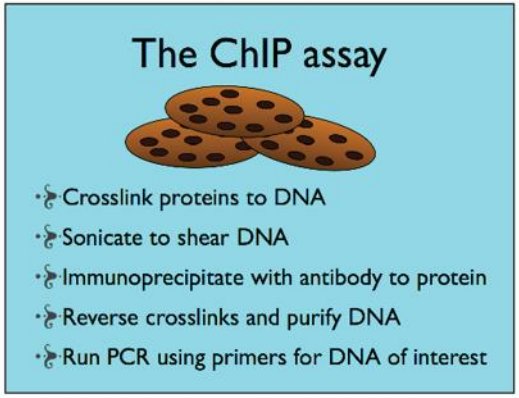

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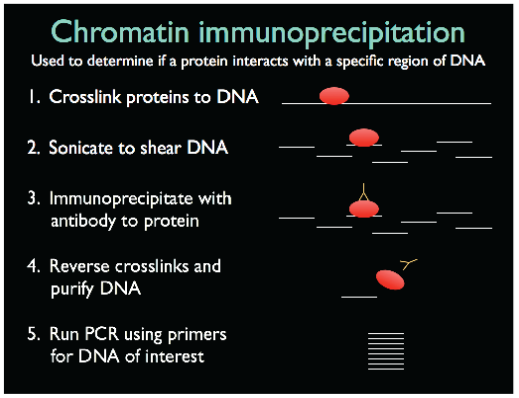

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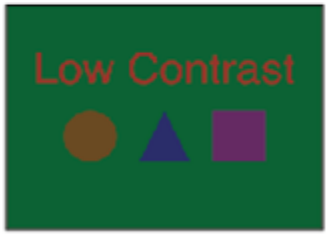
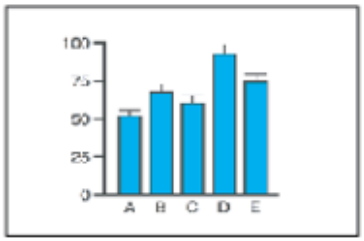
Use color wisely

Before



After

Before



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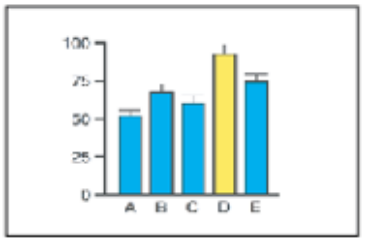

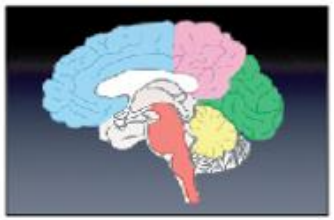

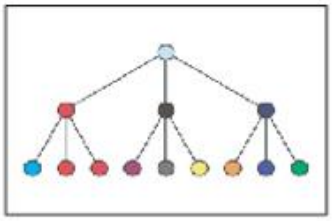

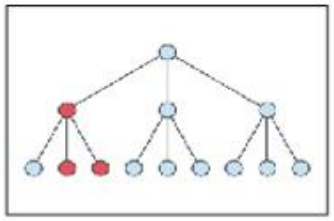

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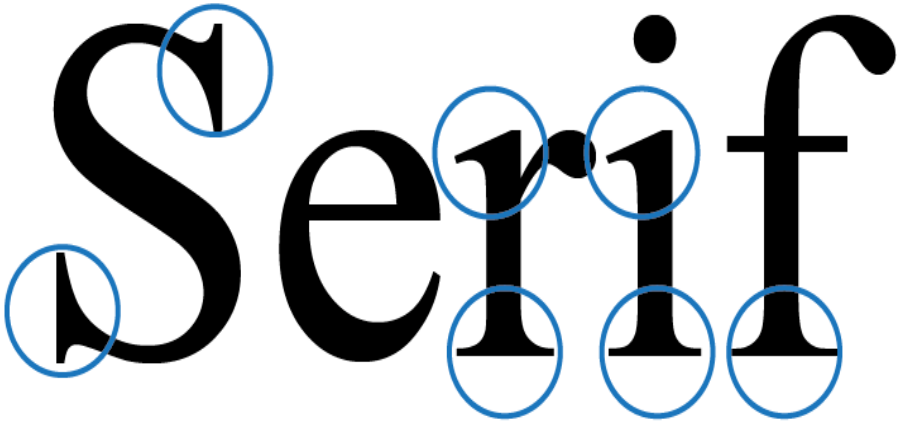
Use a sans serif font



Calibri
Century Gothic
Gill Sans
Helvetica
Myriad Pro
Tahoma
Verdana

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Ensure that all text is easy to read

- Use 18-36 pts font to be seen in the back of the presentation room
- Use smaller fonts for citations and footnotes
- All text should be visible from back row

On a slide, it is harder to read underlined words or words in ALL CAPS

If you want to emphasize a word, use **bold letters** or *italics*

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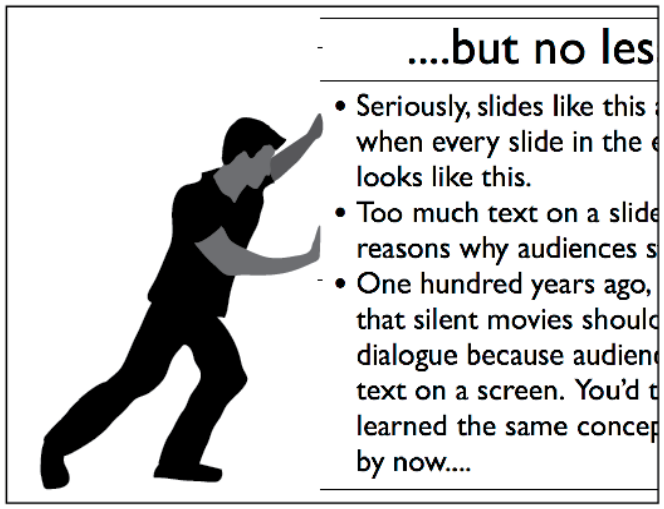
Keep text on a slide to an absolute minimum

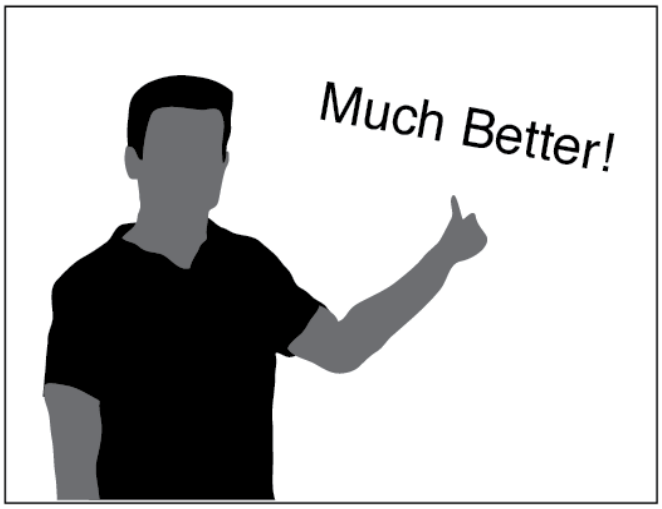
A common mistake....

- How many times have you seen a slide like this? Probably too often.
- The use of too much text on one slide is so common that many of us don't even think to question it.
- If presenters are going to write out everything they are going to say during their delivery, then what is the point of attending their presentations? They might as well send their slides to us over email and we can read them whenever we want.

....but no less annoying.

- Seriously, slides like this are awful. Especially when every slide in the entire presentation looks like this.
- Too much text on a slide is one of the top reasons why audiences stop paying attention.
- One hundred years ago, movie studios realized that silent movies shouldn't contain too much dialogue because audiences didn't enjoy reading text on a screen. You'd think we would have learned the same concept in slide presentations by now....





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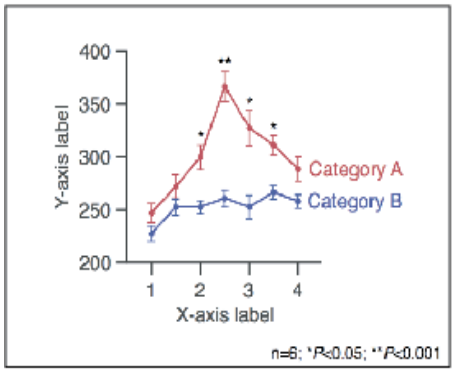
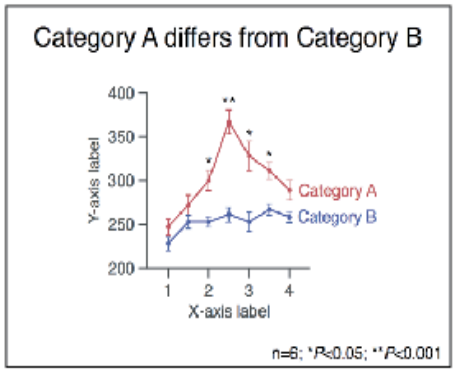
Use slide titles to make a point





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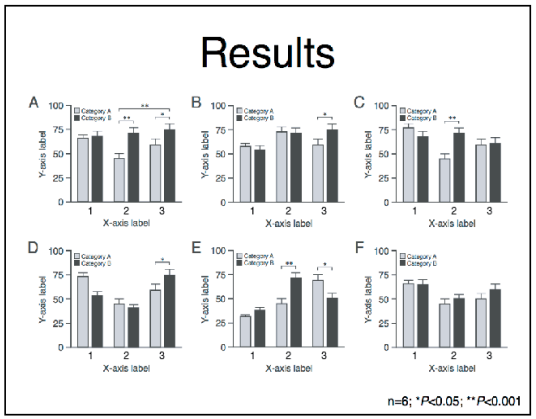
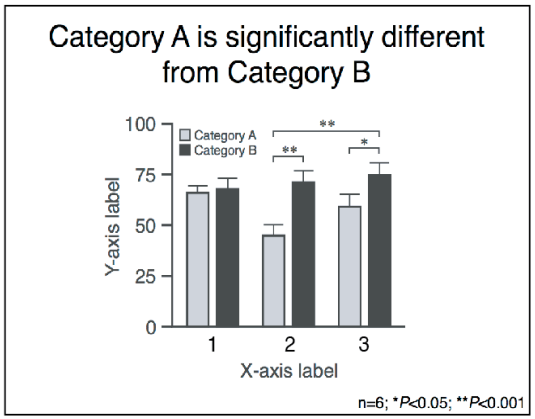
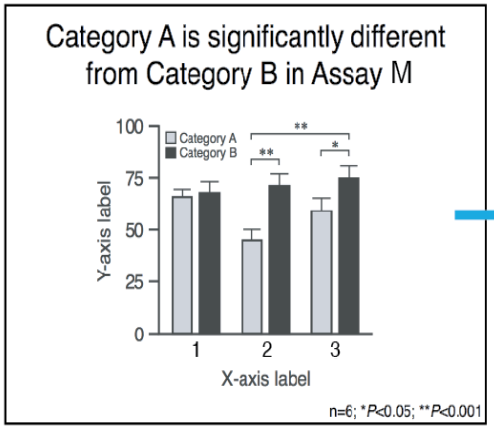
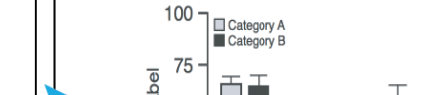
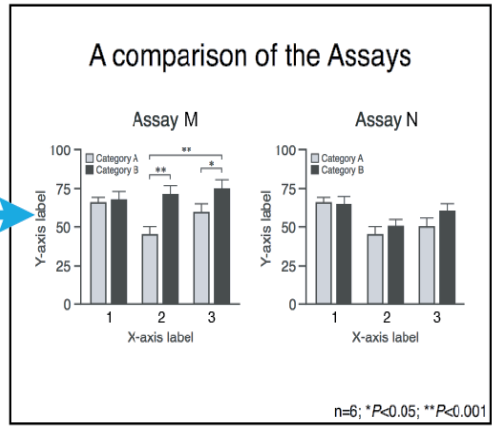
Try to make only one point per slide











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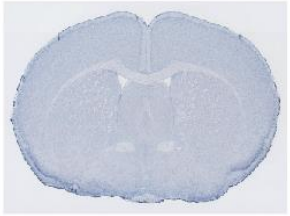
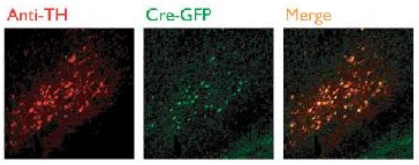
Use the best photos/images for talks

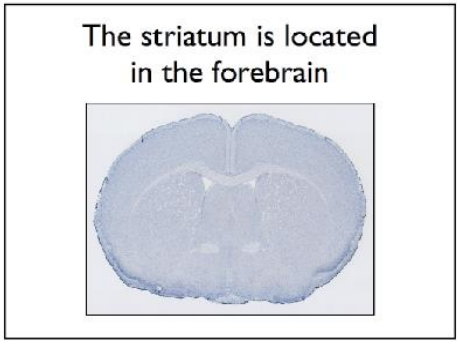
The Coniferous Forest

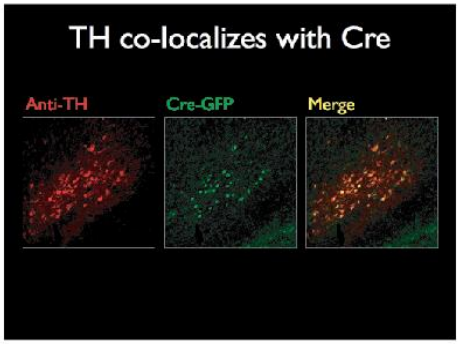
The striatum is located in the forebrain



TH co-localizes with Cre







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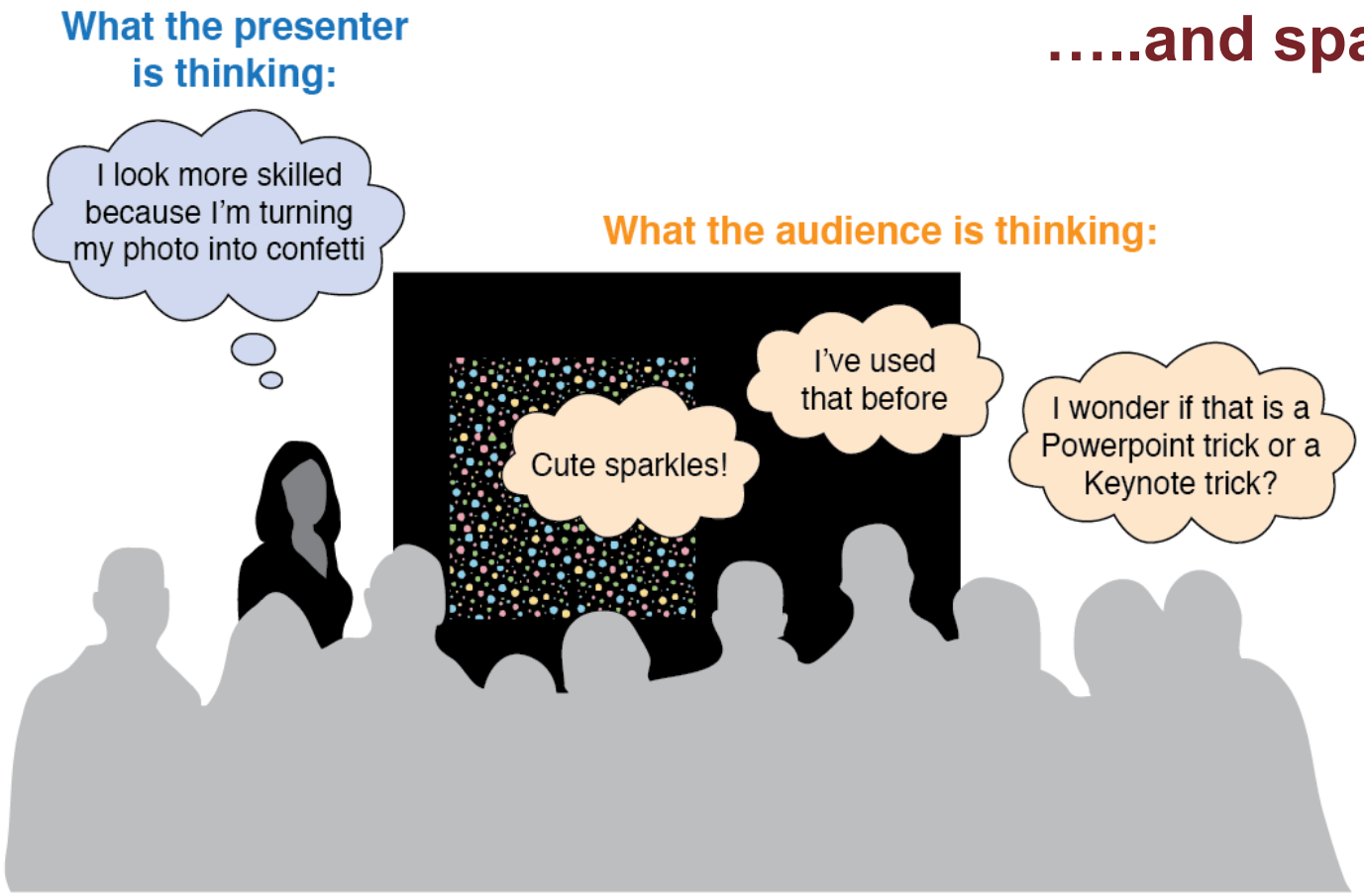
Use animation/slide transitions wisely

.....and sparingly



What the audience is *not* thinking about: **your message**

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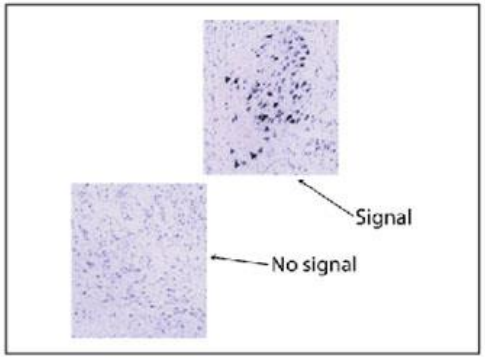
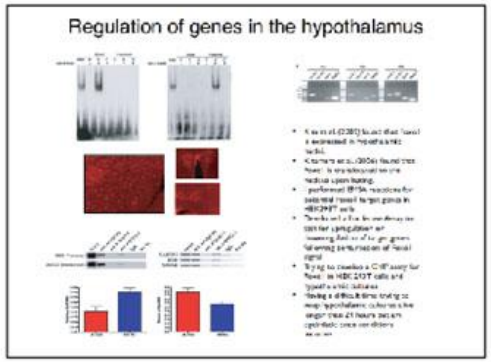
Strive for a simple slide layout

Slides that could use a good layout tune-up:



Too random and chaotic



Too busy and overwhelming

- Is it possible to crystallize the ADC-3 protein?

Too sparse and asymmetric (and a terrible use of a bullet)

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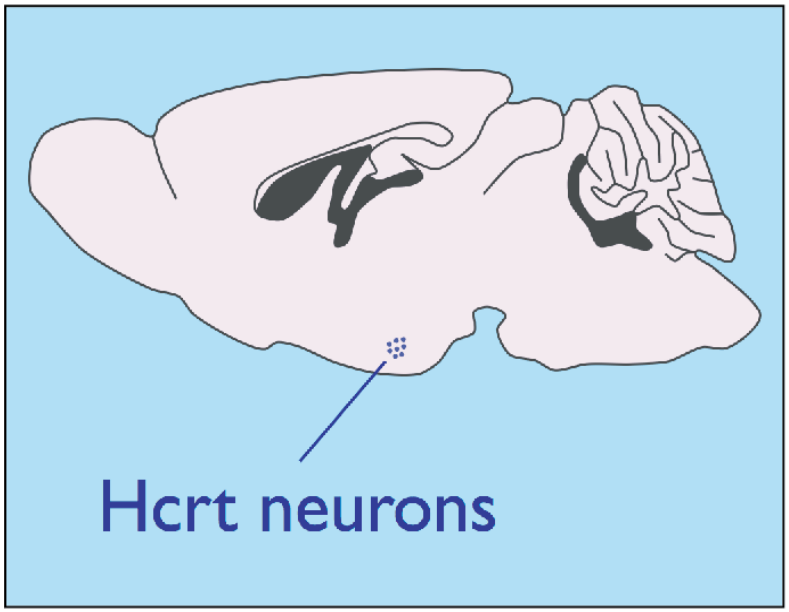
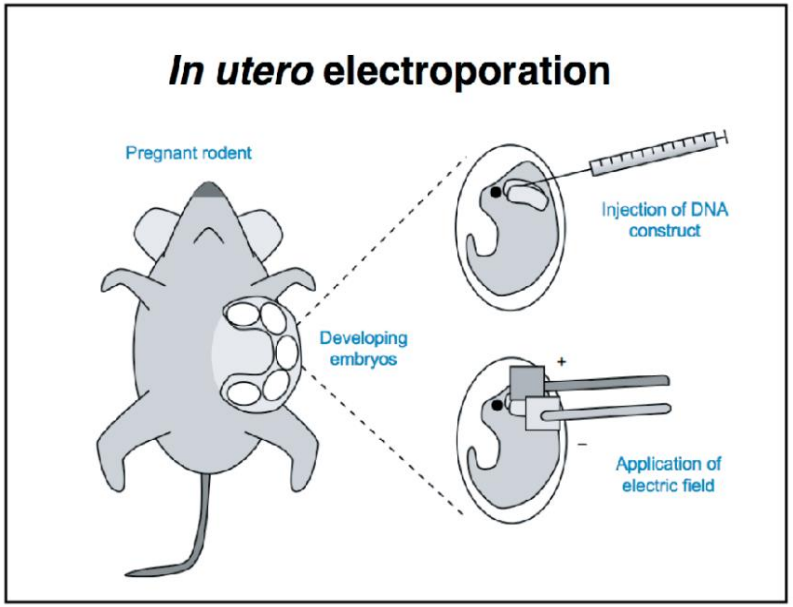
Produce the easiest-to-read slides as possible

The old maxim “less is more” truly holds for slides





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The three elements of a scientific presentation

1. Structure/narrative

2. Visual aids (slides)

3. **Delivery of the presentation**

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Rehearse and practice for a good delivery

Rehearse as much as possible

- Deliver a mock presentation to an empty room while projecting slides on a screen

- Rehearse mentally: at your desk, while riding your bicycle in the shower, etc.

- Rehearse however you feel most comfortable, just try to rehearse so that you know exactly what you will say and, importantly, how long it will take you to say it

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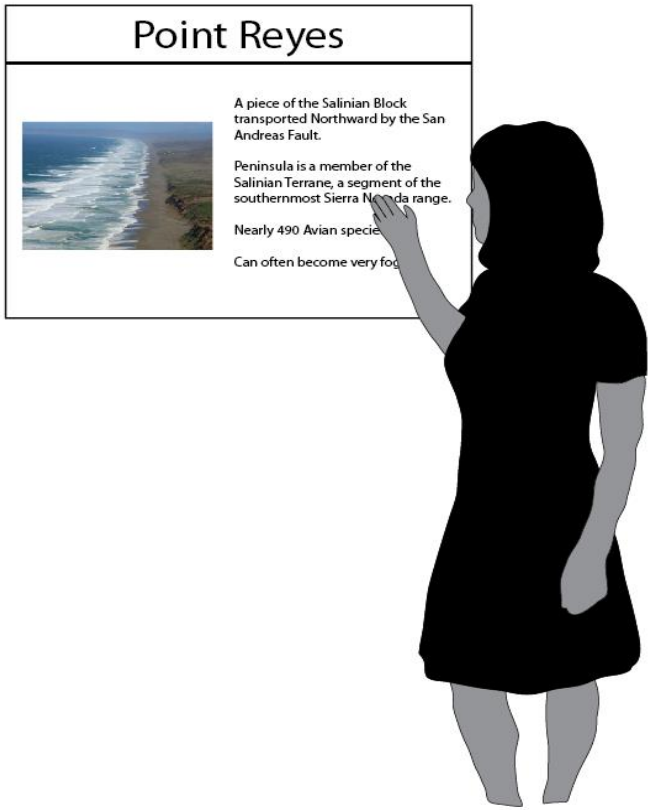
Don’t use slides as presentation notes

Before



After

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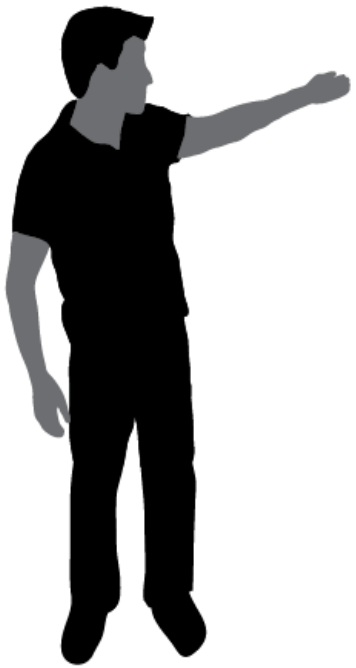
Try to “be present” as much as possible

Be aware of....



Yourself:

Are you talking too slow, too fast, too quiet, too loud, or too monotonous?

How is your posture?

Is anxiety causing you to perform a nervous, repetitive movement?

Your audience:

Is your audience showing signs of confusion, boredom, or impatience?

Where is your audience maintaining eye contact?

Is your audience distracted by something else in the room?

Your environment:

Is the lighting optimal for viewing slides and keeping the audience awake?

Is the temperature too hot or cold?

Are there visual or audible distractions?

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Prepare for inevitable nerves and anxiety

Practice & preparation are key!

Some tricks:

- Rehearse for the 5 min before your presentation begins
- Memorize and rehearse the first 1-2 min of your talk most of all
- Walk around your presentation space
- Bring a water bottle

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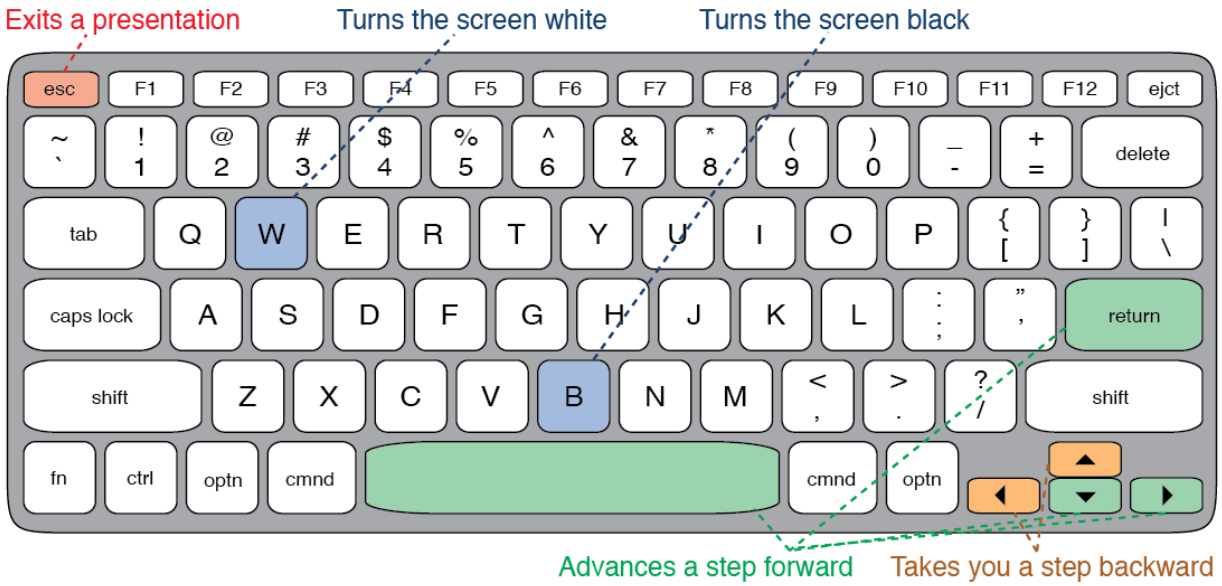
Practice using technology

Know how to use your keyboard to control your presentation including all shortcuts

- Remember power cord and adapter
- Determine how to dim or turn off lights if necessary
- Bring a timer – phone or use presentation mode in PowerPoint
- Bring a Laser Pointer for traditional screens
- Use computer cursor for LED screens



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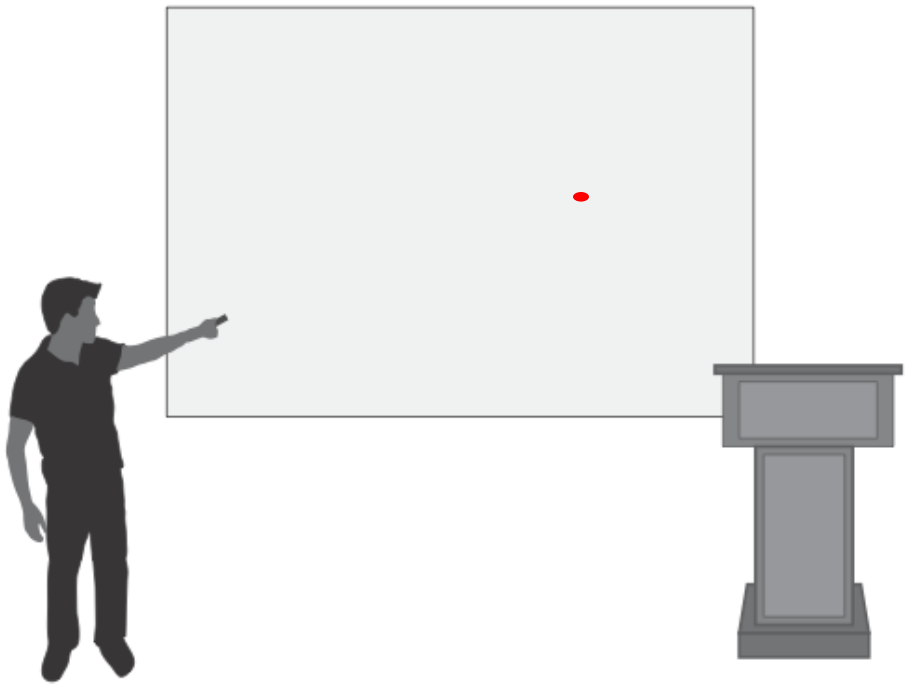
Practice using a laser pointer

Use a laser pointer sparingly:

- Don’t turn on the laser pointer until it is aimed at the screen
- Never aim a laser pointer in the direction of the audience
- Don’t highlight text
- Try to leave your pointer on for only a few seconds at most
- Steady your hand if nervous and shaking
- Consider purchasing a remote slide advancer with laser pointer



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Soliciting and answering audience questions

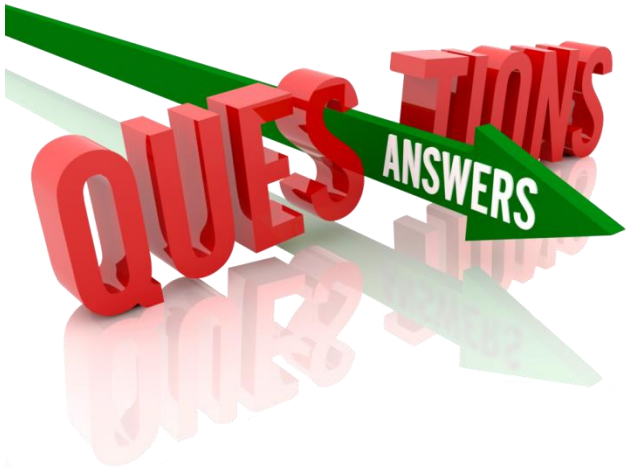
- Consider rephrasing the question in your own words before providing an answer

- Prepare for difficult questions from the audience

- Remain calm and project confidence

- Don’t be afraid to say “I don’t know,” while speculating on an answer

- Offer to talk with the questioner after the Q&A session is over



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Conclusion

Remember to have fun!

- Remember that designing science talks is an art form, and there is no such thing as “the perfect talk”

- The audience is on your side and wants you to do a great job

- Each presentation you give is another evolution in your development as a presenter, and another experience to learn from for the future

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