Principles for Powerful Presentations

Structure, design, and deliver your talk for maximum impact

By Preethi Vaidyanathan and Haleem Syed
References

A Technical Writer’s Advice for Scientists and Engineers

Nancy Duarte

Never confuse motion with action.
—Benjamin Franklin

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Presentation is a three legged stool

Structure  Delivery

Visual Story
Purpose of a presentation?
What we can learn from Aristotle’s model?

**Ethical Appeal**
Garner respect through credibility and character

**Emotional Appeal**
Stir emotions and imagination of the audience

**Logical Appeal**
Provide evidence through words, structure, and data

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What is the objective?

- REPORT
  Exhaustive

- PRESENTATION
  Explanatory

- STORY
  Dramatic

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Modify the presentation to map to the needs of audience

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What is your process of developing the presentation?
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Two fundamental rules for every writing project:

Rule #1—think first, then write

Rule #2—Never try to write *anything* without first making an outline

“Stream of conscious” may have worked for James Joyce (although the jury is still out on that one, in my opinion), but it *doesn’t work* for science writing
Writers use two kinds of outlines—“topic” and “sentence”

Topic outlines use short phrases
- CO₂ underground storage—motivation
- Advantages of deep saline formations
- Convection could provide “stirring”
- Boycott effect
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Topic outlines use short phrases
- $\text{CO}_2$ underground storage—motivation
- Advantages of deep saline formations
- Convection could provide “stirring”
- Boycott effect

Sentence outlines use full sentences (duh!)
- Deep saline aquifers (DSAs) are underground salt-water reservoirs capped by impermeable rocks.
- DSAs offer large storage capacity for carbon capture and sequestration.
- Sequestered CO$_2$ would rise and form a separate layer that restricts dissolution.
Practice full-sentence outlining

Improved clarity
Improved logical argument
Improved cohesiveness; better transitions
Improved conciseness
Improved control of length
Improved writing efficiency
Improved reader experience

This slide is an example of a “topic” outline—
the order the points are presented in doesn’t really matter
Tips for writing a sentence outline

Make your sentences as specific and quantitative as possible

If you have two closely related sentences, combine, differentiate, or eliminate one

Make a logic map of your sentences; can you show a linear progression of your ideas?

Devise a method that makes it easier to move sentences around and “see” the overall structure of the paper

This slide is an example of a “sentence” outline—use it for writing projects (papers, proposals, talks) where it’s important to show a logical progression of your ideas.
Start by writing down the main points you want to make

- The NASA Solar Dynamics Observatory (SDO) was launched in 2010 to study the solar corona.
- One component of SDO is the Atmospheric Imaging Assembly (AIA), a suite of four telescopes.
- Mirrors image Sun at all seven EUV wavelengths.
- The Sun is the source of all space weather, but its physical processes are poorly understood.
- The AIA is composed of highly reflective multi-layer mirrors.

TIP: Write a complete sentence for each point
Next, arrange the points so they provide a logical narrative

• The NASA Solar Dynamics Observatory (SDO) was launched in 2010 to study the solar corona.

• One component of SDO is the Atmospheric Imaging Assembly (AIA), a suite of four telescopes.

• Mirrors image Sun at all seven EUV wavelengths.

• The Sun is the source of all space weather, but its physical processes are poorly understood.

• The AIA is composed of highly reflective multi-layer mirrors.
Check to see if you’ve left anything out...

- The Sun is the source of all space weather, but its physical processes are poorly understood.
- The NASA Solar Dynamics Observatory (SDO) was launched in 2010 to study the solar corona.
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... or if you’ve included superfluous material that will derail the logical flow of your story.
Number your sentences...

1. The Sun is the source of all space weather, but its physical processes are poorly understood.

2. The NASA Solar Dynamics Observatory (SDO) was launched in 2010 to study the solar corona.

3. One component of SDO is the Atmospheric Imaging Assembly (AIA), a suite of four telescopes.

4. The AIA is composed of highly reflective multi-layer mirrors.

5. Mirrors image Sun at all seven EUV wavelengths.
Celia’s foolproof, four-step method to crank out science writing:

1. Put the topic sentence first
2. Explain it
3. Give an example of it
4. Summarize it in a way that leads logically to the next topic sentence

Tip: Use the same construction paradigm for paragraphs, subsections, and sections of your paper
1. Topic sentence goes first

The Sun is the source of all space weather, but its physical processes are poorly understood.

The Solar Dynamics Observatory was launched by NASA in 2010 to study the solar corona.
2. Explain it

The Sun is the source of all “space weather,” but its physical processes are poorly understood. **Space weather refers to conditions on the Sun and in the solar wind, magnetosphere, ionosphere, and thermosphere of the Earth that affect the performance and reliability of space and terrestrial systems and that can endanger life and health.**

The Solar Dynamics Observatory was launched by NASA in 2010 to study the solar corona.
3. Give an example

The Sun is the source of all “space weather,” but its physical processes are poorly understood. Space weather refers to conditions on the Sun and in the solar wind, magnetosphere, ionosphere, and thermosphere of the Earth that affect the performance and reliability of space and terrestrial systems and that can endanger life and health. **For example, a coronal mass ejection, the solar equivalent of a hurricane, can disrupt telecommunications systems on Earth.**

The Solar Dynamics Observatory was launched by NASA in 2010 to study the solar corona.
4. Summarize and transition

The Sun is the source of all “space weather,” but its physical processes are poorly understood. Space weather refers to conditions on the Sun and in the solar wind, magnetosphere, ionosphere, and thermosphere of the Earth that affect the performance and reliability of space and terrestrial systems and that can endanger life and health. For example, a coronal mass ejection, the solar equivalent of a hurricane, can disrupt telecommunications systems on Earth.

Solar research is needed to understand solar processes and predict space weather.

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Process

- Write your **general objective** and **specific objective**
- Generate a **sentence outline**