The Art of Scientific Presentation

Samuel B. Silverstein

Department of Physics

Stockholm University

Fallacy 1: Scientific presentations should primarily present information

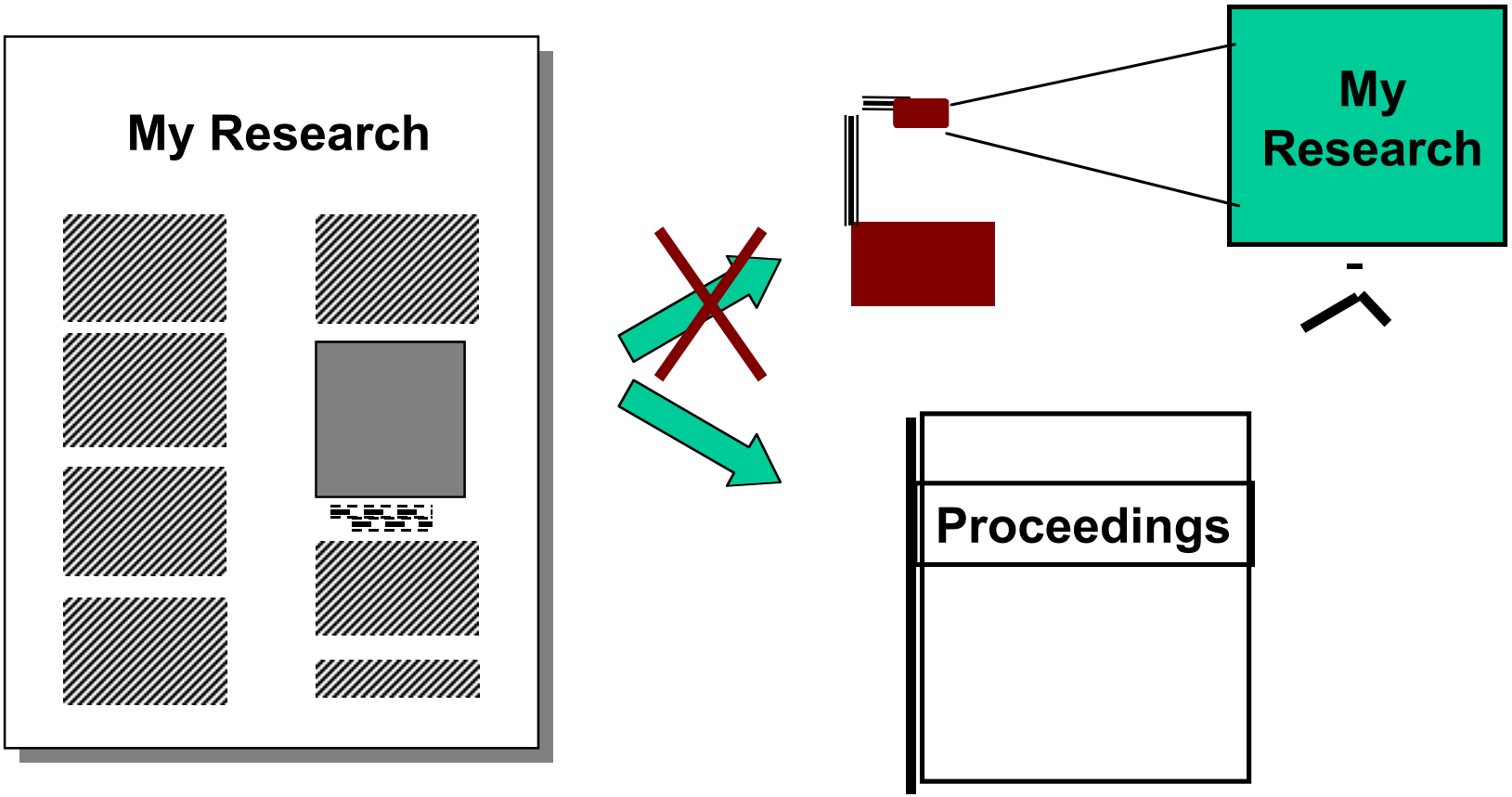
Inform:

Describe your work.
Show the results you obtained

Persuade:

Is it an interesting and worthwhile question?
Was it a valid test?
Are the results accurate?
Significant?

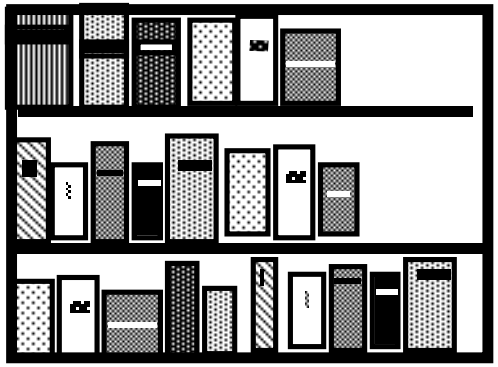
Fallacy 2: ÓTalks are like papers, except you present them out loudÓ



Fact: presentations differ from papers in some very fundamental ways!

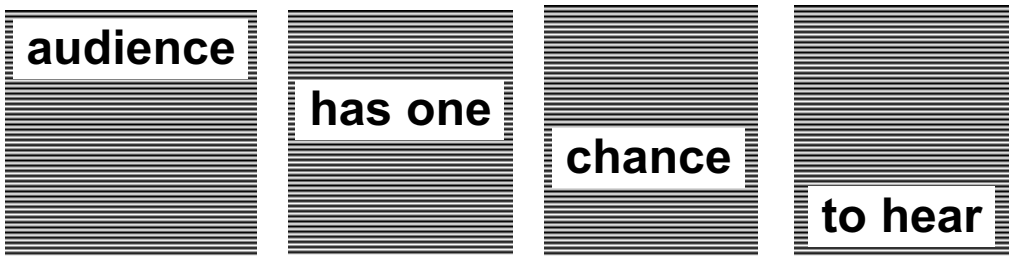
Paper:

Reader sets own pace
Can skip around in text
Can look up references



Presentation:

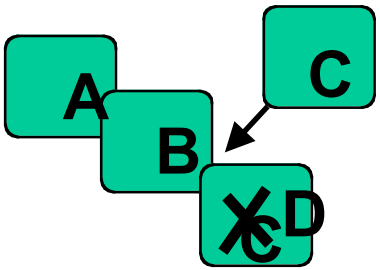
Audience has limited attention span
Can't re-read text

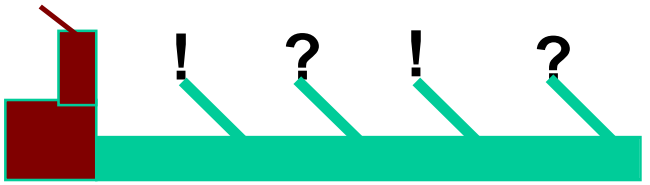


Presentations have some advantages

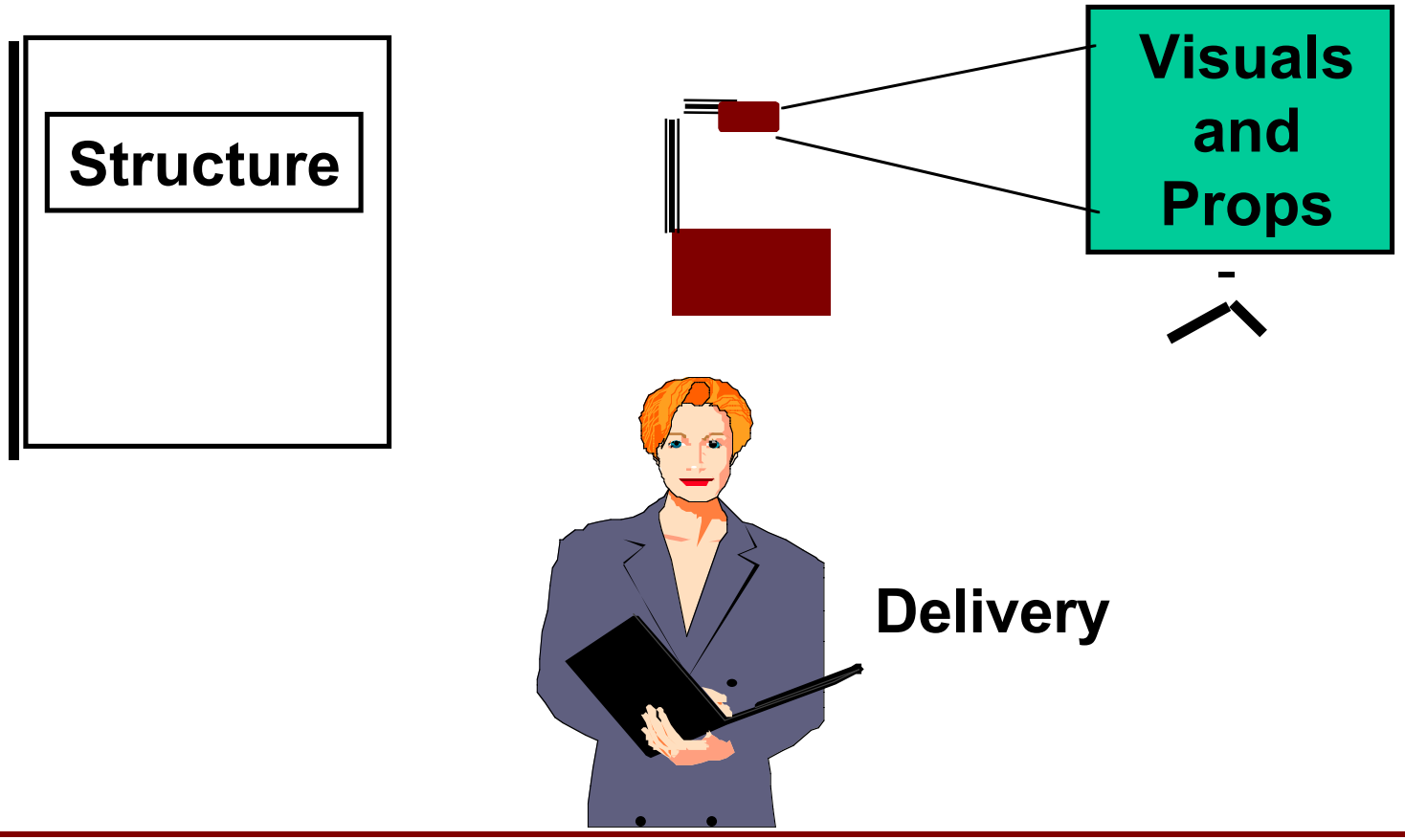
Use **sights** *and* **sounds** to bring work to life!

Instant **feedback**
Can **adjust** presentation





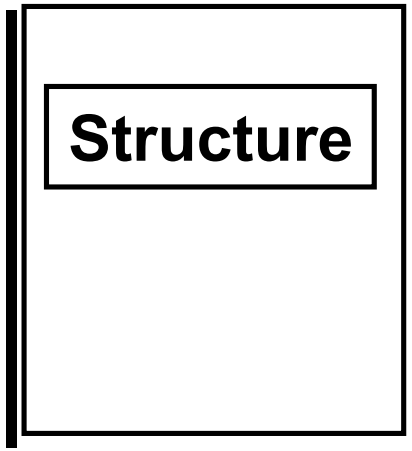
An effective presentation depends on three important aspects of style



The **structure** of a presentation is strongly influenced by your constraints

Audience
(multiple?)

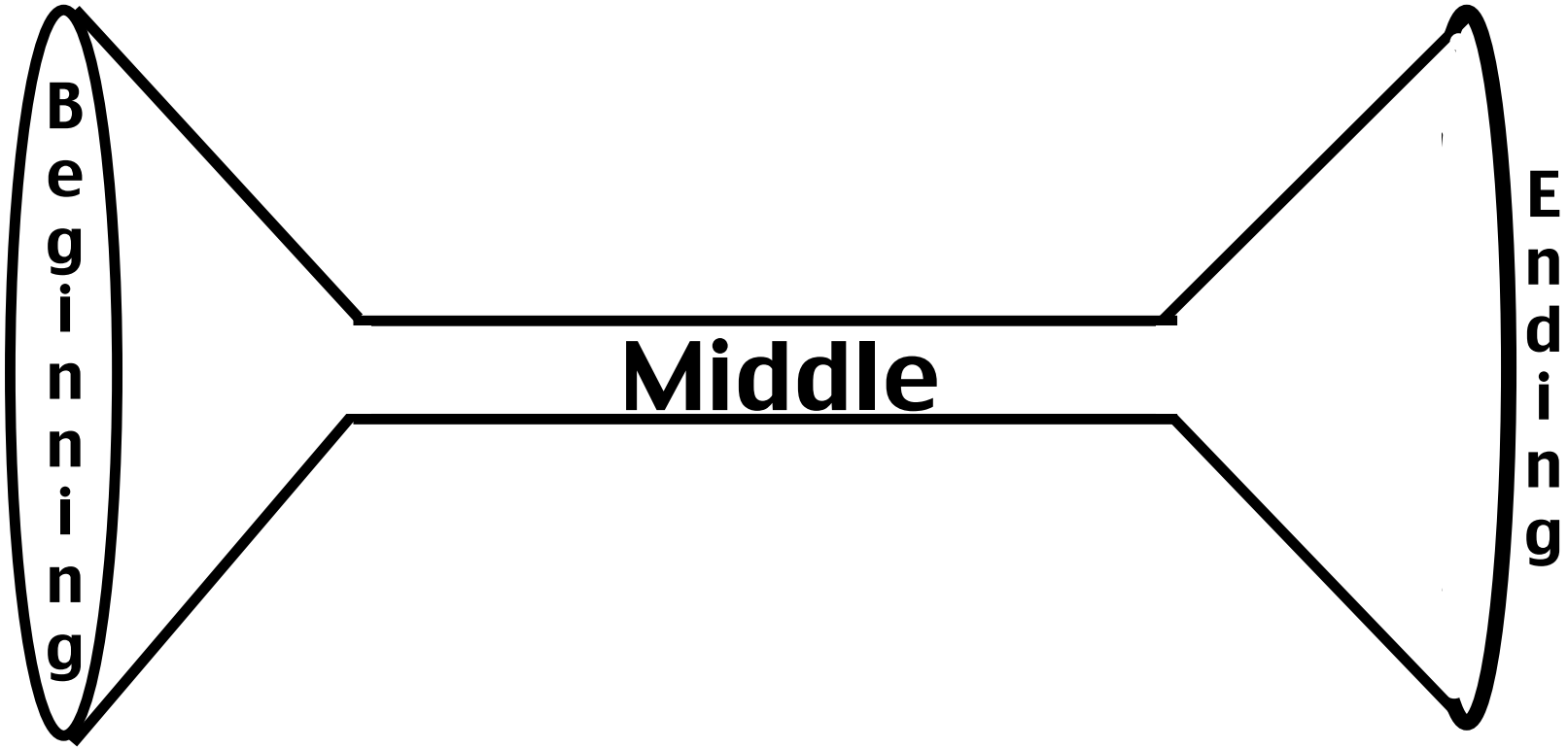
Format
(time limits, time of day, facilities)



Formality
(questions during or after talk?)

Politics
(Hostile or friendly audience?)

Presentations should have clear beginnings, middles, and endings

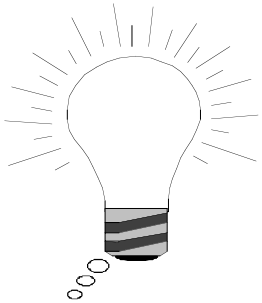


Beginnings prepare the audience for the work you are presenting

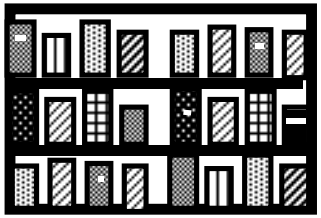
Define work

Work = A + B

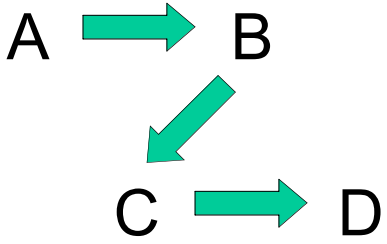
Show importance



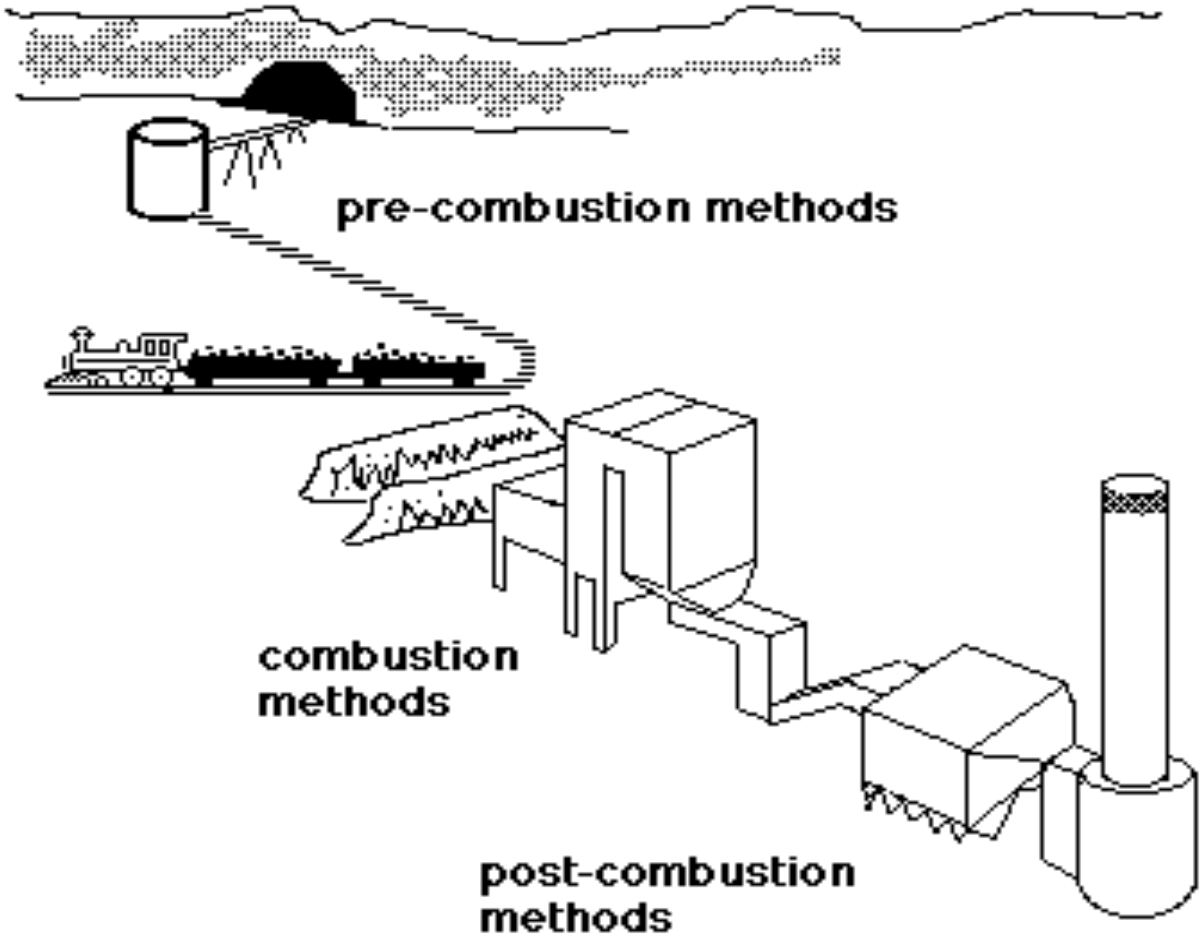
Give background



Map presentation

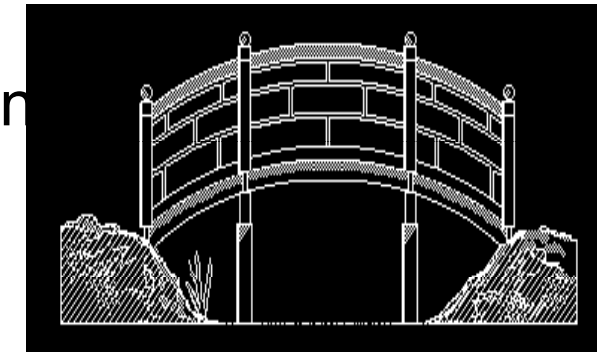


The middle presents the work in a logical order



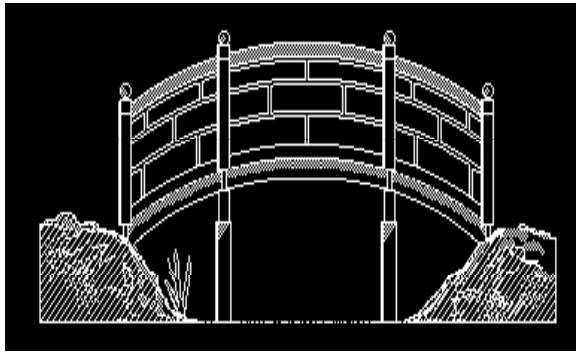
In the middle, make smooth transitions between major points

Pre-combustion methods



Combustion methods

Combustion methods



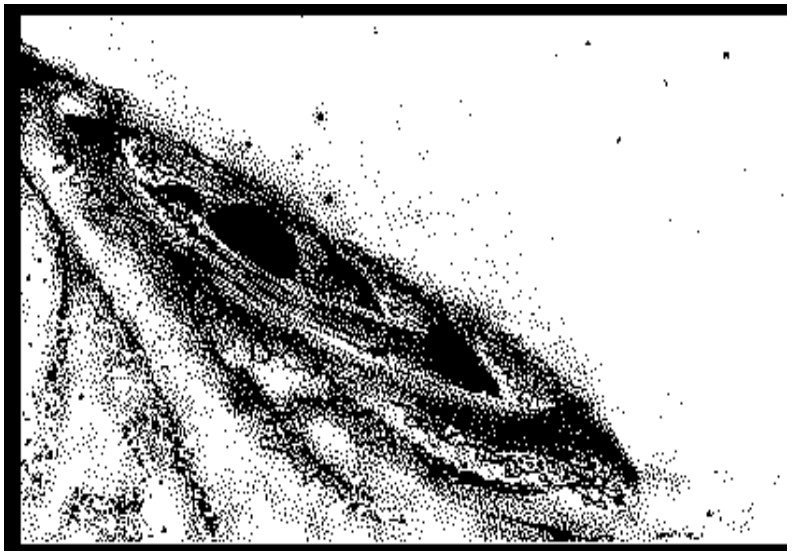
Post-combustion methods

The ending summarizes main points, and places them in the big picture

point 1
point 2
point 3
point 4
point 5
point 6
point 7
point 8

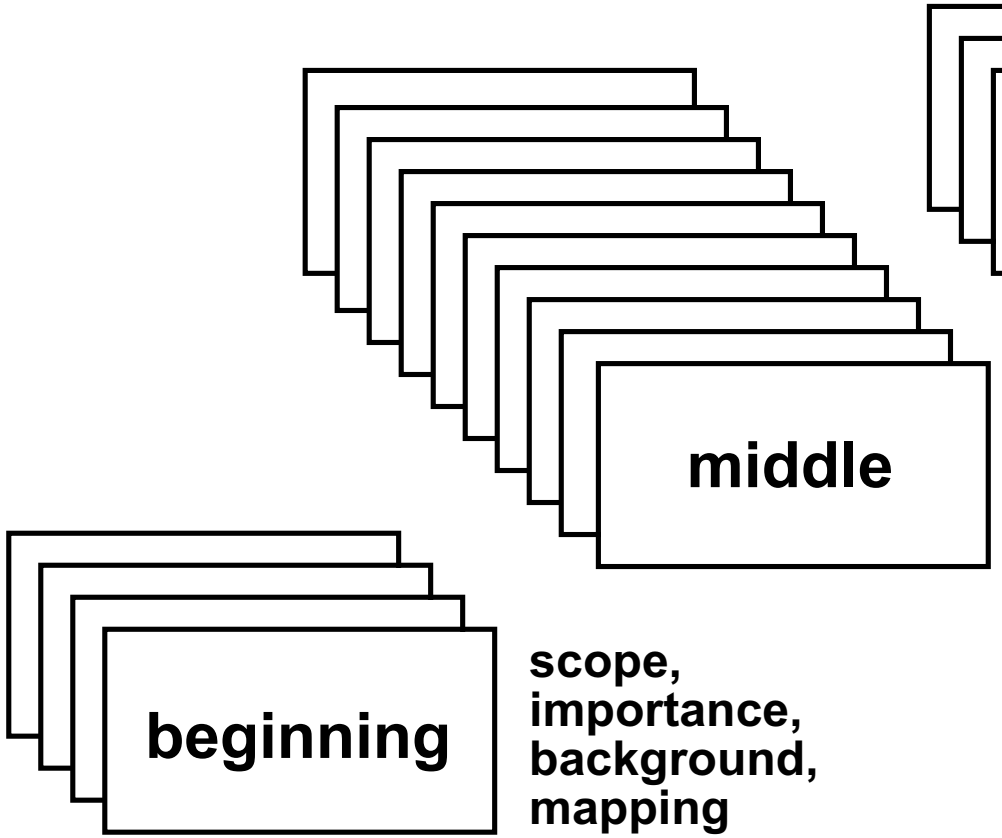
point 1
point 7

Summary



Big picture

Visuals reflect the structure of the presentation

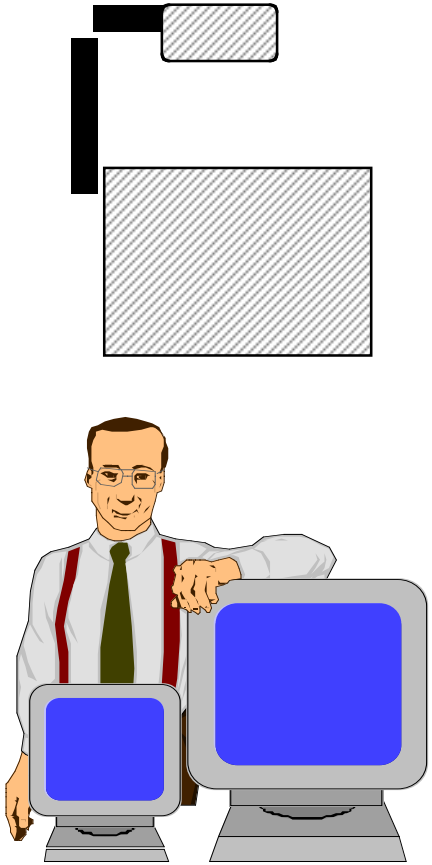


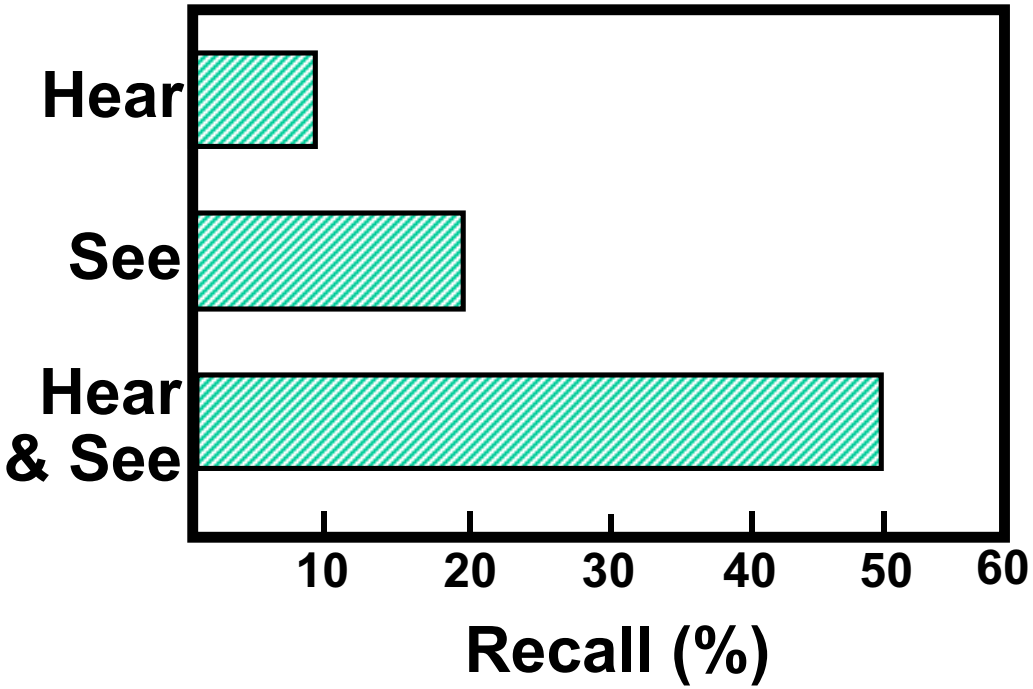
1 visual =
~1 to 1.5 minutes

Visuals serve the presentation in several ways

- Notes for audience during presentation
- Notes for audience after presentation
- Notes for speaker(s) before and during presentation

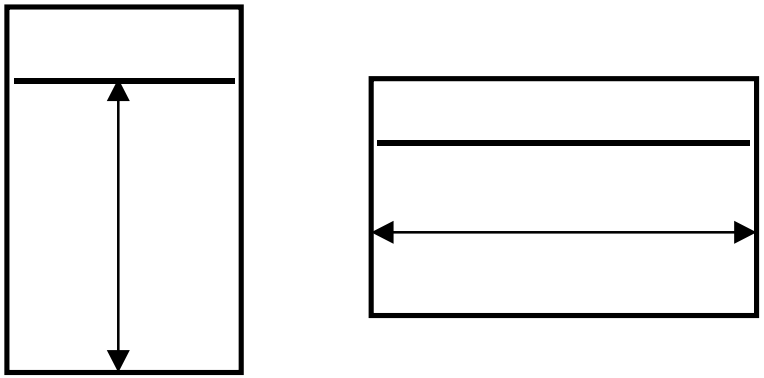
Well-designed visuals help the audience remember more of your presentation



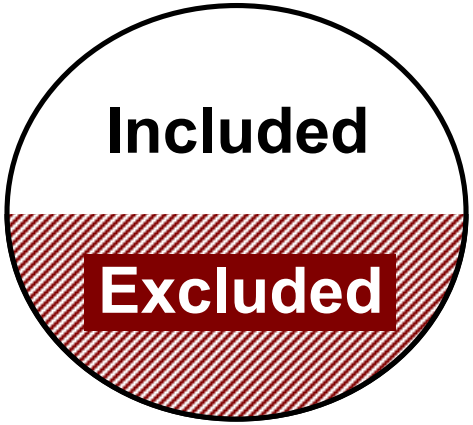


You must make certain decisions when designing visuals

What format?



What information?



Headline/body format orients the audience

Headline

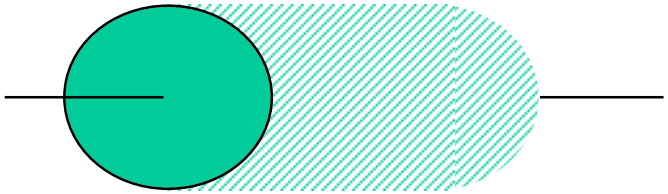
Use a headline that concisely states the idea of the visual

Body

Body supports with words

words
words
words

Body supports with images



Use strong headlines!

- Orient the audience
- Help define presentationÕs structure
- Help keep speaker on track

The body supports the headline with words and images

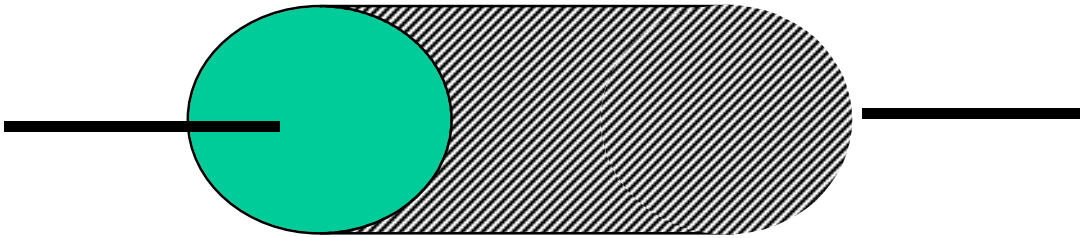
Supports with words

clear

familiar

concise

Supports with images



Use large, legible type

Clear typeface:

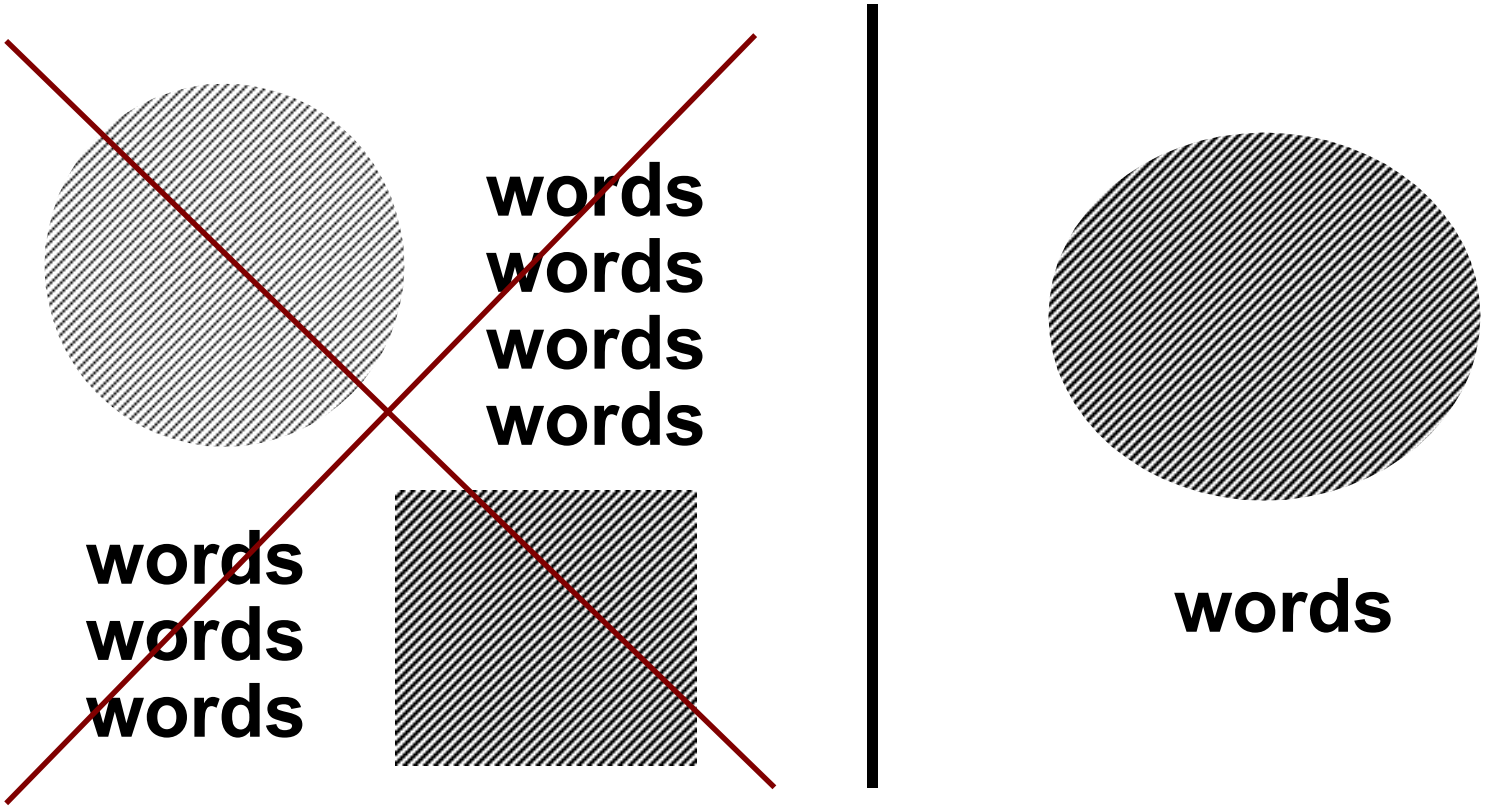
✓ **Arial**

✗ ***BOOK ANTIQUA***

Large type (18-36 point)

12 point
14 point
18 point
24 point
28 point
36 point
40 point

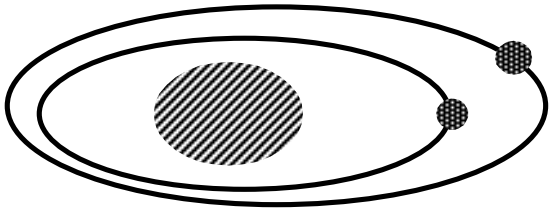
Avoid clutter



Select body material that effectively supports your headlines

Images

Mars has two moons

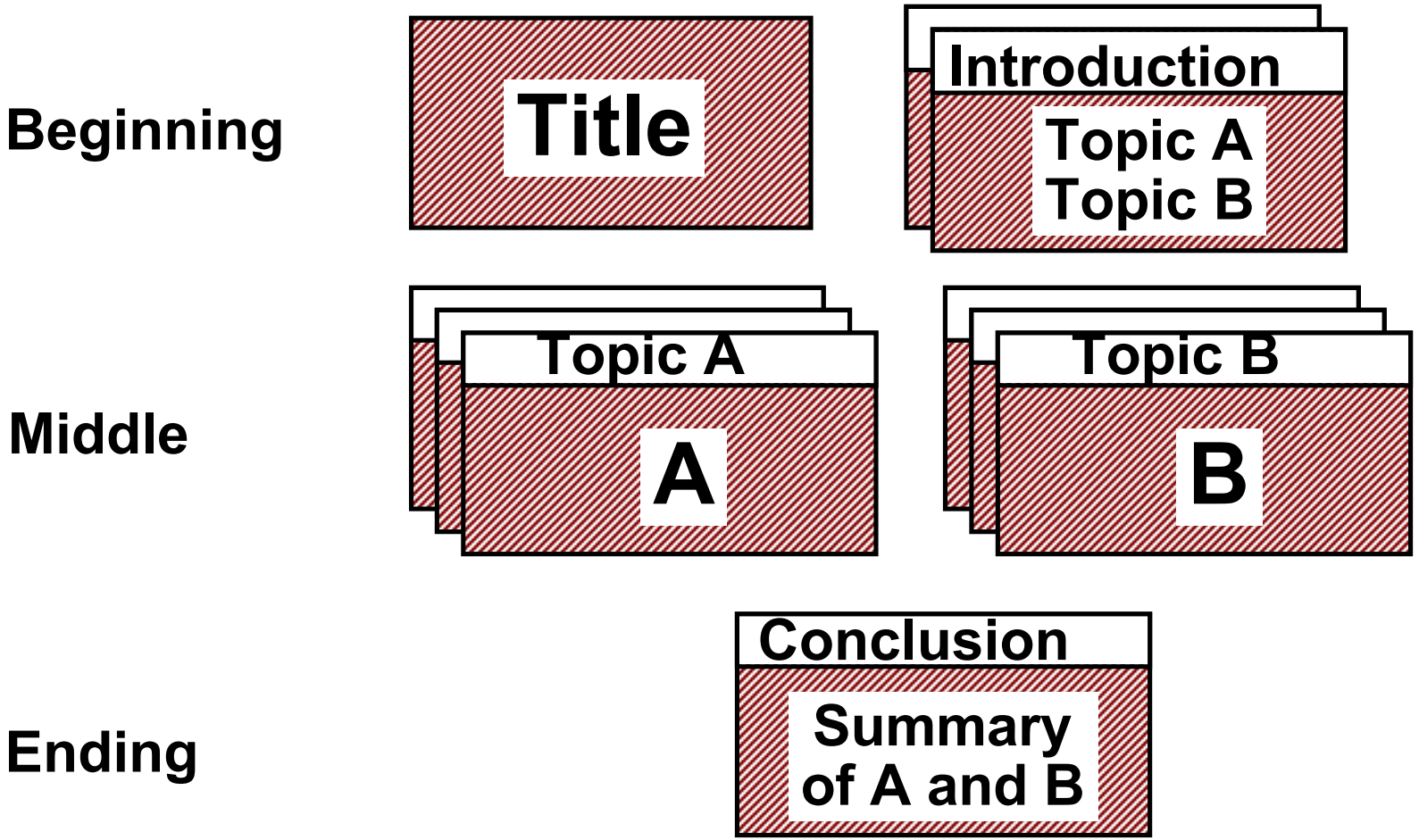


Results

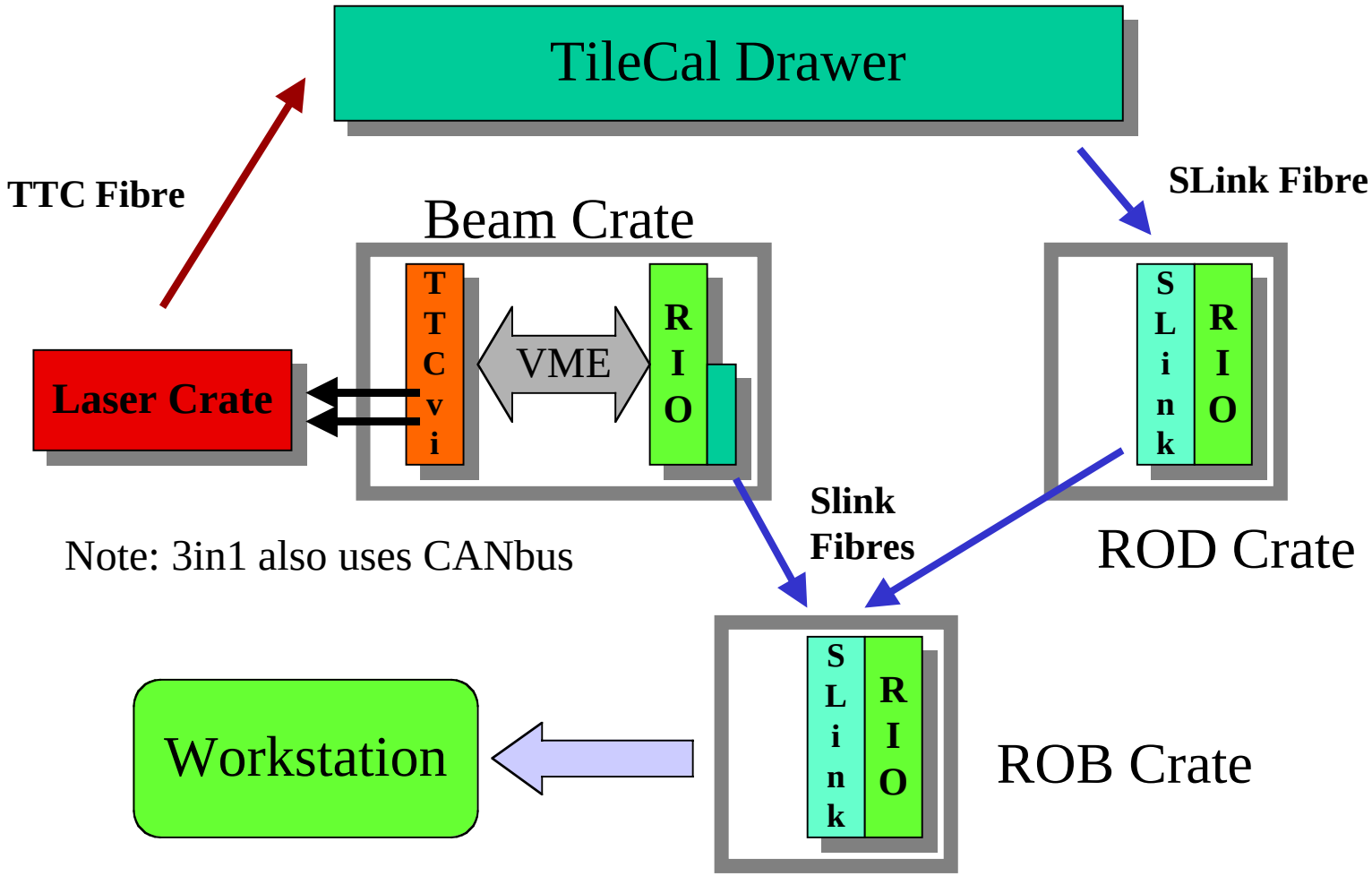
The world is warming

Six warmest years of the 20th century → **1998, 1997, 1995, 1990, 1999, 1991**

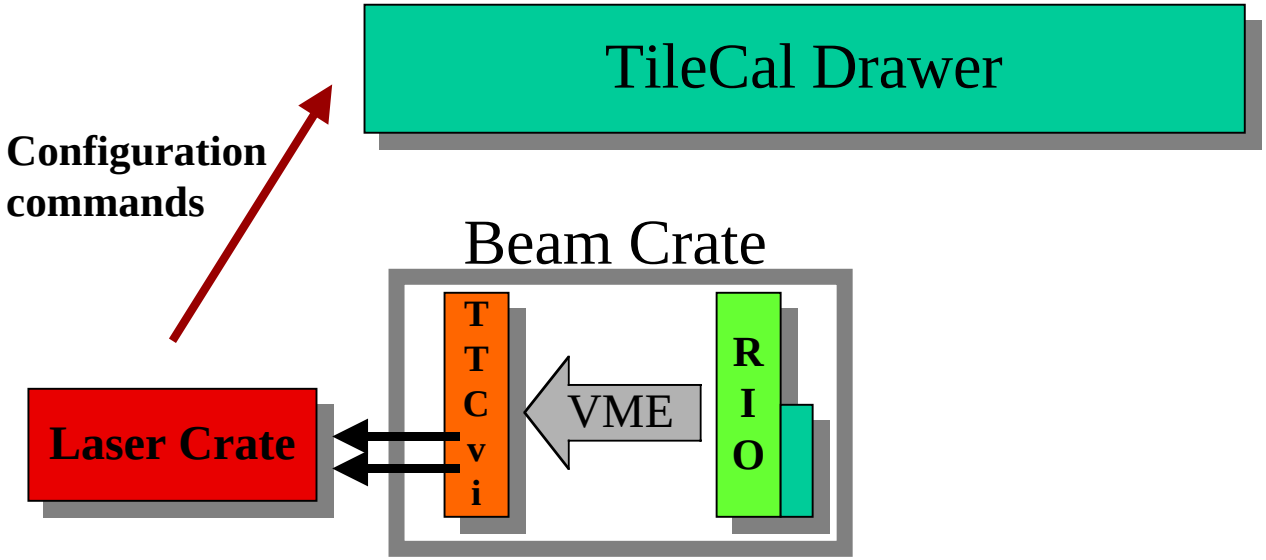
Include visuals that show organization



Layout of Test beam System



Step 1: Configure 3in1 and digitizer systems via TTCvi

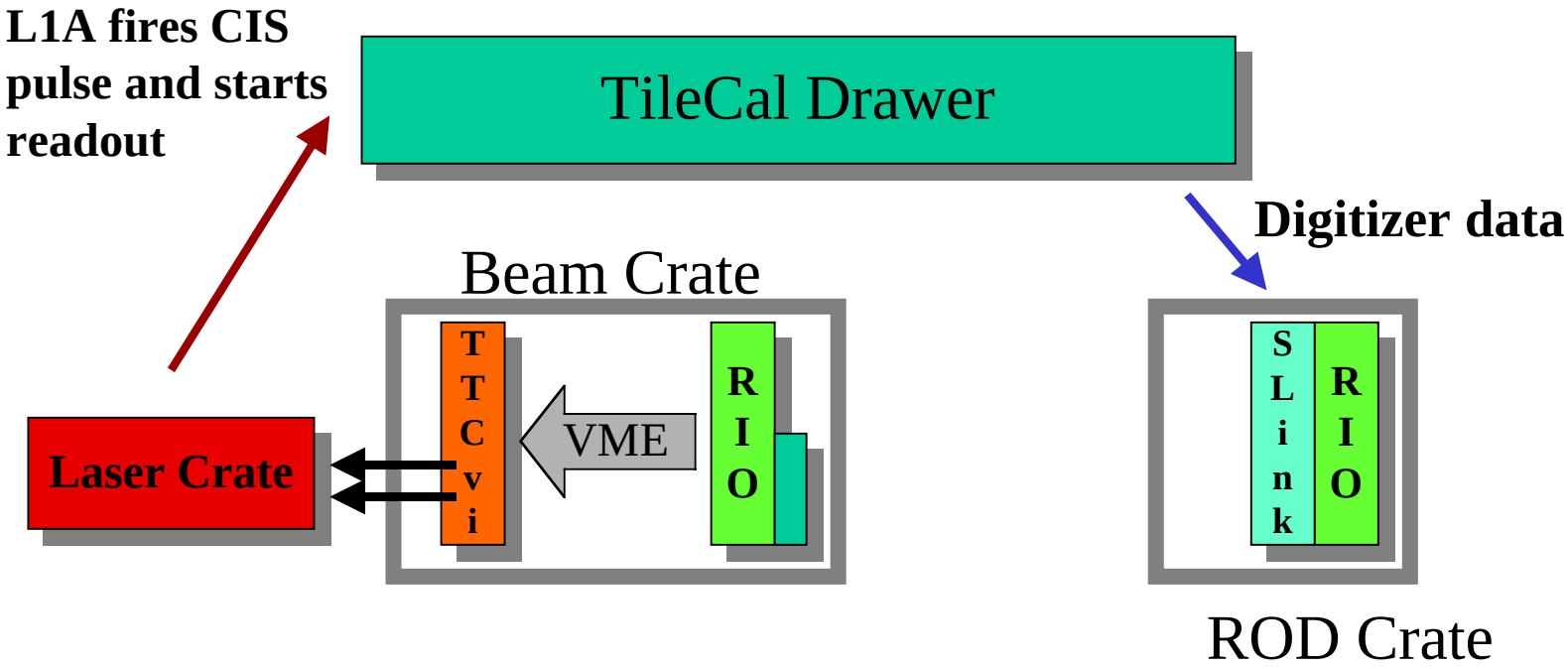


To 3in1: Enable CIS, select capacitor, charge setting, etc.

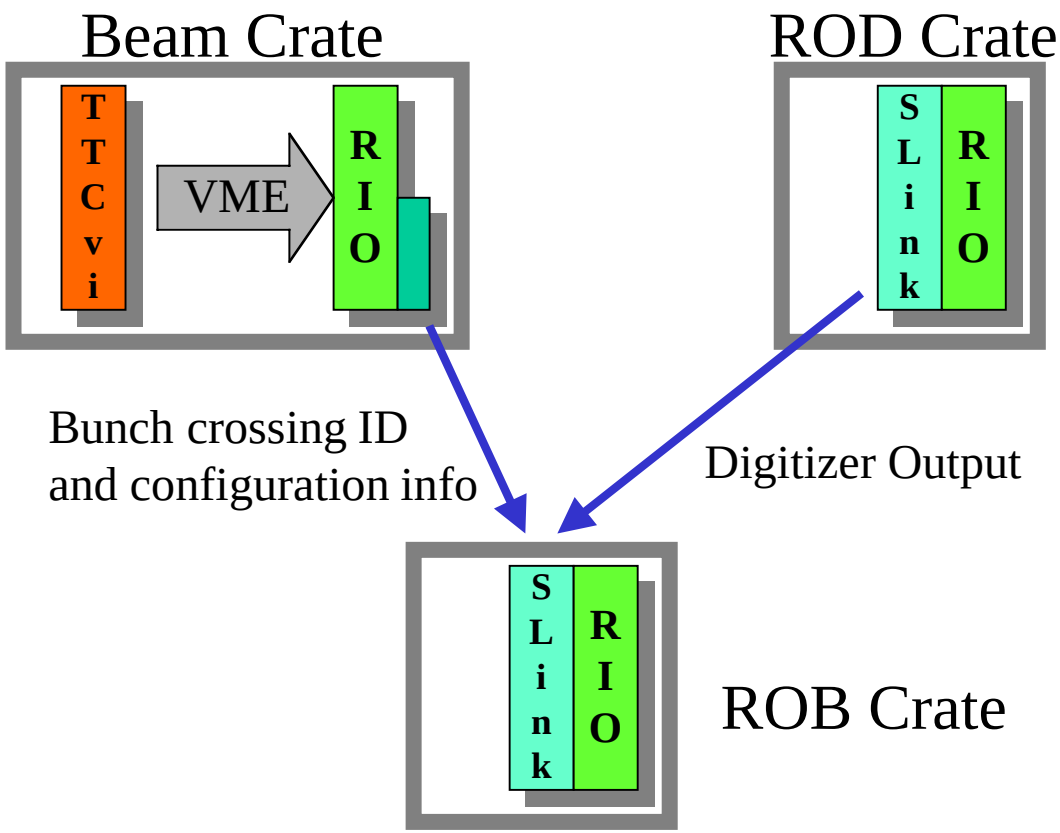
To Digitizer: Read out Low and High gain, set number of readout samples, set pipleline length, etc.

All systems configured by Beam Crate using TTC (+ CAN?)

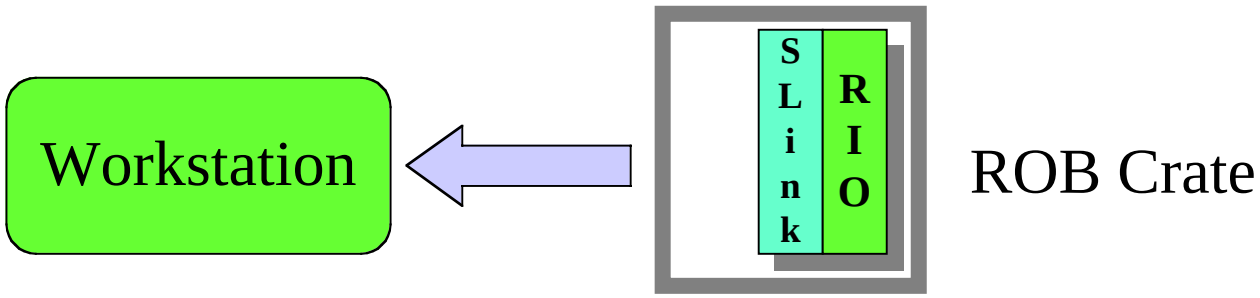
Step 2: Fire CIS pulse and read out digitizer data



Step 3: Transfer event data to the event builder (ROB crate)



Step 4: Transfer data to workstation for offline analysis



Don't include information the audience doesn't need or can't remember

Filler information

Roentgen discovered x-rays in 1895. He found that a cathode-ray tube produced fluorescence in a distant plati-num-barium-cyanide screen.

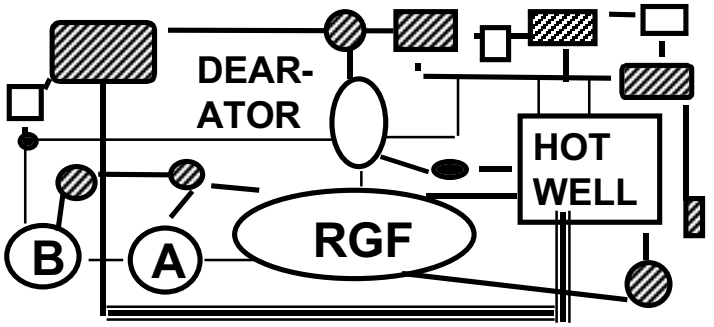
Complex math

$$\frac{(x+2)^2 \ln x}{(x+1)^3 (x^2-1)}$$

Long lists

- Corrosion
- Acid rain
- Toxic materials
- Pulsed combustion
- Energetic materials
- Pyrogenic materials
- Smog

Complex images



An effective **delivery** conveys your message to the audience

- Language
  - Familiar
  - Precise
  - Concise
  - Tone
- Performance

You have several choices for delivering your speech

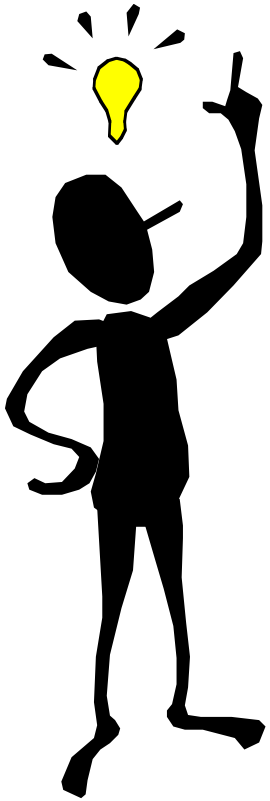
Memorize the speech + allows eye contact - difficult for long speeches - room for precision errors - no room for improvising	**Read from a text** + ensures precision - doesn't sound natural - no room to improvise - hinders eye contact
"Wing it" + sounds natural - much room for error	**Speak from visuals/notes** + insures organization + allows eye contact + allows improvising - some room for error

Prepare strong wording to emphasize strong points or transitions

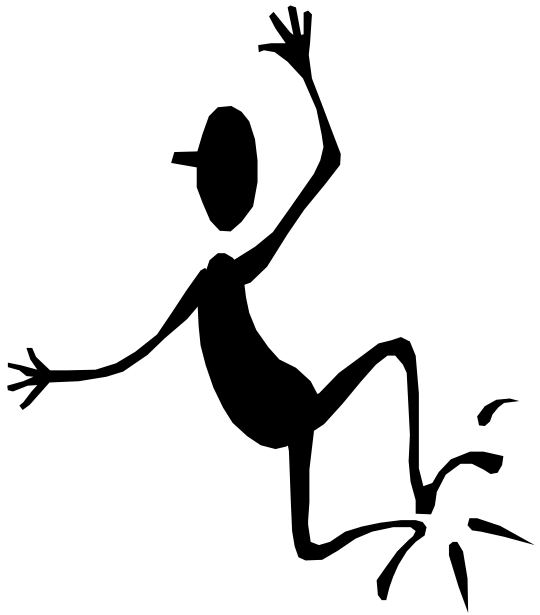
- Beginnings
  - OK: ÒMy name is _____ and I will be talking aboutÉÓ
  - Better: ÒOne question which has come up more than once during this conference is: ÔNow that the top quark has been found, what kind of physics can we do with it?ÕÓ
- Middles
  - ÒThat concludes what I have to say about cross sections. I will now discussÉÓ
- Endings
  - ÒTo summarize, I would like to show you this table of ...Ó

An important part of delivery is your interaction with the audience

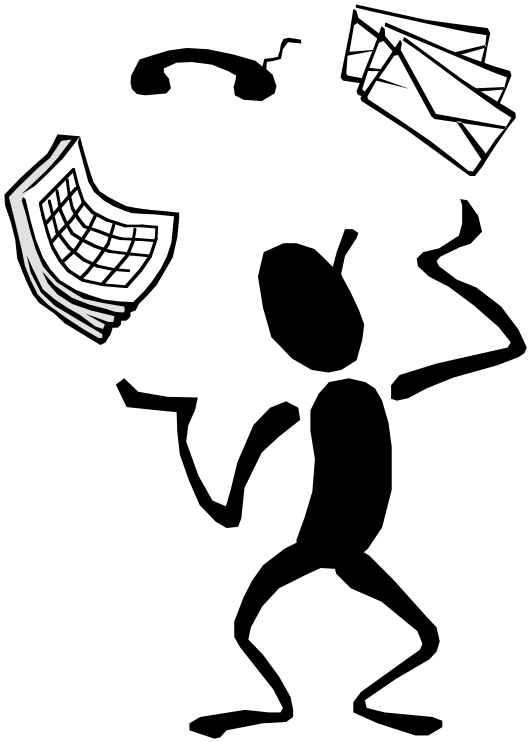
Voice



Movements



Stage Presence



An effective presentation depends on three important aspects of style