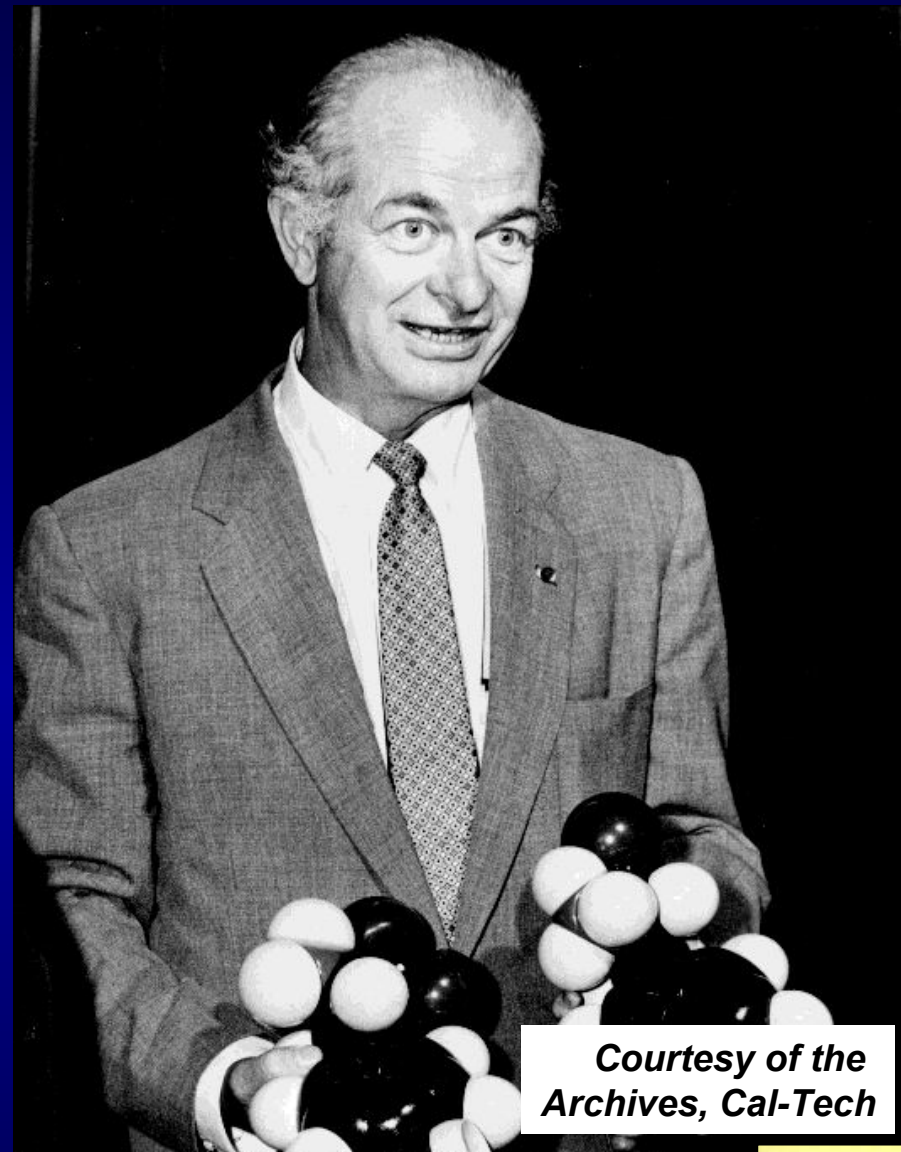


# Making Scientific Presentations

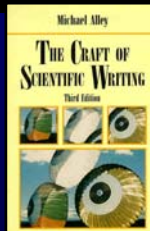
Yesterday I gave a colloquium.... [I] spoke loudly and looked at the audience and not the blackboard, although under the circumstances the blackboard seemed far more appealing than some of the people.

Lise Meitner  
Physicist



*Courtesy of the  
Archives, Cal-Tech*

Linus Pauling



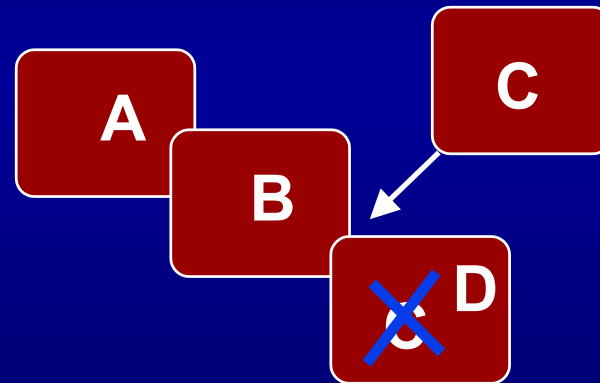
# Presentations have several advantages over documents

Work can come alive for audience

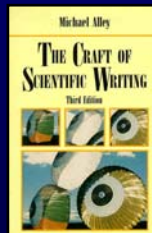
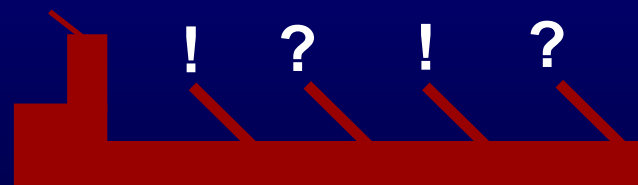
*Work* →



Presenter can read audience and react

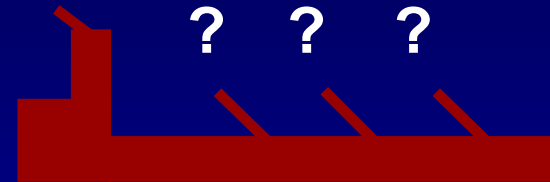


Presenter receives instant reaction



# Presentations also have several disadvantages

Speaker has limited chance to catch errors



Audience cannot reread text

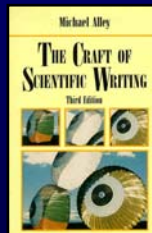
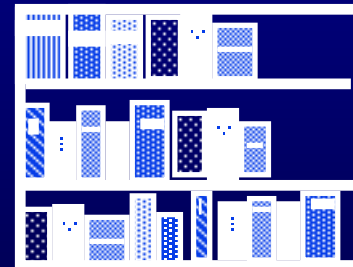
audience

has one

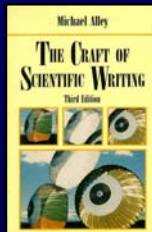
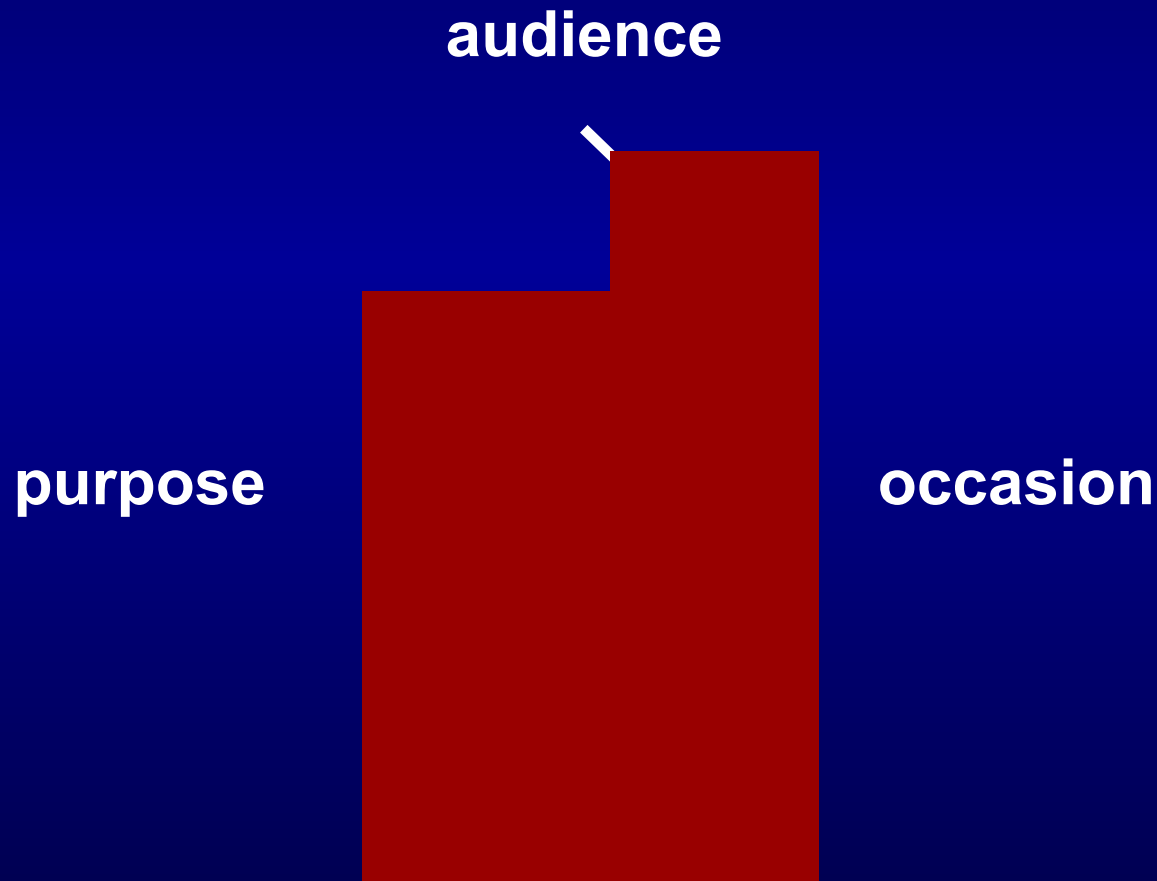
chance

to hear

Audience cannot look up background material



# You begin preparing a scientific presentation by analyzing your constraints

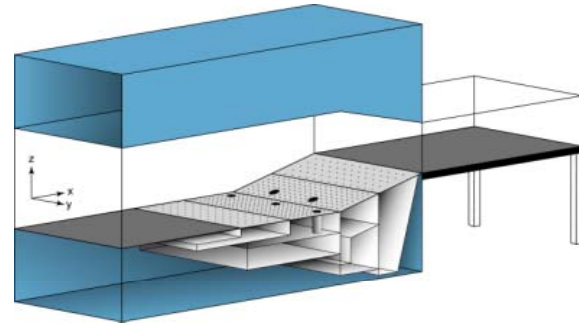


# In a scientific presentation, you have to juggle four aspects of style

## Structure



## Visual Aids



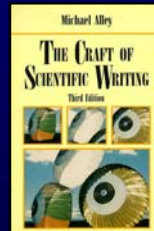
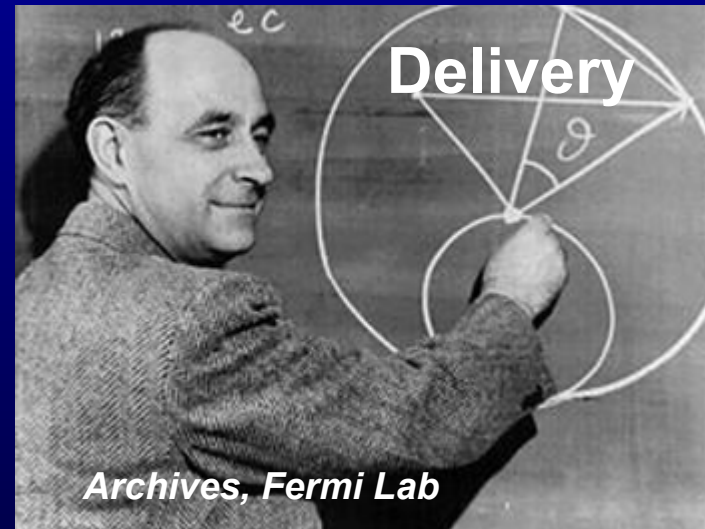
VTECCL

AIP

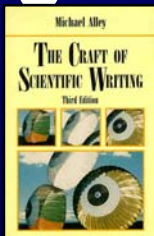
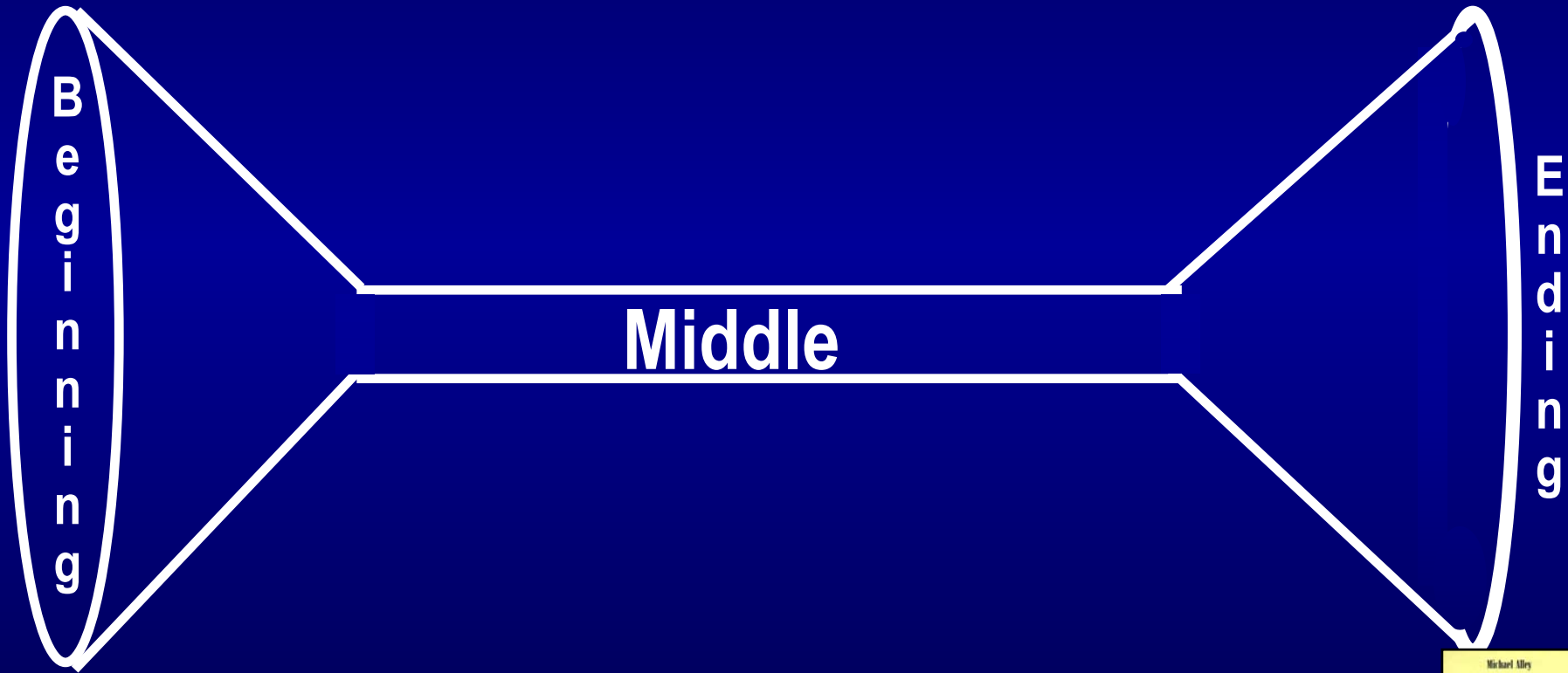
## Speech



## Delivery



As with documents, the structure of presentations should have clear beginnings, middles, and ends

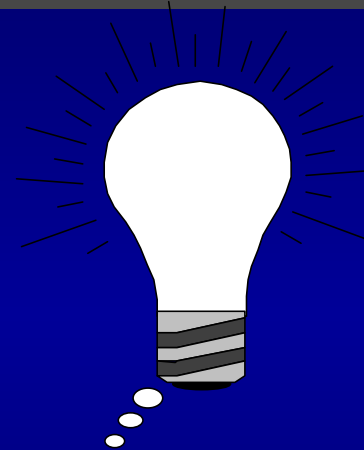


# Beginnings prepare the audience for the work to be presented

Defines work

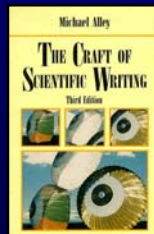
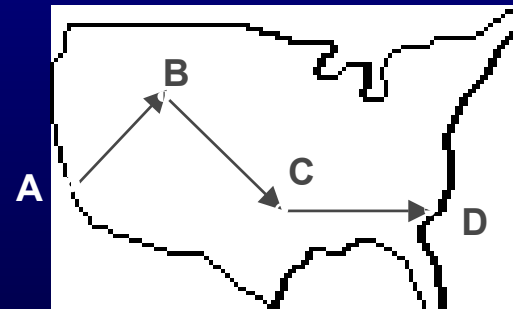
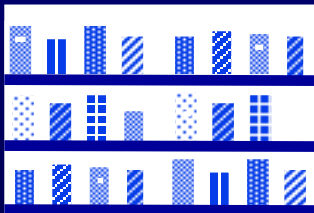
Shows importance

*Work = A + B*



Gives background

Maps presentation

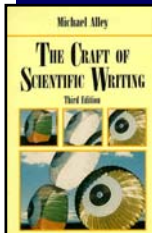


# The middle presents the work in a logical order

pre-combustion methods

combustion  
methods

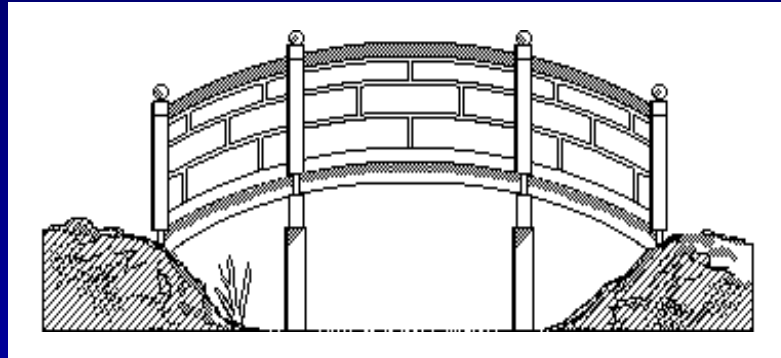
post-combustion  
methods





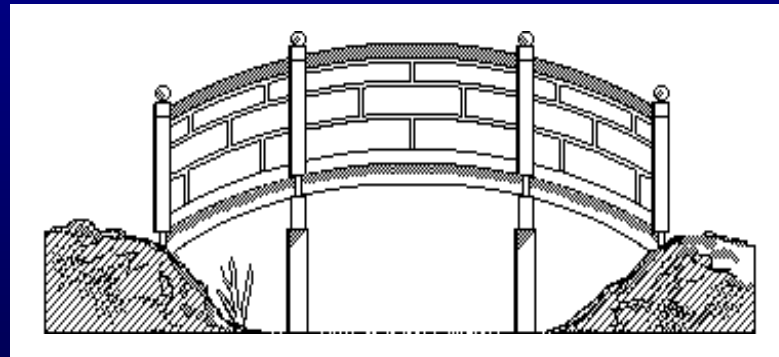
# In the middle, you make smooth transitions between major points

pre-combustion  
methods

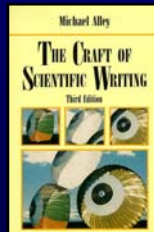


combustion  
methods

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

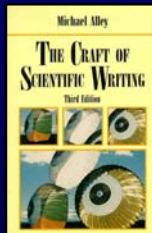


point 1  
point 7

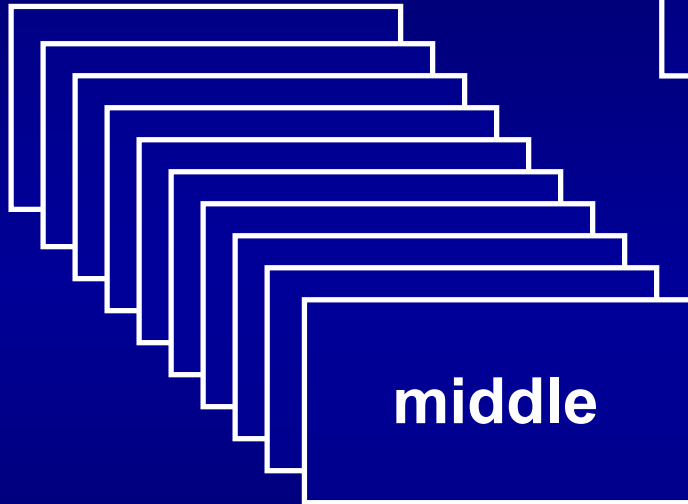
summary



big picture



# In a formal presentation, the slides reflect the structure

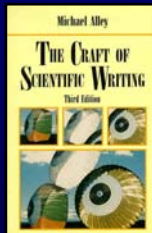


overall perspective  
summary

logical order  
transitions



scope  
importance  
background  
mapping

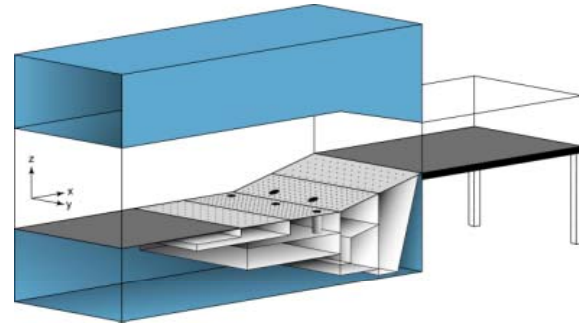


# In a scientific presentation, you have to juggle four aspects of style

## Structure



## Visual Aids



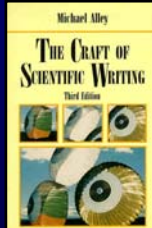
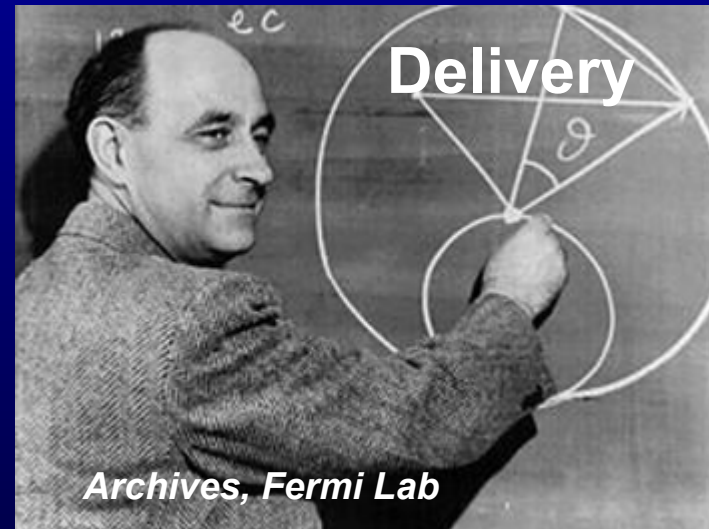
VTECCL

AIP

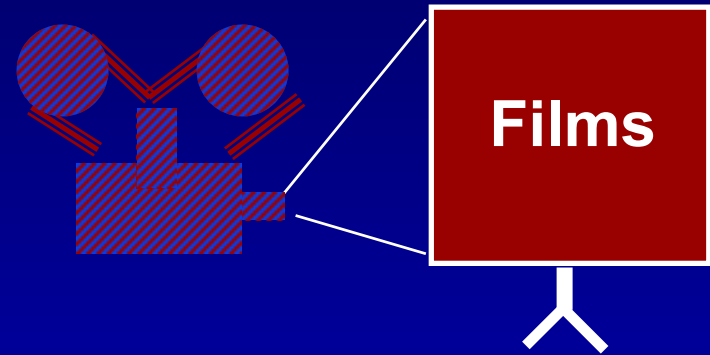
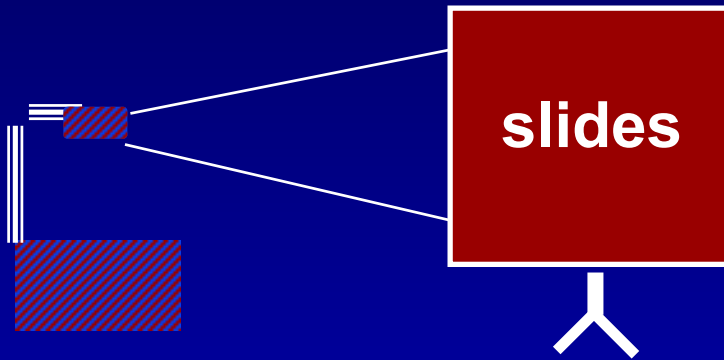
## Speech



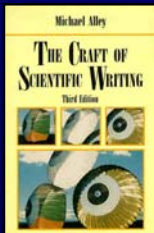
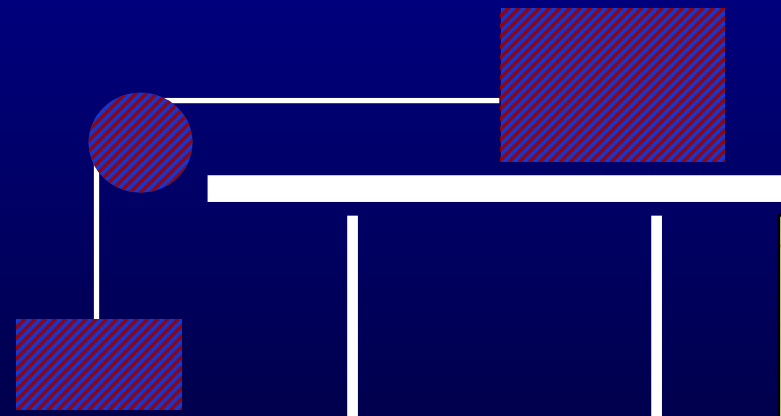
## Delivery



# Scenery and props serve as your supporting cast

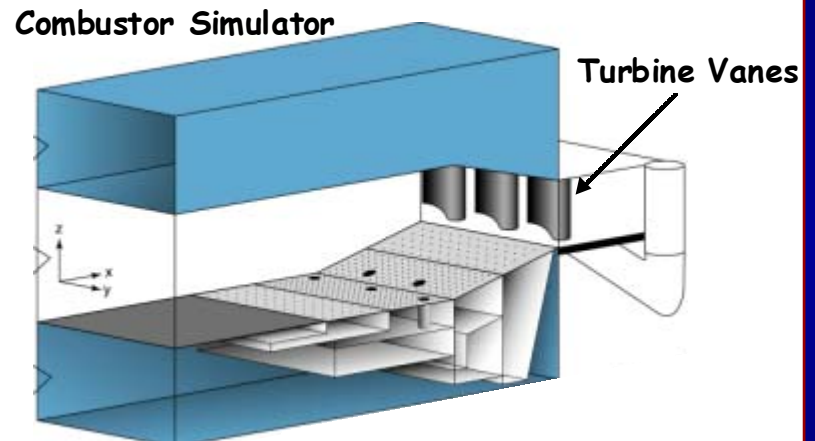


## Demonstrations



# Designing Presentation Slides

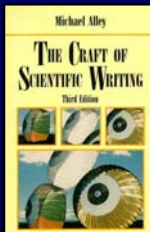
Downstream of the combustor simulator is a section to test turbine vanes



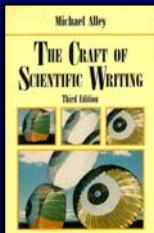
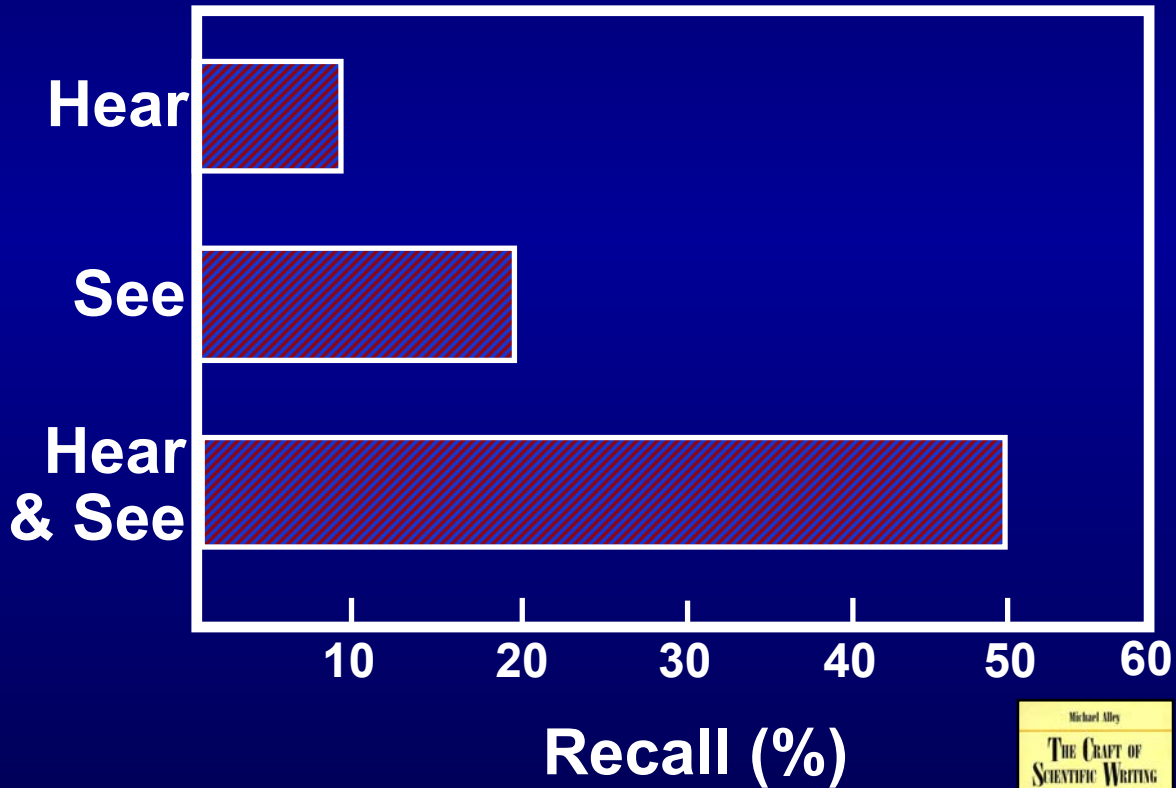
VTExCCL

I could somehow see nothing all around me but the paper, and I felt as if my body was gone, and only my head was left.

Charles Darwin

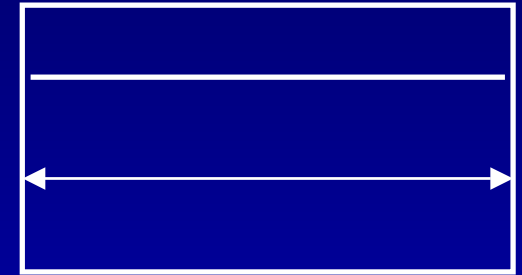
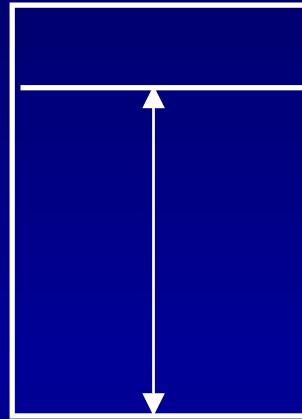


# Audiences remember more when you use well-designed slides

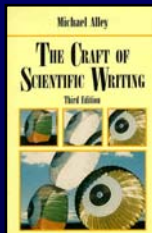


# No matter what type of projection you use, you must make certain decisions

What format to choose?



What information to include?





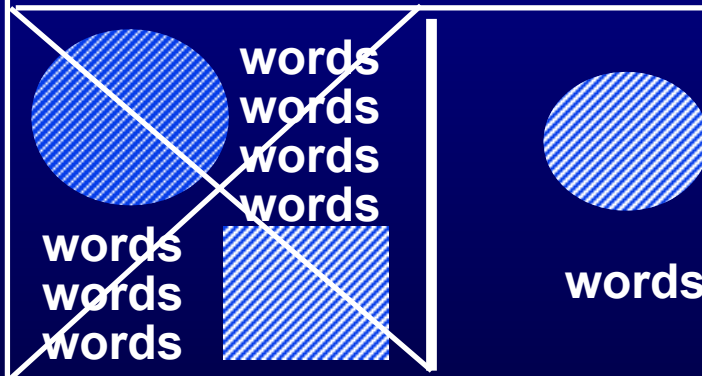
# Choose a format that is professional

## Choose legible type

✓ Arial

✗ ~~BOOK ANTIQUA~~

## Avoid clutter



# Headline/body formats orient the audience

*Headline*

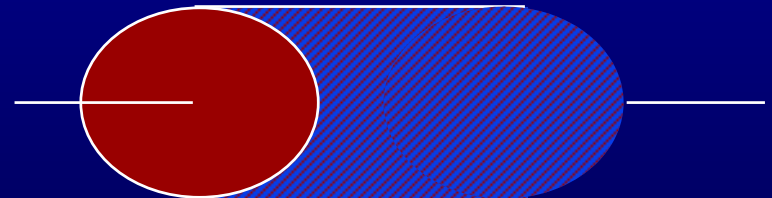
Use a headline that succinctly states the idea of the slide

Body supports with words

words  
words  
words

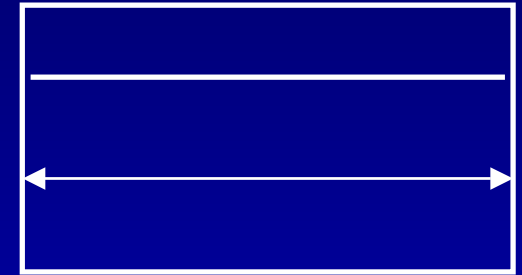
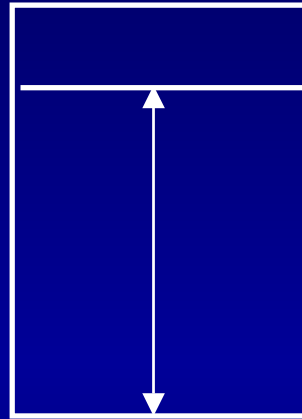
*Body*

Body supports with images

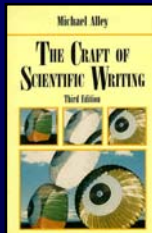


# No matter what type of projection you use, you must make certain decisions

What format to choose?

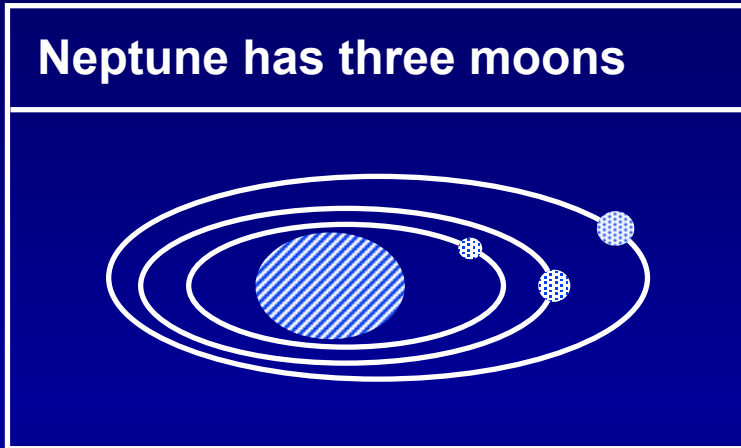


What information to include?

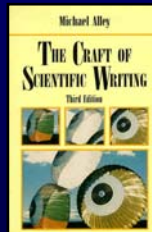
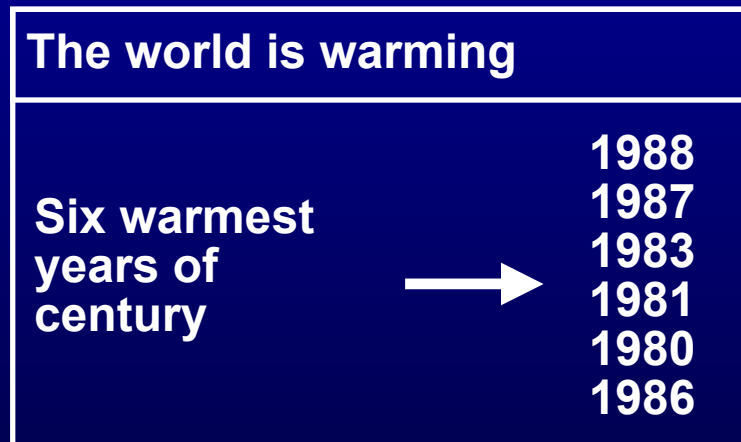


# Include slides that accent important details

## Images

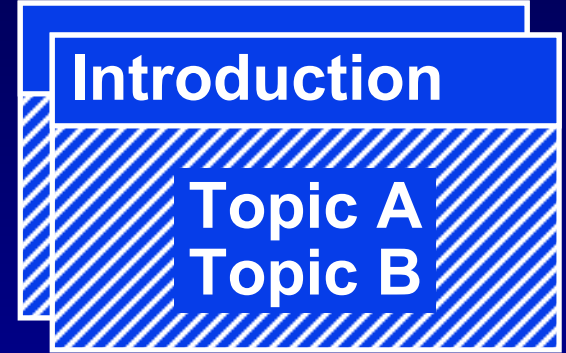


## Results

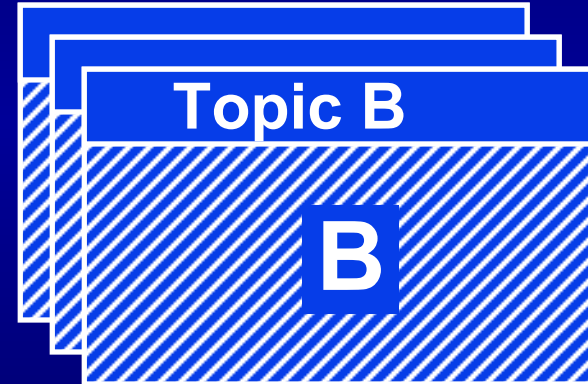
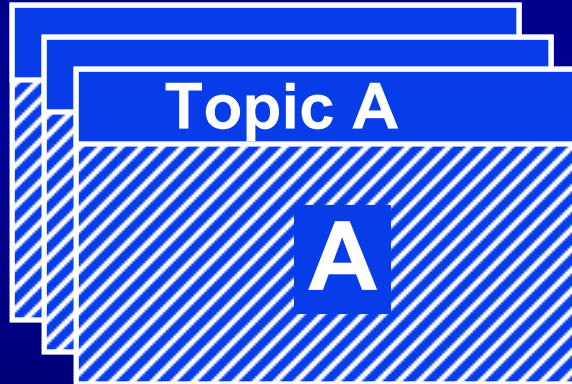


# Include slides that show organization

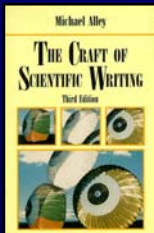
Beginning



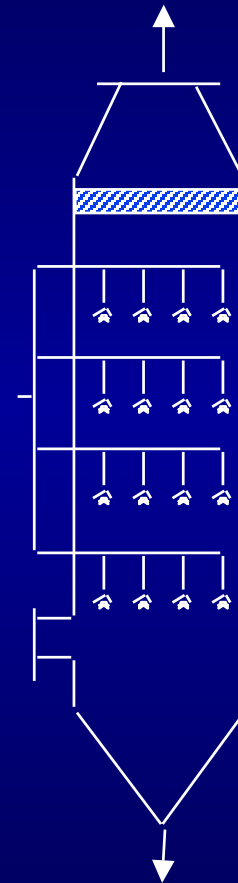
Middle



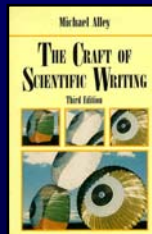
Ending



# Methods to Reduce Sulfur Dioxide Emissions From Coal-Fueled Utilities



Cynthia Schmidt  
Mechanical Engineering Department  
University of Texas

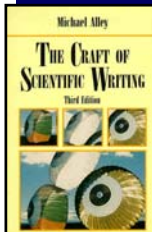


# Three classes of methods exist for reducing emissions of sulfur dioxide

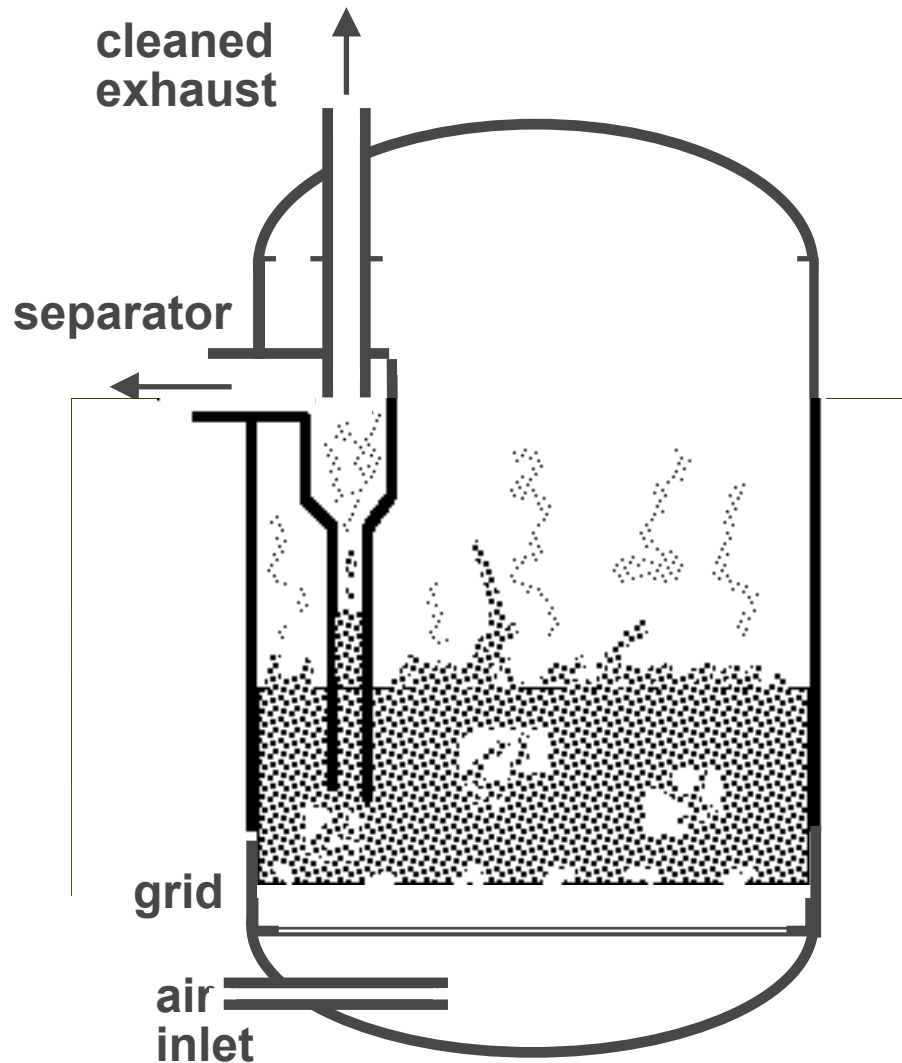
pre-combustion methods

combustion  
methods

post-combustion  
methods



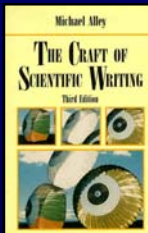
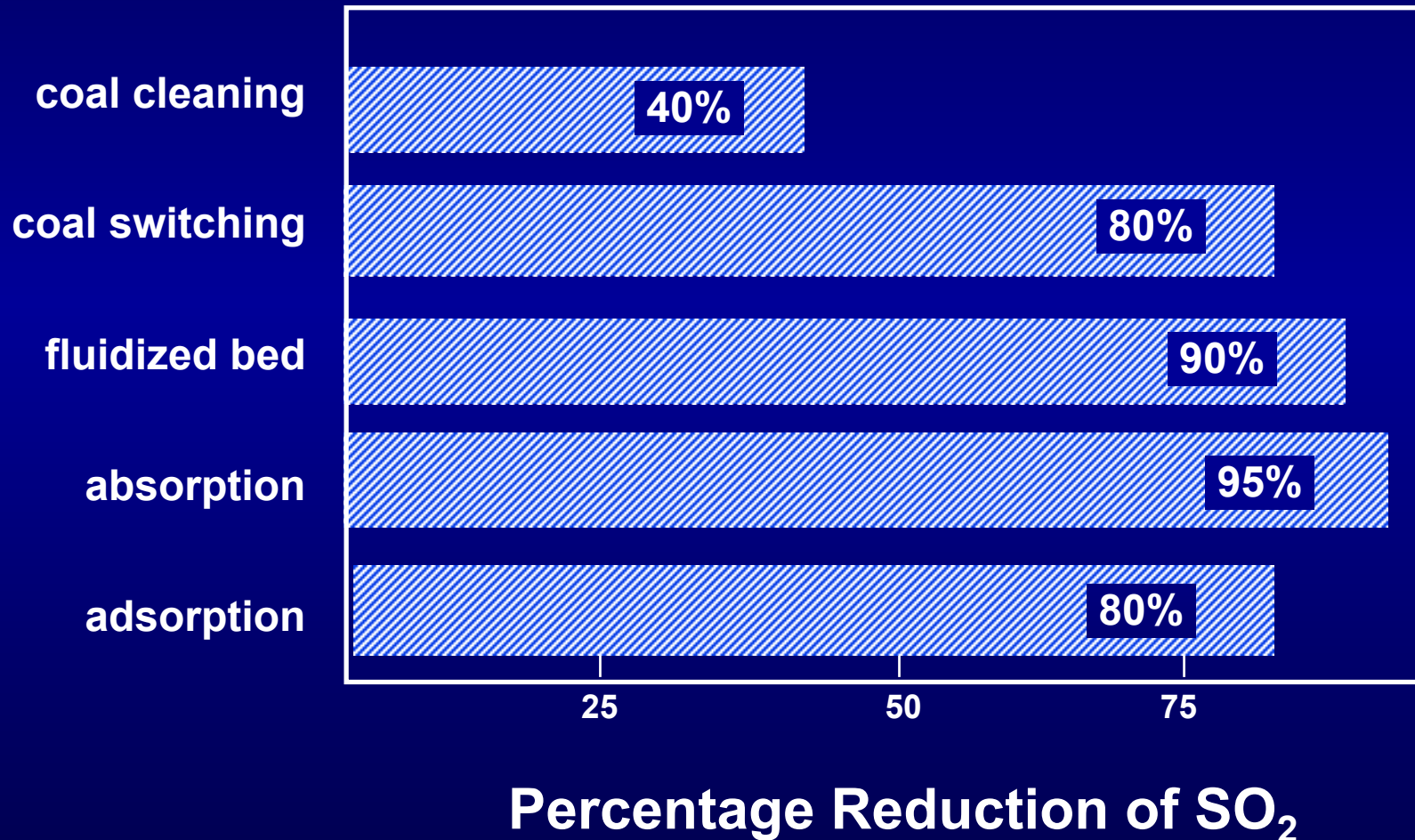
# The most effective combustion method is an atmospheric fluidized bed



- 90% removal capability
- low capital cost—able to use in existing equipment
- high operating cost
- ability to use different grades of coal



# By using these methods, coal utilities can greatly reduce SO<sub>2</sub> emissions



# Exclude details that the audience does not need or cannot remember

## Avoid filler information

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

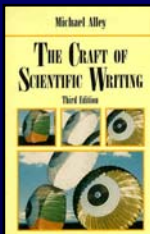
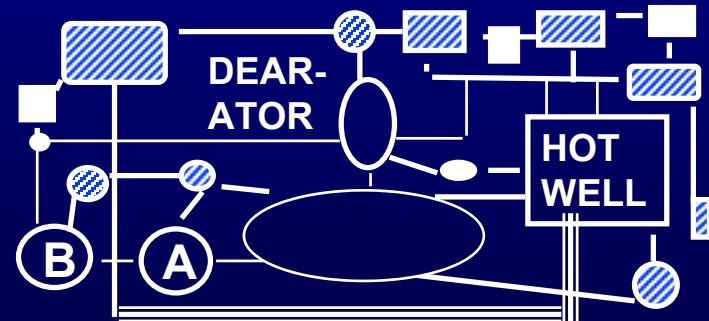
## Avoid complex math

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

## Avoid long lists

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

## Avoid complex images

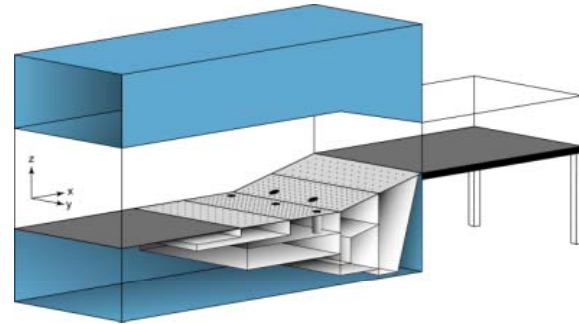


# In a scientific presentation, you have to juggle four aspects of style

## Structure



## Visual Aids



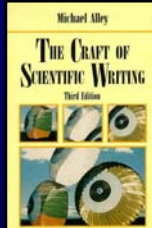
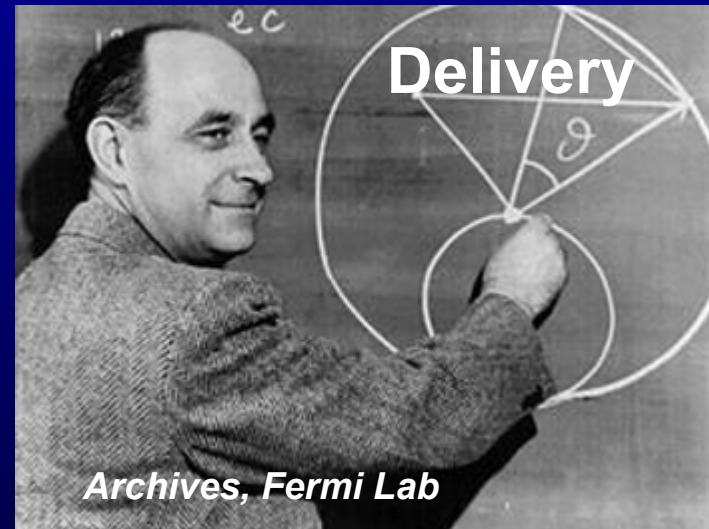
VTECCL

AIP

## Speech



## Delivery

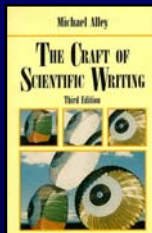
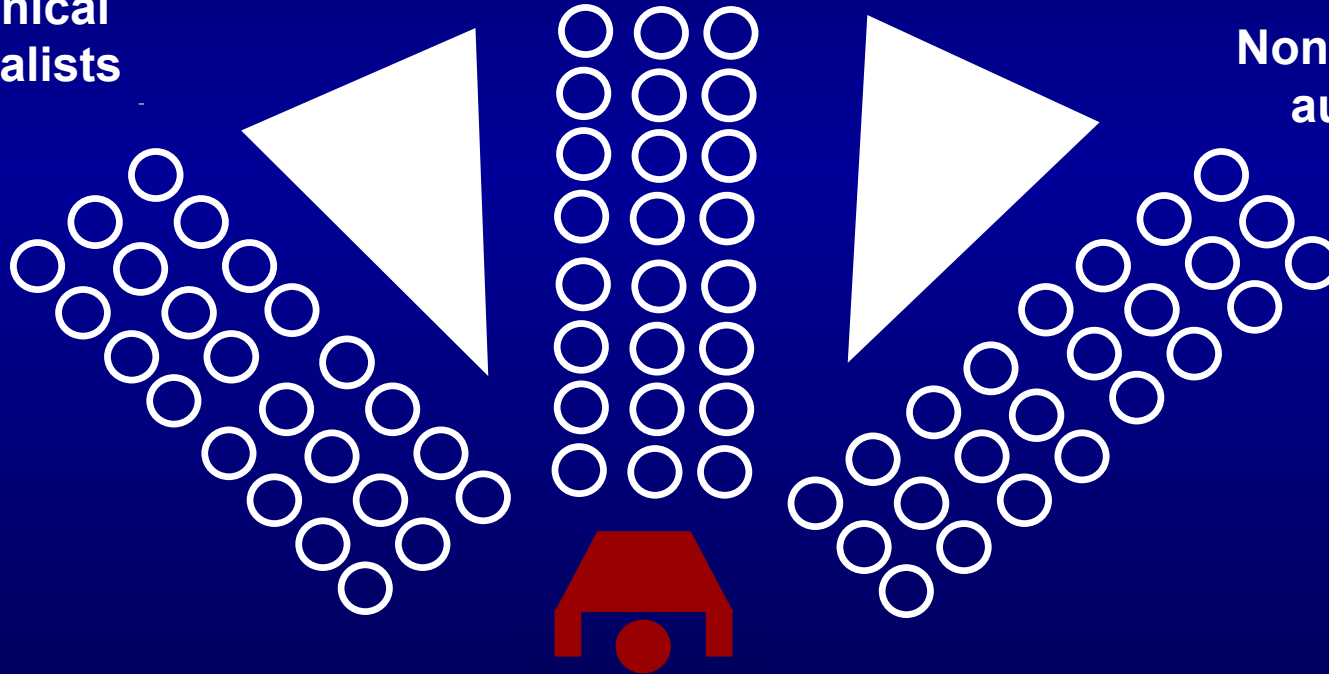


# Audience, purpose, and occasion determine the appropriate speech to give

General technical audience

Technical specialists

Non-technical audience



# You have several choices for how you deliver your speech

## Memorizing the Speech

- + allows eye contact**
- difficult for long speeches
- room for precision errors
- no room for improvising

## Reading From a Text

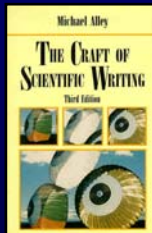
- + ensures precision**
- does not sound natural
- no room for improvising
- hinders eye contact

## Winging It

- + sounds natural**
- has much room for error

## Speaking From slides

- + insures organization**
- + allows eye contact**
- + allows improvising**
- some room for error

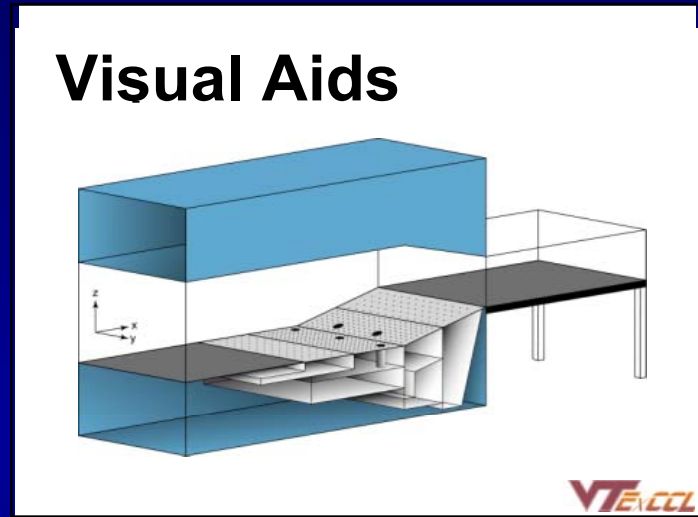


# In a scientific presentation, you have to juggle four aspects of style

## Structure



## Visual Aids

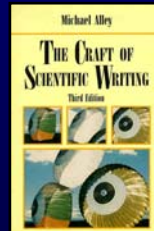
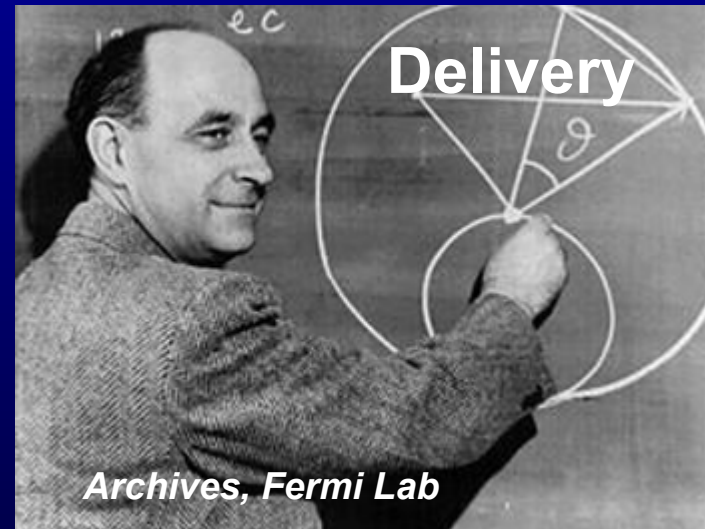


AIP

## Speech



## Delivery

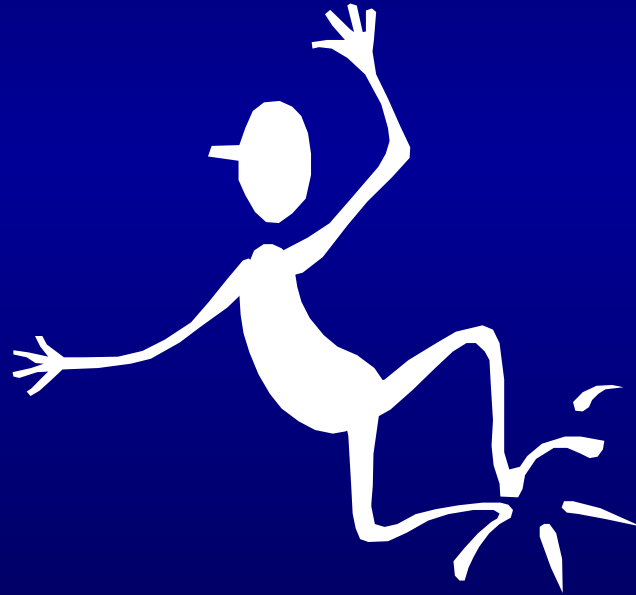


# Delivery is the speaker's interaction with the audience

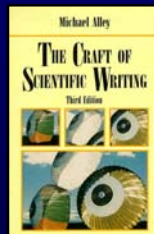
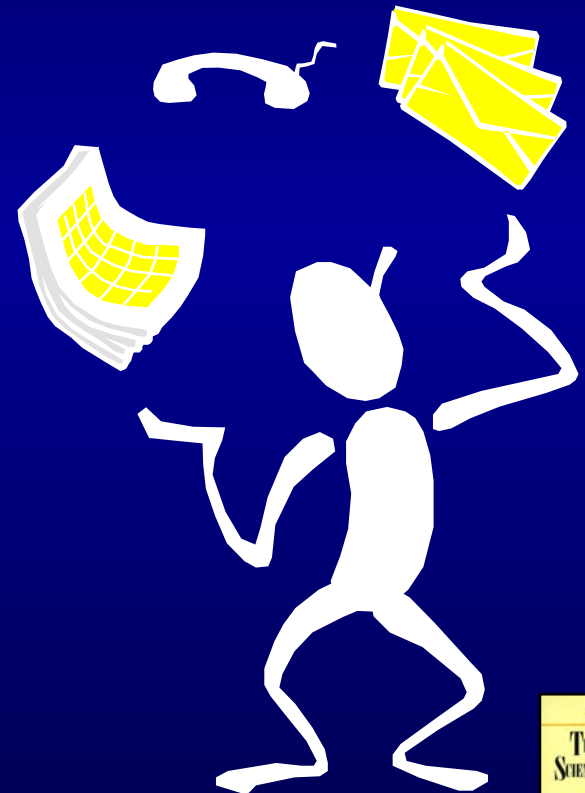
Voice



Movements



Stage Presence

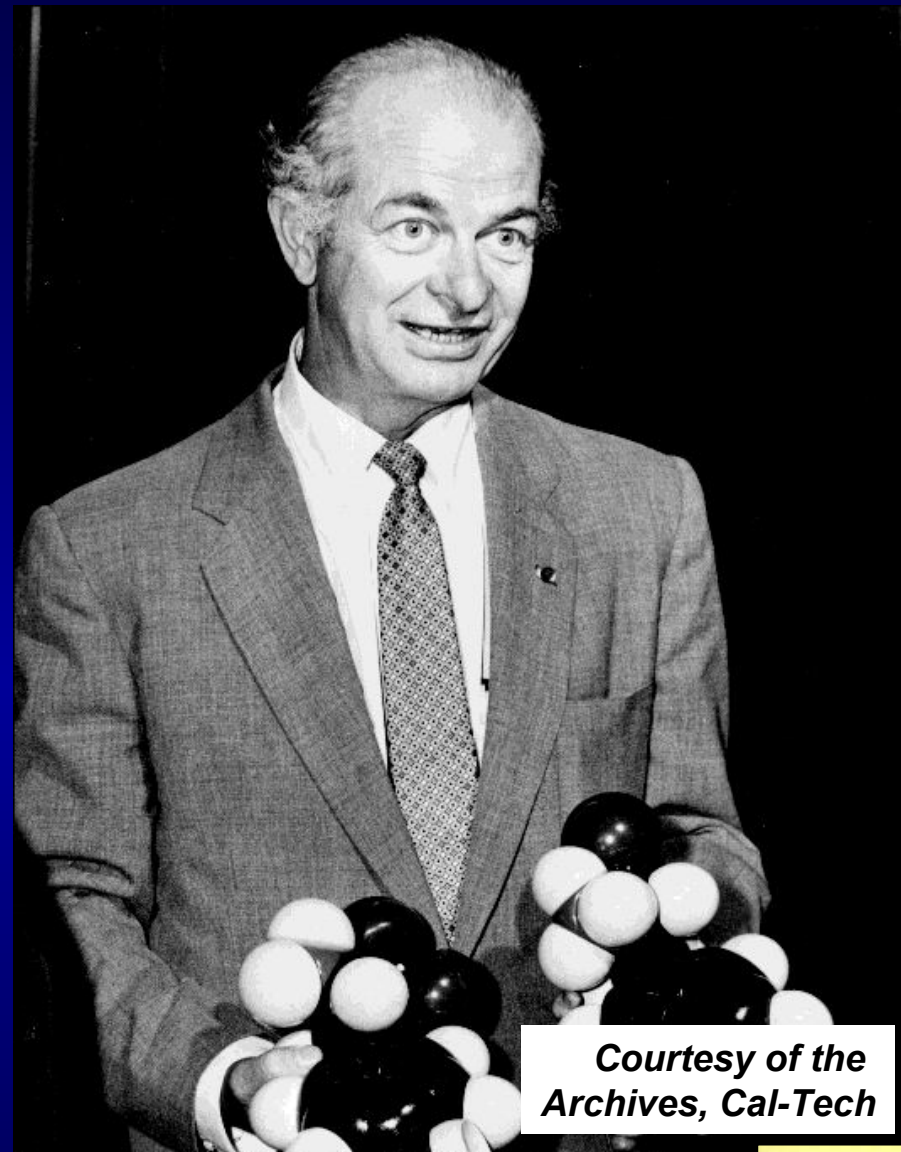




# Making Scientific Presentations

Yesterday I gave a colloquium.... [I] spoke loudly and looked at the audience and not the blackboard, although under the circumstances the blackboard seemed far more appealing than some of the people.

Lise Meitner  
Physicist



*Courtesy of the  
Archives, Cal-Tech*

Linus Pauling

