

Technical Presentation Methodology

Learning from our Errors



Dr. Ronald H. Rockland
New Jersey Institute of Technology
Department of Engineering Technology

Sponsored in part
by the Gateway Engineering
Coalition with support from the
National Science Foundation

Background

Good oral communication skills are considered to be a necessary achievement of a college graduate, according to accreditation requirements. To help students achieve these types of skills, a series of lectures were given, over the last two years, to over 200 students in both upper division engineering technology courses and a Freshman Engineering Design (FED) course. These lectures were designed to provide students with information on presentation techniques, and contained topics such as planning a presentation, building the presentation, overcoming fear, and how to make a presentation more interesting.

The material is based on both the author's prior industrial presentation experiences as a marketing executive in various technical companies, as well as observations on errors in presentation methodology that students made in class over the last five years. This paper will review the material presented to these students. While references are made to PowerPoint, this paper is intended to enhance the presentation skills of the students as oppose to their knowledge of a specific computer application. Many of the concepts in this paper can be used with presentations involving overheads. An evaluation sheet that can be used to reinforce the concepts of this paper is also included.

Oral and written communication skills are important for students graduating into today's industrial climate, as well as helping institutions meet accreditation requirements. In a recent advertisement for a development engineer, a major medical instrumentation company listed three qualifications: the first was a BSEE or equivalent, the second was low signal and low-noise analog development experience, and the third qualification was written and verbal communication skills. Companies believe that those with superior communication skills, rather than technological skills, will be the companies on the cutting edge¹.

With today's computer technology, communication to groups of people can be best accomplished using presentation software packages, such as Microsoft PowerPoint®. Effective use of this type of package requires more than just an understanding of how to use the software. What is also needed is an understanding of basic concepts of presentation techniques. These skills are independent of the type of application used, although use of standard word processing applications usually results in poor presentations.

Presentation Techniques

- Anxiety
- Clipart
- Bullets
- Technical Drawings
- Practice
- Speaking
- Numbering pages
- Ending
- Beginning of presentation
- Other topics
- Still other topics
- Can't stop now
- Running out of space

Another Slide Example

- This is the first bad slide, because it uses all sentences that are greater than one word, and tries to convey the meaning of an entire sentence or paragraph into a few bullets, rather than break the sentences up into bullets and sub-bullets
- If you don't break up the main bullets into sub-bullets, they can overpower you, and it would be very difficult to read these bullets. Because they are difficult, you might not follow the lecturer

Concept of Talk

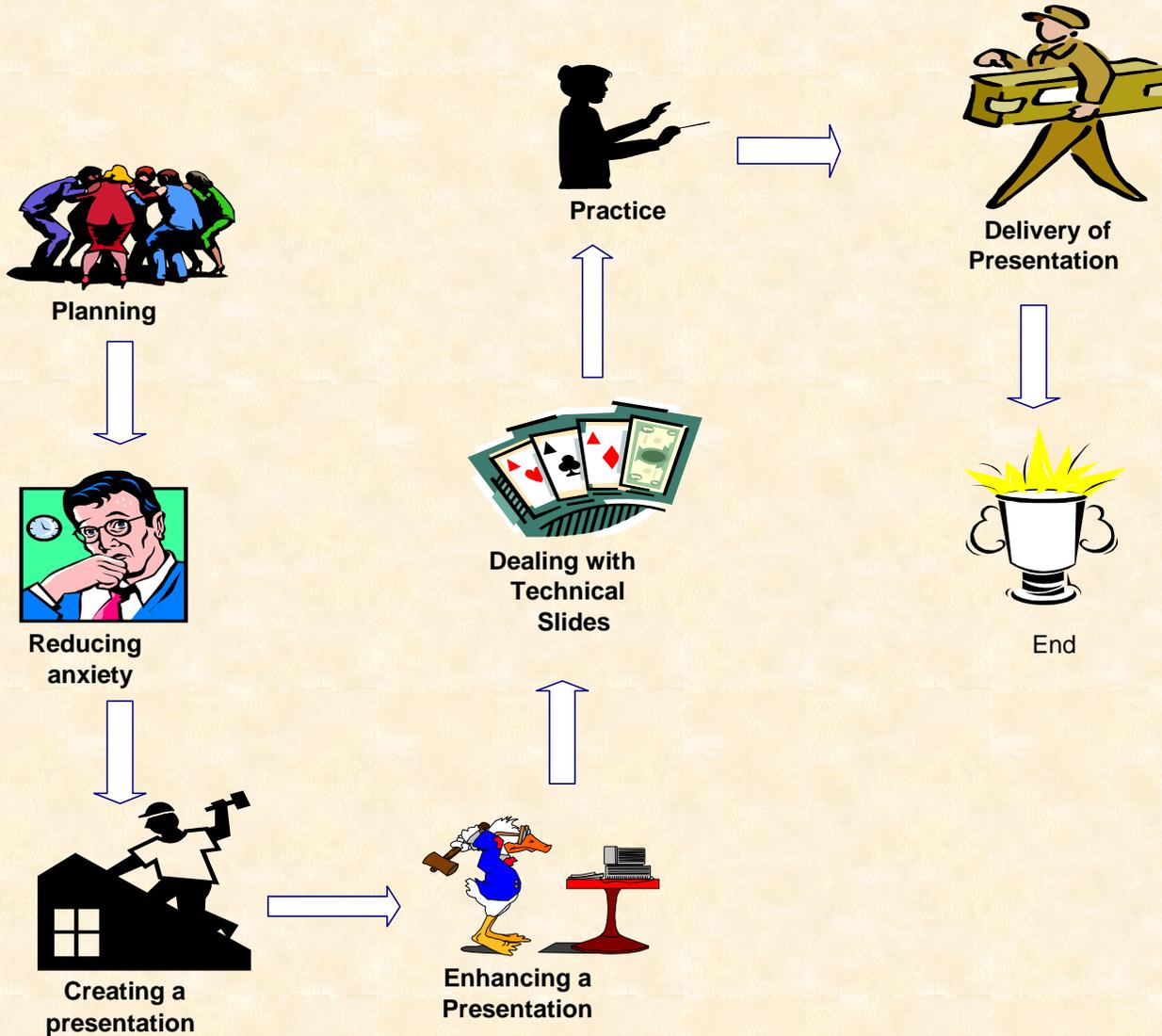
- Deals with how to present (How to apply the tool)
 - Not how to use PowerPoint features (How to use the tool)
 - Though will see some aspects of PowerPoint
 - Won't show you how to create a presentation
 - How to plan and deliver it



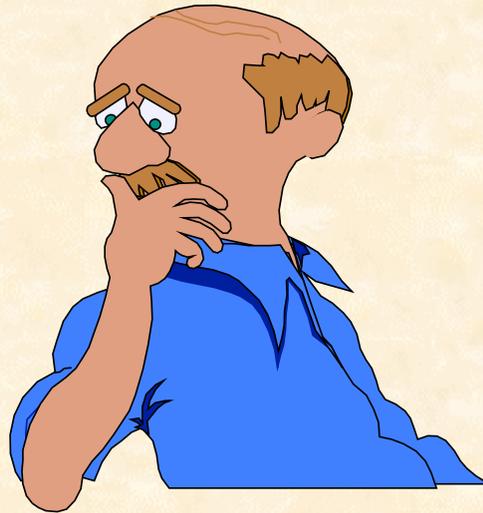
Information Sources

- Prior experiences by presenter
 - Over 20 years industrial experience
 - 7 years in R&D and product development
 - 13 years in marketing and sales
 - Presentation experiences
 - Customers, sales training seminars
 - Board of director's meetings
 - Technical papers & classes
- Review of mistakes - student and others

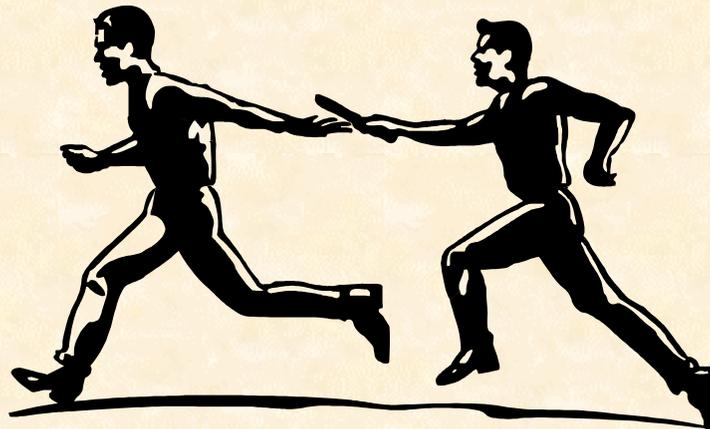
Agenda



You can ask questions during this talk



Let's Get Started



Joseph Priestly (18th Century Chemist, Theorist and Clergyman)

Discovered Oxygen

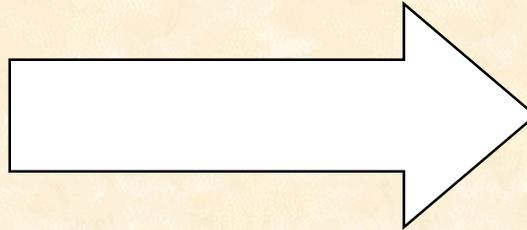
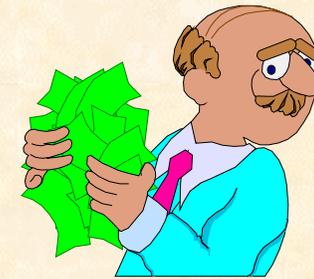


*“The more elaborate our means of communication,
the less we communicate”*

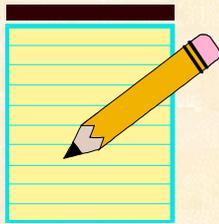
He obviously didn't know about PowerPoint

Communication Skills are needed in technical job area

Oral



Written



Success

Recent Job Description

GE Medical

Three Requirements

- BSEE or equivalent
- Low signal and low-noise analog development experience
- **Written and verbal communication skills**



Planning



Reducing anxiety



Creating a presentation



Dealing with Technical Slides



Enhancing a Presentation



Practice



Delivery of Presentation



End

4 Questions to Ask



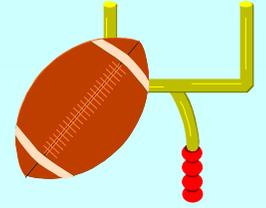
- **Who** is the audience?
- **What** are the goals of the audience?
- **What** is going to be presented?
- **How** is the presentation going to be given?

Who is the Audience?



- Understand technical abilities
 - Don't get too technical for general audience
 - Don't use acronyms or specialized words for non-technical audience
 - Firewire, GPS, IEEE 488
 - Use examples and stories
 - Don't be too simple for technical audience
 - Still explain acronym first time

What are the Audience's Goals?



- What type of information do they want?
 - Understanding of general topic
 - New concepts
 - How to do something

What do you think they want to take away from the talk?

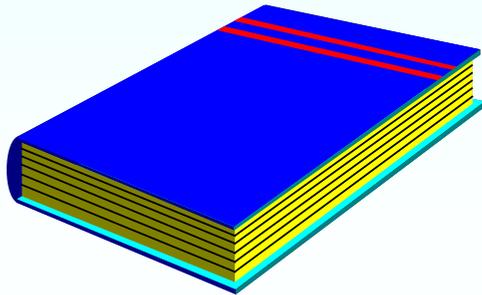
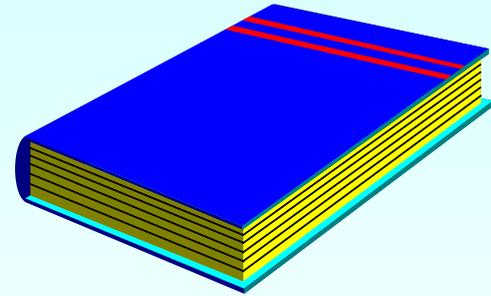
What is to be Presented?

- Design for Top- Down Approach
 - Start with main concepts
 - Fill in as needed
 - Use Outline View



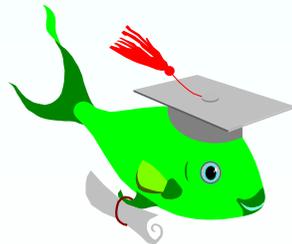
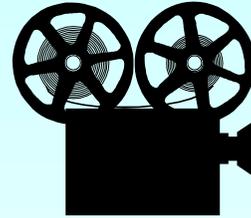
- 3 **Communication Skills are needed in technical job area**
- 4 **Recent Job Description**
GE Medical
 - BSEE or equivalent
 - Low signal and low-noise analog development experience
 - Written and verbal communication skills
- 5 **Agenda**
 - Cover 20 key points in presentation
 - From title page through ending
 - Key topics include:
 - » Style
 - » Reducing anxiety
 - » Using voice and body effectively
 - » Styling of slides
 - Present to students in various lab courses
- 6 **Presenter's Background**
 - Over 20 years industrial experience
 - 7 years in R&D and product development
 - 13 years in marketing and sales
 - Presentation experiences

Presentation and Report



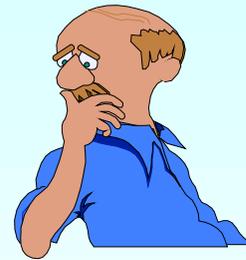
How is the presentation given?

- Background problems
 - Reduce brightness (30%)
 - Have backup
- Overhead
 - B/W slides most of the time
 - Need to view how PowerPoint looks

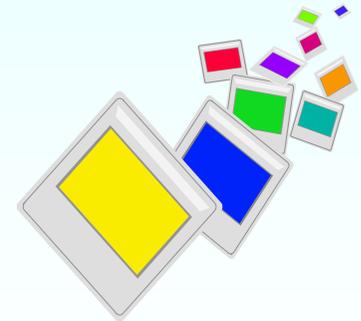


Overheads vs. Slide Show

- Advantages of overheads
 - Immune to computer glitches
 - Not to bulb burnout
 - Doesn't appear “glitzy”
 - So what

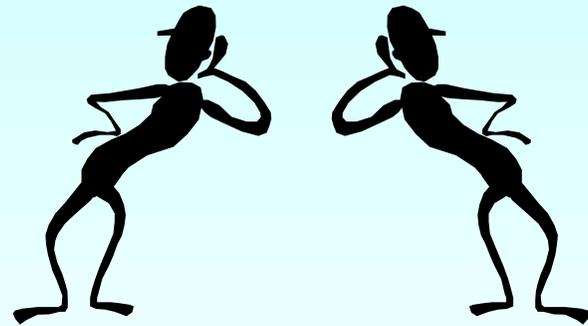


- Advantages of slide show
 - Control appearance of bullets easier
 - Multimedia/Internet connectivity
 - Use of **colors** much more **dramatic**
 - Change on the fly



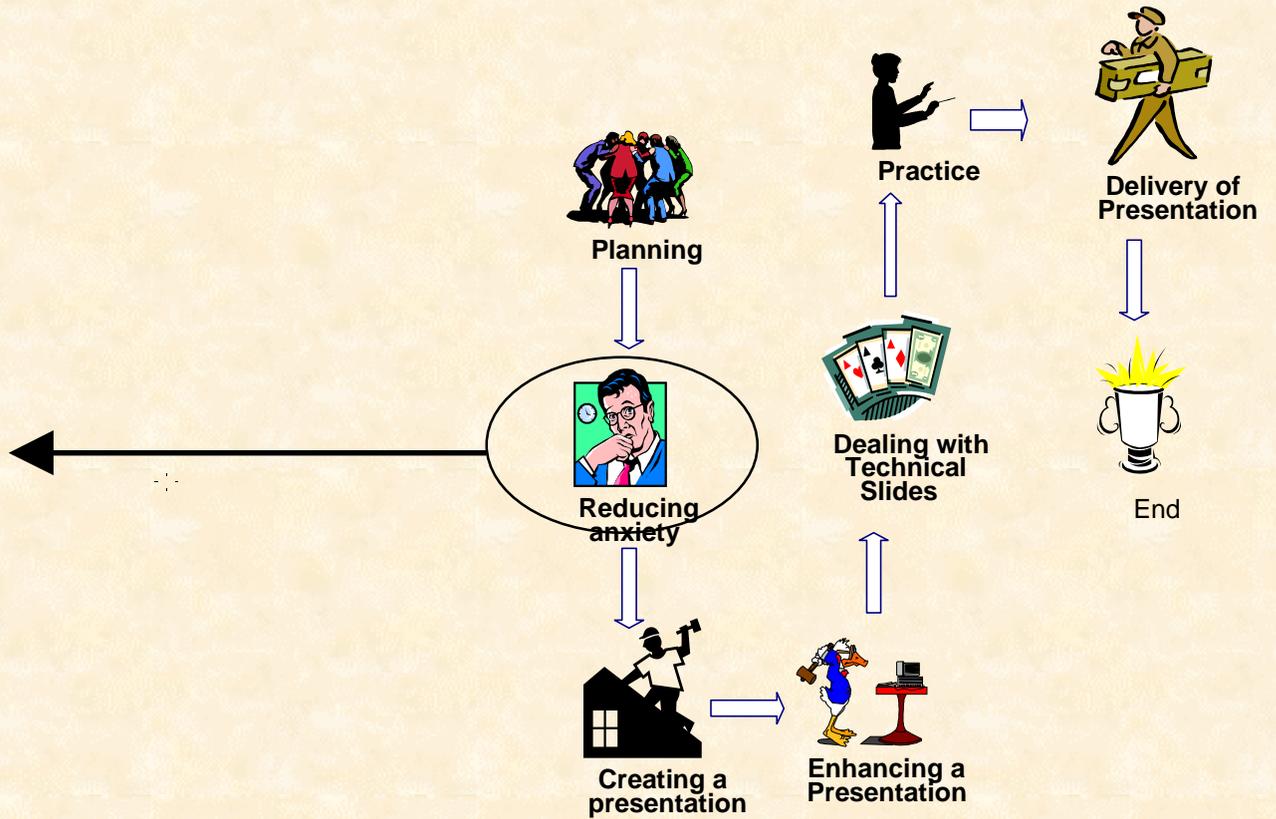
Plan on how to cover questions

- During or at end
 - During involves audience
 - End is easier
 - Time restriction
- Presenter can still ask questions
 - Prefer at end

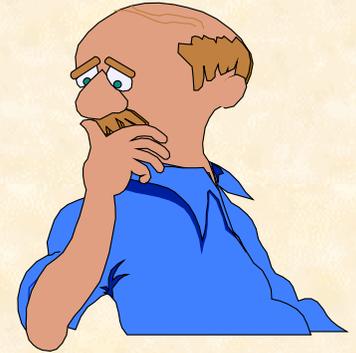




Anxiety



Reduce Anxiety - Part 1

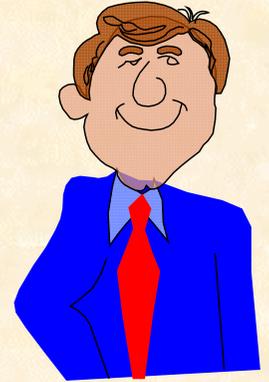


- Know material - practice 5 to 6 times
 - With each practice gain confidence
 - Don't memorize
- What are problem slides
 - Pauses or errors
 - Add bullets or extra slides
 - Key words to trigger you
- Don't use cards



- Visualize successful presentation

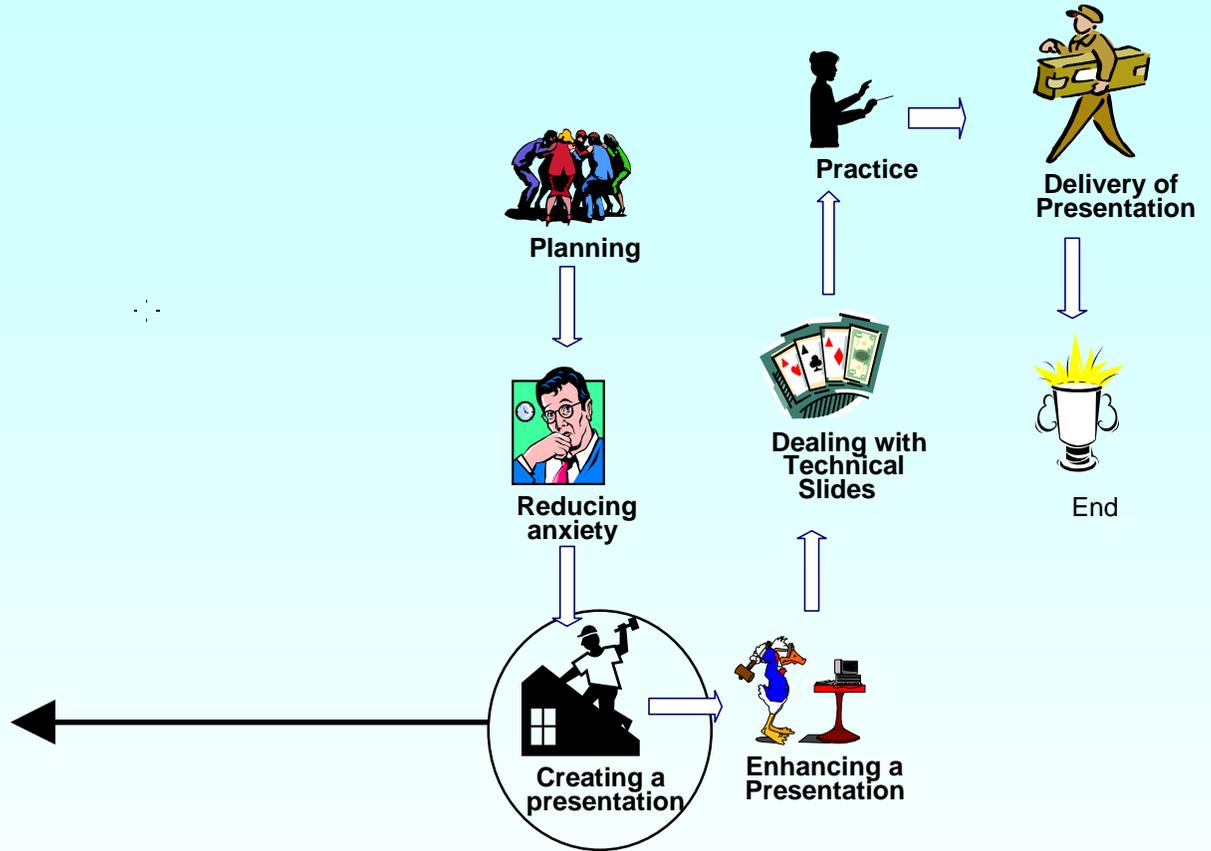
Reduce Anxiety - Part 2



- Start : Stand erect, deep breath, smile, eye contact
 - Upbeat voice
- Rapport - yes/no or showing of hands
 - Get audience involvement
- Be yourself- tell story
- Experience
 - First time vs. 20th time



Creating a presentation



Structuring the Opening

- Title slide first
 - Speaker's name, class, subject
 - Nice large font, WordArt, or other application
- Either agenda or introductory slide follow
 - Agenda slide lists main points
 - Expand slide
 - Introductory slide
 - Opening remark
 - Quote



Title
Slide



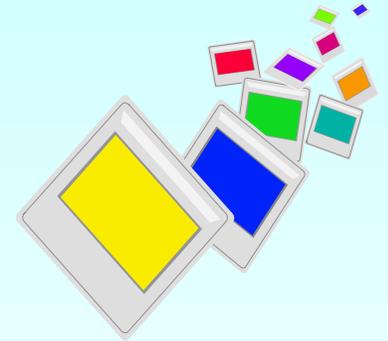
Intro
Slide



Agenda
Slide

Establish relevancy of topic to audience

Bulleted Slide Structure



- Keep to 5-6 main bullets
 - Break up into multi-slides if more
 - Less bullets if use a lot of sub-bullets
- Keep to one sentence if possible
 - Use sub-bullets to add additional text
 - Will prevent you from reading screen
- “Joy of Six”
 - Max six points per slide, six words per point

Think of all these points



- List all the tasks
- Create time frames for all tasks
- Arrange in groups
- Link all the tasks
- Create milestones
- Develop resources and their costs
- Assign resources
- Resolve conflicts
- Look at alternative linking
- Manage the program
- Report to management



**Keep to 5-6
main bullets**

**Can use more
once in a while**

Too Many Words on Slide

Would like to present the following points on the development process. The five phases of a development process include the product definition, design, test and evaluation, production and support phases.

Typically, we would spend a lot of time in test and evaluation phase, where we should be spending more time up front in the product definition and design phase.

In the product definition phase marketing typically will outline a series of specifications that hopefully are derived from quality marketing research with targeted customers. In that phase, technical feasibility must also be considered.

In the design phase, prototype development occurs. In recent years the concept of concurrent engineering has encourage multi-disciplinary meetings between engineering, marketing, production, service, and

Even Worse... From Using Word

Would like to present the following points on the development process. The five phases of a development process include the product definition, design, test and evaluation, production and support phases.

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Development Process

Look at first 2 paragraphs

- Five Phases
 - Product Definition
 - Design
 - Want more time spent
 - Test and Evaluation
 - Production
 - Support

Would like to present the following points on the development process.

The five phases of a development process include the product definition, design, test and evaluation, production and support phases.

Typically, we would spend a lot of time in test and evaluation phase, where we should be spending more time up front in the product definition and design phase.

Development Process

Look at first 2 paragraphs

- Five Phases
 - Product Definition
 - Want more time spent
 - Design
 - Want more time spent
 - Test and Evaluation
 - Most time typically
 - Production
 - Support

Would like to present the following points on the development process.

The five phases of a development process include the product definition, design, test and evaluation, production and support phases.

Typically, we would spend a lot of time in test and evaluation phase, where we should be spending more time up front in the product definition and design phase.

Another Bad Slide - Long Sentences

- This is the first bad slide, because it uses all sentences that are greater than one word
- If you don't break up the main bullets into sub-bullets, they can overpower you
- Writing these long sentences mean you can't think of just the phrases
- Even though I might have only five bullets on this slide, it looks too busy
- Would you want someone to look at this slide from a distance

Better Way - Sub-bullets

- This is the first bad slide
 - Uses all sentences that are greater than one word
- Break up the main bullets into sub-bullets
 - Otherwise they can overpower you
- Only write long sentences
 - Can't think of short phrases
- Have only five bullets
 - Looks too busy
- Look at this slide
 - Looks better from distance

When Using Quotes...

- Avoid bullets
- Can have 2-3 lines

Which looks better?

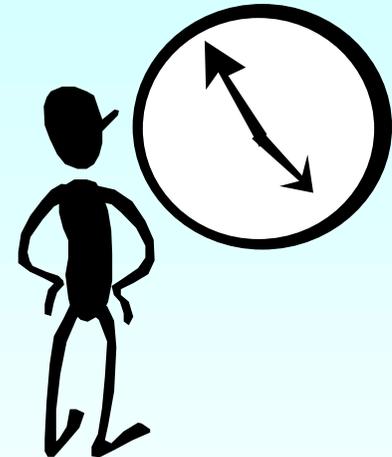
*“The more elaborate our means of communication,
the less we communicate”*

OR

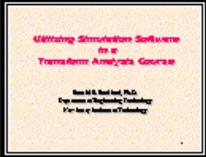
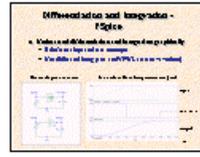
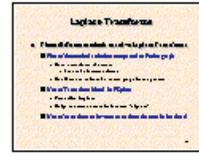
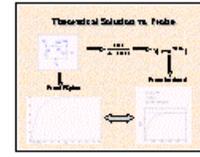
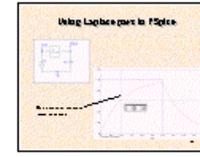
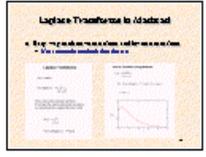
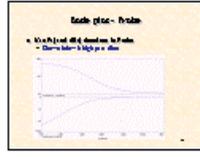
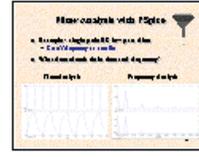
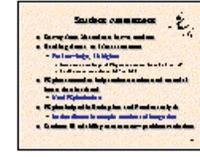
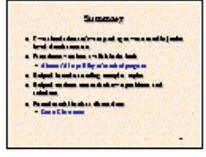
- The more elaborate means of communication
 - Less we communicate

Determine correct time for slide

- Minimum of 20 seconds, maximum of 2 minutes
 - Avoid movie effect or sleeper effect
 - Add or combine slides if different
 - 20 minute presentation have between 15-30 slides
- Use rehearse time feature
 - Turn off automatic time

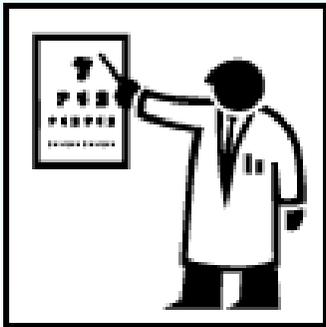


Rehearse Time Feature

 <p>Using Simulation Software as a Transform Analysis Course</p>	 <p>Let's face it, reality is only what we see</p>	 <p>Background</p>	 <p>Problems</p>	 <p>Solution</p>	 <p>Solution (cont.)</p>	 <p>end message to Students</p>
⏮ :06 1	⏮ :14 2	⏮ :26 3	⏮ :27 4	⏮ :52 5	⏮ :48 6	⏮ 01:00 7
 <p>Example in the Steins</p>	 <p>Complex variables - (Advanced)</p>	 <p>Differentiation and Integration - (Advanced)</p>	 <p>Differentiation and Integration - PSpice</p>	 <p>Laplace Transforms</p>	 <p>Theoretical Solution vs. Probe</p>	 <p>Using Laplace in PSpice</p>
⏮ :30 8	⏮ 01:11 9	⏮ :33 10	⏮ 01:03 11	⏮ :47 12	⏮ :53 13	⏮ :56 14
 <p>Laplace Transforms to (Advanced)</p>	 <p>Steady-State Circuit - PSpice</p>	 <p>Solve (cont. - Probe)</p>	 <p>Fourier analysis - PSpice</p>	 <p>Filter analysis with PSpice</p>	 <p>Transform analysis with PSpice</p>	 <p>Source comments</p>
⏮ :56 15	⏮ :26 16	⏮ :24 17	⏮ :48 18	⏮ :42 19	⏮ :18 20	⏮ :54 21
 <p>Summary</p>	 <p>The End</p>					
⏮ :31 22	⏮ :01 23					

Starting a New Slide

- New topic means new slide
 - Want to reinforce spoken word with visuals (Demo)
- Remember, people learn in a presentation



By seeing



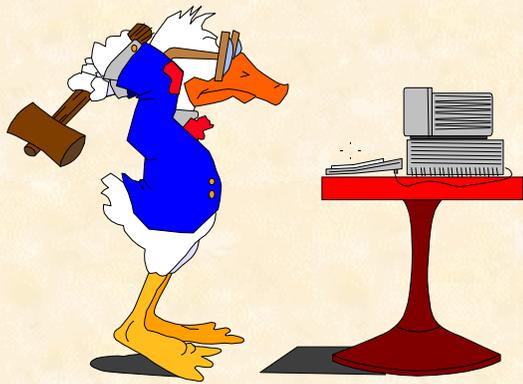
By hearing



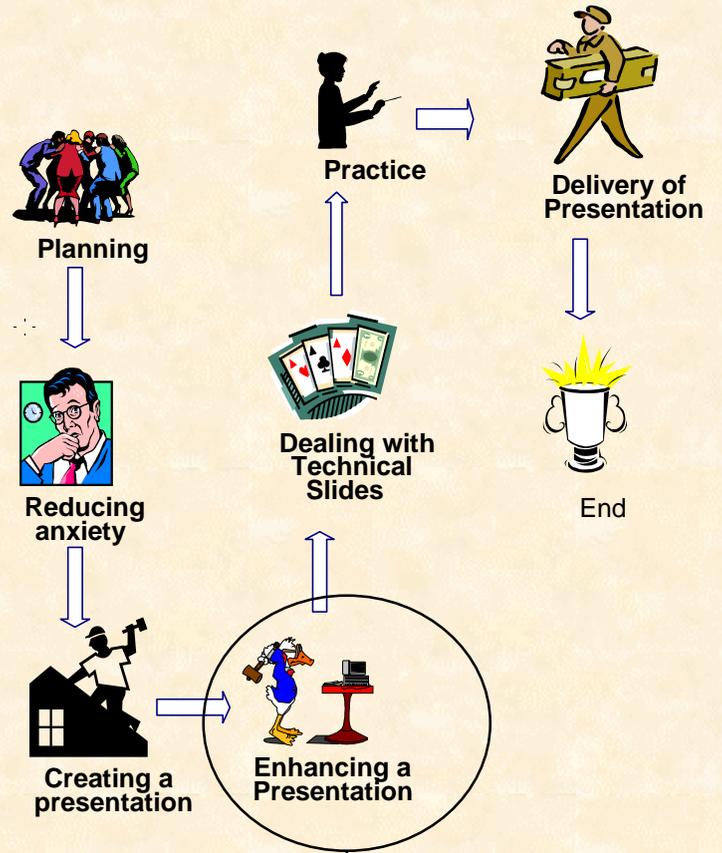
By writing

Numbering Slides

- Important for overheads
 - Problem if dropped or not sorted properly
 - Usually in footer
- Don't number title slide
 - Option in PowerPoint



Enhancing a Presentation



Vary the slide style and look

- Mix up styles of slides
 - Use graphs, clipart, org charts, two column text
 - Use different text style or bullet styles for emphasis
 - Don't get carried away with too many styles
 - Sometimes, don't use bullets
 - Use sufficient size font for the room you are in

Remember, substance over style

But style counts



Fonts

- Different type
 - Serif (Times Roman, Garamond)
 - Better for writing
 - Sans-Serif (Arial, Tahoma)
 - Better for display
 - Still use Times Roman
 - Headline (Braggadicio, Swiss 721)
 - Either media
- Within same font
 - size **size**
 - **Bold, *Italicize*, Shadow**
 - Space between letters
S I Z E
 - **Color**
 - **Be careful**

Font Size

- Use different font sizes for sub-bullets
 - From 3-4 points smaller than the main bullet
- In this presentation main bullets are 28 points
 - Sub-bullets (second level) are 24 points and blue
 - Third level is 20 points
 - 72 points = 1 inch

Templates

- Applies color, font style and size, and color background
 - Applies to all slides
 - Can change at any time
 - Be careful about changing too far into presentation
 - Word spacing
 - Can modify all with Master View
- Some templates are not as easy to view as others
 - Background color and font size
 - Can modify specific slides with background/fonts

Same Slide with different Template

- Applies color, font style and size, and color background
 - Can change at any time
 - Be careful about changing too far into presentation
- Some templates are not as easy to view as others

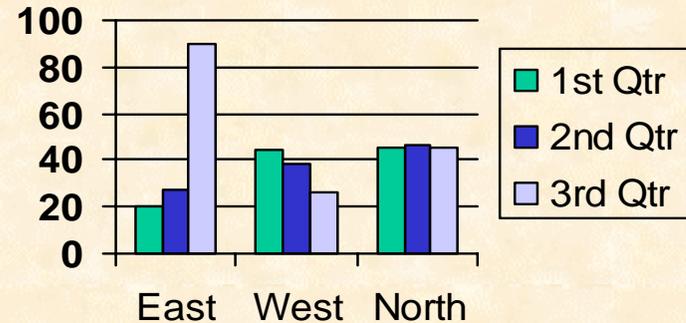
TITLE MOST PEOPLE LIKE
Title Most People Should Use

Use Case Sensitive for Titles

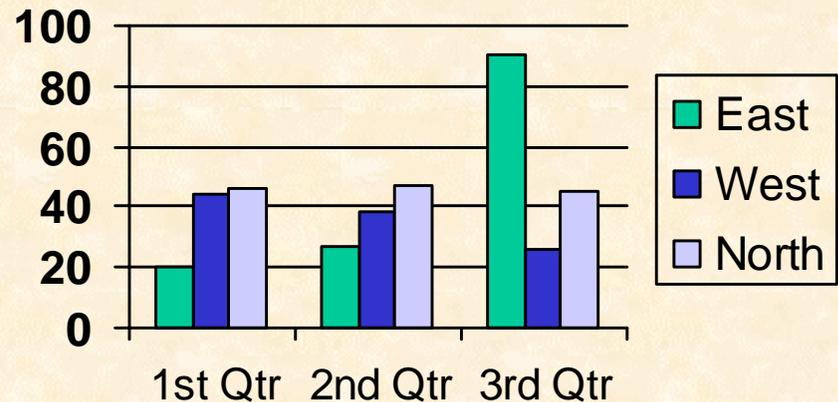
- PUT THE MAIN BULLET IN CAPS
- Put the main bullet in Caps
- Don't use too small a bullet (24 point)
 - This is smaller (16 point)
 - This is great for reading (11 point)

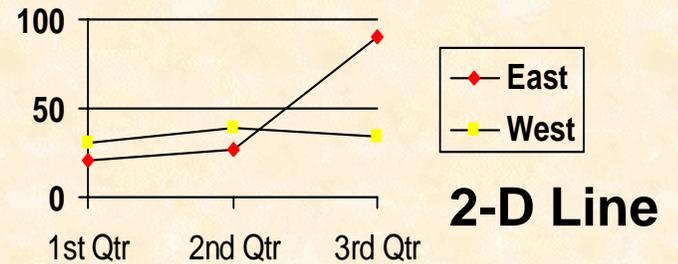
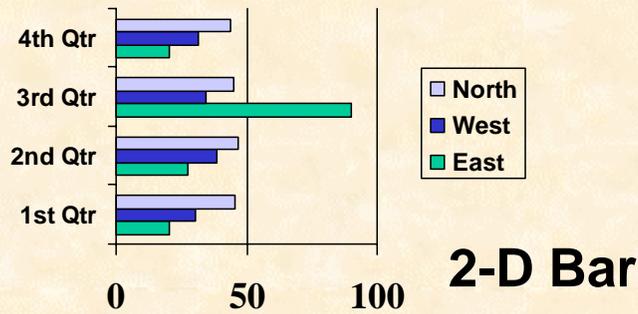
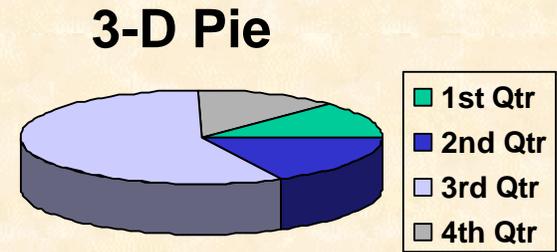
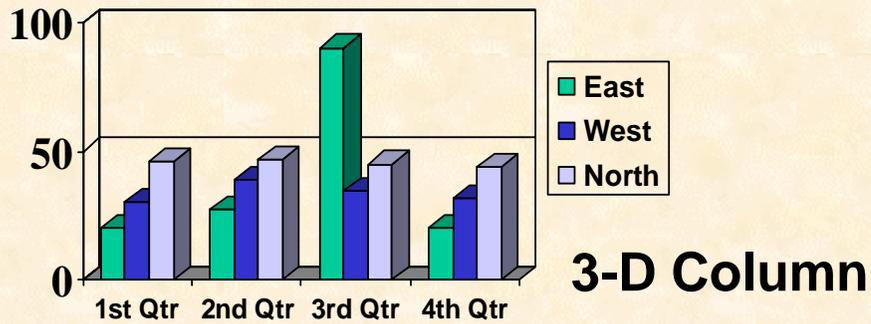
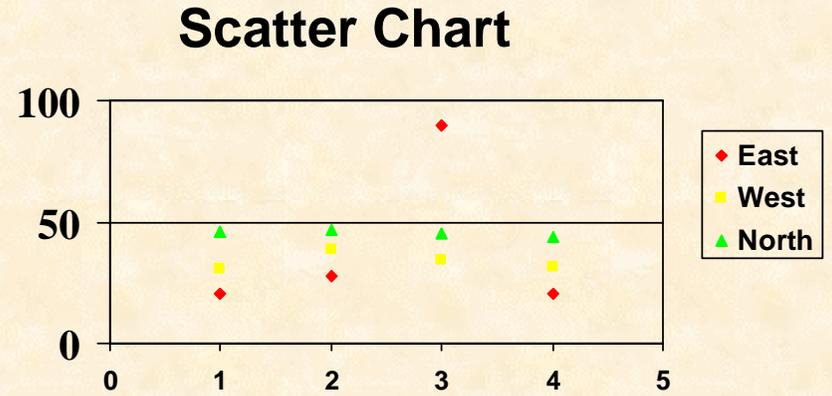
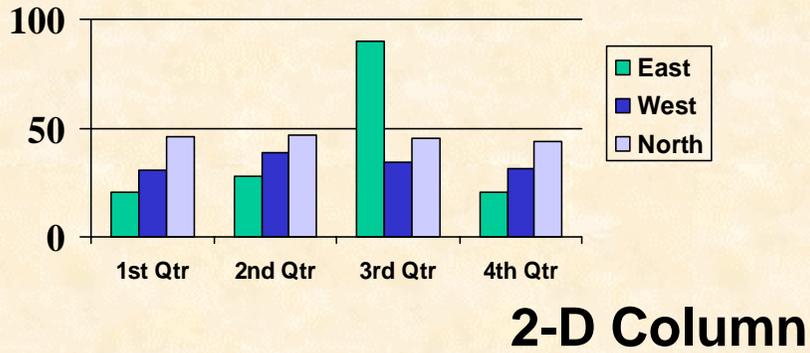
Graphs- for enhancing data

- The Eastern area has achieved significant growth over the year



- The Western area is not contributing enough in the 3rd Quarter





Graph Hints

- Use Excel for most graphing
 - Can create graph in PowerPoint (difficult)
 - Have more choices in Excel
- Paste or Paste Link from Excel
- Can do same thing with other graphing apps
 - Sigma Plot, Axum

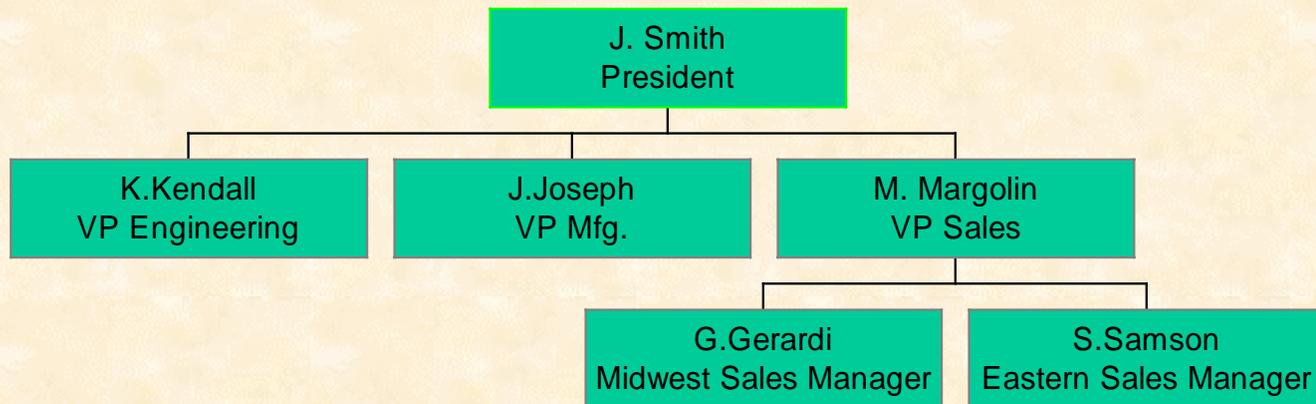
Organizational layout (wrong way)

- J. Smith is President
- Reporting to J. Smith is
 - K. Kendall (VP Engineering)
 - J. Joseph (VP Mfg.)
 - M. Margolin (VP Sales)
- Reporting to M. Margolin
 - G. Gerardi (Midwest Sales Manager)
 - S. Samson (Eastern Sales Manager)

Org Charts

(Better than words)

ABC Organization- Top Level



Even better is using Visio and copying/pasting

Bullet Styles

✓ Bullets can be different



Be careful not to get carried away

😊 Bullets can be fun

☹️ Bullets can be sad

Relate bullet shape to words

Can have two columns of bullets

Advantages

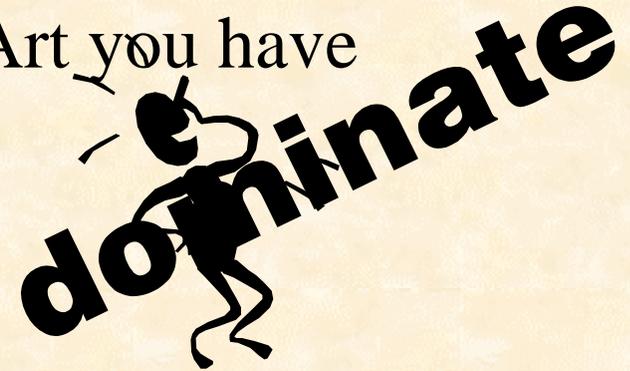
- Lower price
- Better warranty
- 800 number for service
- 5 years in business

Disadvantages

- Perceived as lower quality
- No in-house service
- Parts hard to find

Using Clip Art

- Need to understand what Clip Art you have
 - Can be humorous
 - Be careful about being offensive
 - Can be used to illustrate a point
- Either place Clip Art while creating or go back
- Additional Clip Art from CD's or Internet
- The visuals should support and supplement your presentation



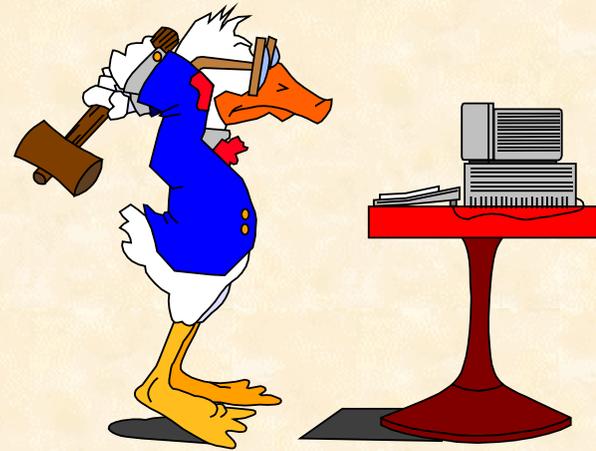
They should not dominate

Frustration with Computers

- People need to take time to understand computer programs
 - Should not get frustrated
 - Occasionally you will
- Remember the cost of a broken computer

Frustration with Computers

- People need to take time to understand computer programs
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- Remember the cost of a broken computer



Growth of Women in Engineering

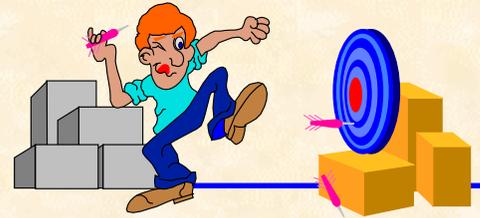
- There has been significant growth over the last 10 years



Other Clip Art from PowerPoint



Stability of Systems



On target with the answer



Need to investigate



Sometimes, just guess

ClipArt/Photos from the Internet



- Go to my home page
 - <http://www-ec.njit.edu/~rockland/>
 - Go to the Links subpage
 - Have a number of links to pictures and clipArt on the Internet
 - AltaVista Photofinder, Scour.Net
 - When get to clipArt you like, right click mouse button
 - Click on Save Image As
 - Be careful about copyright infringement

Clip Art Links

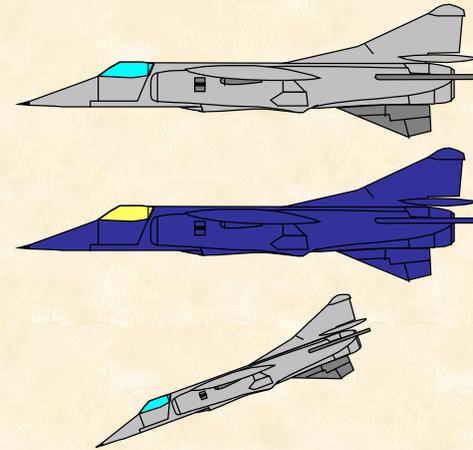
Website	Description
http://www.altavista.com/cgi-bin/query?pg=q&styp=siimage	Alta Vista, which is a search engine, has an excellent image search capability, and is very quick
http://www.scour.com/	Scour Inc. is a multimedia search engine.
http://www.webshots.com/	Webshot is an image search engine that is part of the Excite search group
http://www.clipartguide.com/	The Whole Internet Clipart Guide is a source of links to other sites that contain clip art
http://desktoppublishing.com/cliplist.html	A site called Image Paradise provides images for non-commercial use as well as extensive links to other sites

Final Words on Clip Art

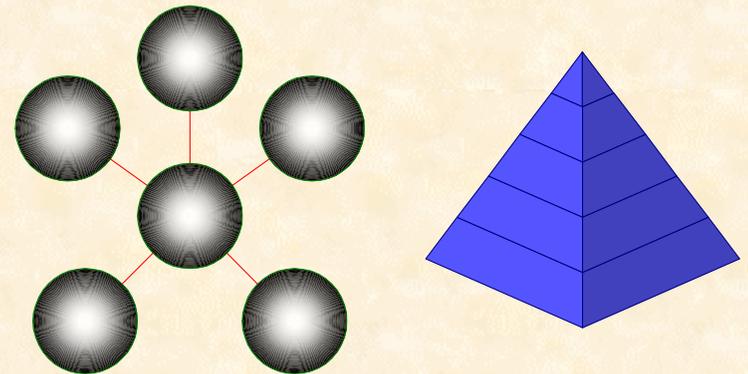
- PowerPoint 2000 not complete
 - Better clip art with PowerPoint 97
 - Can use 2nd CD with Office 2000
- Can have sound or movies
 - Automated gif run (from gallery) in Slide show view
 - Other animation need to click
 - Sound can be either way
- Can modify clipart
 - Ungroup and manipulate

Creating graphic

- Combine clipart
 - Use recolor or ungroup/regroup to modify clipart

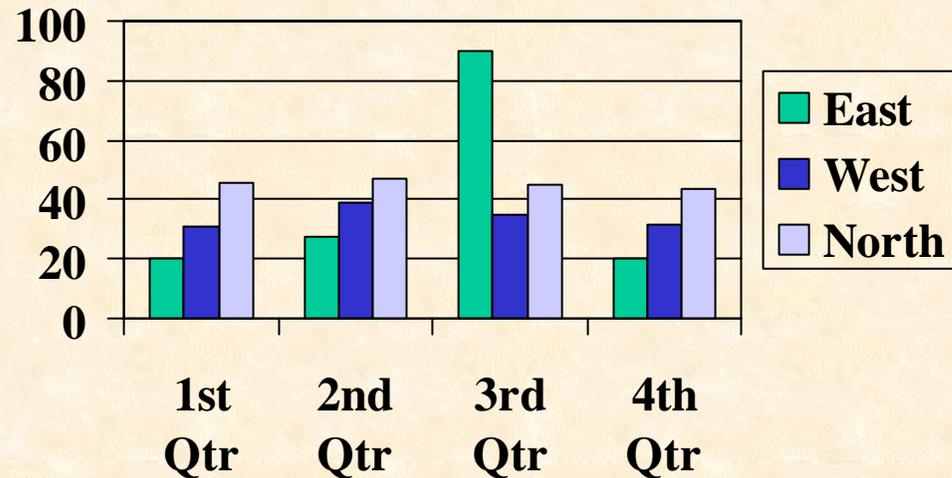


- Use program such as Visio
 - Marketing type of diagrams



Bullet Animation

- Use build effects if using LCD or projector
 - Can use different colors on recent vs. old bullets
 - Cover up past points if using overheads (not best)
- Charts can also be animated



Builds



- Control over what audience sees
- Either main bullets or sub-bullets
- Can change color of last bullet
 - Shows that bullet is there, but can't see it
- Similar to way presenter writes
 - One line at a time

When not to use builds...

- Talk about bullets for just a few seconds
- Vary once in a while
- Only have 3 or 4 bullets
- Two column bullets - grouping

Custom Builds

- Normally have one text area
 - Bullets build by main bullet or secondary bullet
- Can duplicate text areas
 - Especially when varied sub-bullets and dimming

Slide without Build

Advantages

- Lower price
- Smaller profile
- Better warranty

Disadvantages

- Small company
- Limited service group
- Last to market

Slide with Build

Advantages

- Lower price
- Smaller profile
- Better warranty

Disadvantages

- Small company
- Limited service group
- Last to market

Slide Transitions

- Use transition effects if using projector
 - Be careful that they are long enough and interesting
 - Can use sound as effects- don't overuse
- Advance slide with mouse/keyboard
 - Page Up/Page Down or left mouse
- Best to use at different sections
 - Can use color for different sections
- For overhead, use flipchart or whiteboard
- Blank screen (Shift-B)



Can also use right mouse button for emphasis

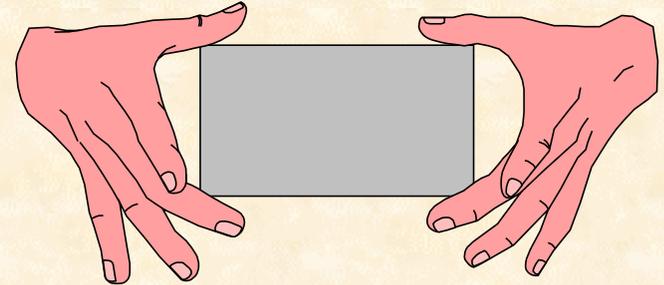
Don't get carried away

Spelling/Punctuation



- Spell check
 - Just as easy to make a mistake in a few slides
 - Use SpellCheck at very end
- Be consistent with punctuation
 - Periods or no periods

Audience Handouts



- Helps focus audience to you
 - Give out either before or after
 - Print out 6 per slide
 - Can also Send to.. Microsoft Word
 - Incorporate with .pdf format
- Be careful about reverse print
 - Especially when using tables and printing handout

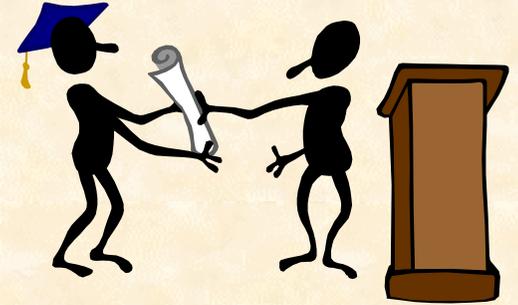
Table with White Font Color

Student	Test 1	Test 2
J. Smith	80	85
K. Kline	90	65

Table Appearance in Handout

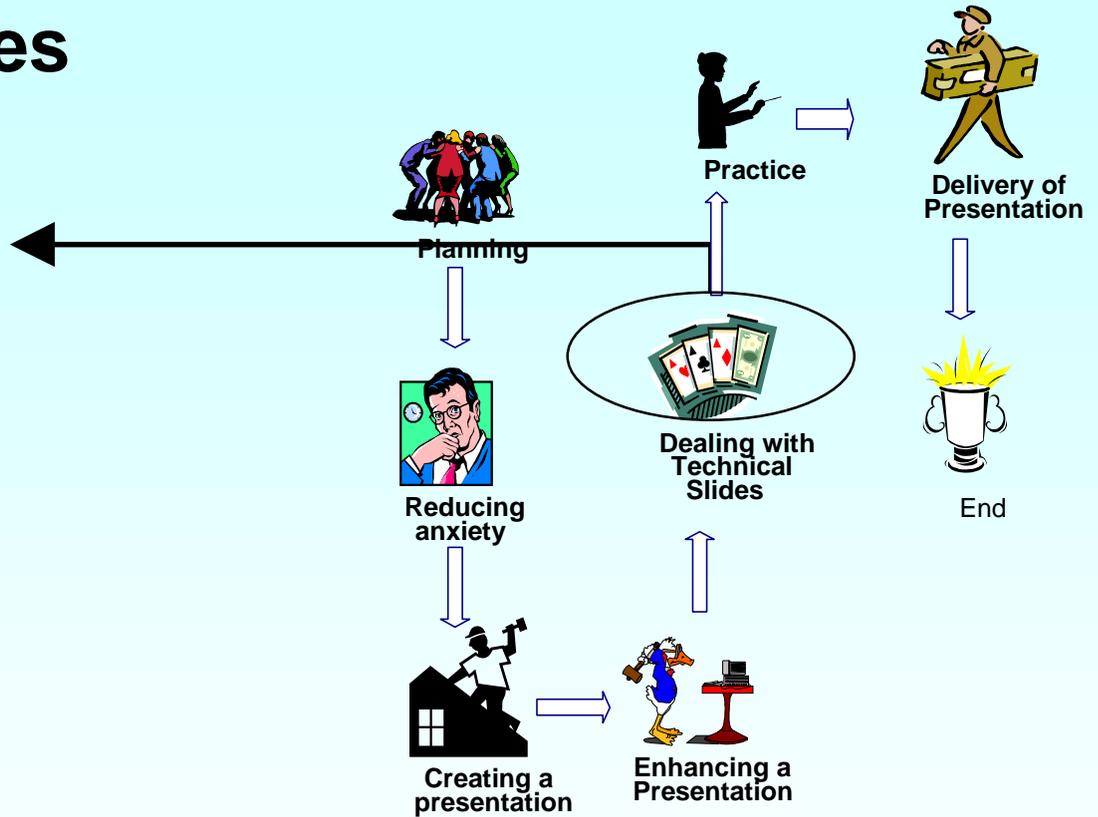
Student	Test 1	Test 2
J. Smith	80	85
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The Closing



- End should include summary slide
 - Key points
 - Conclusion
 - Relevant to audience
- Describe future options (if applicable)
 - Or a future strategy, plan and/or goal
- Last slide could be Thank You- with graphics

Dealing with technical slides



Technical Drawings

- Don't show detailed drawing
 - Hard to see
 - Spend too much time on slide

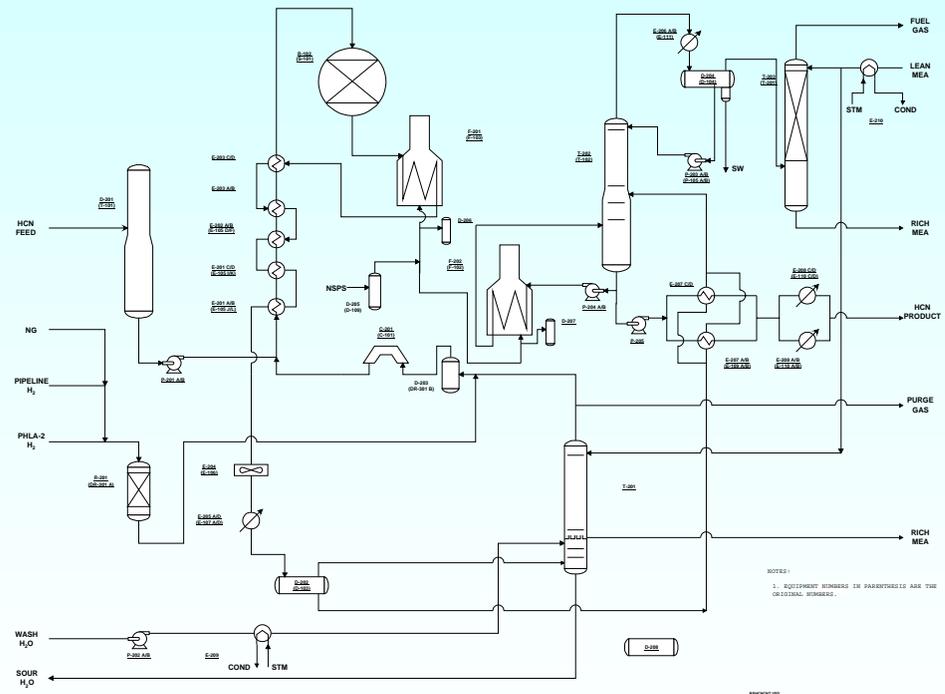


- Break up into multiple slides



Detailed Drawing

- Hard to read



Using Images

- Can get from Internet or scanner
 - Be careful of copyright laws
 - For Internet
 - Click on right mouse button, and either View image or Save Image As...
 - Save in file and use Insert...Picture... File
- Use bullets under or to the side of image to explain
 - Don't leave the image alone

State of the Art in Oscilloscopes



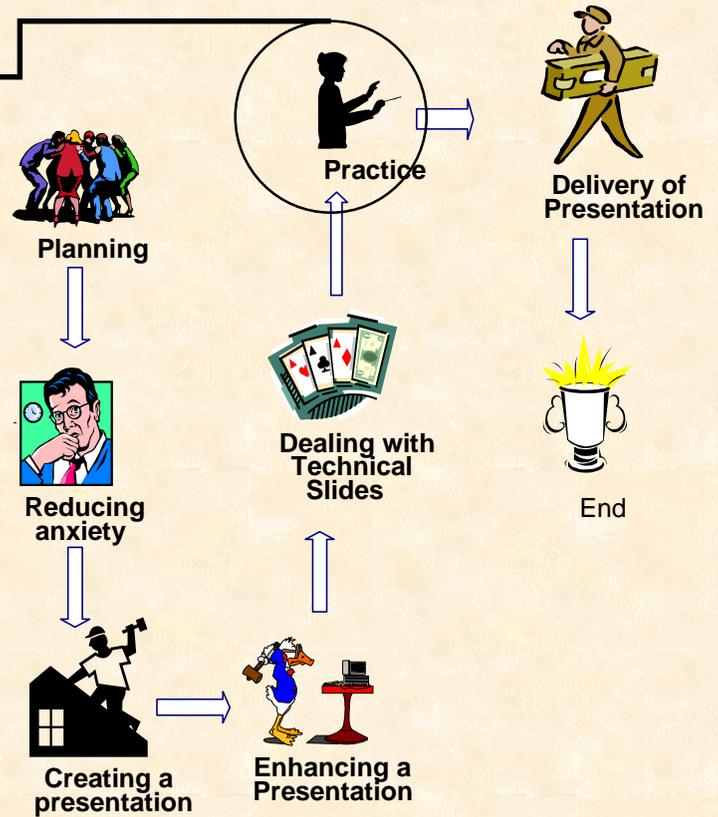
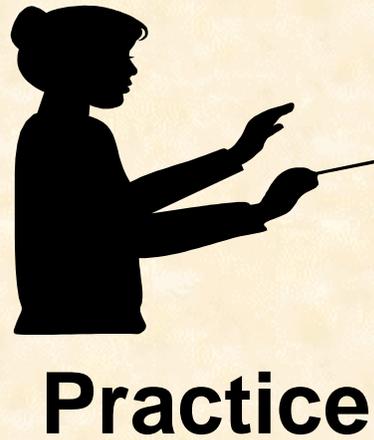
- Infinium is a 2 channel, 500 MHz oscilloscope from HP
 - 1-GSa/s sample rates
 - Simple, analog-like front panel
 - Windows® 95-based graphical user interface
 - Built-in information system

Using Equations

Average = $1/T * \int(x(t)dt)$ [from 0 to T]

$$\text{Average} = \frac{1}{T} \int_0^T x(t) dt$$

- Use Equation Editor - looks better
 - Or more powerful program [MathType](#)
 - Use in conjunction with bullets or standalone
- Use with Insert...Object command
 - [Have free standing text](#)
 - Will have to resize and move
 - [Copy/Paste to another slide](#)

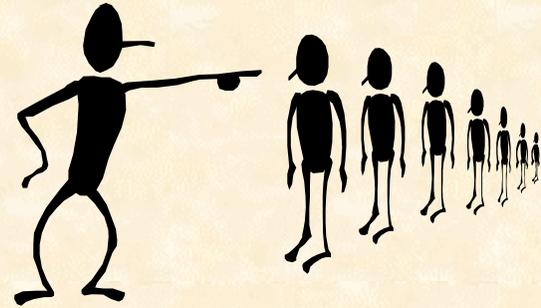


Concepts of Practicing



- Practice at least 5-6 times
- Wait at least one or two days between reviews
- Practice in front of computer (simulation)
- What questions will audience ask?
 - Anticipate and put in presentation
- Can use video or audience after 3rd or 4th practice

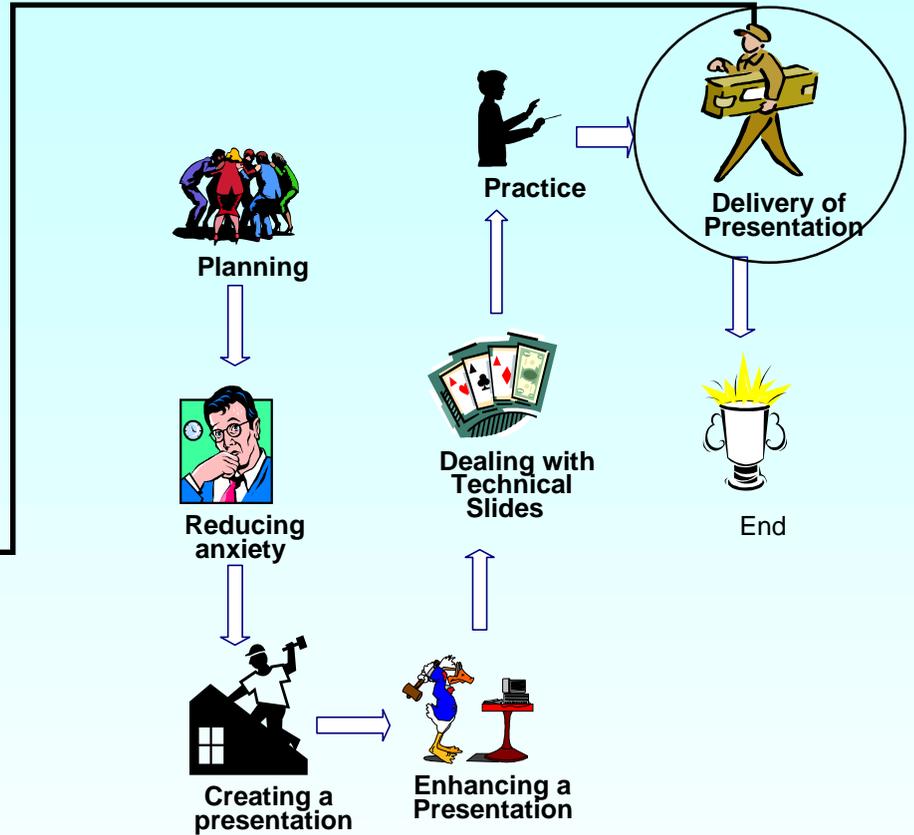
Review Paradigm



- ① Missing slides and general flow (quick review)
- ② Problem words (talk)
- ② Adding bullets/sub-bullets
- ③ Eye appeal and logical flow (modify style)
- ④ Clip art placement (or other visuals)
- ⑤ Trial practice with timing (last minute corrections)
- ⑥ Final practice/spell check



Delivery of Presentation



Use Voice Effectively



- Project voice
 - Face audience, not screen
- Voice inflection should vary
 - Visual complements audible
 - Think of Ben Stein
- Use pauses
- Enunciate

Eliminate Filler Words

Um

OK

Yes

You know

Pause, don't speak

Use your body effectively

- Don't lean on desk
 - Posture erect



- Relax hands, broad gestures

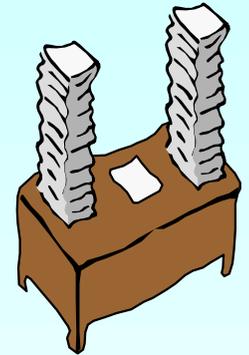


- Avoid talking with hands
 - Emphasize points only

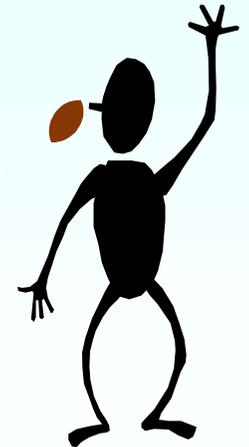


Placement of overheads/others

- Place overheads close to speaker
 - Have good transition



- Don't stand in front of overhead
 - Two B's (blinded and block)



Stand near computer to change for slide show

- Can use left mouse button
 - Don't sit

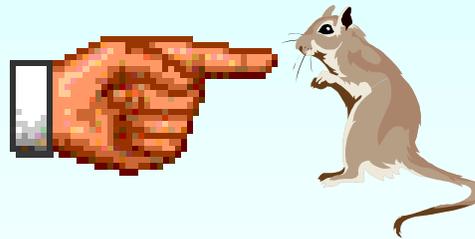


Pointing out main ideas

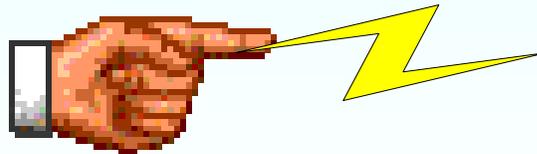
- Finger Pointing



- Mouse Pointing



- Laser Pointing

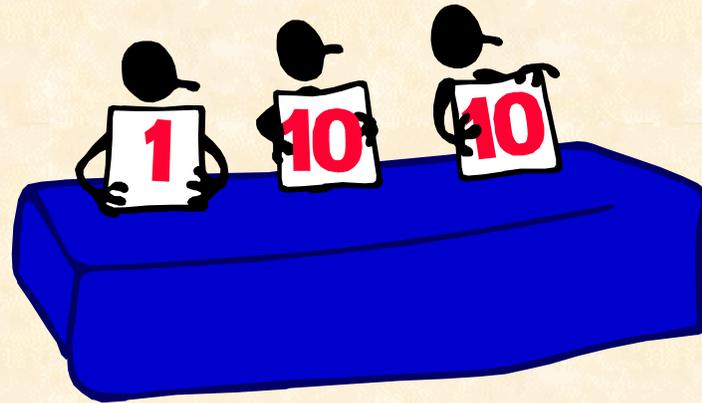


“For very important talks, always have overheads as backups – for when you don’t, that is the time the computer will crash”

Murphy’s 3rd Law of Presentation

Summary

- Presented 7 main areas on technical presentations
- Know how to present AND know how to use application
 - Both are important
- Practice is the key



The End

