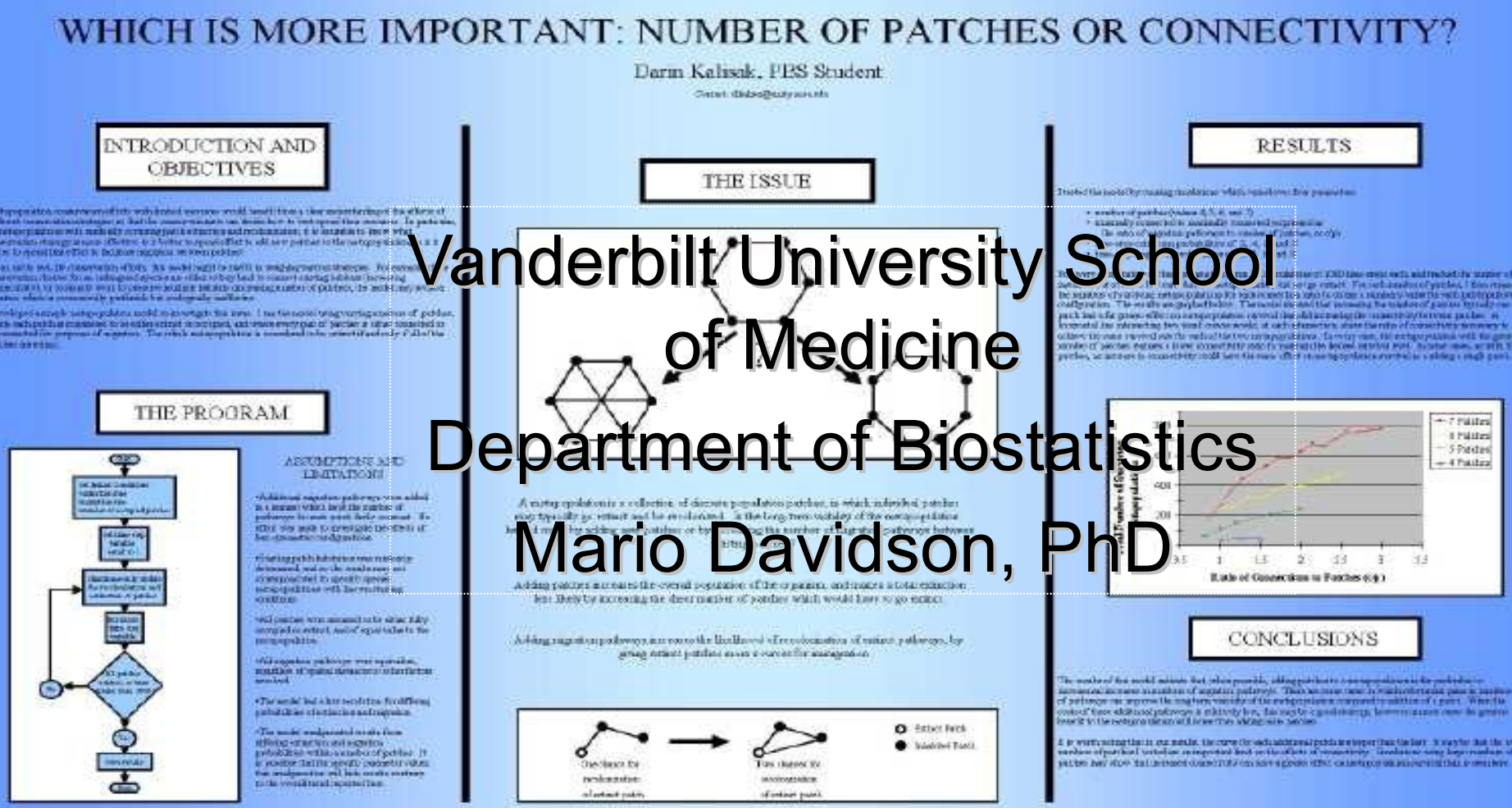
Creating Effective and Visually Attractive Scientific Posters: Making People Stop!



Vanderbilt University School of Medicine

Department of Biostatistics

Mario Davidson, PhD

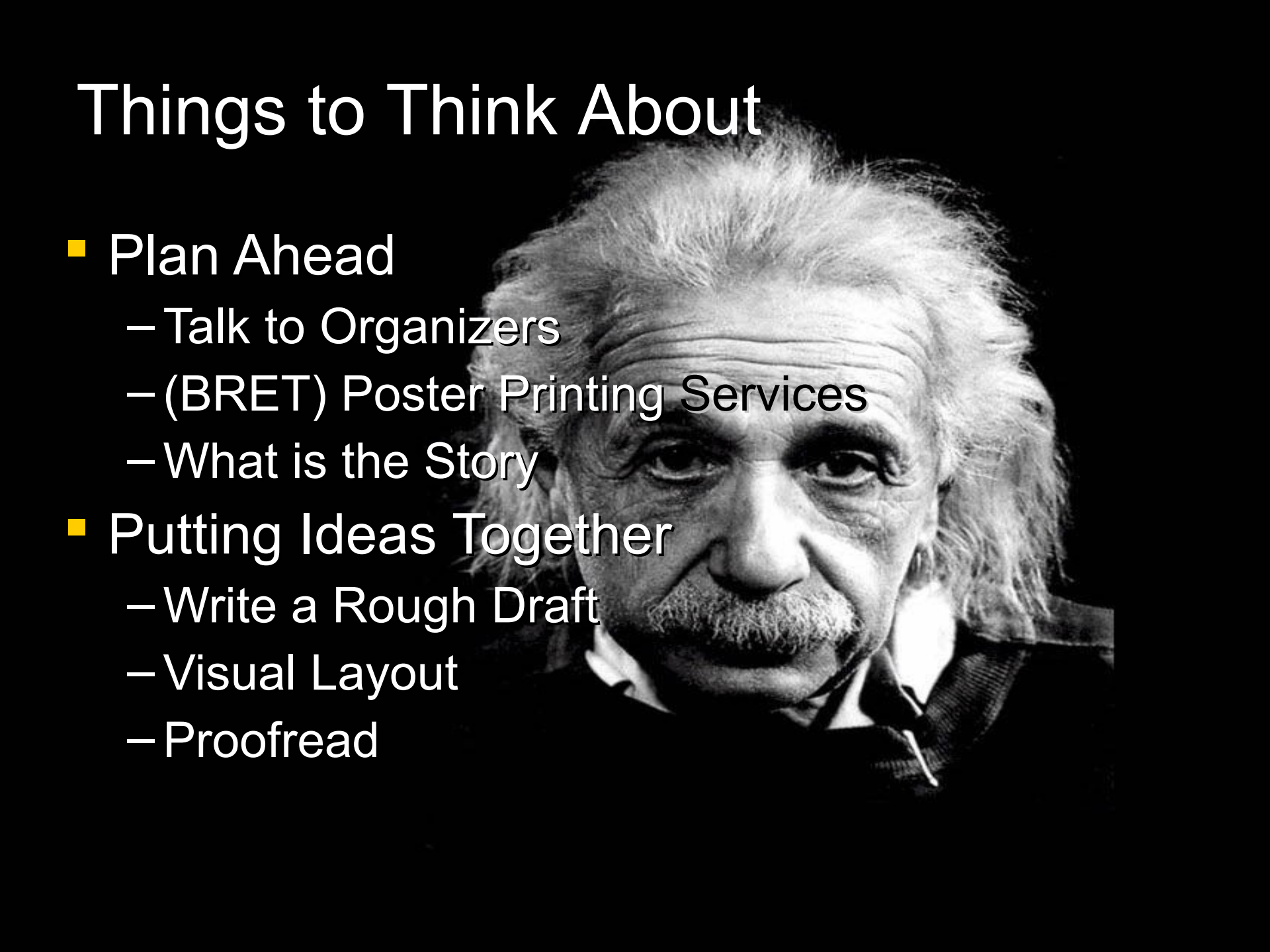
Introduction

- Purpose
- Things to Think About
- Advise and Feedback
- Poster Evaluation
- Presenting

Purpose

- Display Research
- Recognition & Notoriety
- Provides Venue for Future Ideas

Things to Think About



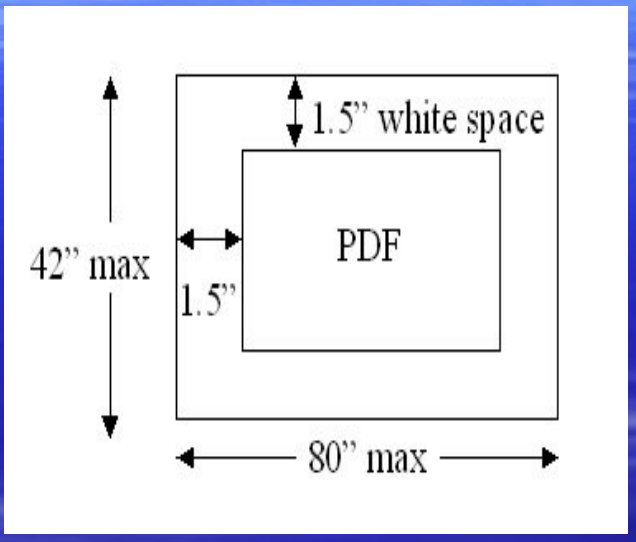
- Plan Ahead
  - Talk to Organizers
  - (BRET) Poster Printing Services
  - What is the Story
- Putting Ideas Together
  - Write a Rough Draft
  - Visual Layout
  - Proofread

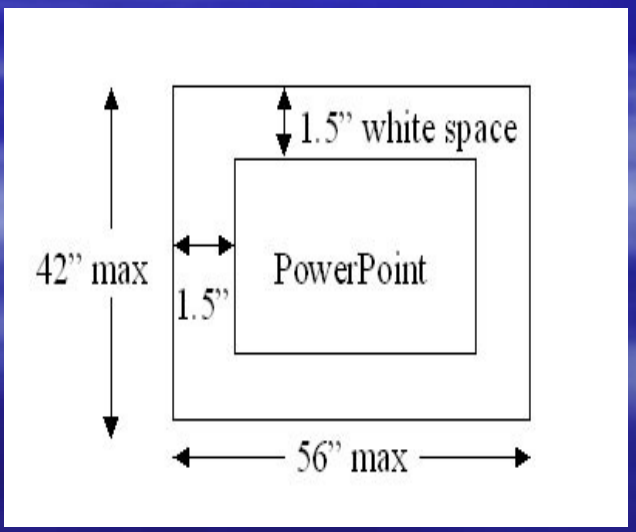
Plan Ahead: Talk To Organizers

- Format
- Previous Successful Posters
- Type of Audience

Plan Ahead: (BRET) Poster Printing Service

- Drop-Off Location
  - 307 Light Hall
  - M – F; 8:30 - 4:30
- Submit Poster Request Form
- Allow Two Business Days
- Margin Requirements
- Special Characters
- Text Boxes on the Page
- Use a Graphics Program
- Acquire a Poster Tube





Plan Ahead: What is the Story

- Make Your Story Interesting for Mixed Audiences
- Be Creative
- Short Time to Grab Attention

Putting Ideas Together: Write a Rough Draft

- Create a Working Title
- Focused Ideas
- Headings
- Order Ideas Logically
- Background
- Methods
- Results
- Conclusion
- Author Identification

Putting Ideas Together: Fonts & Text

- Poster should be readable from 4-8 ft
- Title should be at least 48
- Text should be at least 36 points
- Headers should be larger than the text but smaller than the title or bordered
- Avoid script fonts and italicize
- Avoid equations
- Bullets vs. Paragraphs

Putting Ideas Together: Visual Layout

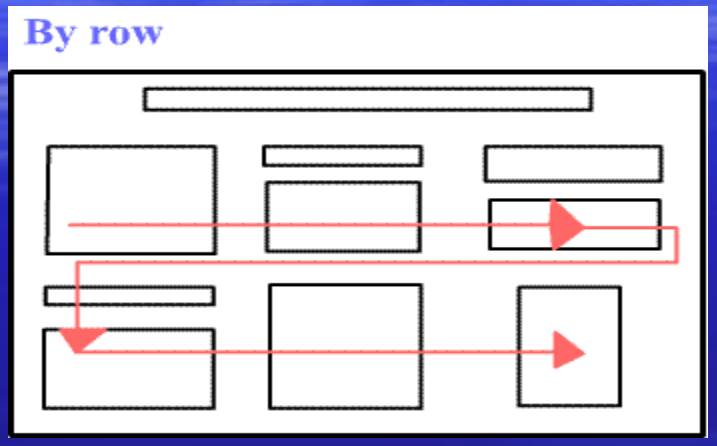
- Effective Visuals
- Try Different Layouts
- Make Appealing to the Eye
- Colors and White Space
- Color schemes
  http://colorschemedesigner.com/
  Google “color schemes”
- Size
- High Quality Resolution

Putting Ideas Together: Visual Layout

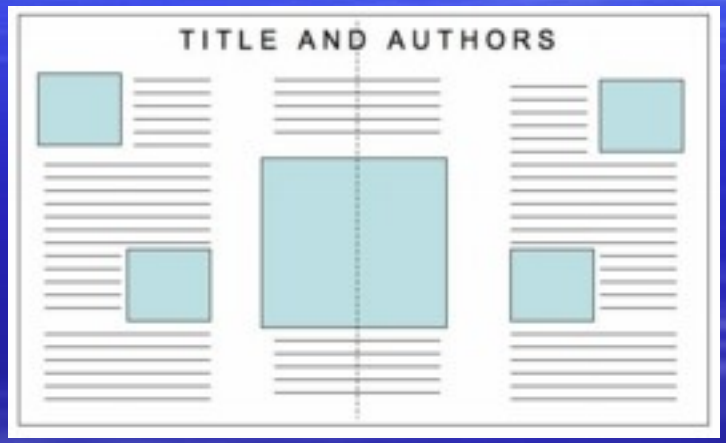
- Search with “Creative Commons”
- commons.wikimedia.org/wiki/Main_Page
- www.flickr.com
- gettyimages.com
- spffy.com

Visual Layout

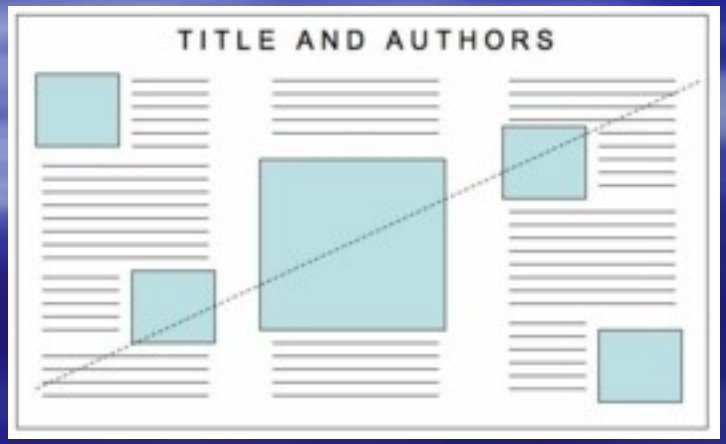
Left to Right



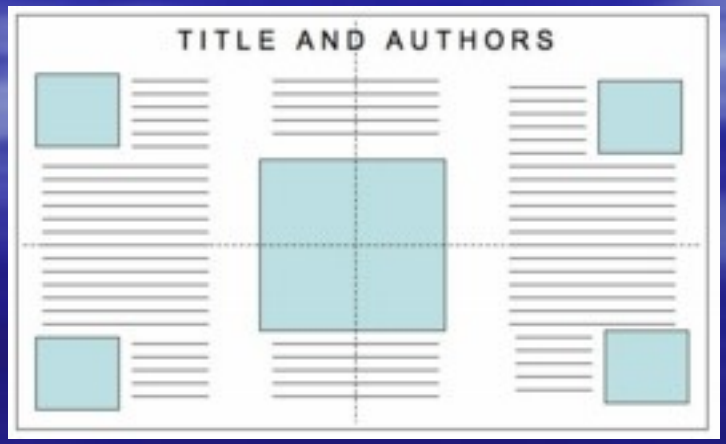
Horizontal Symmetry



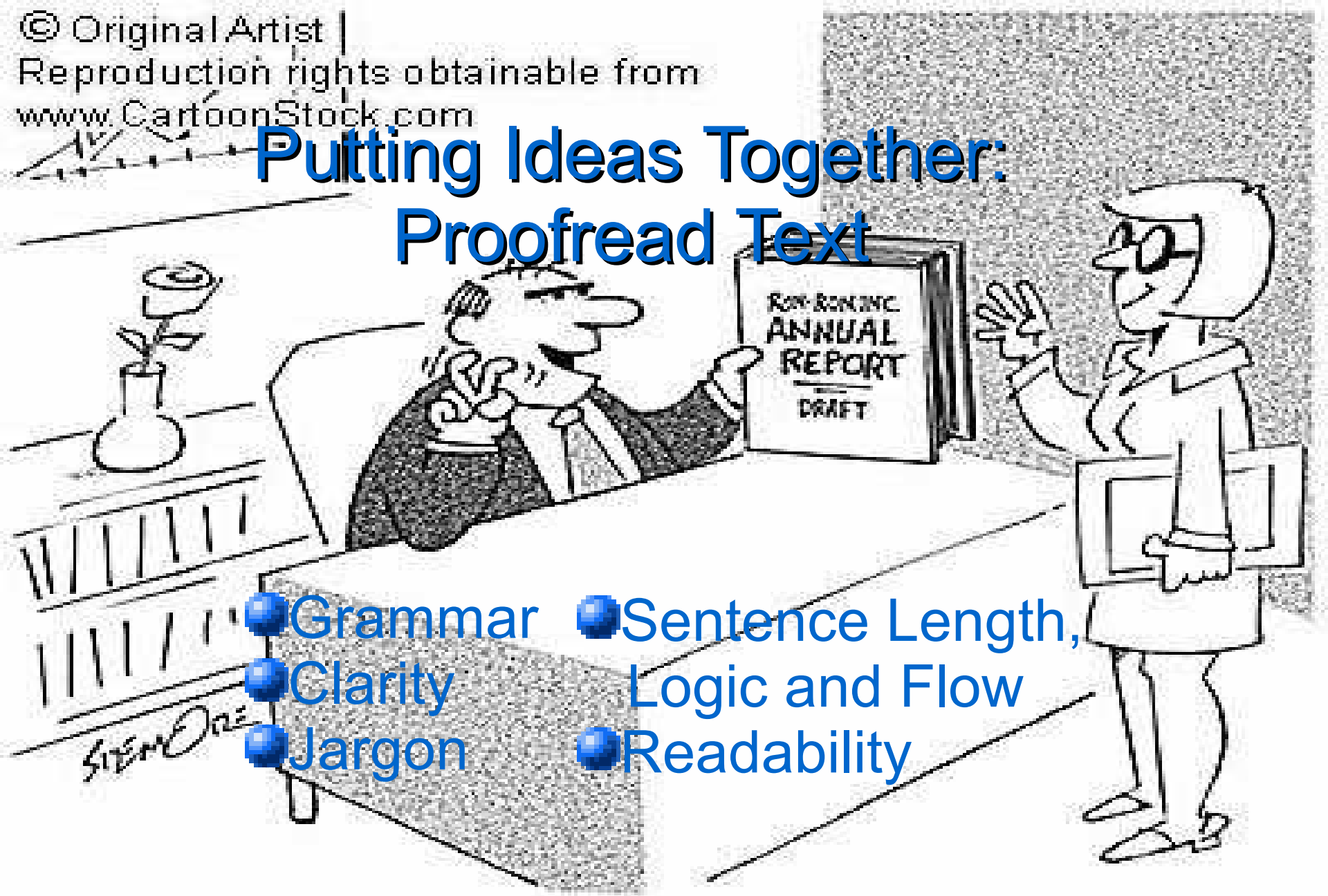
Diagonal Symmetry



Horizontal and Vertical Symmetry



Putting Ideas Together: Proofread Text



- Grammar
- Clarity
- Jargon
- Sentence Length, Logic and Flow
- Readability

"Don't laugh Ms. Newborn, but I want you to proof this for 'accuracy'."

Web-based teaching modules for plant pathology applications in the R programming environment

A. H. Sparks, P. D. Esker, K. A. Garrett, Dept. of Plant Pathology, Kansas State University, Manhattan, KS

What is R?

Web-based teaching modules

Objectives

Development of an Educational Web Site for Swine Lameness

Luke Bely, Laura Kovar, Elisha Lim, Alex Sellenberg, Terry Borrow

Abstract

Procedure

Introduction

Results

References

Can Suburban Greenways Provide High Quality Bird Habitat?

George R. Hess :: NC State University :: Department of Forestry & Environmental Resources :: Raleigh, NC 27695-8002 USA :: george_hess@ncsu.edu
Christopher E. Moorman, Jamie H. Mason, Kristen E. Sinclair, Salina K. Kohut :: NC State University :: Department of Forestry & Environmental Resources
www4.ncsu.edu/~grhess/GreenwaysForWildlife

Birds of Conservation Concern in Decline

- Many bird species of conservation concern – including neotropical migrants, insectivores, and forest-interior specialists – decline with increasing human development
- Greenways might mitigate this effect
- Habitat patch size, vegetation composition & structure, and landscape context are key factors
- Standards are lacking for designing and managing suburban greenways as high quality habitat

Objective: Greenways for the Birds

- Determine how development-sensitive forest birds are affected by
  - forested corridor width
  - adjacent development intensity
  - vegetation composition & structure
- Develop recommendations for greenway designers and planners

Study Design & Independent Variables

- Sampled 34 - 300m corridors in Raleigh & Cary, NC, USA
- Sampled range of
  - Forested corridor widths (20 – 1,200m)
  - Adjacent density (low density residential – office/commercial)
- Additional measures
  - Vegetation composition & structure in corridor
  - Land cover in 300m x 300m adjacent to corridor (context)
- Measured richness & abundance of
  - Breeding birds
  - Neotropical migrant birds during stopovers
  - Mammal nest predators

Breeding Birds of Concern More Common in Wider Greenways with Less Managed Area Surrounded by More Forest Canopy

- 8-minute, 50m point counts at center of corridor
- Revisited 4 times during breeding season

Mostly suburban adapters (omnivores)
Some insectivores
Some interior, area-sensitive species
Interior, ground-nesters
0 50 100 300
Forested Corridor Width (m)

Significant Predictors for Breeder Abundance

Greenway:
(–) Managed Area
(+)Shrub Cover

Adjacent Landscape:
(+) Canopy Cover
(–) Building Density
(–) Bare Earth

Spring Neotropical Migrant Stopovers More Common in Wider Greenways with More, Taller Hardwood Trees

- 200m x 25m transects along one side of greenway path
- Revisited sites for two spring seasons and one fall season
- Width *not* significant, but trend consistent with other findings

Migrant Species Richness per Visit
Migrant Species Abundance per Visit
0-75 m 76-150 m >150 m Reference
Forested Corridor Width

Significant Predictors for Spring Migrant Abundance

Greenway:
(+) % Hardwoods
(+) Canopy Height

Adjacent Landscape:
(–) Bare Earth

Predators Less Common in Wider Greenways with Narrower Paths

- Five baited scent stations along each greenway segment
- Observed for 5 nights each

Bait
Raccoon
Cat
Tracks
Scent-station

Significant Predictors for Predator Abundance

Greenway:
(–) Corridor width
(+) Trail width
(+) Mature forest
(+) Ground cover
(–) Vine cover

Adjacent Landscape:
(–) Building density

Greenways for Development-Sensitive Forest Birds Might Conflict with Intense Recreational Use

People & Managers Prefer …

- Good for walking, running, cycling, strollers, wheelchairs
- Easier to maintain, especially with higher intensity use

Forest Birds Prefer …

- Narrow path avoids splitting forested corridor
- Discourages heavy human use
- Fewer nest predators

Potential Solution: Wide Corridor, Trail Near Edge

- Make corridors at least 50m wide; wider is better
- Don't split forested corridor
  - Keep trails as narrow as possible
  - Avoid wide grassy areas along trails within forested corridor
  - Locate trails near the edge of forested corridors

ID #: 192407

EXPLORING CELLULAR TENSEGRITY: PHYSICAL MODELING AND COMPUTATIONAL SIMULATION

STANFORD UNIVERSITY
Chun hua Zheng[†], Joseph Doll [†], Emily Gu [†], Elizabeth Hager-Barnard [†], Zubin Huang[†], AmirAli Kia[†], Monica Ortiz [*], Bryan Petzold[†], Takane Usui[†], Ronald Kwon[†], Christopher Jacobs[†*], Ellen Kuhl[†*]
[†]Mechanical Engineering, [*]Materials Science and Engineering, [*]Bioengineering -- Stanford University, Stanford, CA

Introduction

Tensegrity

The word tensegrity was coined by Buckminster Fuller to describe structures in which continuous tension in their members forms the basis for structural integrity. This structural integrity is created through the dynamic distribution of tensile and compressive forces amongst members.

Fuller most famously demonstrated the concept of tensegrity in architecture through the design of geodesic domes while his student Kenneth Snelson applied the concept of tensegrity to sculpture (Fig. 1). The structural efficiency and dynamic force balance properties of tensegrity have inspired its adoption as a paradigm for analyzing cell structure and mechanics.

Figure 1. Tensegrity structures: Fuller's geodesic dome, Snelson's sculpture 'Mozart', elastic-wood model, and fibroblast cytoskeleton

Cellular Tensegrity Model

The cellular tensegrity model aims to explain intracellular and extracellular processes via a biomechanics viewpoint. The model uses three distinct biopolymers to describe cell cytoskeletal structure. These three biopolymers work in conjunction to provide structure and support for the cell and its internal organelles (Fig. 2).

microfilaments microtubules intermediate filaments

Figure 2. Structural biopolymers found within the cell cytoskeleton

1. Microfilaments – Thin tension members (5-9 nm diameter), observed as straight and taut *in vivo*
2. Microtubules – Hollow tubular compression members that are the largest of the three biopolymers (25 nm diameter) and mechanically the stiffest
3. Intermediate filaments – Highly flexible and extensible members that act like guy wires (10 nm diameter), keeping individual microtubules from buckling

Purpose

Motivated by the simple mechanical elegance of the tensegrity model, this study investigates cellular tensegrity by creating physical models and computational models that are analyzed for structural integrity and design efficiency.

The goal of this study is to gain a preliminary understanding of how tensegrity structures physically respond to external loading, use this learning to analyze the response characteristics of different tensegrity forms and to draw parallels between these observations and cell mechanics.

References

[1] Ingber SA 1998. [2] Ingber JCS 2003. [3] Ingber JCS 2003. [4] Chen+ O&C 1999.

Models

Physical Models

Physical tensegrity models were built using wooden struts and elastic bands (Fig. 3). Varying numbers of compression and tension members were used to achieve different structures with unique mechanical properties.

Figure 3. Physical tensegrity cell models built using compressive wooden struts and tensile elastic bands.

Computational Models

Computational models of were created in Matlab (Fig. 4). Tensile, compressive and shear stiffness, as well as structural efficiency were calculated using nonlinear finite element based analysis (Fig. 5).

Figure 4. Cell membrane and intracellular structural models.

Figure 5. Computational analysis of tensegrity cells designed using compressive microtubules and tensile filaments.

Results

- A minimum number of filaments is required to establish structural integrity; failure of a non-redundant member results in structural collapse.
- Properly reinforced structures intrinsically recover from large deformations without irreversible damage.
- Altering prestress, compliance and cross-linking significantly impacts cell shape, stiffness and response to load.
- Distinct locations on the surface of the tensegrity cell are more mechano-transducive than others (analogous to cell membrane adhesion receptors known as integrins).

	A	B	C	D
# Microtubules	6	6	3	90
# Filaments	36	36	12	60
Tensile stiffness*	0.165 N/nm	1.177 N/nm	1.527 N/nm	0 N/nm
Shear stiffness*	0.050 N/nm	0.010 N/nm	0.080 N/nm	0 N/nm

Table 1. Normalized tensile and shear stiffness for tensegrity cells.

Conclusions

To gain an understanding of the response of tensegrity cell structures, physical and computational models were designed and elaborated in this study. The tensegrity structures varied in stiffness depending on the magnitude of prestress and the geometric interconnections. Observations from the models revealed characteristics that are analogous to those observed in biological cells such as dynamic response to load, the ability to sustain large deformations without failure and existence of mechanosensitive locales / receptors. Computational simulations enabled a quantitative analysis of the highly nonlinear force network generated within the cell.

Get Advise & Feedback

- Organizers
- Friends
- Colleagues
- Poster Evaluation

Poster Evaluation: Posed in Emphasis Program

- Is the title appropriate and interesting?

Effect of Protein Phosphatase 2A Subunit Gene Haplotypes and Proliferative Breast Disease on Breast Cancer Risk.
William Dupont, Joan P. Breyer, Kevin M. Bradley, Peggy Schuyler, W. Dale Plummer, Melinda E. Sanders, David L. Page, Jeffrey R. Smith

Synthesis of b-(1-Azulenyl)-L-Alanine, a New Blue-Colored Tryptophan Analog, and Its Use in Peptide Synthesis. Hans-Jürgen Musiol

Solid-Phase Synthesis of Substance P C-Terminal Hexapeptide Containing 1,4-Diazepine-3-One as a Dipeptidomimetic Element. Yinglin Han

Poster Evaluation Posed in Emphasis Program

- Is the manner of presentation interesting?
- Is there sufficient information so that non-experts can understand the poster?
- Does the overall project appear to be well planned and executed?
- Does the poster's design stimulate interest and discussion?

Poster Evaluation Posed in Emphasis Program

- Are charts, images, and schematics well labeled?
- Is there consistency in formatting: justifying, boldfacing, table/figure dimensions, fonts, alignment of text boxes, etc.
- Do the authors provide an adequate background or introduction of the research question?
- Is the project methodology appropriate to the project goals?

Poster Evaluation Posed in Emphasis Program

- Is the methodology adequately and clearly outlined, yet concise?
- Can you easily grasp the conclusions?
- Is there a memorable “take-home” message?
- Does the presenter engage visitors and show enthusiasm?

Poster Evaluation Posed in Emphasis Program

- Does the presenter demonstrate knowledge of the topic and answer questions clearly?
- Have the objectives been addressed?

60-Second Poster Evaluation

Use the following rating system:

- Overall Appearance
  - 0 Cluttered
  - 1 Pleasant
  - 2 Very Pleasing
- White Space
  - 0 Very Little
  - 1 Some Separation
  - 2 Plenty
- Text/Graphics
  - 0 Too Much/Little Text
  - 0 Confusing Graphs
  - 1 Balanced
- Text Size
  - 0 Too Small
  - .5 Body Text Good; Figure Text Bad
  - 1 Easy to Read
  - 2 Very Easy

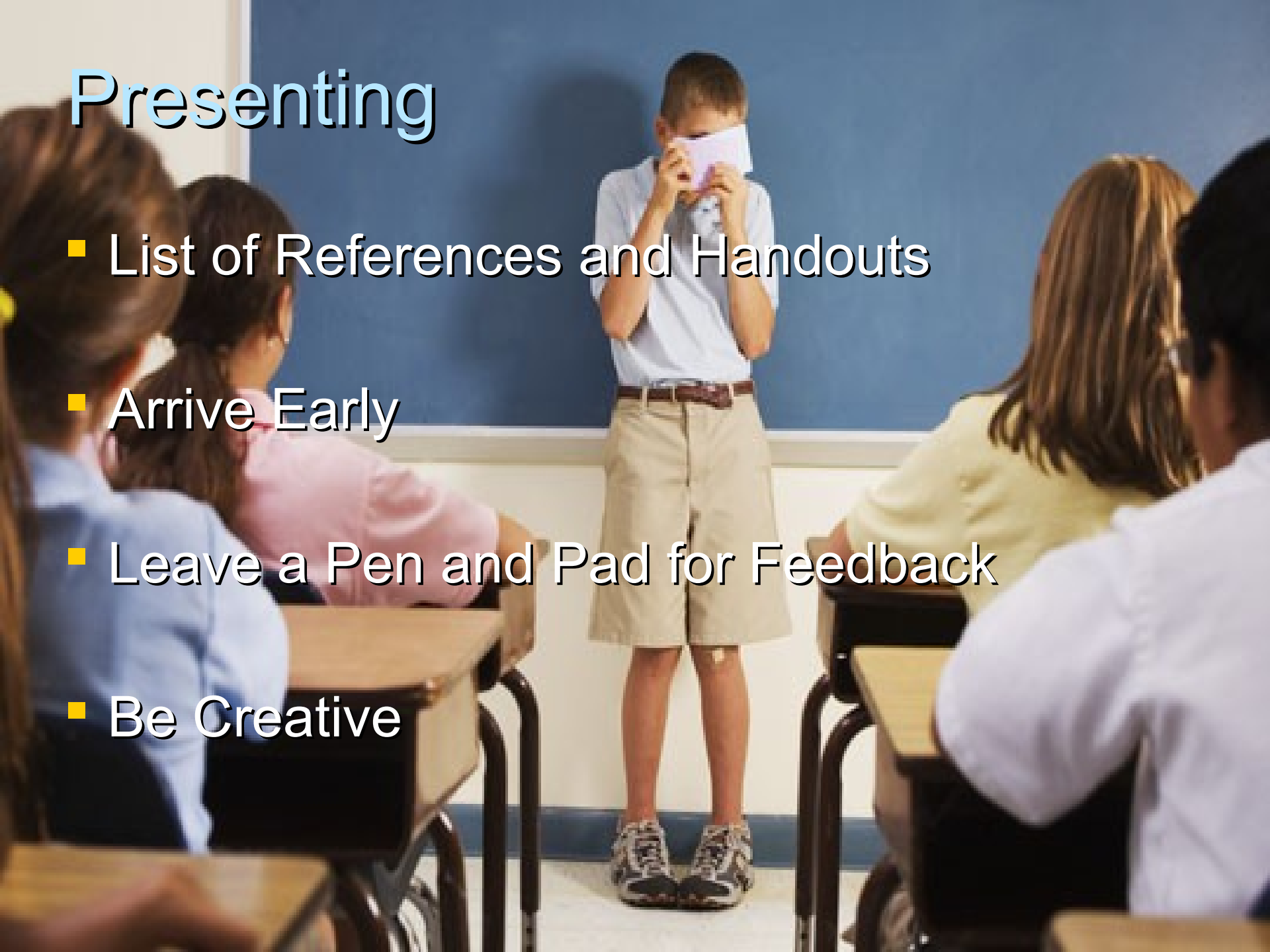
60-Second Poster Evaluation

Use the following rating system:

- Author Identification
  - 0 None
  - 1 Partial
  - 2 Complete
- Research Objectives
  - 0 Missing
  - 1 Present; not Explicit
  - 2 Explicit
- Main Points (Headers)
  - 0 Absent
  - 1 Not Obvious
  - 2 Labeled
- Summary
  - 0 Absent
  - 1 Present

The higher the score, the better

Presenting



- List of References and Handouts
- Arrive Early
- Leave a Pen and Pad for Feedback
- Be Creative

Presenting

- Practice different lengths of your presentation.
- Be able to sum up major points in 2-3 sentences.
- Practice simplifying your poster.
- Anticipate questions and practice your responses.
- Dress to impress.
- Maintain eye contact.

Presenting

- Be enthusiastic and confident.
- Speak loud enough.
- Use pointers and hand motions to illustrate material on the poster.
- Use proper English.
- Summarize each section before moving on.
  - If people come after you have begun your spiel, welcome them and identify where you are by saying something like, “I was just explaining...

Presenting

- Stand to the side of your poster.
- Determine the audience's understanding by saying, “Do I need to explain XXX further?”
  - Do not ask, “Do you understand?”
- Maintain professionalism.
  - Thank them for listening and be receptive of their feedback.

References

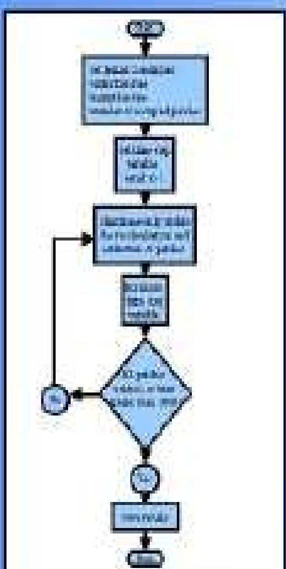
- www.training.nih.gov/careers/careercenter/publish.html
- http://bret.mc.vanderbilt.edu/bret/php_files/poster2.php
- http://www.ncsu.edu/project/posters/NewSite/60second.html
- http://www.owlnet.rice.edu/~cainproj/presenting.html
- http://colorschemedesigner.com/

WHICH IS MORE IMPORTANT: NUMBER OF PATCHES OR CONNECTIVITY?

Darin Kalisak, PBS Student

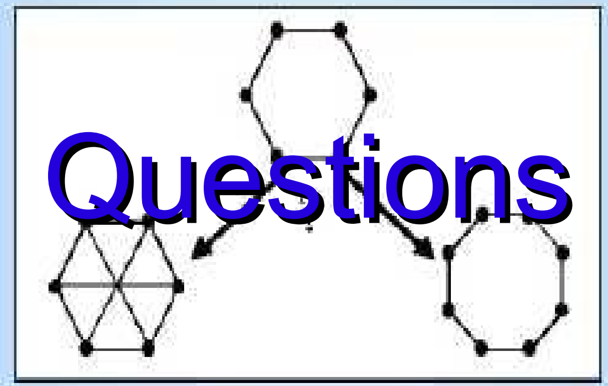
INTRODUCTION AND OBJECTIVES

THE PROGRAM



ASSUMPTIONS AND LIMITATIONS

THE ISSUE



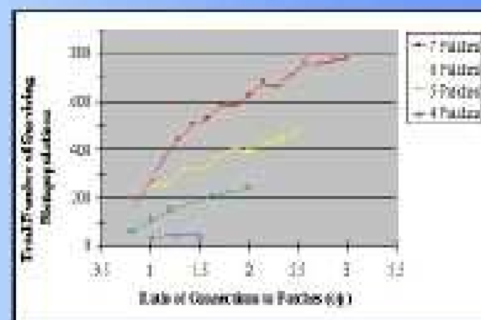
Questions

A metapopulation is a collection of discrete population patches, in which individual patches may typically go extinct and be recolonized. Is the long term viability of the metapopulation helped more by adding new patches or by increasing the number of migration pathways between existing patches?

Adding patches increases the overall population of the organism, and makes a total extinction less likely by increasing the direct number of patches which would have to go extinct.

Adding migration pathways increases the likelihood of recolonization of extinct patches, by giving extinct patches more sources for immigration.

RESULTS



CONCLUSIONS