UNIVERSITY OF SOUTH CAROLINA

# DISCOVERY DAY

## Tips for Successful Posters

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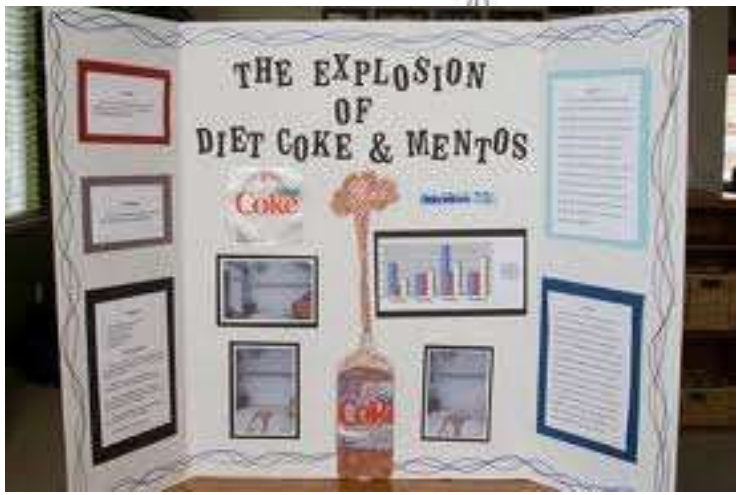
# What do we mean **POSTER SESSION**?

# NOT this…


Science Fair

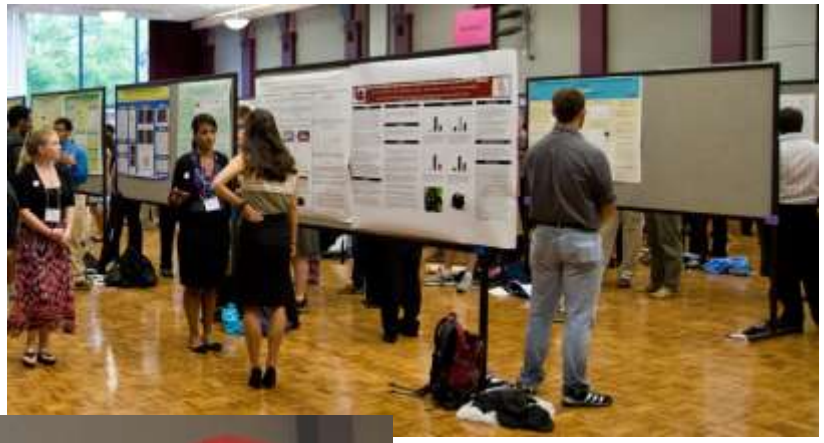

37


PROJECT TITLE
DATA
RESULTS
CONCLUSION
NEXT TIME
ABSTRACT


THE EXPLOSION
OF
DIET COKE & MENTOS
Coke


Volts

# But THIS…



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# *See it for yourself:*

View one of the

Discovery Day videos

ONE and TWO

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# DISCOVERY DAY

## Logistics

# Logistics

Review

***Discovery Day guidebook***

on OUR website

(http://www.sc.edu/our/doc/Guidebook.pdf)

# Logistics

## Event Date: Friday, April 22nd

## Location: Russell House

Registration

| | | |
|---|---|---|
| 8:15 am-2:00 pm | Registration opens | Russell House 2nd floor lobby |

Posters

| | | |
|---|---|---|
| 9:00 am-10:30 am | Poster Session - Morning | Russell House Ballroom |
| 11:30 am-1:00 pm | Poster Session - Mid-day | Russell House Ballroom |
| 2:00 pm-3:30 pm | Poster Session - Afternoon | Russell House Ballroom |

Oral & Creative Presentations

| | | |
|---|---|---|
| 9:00 am-11:00 am | Oral & Creative Presentations - Morning | Russell House - Rooms vary |
| 11:30 am-1:00 pm | Oral & Creative Presentations - Mid-day | Russell House - Rooms vary |
| 1:30 pm-3:30 pm | Oral & Creative Presentations - Afternoon | Russell House - Rooms vary |

Reception & Awards

| | | |
|---|---|---|
| 3:30 pm-4:30 pm | Celebration & Reception | Russell House Ballroom |
| 4:30 pm-5:30 pm | Awards & Recognition Ceremony | Russell House Theater |

# Logistics

- 3 poster sessions (morning, mid-day, afternoon)
- Assignments random unless abstract submitted by PRIORITY deadline (last Friday before Spring Break)
- Notification on timing: week before (on website and by email)
- At Ballroom door, give your last name and you will be shown to poster location

# Logistics

- 2 posters per side of display board
- Poster dimensions: 3-4 ft high x 3.5 ft wide
- 4 t-pins provided to hang
- Angle pins down NOT straight through
- Nametags at registration table

# Logistics

- Posters sub-divided into categories
- Categories based on topic/mentor department
- Judged within categories (IF selected yes on abstract submission; can only change to NO)

# Logistics

- Judging guidelines in guidebook
- Judges: faculty, staff, and grad students
- Judges: 2-3 per section
- Judges are NOT experts in field
- No judging if NOT present at poster

# Logistics

- Award Ceremony: *attendance expected*
- Awards: receive envelope with information for certificate

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South Carolina

# How To:

## General Overview

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# A successful poster…

- conveys a clear message,
- by high-impact visual information,
- with minimum text

…grabs attention!

# A great poster is…

- Readable – use clear language and good grammar in all poster text
- Legible – all poster text should be readable from 5 feet away
- Well-organized – group items logically and visually for maximum impact
- Succinct – you have 10 seconds to grab your audience's attention

# Overview: Content

**Remember**: Do **NOT** duplicate the full text of your work **on** your poster.

***Hit the high points!***

Provide handouts for more information.

# Overview: Content - *OPTION 1*

## Sections you may wish to include:
(will vary depending on your desired message)

- Introduction, background, or overview
- Hypothesis (Question you explored)
- Motivation or purpose (Why you did it)
- Methods (How you did it)
- Results (What you found)
- Conclusions (What you learned)
- Significance (What it means)
- Future plans or next steps
- References (Works cited)
- Acknowledgements

Abstract is not needed!

# Overview: Content - *Option 2*

## Sections you may wish to include:
(will vary depending on your desired message)

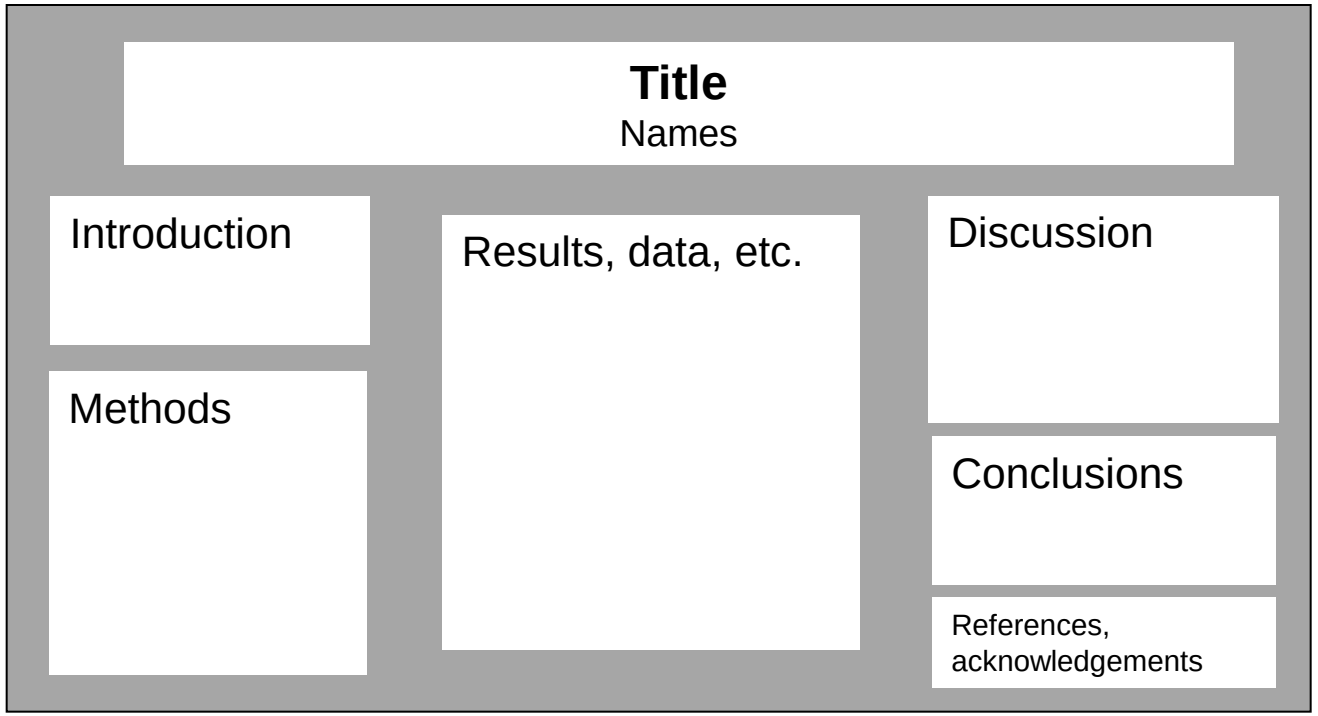
- Introduction, background, or overview
- Activity/Event description (What you did)
- Motivation or purpose (Why you did it)
- Reflection (What you learned; What was the impact on you)
- Significance (What it means; what you want others to learn/know from your experience)
- Future plans or next steps
- References (Works cited)
- Acknowledgements

# Overview: Layout

People take in information according to a known spatial sequence.

*Capitalize on this and use it effectively!*

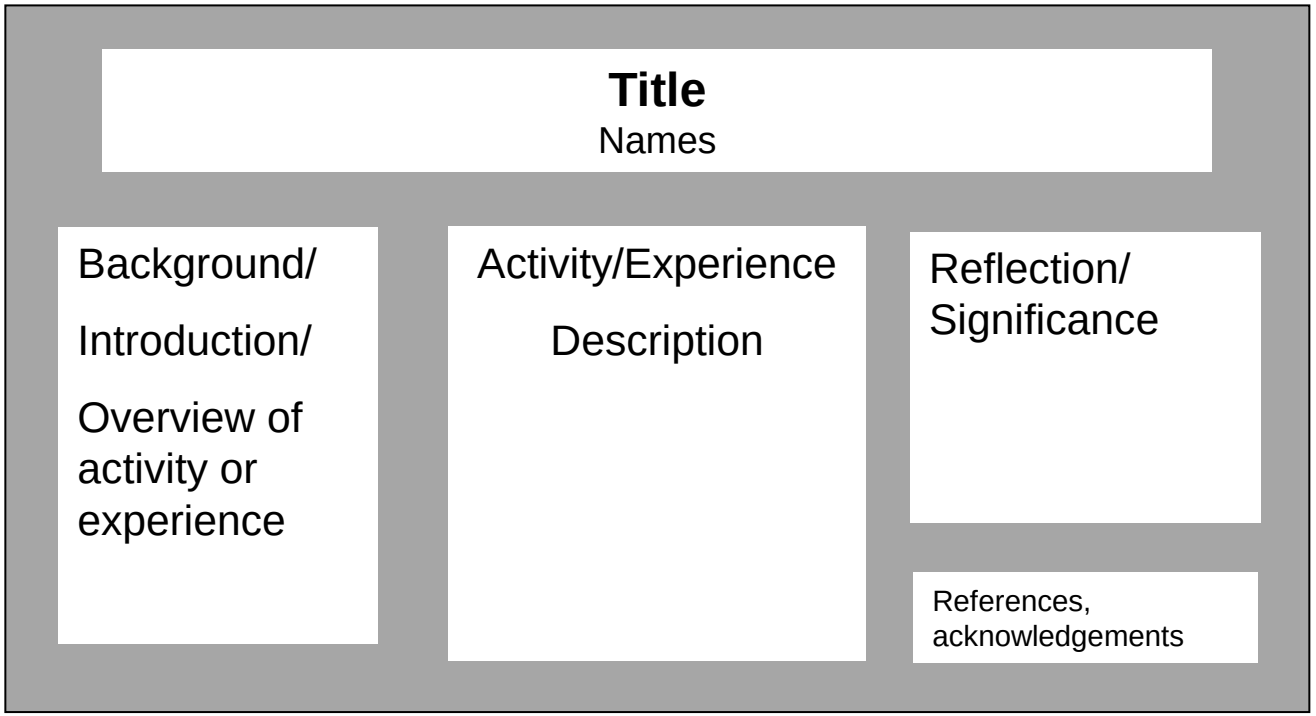
Expected layout (3-4 columns of information):



# Overview: Layout

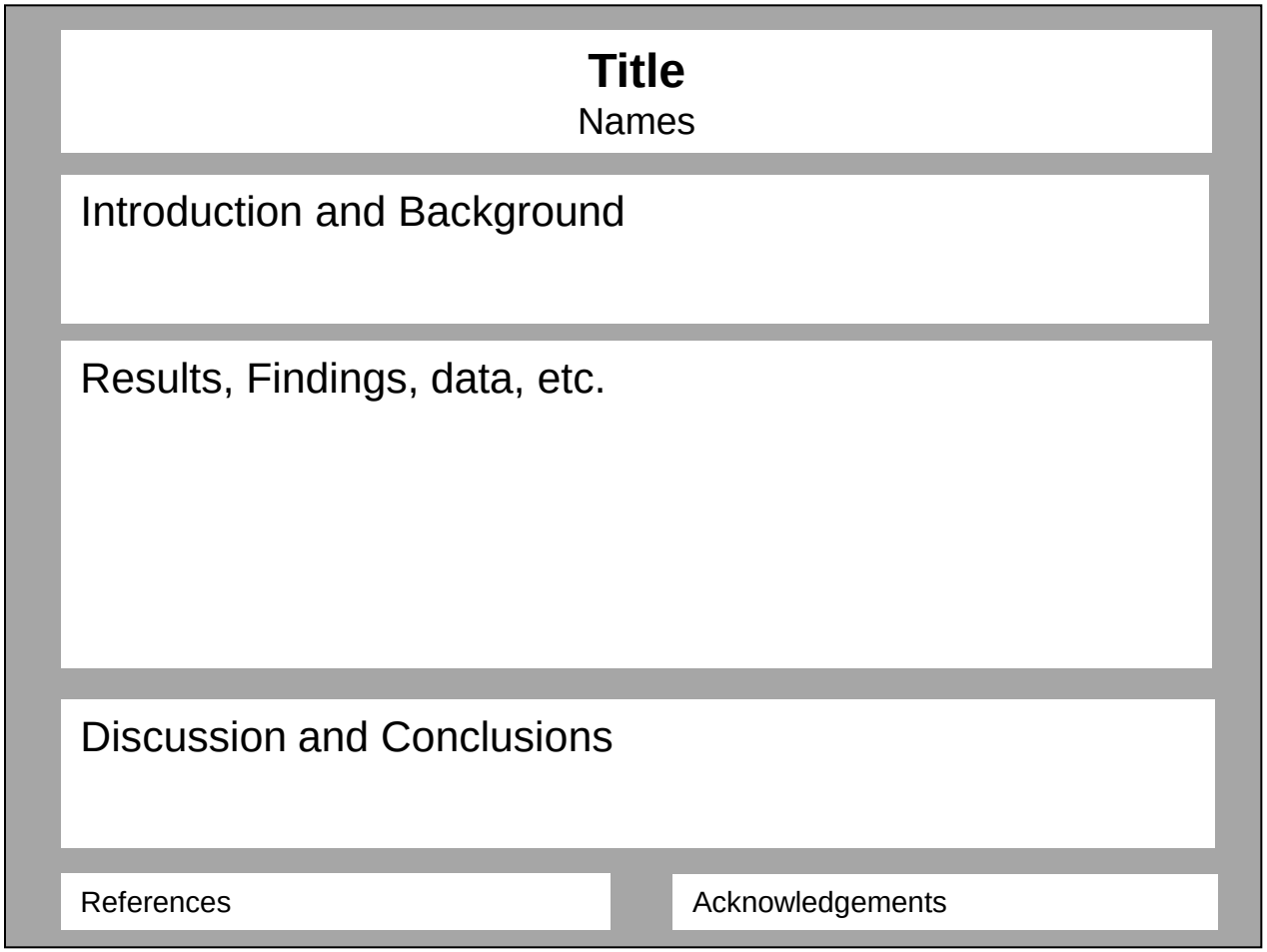
## Activity or Experience

Expected layout (3-4 columns of information):



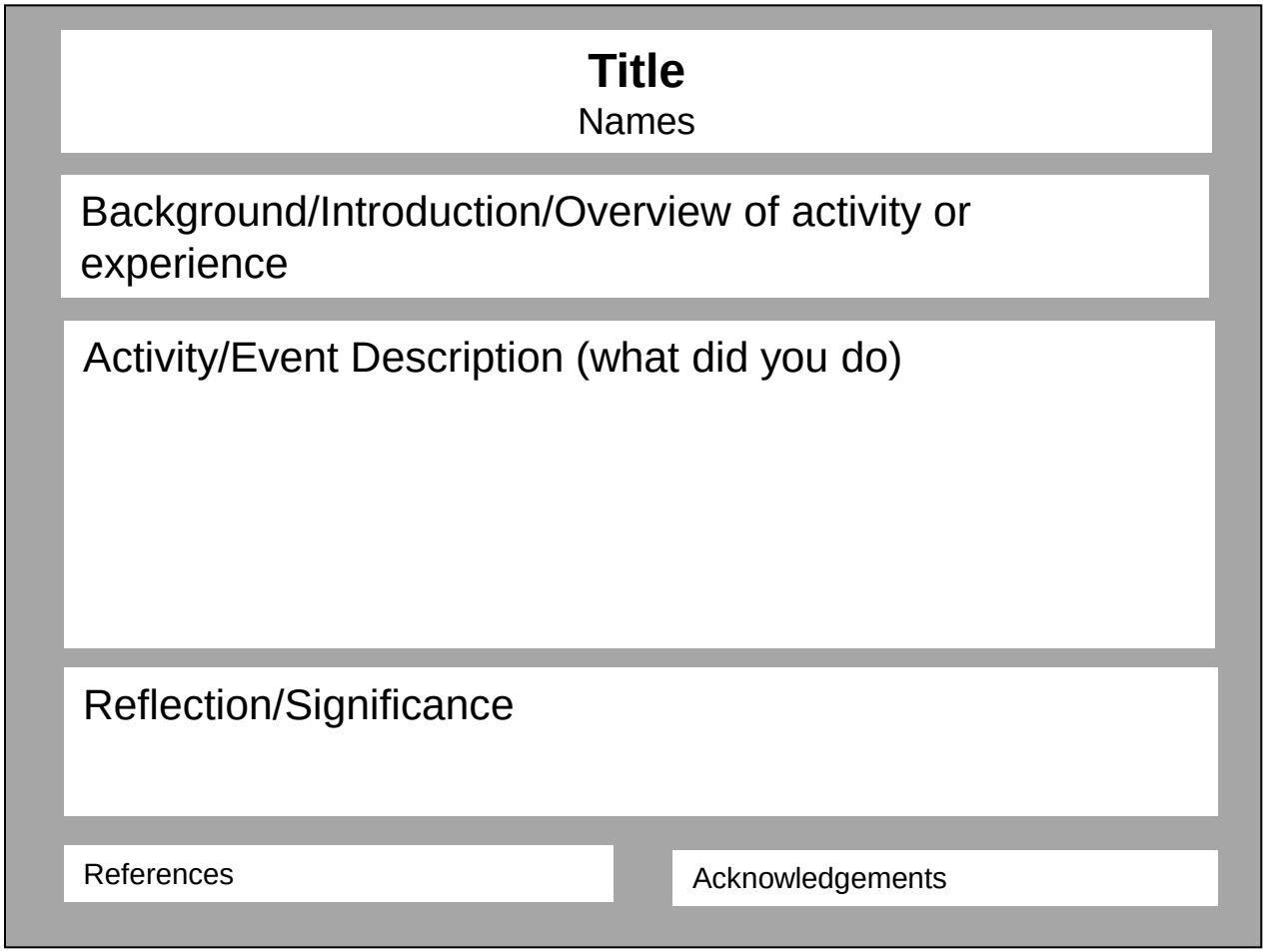
# Overview: Layout

## Alternative layout: Progression of information (*much less common*)



# Overview: Layout

## Activity or Experience



# Overview: Layout

**YES!!!**

You can use a different format than “expected.”

- The key is to make the flow of information logical.
- Be sure your chosen layout emphasizes your message!

**See examples in the next section**

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# How To:

## Examples

# “Expected” layout

**Title**

Names, departments

## Introduction: Chemical Hydride Hydrolysis

- Chemical hydrides are a means of storing hydrogen.
- Sodium borohydride ($NaBH_4$) undergoes hydrolysis to produce hydrogen as follows:

$$NaBH_4 + (2+x)\ H_2O \rightarrow NaBO_2 \cdot xH_2O + 4H_2$$

- The coefficient x represents the hydration state of sodium metaborate ($NaBO_2$).
- Minimizing x minimizes the total weight in the hydrogen delivery system while maximizing the efficiency.
- Four stable hydration states exist and the formation of these states is temperature dependent and shown below:

| Hydration State | Temperatures Where Stable |
|---|---|
| Tetrahydrate (x=4) | <54 °C |
| Dihydrate (x=2) | 54 °C-110 °C |
| 1/3-hydrate (x=1/3) | 110 °C-350 °C |
| Anhydrous (x=0) | >350 °C |

## Water Usage and Reaction Pathway

- First attempted to hydrolyze sodium borohydride with liquid water.
- Required approximately 30 times more water than stoichiometric feed.
- Experimental conditions were limited to below 100°C, yielding low reaction rates.
- Experimental temperature range increased with steam hydrolysis reactor.
- Steam would adhere, or deliquesce, to the surface of sodium borohydride.
- Expanded temperatures to over 140°C.
- Low relative humidities prevent reaction at high temperature conditions.

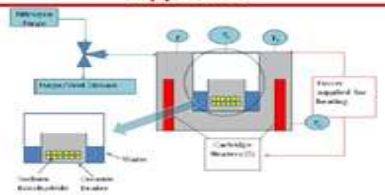
## Deliquescence

- Sodium Borohydride undergoes deliquescence in the presence of water vapor.
- Deliquescence is the process of water vapor in the air adhering to the surface of a solid.
- Water vapor goes to the liquid phase while in contact with the solid during deliquescence.
- Deliquescence usually ends with too much water surrounding the solid, in which case the water will dissolve the solid.
- Water vapor uses as little as 10% of the liquid water needed to pre-dissolve the $NaBH_4$
- As less water is needed to dissolve the $NaBH_4$, the necessary weight of the reactor lessens which, in turn, increases the efficiency.


## Hypothesis and Objectives

- Construct and utilize a high pressure batch reactor to hydrolyze solid sodium borohydride with water vapor.
- Predict the reaction progress as a function of time using the pressure profile
- Determine the amount of $NaBH_4$ conversion using Boron11-Nuclear Magnetic Resonance ($B^{11}$-NMR)
- Determine the water content of the final product using Thermogravimetric Analysis (TGA).

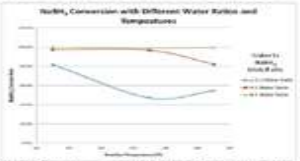
## Apparatus



- Sodium borohydride and water are separated initially.
- Nitrogen originally pressurizes the bomb reactor.
- Heat is supplied to the reactor using six cartridge heaters.
- Thermocouples measure three temperatures at different points to ensure gradient.
- Pressure measurements were recorded by a pressure transducer.

## NaBH4 Conversion Measured with $B^{11}$-NMR

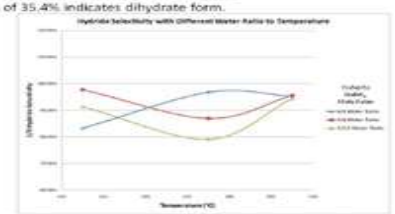
- $B^{11}$-NMR analysis measures the composition of $BH_4^-$ and $BO_2^-$.



- Hydrolysis goes to completion when a slight excess of water is introduced to the system.
- Reactions running only the stochiometric water feed had approximately 50% conversion.
- Higher temperatures generate a faster reaction but at the cost of lower conversions.

## Water Content of Product Measured by TGA

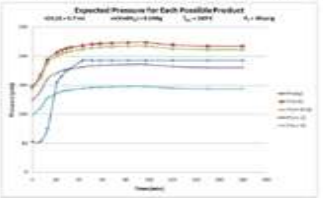
- The TGA quantifies the water of hydration in the $NaBO_2$ products.
- A mass loss of 8.4% indicates 1/3-hydrate form.
- A mass loss of 35.4% indicates dihydrate form.



- Higher selectivity of 1/3-hydrate is correlated to a lower water content in the final product
- TGA analysis suggests that the mass lost lies somewhere between 8.4% and 35.4%, consistent with the idea that a mixture of 1/3-hydrate and dihydrate would be formed.
- Runs with higher feeds of water favored the formation of the 1/3-hydrate form.
- At lower temperatures, 1/3-hydrate selectivity decreases with the water ratio.
- The effect of water to $NaBH_4$ feed ratio is minimal at higher pressures.

## Pressure Profile

- Experimental pressures were recorded using a pressure transducer.
- One expected pressures can be calculated for each of the four possible hydration states of $NaBO_2$.
- Expected pressures were calculated with the Redlich-Kwong equation of state.



| Temperature (°C) | Molar Ratio of Watering $NaBH_4$ | x* | Highest Experimental Pressure (psia) | Theoretical Pressure (psia) x = 0 | Theoretical Pressure (psia) x = 1/3 | Theoretical Pressure (psia) x = 2 | Theoretical Pressure (psia) x = 4 |
|---|---|---|---|---|---|---|---|
| 150 | 0.1 | 4 | 162.0 | 222.3 | 225.9 | 184.2 | 144.0 |
| 150 | 0.1 | 2 | 144.0 | 188.9 | 192.4 | 149.1 | 120.5 |
| 155 | 2.5:1 | 0.5 | 103.0 | 150.9 | 149.2 | 115.1 | 97.7 |
| 160 | 0.1 | 4 | 172.7 | 230.8 | 231.9 | 197.9 | 154.8 |
| 160 | 0.1 | 4 | 172.7 | 243.8 | 236.8 | 201.4 | 158.2 |
| 160 | 4:1 | 2 | 164.7 | 205.6 | 198.5 | 162.6 | 131.6 |
| 160 | 0.1 | 2 | 148.7 | 206.0 | 196.9 | 161.2 | 130.6 |
| 180 | 2.5:1 | 0.5 | 86.7 | 168.7 | 161.5 | 125.1 | 109.5 |
| 180 | 2.5:1 | 0.5 | 76.7 | 167.5 | 160.3 | 124.8 | 103.8 |
| 200 | 0.1 | 4 | 197.7 | 249.3 | 242.1 | 206.2 | 161.2 |
| 200 | 4:1 | 2 | 145.0 | 212.0 | 204.6 | 167.2 | 135.8 |
| 200 | 2.5:1 | 0.5 | 115.0 | 174.9 | 168.4 | 128.2 | 109.0 |

- From TGA, it is expected that the actual pressure will be between the 1/3-hydrate and dihydrate estimations.
- Few experiments had a pressure profile precise enough to give expected pressures.

## Conclusions

- The batch reactor was successful in that the steam hydrolysis reaction went nearly to competition for runs with only a slight increase of water over the stoichiometric ratio.
- A stable 1/3 hydrate form of sodium metaborate was produced under the reaction conditions, significantly reducing the amount of water tied into the solid product.
- The decreased water in the solid product increases the efficiency of hydrogen delivery
- The stable hydration states did not appear to change with pressure.
- Although the pressure measurements were not as precise as desired, new reactor designs are being examined to address any potential problems.

## Acknowledgements


- NSF Grant # CBET 0756089
- University of South Carolina Magellan Scholarship


## References


1. Hu, Hong; Boyd, Christopher M.; Beaird, Amy M.; and Matthews, Michael A. "Vapor phase batch hydrolysis of $NaBH_4$ at elevated temperatures and pressure." International Journal of Hydrogen Energy. February 2011.
2. Romero-Alfonso, E. Y.; Gray, J. K.; Davis, T. A.; and Matthews, M. A. "Hydrolysis of sodium borohydride with steam hydrates." International Journal of Hydrogen Energy. December 2007. 32 (18) 4717-4722
3. Beaird, Amy M.; Davis, Thomas A.; and Matthews, Michael. A. "Deliquescence in the Hydrolysis of Sodium Borohydride by Water Vapor." Industrial and Engineering Chemistry Research. 2010. 49 (20) 9586-9590

# “Expected” layout

Program. No. 611.7

## Expression of Lipocalin-2 in Colorectal Cancer Metastasis to the Liver

Student name; Mentor name

[1]ASBMB UAN at USC [2]Department of Biological Sciences, [3]Center for Colon Cancer Research, University of South Carolina, Columbia, SC 29209

### ABSTRACT

Metastasis, frequently from the colon to the liver, is the major cause of death with colorectal cancer, reducing the five-year survival to less than 12%[1]. Metastasis occurs due to productive collaborations between tumor cells and host-derived cells in the tumor microenvironment, where a pre-metastatic niche is created to prime for cancer cell invasion into the target organ[2]. In a highly metastatic colorectal cancer cell line implanted into the cecum of Balb/c mice, microarray analysis showed LCN2 is the most highly expressed protein in the liver of tumor-bearing mice prior to metastasis. Western blot analysis and examination of blood serum by ELISA illustrated increased levels of LCN2 as tumors progressed into metastasis, with similar results when RT-PCR was performed, as greater levels of LCN2 mRNA were found in highly metastatic cells in contrast to less metastatic cells. It has been found that LCN2 is highly associated with the promotion of colorectal cancer metastasis to the liver, with increased levels connected to the advancement of metastatic progression.

### INTRODUCTION

Colorectal cancer is the third most common cancer, accounting for approximately 850,000 deaths per year worldwide[1]. In the United States, it is the second leading cause of cancer-related fatalities[2]. When patients are treated for colorectal cancer prior to metastasis, the survival rate is high. Unfortunately, those affected do not typically express outward symptoms of metastasis and it is often diagnosed when very little can be done. More research must be pursued on the biological and molecular hallmarks that direct the early stages of metastasis, which can provide the best opportunity for therapy to block its progression. Lipocalin-2 (LCN2) is from a family of proteins associated with cell regulation, specifically in differentiation and proliferation[3]. There is conflicting evidence on their role in cancerous growth; some evidence suggests that lipocalins can inhibit the proliferation of cancer cells[4], while others suggest that they promote its progression[5]. These studies examined LCN2 expression in cancer cells, but not in the target organ microenvironment; thus, further studies must be undertaken to determine the role of LCN2 in establishing and promoting metastasis.

### HYPOTHESIS

Increasing presence of LCN2 is positively associated with progression of early colorectal cancer metastasis to the liver.

### OBJECTIVES

- To assess LCN2 protein levels in isogenic colon cancer cell lines with different capabilities to metastasize
- To determine whether increasing levels of LCN2 coincides with the progression to early colorectal metastasis to the liver

### METHODS

- Western blotting to verify presence of LCN2 protein
- ELISA (R&D Systems) and qRTPCR (BioRad iQ5) were performed on these cell lines to determine varying levels of LCN2 concentration

### PRELIMINARY DATA

Figure 1. Mouse model on colon cancer metastasis to the liver[2]. CT26 cells, with low metastatic capabilities are educated to become highly metastatic CT26-FL3 cells

### PRELIMINARY DATA

Figure 2. Frequency of liver metastasis in mice bearing tumors from two isogenic cell lines. Mice bearing tumors from the less metastatic CT26 parental cells had 10-fold less frequency of liver metastases compared to mice with tumors from CT26-FL3 cells.

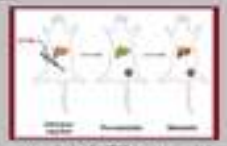


Figure 3. Microarray analysis of mRNA expression in tumor-bearing mice before and after the arrival of metastatic cells. LCN2 is over-expressed by 34-fold in a pre-metastatic liver versus a sham control liver.

Figure 4. Immunoblot analysis of sera from tumor bearing mice at various stages of metastasis. In mice with CT26-FL3 cells, the circulating LCN2 levels increase with tumor progression.

### RESULTS

Figure 5. Lcn2 protein levels in CT26 and CT26-FL3 cells stably expressing high levels of Lcn2.


Figure 6. Lcn2 protein levels secreted into the media by cells expressing Lcn2.

### RESULTS

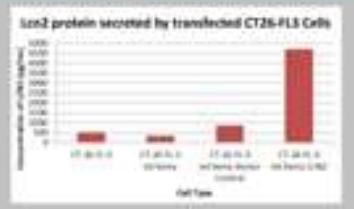



Figure 7. Concentration of Lcn2 (pg/mL) secreted by stably transfected CT26-FL3 cell lines.

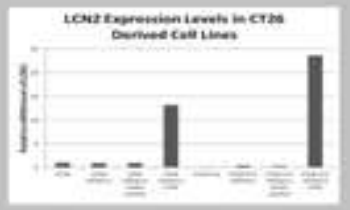



Figure 8. Relative levels of mRNA transcripts in CT26 derivative cell lines using real time PCR against β-actin.

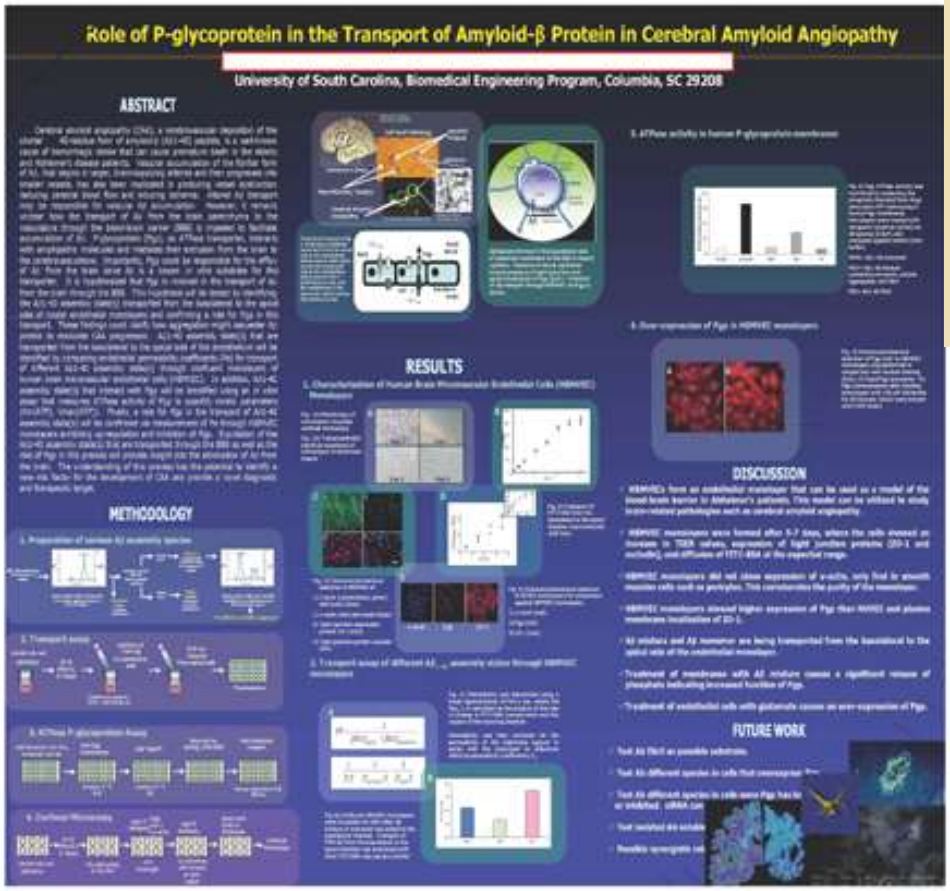
### CONCLUSIONS AND FUTURE DIRECTIONS

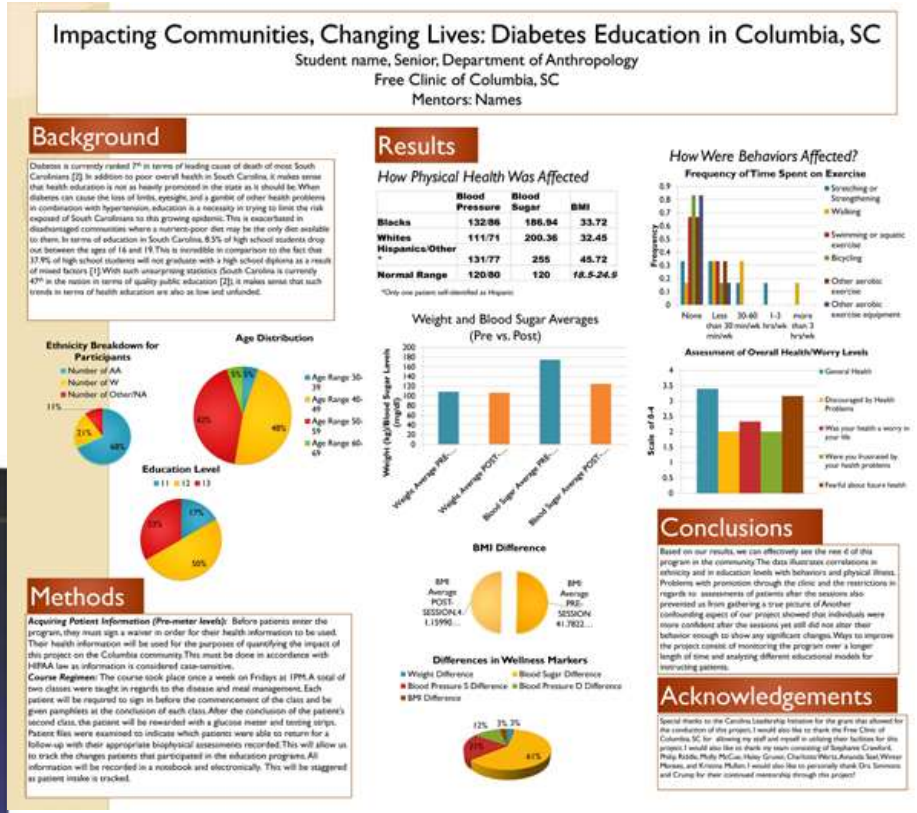
- LCN2 is positively associated with colon cancer cells with greater ability to metastasize.
- LCN2 is upregulated in the pre-metastatic niche after implantation of colon cells shown by real time PCR.
- The impact of manipulating LCN2 levels both by gene suppression and overexpression in vitro, and especially in vivo, must be assessed to additionally determine the role of LCN2 in early colorectal cancer metastasis to the liver.
- The results of this further experimentation may provide significant support for the possibility that LCN2 is a biomarker for the event of metastasis to the liver.

### REFERENCES

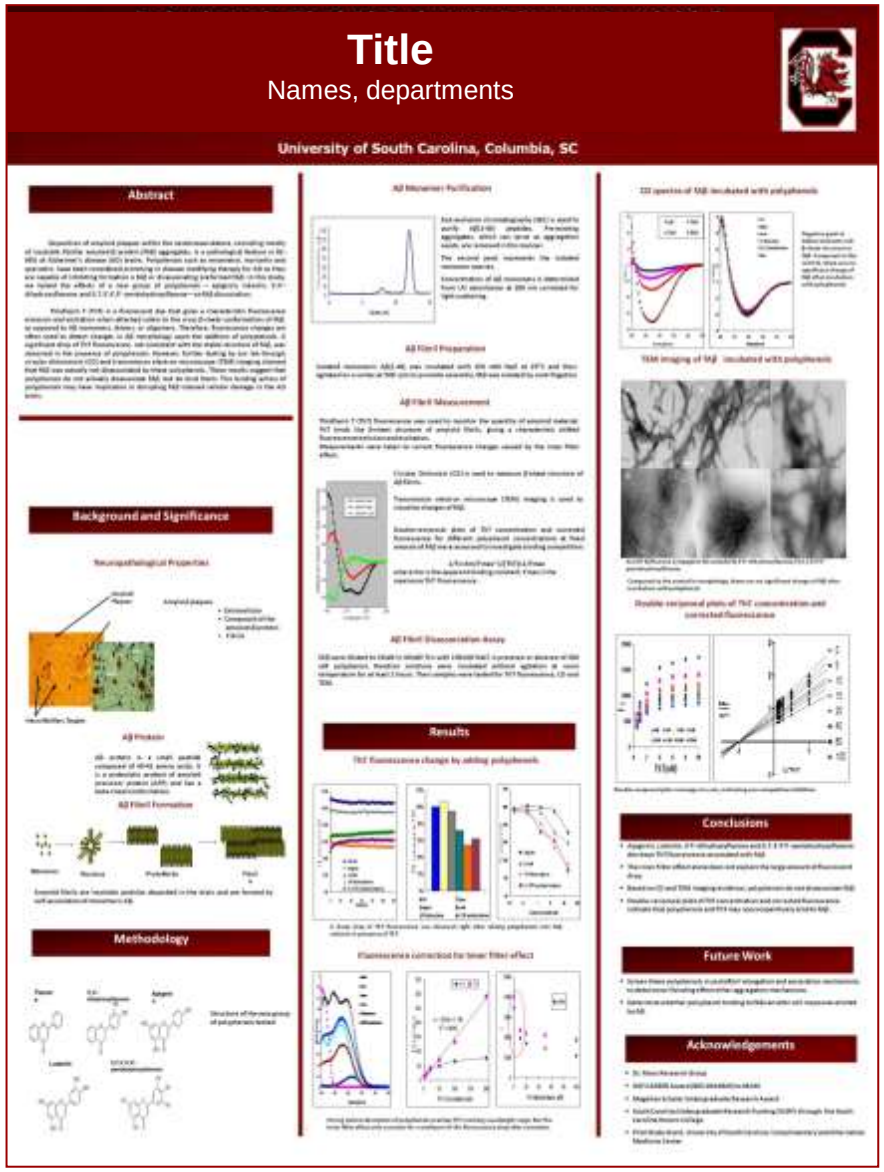
[1] [2] [3] [4] [5]

# “Expected” layout



# “Expected” layouts with height greater than width




# “Expected” layout when few pictures available

**Title**

Names, departments

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## Introduction

### Wireless Networks

- Wireless networks are expected to be available and reliable at all times and all locations
- Environmental conditions like walls, weather, and large crowds cause problems

### Smartphones

- Smartphones have a variety of sensors built into them that can gather information about the surrounding environment
- These sensors include accelerometers, compasses, light detectors, and proximity detectors
- They also have wifi radios and GPS

### Goals

- This project aimed to use the readings from the sensors to detect situations that will cause reduced signal strength
- It may be possible to predict when the user is going to have poor reception so the phone can plan accordingly

### Other Work

- A number of othe projects are underway that also make use of the sensors available on smartphones
  - Mobile Assistant for Inattentive Drivers (MAID)
  - Increasing the reliability of natural interaction systems such as Microsoft's Kinect

## Methods

### Android App

- An app was developed for Android phones that would automatically collect data every 15 minutes
  - This interval was chosen to balance frequency of collection with battery life
- The app was allowed to run constantly on the user's phone to collect data in real world situations
- The app uploaded data after each collection to a MySQL database

### Data Collected

- Data collected included: time, proximity, battery level, location, cellular signal strength, and wifi signal strength
- The data were downloaded from the database into an Excel spreadsheet
- The correlation function in Excel was used to determine if acceleration, magnetic field, proximity, battery charge, or light appeared to have an influence on cellular and wifi signal strengths
- The data points corresponding to wifi signal strength were plotted on a map and color coded to indicate the signal strength of the University wireless network, “uscstudent” at that location.

## Results and Discussion

### Accelerometer

- Cellular Strength: 0.146
- Wifi Strength: 0.069
- These low correlation values indicate the absence of a relationship between acceleration and both cellular and wifi signal strengths

### Magnetic Field

- Cellular Strength: -0.123
- Wifi Strength: -0.022
- These correlation values were even smaller than the ones for acceleration, so there is again little evidence to suggest a relationship between magnetic field and the signal strengths

### Proximity

- Cellular Strength: -0.302
- Wifi Strength: -0.289
- These values are much stronger than the previous two and are the strongest observed.
- There is a possibility of a slight negative correlation
- The relatively strong correlation could also be explained by the phone being in a pocket versus in the open

### Battery Charge

- Cellular Strength: -0.291
- Wifi Strength: -0.193
- These values are weaker than the proximity values and slightly negative
- There may be a negative correlation between battery charge and the signal strengths

### Light

- Cellular Strength: 0.205
- Wifi Strength: 0.017
- These values were opposite the proximity values and much weaker
- This difference supports the possibility of being in the pocket reducing signal strength and being in the open increasing it

### Figure 1: Wifi Map

- The map reveals the clustering of the data points
- As the project continues, a more even distribution of data points will be collected
- Wifi signal strength appears to be stronger inside than outside

ARENA

Arena for Research on Emerging Networks and Applications

## Wifi Map

Figure 1: Map of Wifi Signal Strength

Detail of LeConte

Detail of Swearingen

## Ongoing and Future Work

### Signal Correlations with Other Sensors

- Use newer sensors such as gyroscopes, barometers, and thermometers
- Collect data in diverse scenarios using multiple phones

### Mobile Assistant for Inattentive Drivers (MAID)

- Link the phone to the car's diagnostics port to get real-time data from the car's sensors
- Identify the fingerprint for each event and create the abstract sensor modules
  - *Reckless*: detect reckless driving
  - *Speed*: detect when the driver is going too fast
  - *Turn signal*: detect if the driver properly signaled before turning
  - *Stop*: detect if the driver obeyed a stop sign
  - *Lost*: detect when the driver appears to be lost
  - *Yield*: detect if the driver properly yielded at a yield sign
  - *Clog*: detect if the driver is causing traffic to back up behind him
  - *Drunk*: detect drunken driving
  - *Lane change*: detect lane changes
- Identify additional situations that might be detectable using the phone's sensors

### Enhancing Kinect with Smartphones

- Wii uses accelerometer and gyroscope to detect motion
- Kinect uses video and depth cameras to detect motion
- Combine the two methods together to make a more robust system
  - Use the phone in the pocket in place of the Wii remote
    - Use its accelerometer/gyroscope sensors to aid Kinect
  - Allow players Kinect cannot see to interact with the system
  - Help the system identify players from a crowd

"Expected" layout with great image use

# Modular Nano-Enabled Sorption Cartridge for Water Treatment

Student Name; Mentor Name
Civil and Environmental Engineering, University of South Carolina, Columbia, SC

## Motivation:

- World-wide potable water crisis needs affordable treatment technologies
- Nanomaterials have promising capabilities (sorption/filtration)
- Lack of strategy for useful application


## Objectives:

STEP 1. *Immobilize* Carbon Nanomaterial in a Water Filter

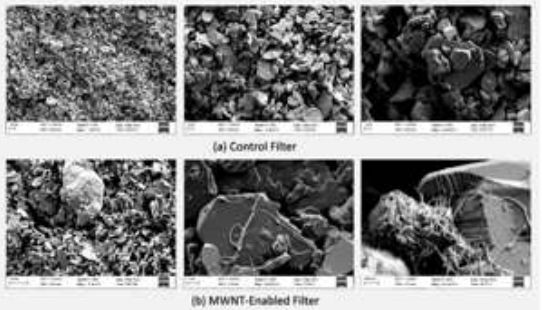
+

STEP 2. *Optimize* Nanomaterial Distribution within Filter

→

STEP 3. *Analyze* Contaminant (e.g. BPA, Lead, Arsenic, etc.) Removal Efficiency

## Results:



(a) Control Filter

(b) MWNT-Enabled Filter

Figure 1: SEM Images

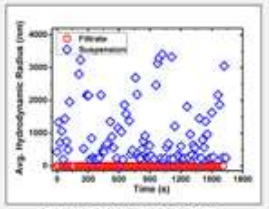


Figure 2: Hydrodynamic Radius

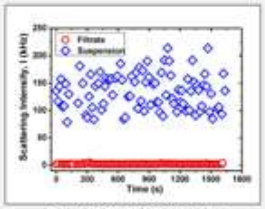
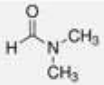
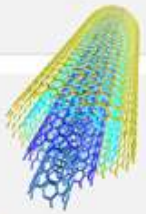


Figure 3: Scattering Intensity

## Materials:

- Carbon Nanotubes (CNTs)
- Organic Solvent: N,N-Dimethylformamide
- Commercial Water Filter





## Methods:


## Underlying Mechanism:

Untreated Filter Surface (No Affinity)

Chemically Treated Filter Surface (Thermodynamic Affinity)

## Conclusions:

- CNTs can be deposited on functionalized surfaces
- The attachment is irreversible thus results in immobilized CNT coated surfaces

*Invention Disclosure (SCRF# 00930): Carbonaceous Nanomaterials Immobilized on Porous Matrices to Remove Organic Contaminant from Water*

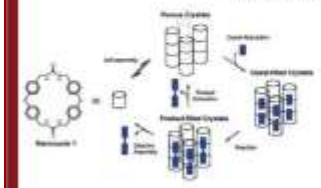
# Non-traditional layout

**Title**

Names, departments

## Introduction

How are certain photochemical reactions influenced by being carried out in a confined environment?

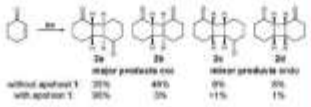


### Macrocycles

- Porous self-assembling monomers
- Form tubular crystals
- Can increase selectivity of certain reactions
- Reusable

### 2-Cyclohexenone

- Phenylether macrocycle used as host
- Increased selectivity



## Background

Chemists are always looking for ways to make reactions more efficient. That is, they are always asking, "How can we attain a higher yield of our target product, quicker, with less reagents, and with minimal environmental impact?" One possible solution can be found in running reactions in a confined environment. By restricting the reaction site, we not only can increase the selectivity of the product of the reaction, but also reduce the use of expensive, harsh chemical reagents. This concept is analogous to the use of enzymes in biological systems, where enzymes drive reactions by fixing substrates together and thereby reduce the activation energy for those reactions.

One type of confined environment that is currently being studied employs the use of a porous crystalline cube-like structure known as a macrocycle that is composed of identical monomers. The size of these macrocyclic monomers that compose the macrocycle can be adjusted, allowing for control of the overall size of the macrocycle. This in turn provides for a wide range of molecules to react within the macrocycle.

Benzophenone Macrocycle (BPMC)


### Thymine

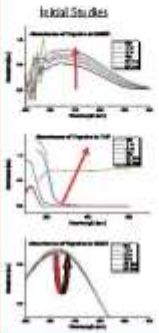
- Structure is similar to 2-Cyclohexenone
- [2+2] photodimerization under UV irradiation
- Thymine photodimers cause kinks during DNA replication; can lead to melanoma

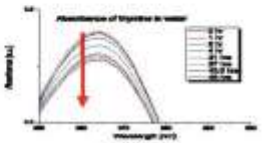
## Methodology

Testing for the best solvent for soak loading

In which solvent does thymine absorbance decrease?


Initial Studies

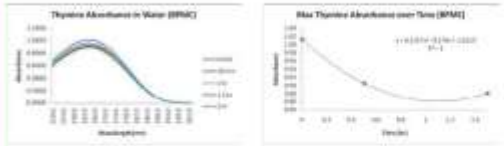




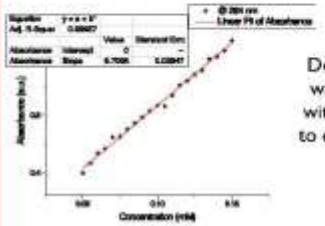
Water was found to be the best solvent candidate for soak loading.

## Data & Discussion

### Loading



Analytical absorbance study



Beer's Lambert Plot for Thymine in Water

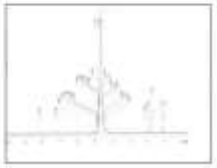
Decrease in absorbance was used in conjunction with Beer's-Lambert plot to determine a host : guest ratio of 2.38:1

### Irradiation

Thymine in D2O

Thymine-Loaded in BPMC

1H-NMR Spectra



Extracted Thymine and Photoproducts after Irradiation

Preliminary results indicate two things. One, the guest molecule certainly loaded into the macrocycle. As is evident on the 1H-NMR spectrum, peaks for both thymine and the benzophenone macrocycle are present. The other finding is that irradiation of thymine in the host macrocycle produced peaks on the 1H-NMR spectrum different from that of just thymine. This indicates that irradiation inside of the macrocycle produced some unspecified products. Future work on this study must consist of producing a more specific identification of the irradiated products of thymine inside of the macrocycle.

## References


1. Dewal, M. B.; Xu, Y.; Yang, J.; Mohammed, F.; Smith, M. D.; Shimizu, L. S. "Manipulating the cavity of a porous material changes the photoreactivity of included guests." *Chem. Commun.* **2008**, 3909-3911. Highlighted by *Nature Chem.*, July 11, 2008; doi:10.1038/nchem.36
2. Yang, J.; Dewal, M.B.; Shimizu, L.S. "Self-assembling bis-urea macrocycles used as an organic zeolite for a highly stereoselective photodimerization of 2-cyclohexenone." *J. Am. Chem. Soc.* **2006**, *128*(35), 8122-8123.
3. Origins of Selectivity for the [2+2] Cycloaddition of α,β-unsaturated Ketones within a Porous Self-assembled Organic Framework
Jun Yang, Mahender B. Dewal, Salvatore Profeta, Jr., Mark D. Smith, Youyong Li, and Linda S. Shimizu
*Journal of the American Chemical Society* **2008** *130* (2), 612-621


## Acknowledgements


I would like to thank Dr. Linda Shimizu for the wonderful opportunity to conduct undergraduate research during the Summer of 2010. I would also like to thank the entire Shimizu Group for their complete support and hospitality during my time as an undergraduate researcher. Finally, I would like to give very special regards to my Graduate Mentor, Michael Geer, who guided me through every step of this fantastic journey.

# Non-traditional layout

## Title

Name, Department, University of South Carolina

### Problems, Issues & Plans

### Purpose

This poster portrays the experience of the University of South Carolina from the decision of creating a journal of undergraduate research to the implementation. Each step will be discussed followed by lessons learned.

### Why a Journal?

- Provide students multiple formats to showcase research (complements presentation opportunity through Discovery Day, university's research conference)
- Publication experience valuable to complete research process
- Publication in professional journals not available for all students
- Marketing tool to showcase student research

### Why On-line?

- Available for all disciplines
- Broader audience access: students, prospective students, potential partners/collaborators
- Recurring costs low
- Content refreshed regularly
- Dynamic interface

### Why Now?

- Technology advanced to meet the needs of publication for all disciplines
- Administration support/critical impetus, staffing, and funds

### Why Caravel?

- Named after the type of ship used by explorer Magellan
- "Magellan programs" is the university's undergraduate research brand
- Research is about the journey not the destination

### Site Design and Development

The original two design bids for Caravel

### Site Considerations and Needs

- Time constraints, staff expertise, IT resources
- Server accessibility (will the site be hosted on- or off-site)
- Content Management System (allows easy updating of website with minimal training, eliminates manual contract with web developer)
- Facilitate responsive website (adjusts for desk/laptop, tablet, phones)
- Article archiving (how often, search options, accessibility)
- Submission process and forms (web or email)
- Journal focus (articles themselves) on the homepage
- What information needs to be available and where

### Site Development and Bid Process

- Evaluate timeline to completion
- Previous experience (review previous jobs/websites for compatibility with journal needs)
- Compare and contrast competing bids for user interface
- Training of staff for site management
- Cost ($34-36K)
- Site: http://caravel.sc.edu/

Final product: Caravel screen captures: above, Caravel homepage. Below, an article page which includes the author bio, a video of the author describing his work, an abstract, and the submission itself (in this case a video)

The site design and editorial and submission process occurred concurrently for Caravel. It is important to evaluate where and when overlaps should occur.

### Editorial and Submission Process

### Submission Guidelines

- Guidelines must be discipline appropriate
- All submissions include a written component, for art/music/media, format is an artist's statement or abstract providing context
- Student form addresses plagiarism, copyright, and compliance issues (human subjects and animal use)
- Faculty mentor approval of submission
- "Paper" forms to be submitted by email
- Writing center consult encouraged

### Faculty Editorial and Advisory Board

- Name board used to guide journal development and review submissions
- Faculty reviewers only
- Provide feedback on submission guidelines and site needs
- Market journal to colleagues and students

### Role of Editorial Board

- Review all submissions within discipline or cross-discipline
- Identify and solicit second reader (topic expert) for each submission (*see Lessons Learned)
- Provide publication recommendations in terms of timing and discipline representation
- Final decision for publication made by Vice President for Research

### Review and Feedback Process

- Anonymous review
- Two reviewers: editorial board and topic expert
- Three options: Accept with minor changes, accept with major changes, or revise and resubmit
- No decline option as this is viewed as an educational experience
- All students receive feedback
- "Revise and resubmit" may include a requirement of additional research inquiry and/or writing center consultation

### Other

- Eligibility: Undergraduates and one year post-graduation
- Research conducted by university's undergraduates at any location and with any mentor
- Copyright: not restrictive, submission may be published in other formats

### Moving Forward

CARAVEL

### Lessons Learned

- Editors submit recommendations for second reviewers to Managing Editor
  - Ensures submission is sent to second reviewer in timely manner
  - Ensures submission is not sent to student's mentor (may occur if reviewing more/recently)
- Short review times (max. two weeks) and timely follow-up needed to maintain editorial timeline (publication does not equal timeliness)

### Future Plans

- Student review board (graduate or undergraduate) may be added in future
- Submissions will move to web form / database rather than by email
- Will our short, catchy titles to capture a broader audience (marketing focus)

### Faculty and Student Quotes

Thank you so much for the good news you bring to [student], whose work it was my pleasure to supervise. I also commend the University, yourself and all others who work on the journal for having launched such a great initiative and for contributing to the development of our students. – *Faculty mentor*

Working with my partner and mentor on this paper has been extremely beneficial for me academically in that it has given me a thorough understanding of how to construct a proper research paper and working well with others to finalize the project. This experience will help me reach my goal of going to graduate school. -Student

# Non-traditional layout

## Dennis and Dennis Architects: Architecture and Culture in Macon, Georgia

Student Name

Art History, Sociology

### Introduction

I am investigating the cultural and architectural histories of six major buildings in downtown Macon, Georgia by the long-running local firm of Dennis and Dennis. Though the firm produced many recognizable public and private buildings during their long career, no one has thoroughly examined the extent of their influence in Macon. Relying on a variety of primary sources, my project assesses both internal evaluations of the firm's work as well as the public perceptions of these buildings over time. In the course of my research the evolution of the firm throughout their work on these six buildings has aligned with and been a parallel to the city's own commercial growth. The products of this research combine architectural histories of each building with analysis of the unique cultural impact that the firm and their buildings have had on the city.

### Future Work

There is still so much more to be learned about the firm and I hope to have opportunities to continue this research. I want to have a more comprehensive idea of the scope of their work and the history of the firm itself, eventually attaining a better point of comparison for their work across the country and within the Middle Georgia area. As I prepare to begin graduate coursework for Historic Preservation, I hope to eventually foster a career of highlighting the great stories behind buildings such as these that so intricately shape communities.

### Resources

My research comes from the firm's private archives, the records of The Macon Telegraph, and the Historical Room at the Washington Memorial Library.

### Temple Beth Israel

Constructed:
- Construction completed in 1902
- Designed for the oldest Jewish congregation in the city

Style:
- Classical details, portico, and a crowning cupola define the symmetrical façade
- Masonry and stucco composition
- White stucco composition, subtle planters, and delicate stained glass line the street-facing elevations and create an elegant

Impact:
- Set on Cherry Street, it binds the residential area on one end with the civic sector on the other
- Its design and longevity have fostered the organization's community involvement and become a physical image of the historic congregation's legacy.

Section drawing by P.E. Dennis

Shortly after Completion

### Centenary United Methodist Church

Constructed:
- Construction lasted from 1903 to 1913.
- Commissioned by a small congregation that started as a Sunday school.

Style:
- Highly decorative classical details
- Richardson Romanesque lorm
- Characterized by dramatic tower
- Brick and plaster

Impact:
- Its placement on a major street, next door to Mercer University, and facing public space gave the church access to the community.
- From here they have established themselves within the downtown area, focusing on outreach and community engagement.
- They are still an active congregation in the area, persisting through various changes in their surroundings.

Centenary Shortly after Construction

### City Auditorium

Constructed:
- Construction from 1923 – 1925
- The decision making process took nearly ten years. This time was characterized by a great deal of indecision on the location, style and capacity.

Style:
- It is Monumental portioned limestone structure
- Sits atop an armouring pedestal
- Houses the largest copper dome in the world
- Neoclassical in design
- Entrances line each street elevations
- An outdoor stage projects from the Cherry Street elevation

Impact:
- The structure has been immensely successful as a locus of culture and civic gathering.
- It commands attention from all over downtown and binds its neighboring governmental, cultural, and commercial sectors.

City Auditorium Original Interior

### Macon City Hall

Constructed:
- Original City Hall constructed in 1833
- Dennis and Dennis renovations in 1935

Style:
- Neoclassical temple front projects from two side bays
- Masonry and stucco composition
- Very symmetrical, rational façade
- Little decoration
- Planters and laurel wreath reliefs within the entablature break up the surface

Impact:
- Its regularity and explicit historic style convey its governmental function.
- Set in the same location for over a century, it has become an icon of the city.
- Cemented Dennis and Dennis's reputation for classical and civic designs

The Original City Hall Building

City Hall after Completion

### Insurance Company of North America

Constructed:
- Completed in 1957

Style:
- Commissioned to look like Independence Hall
- Marble and brick, symmetrical structure
- Rich with symbolic details and design elements

Impact:
- The building sits atop Coleman Hill.
- It does not face the street, but rather looks over the entire city.
- It is an immediately recognizable icon in downtown Macon's landscape
- The building is now home to Mercer University's Law School


Macon Telegraph Ad for INA Open House

Dennis and Dennis Rendering for Insurance Company of North America

### Post Office

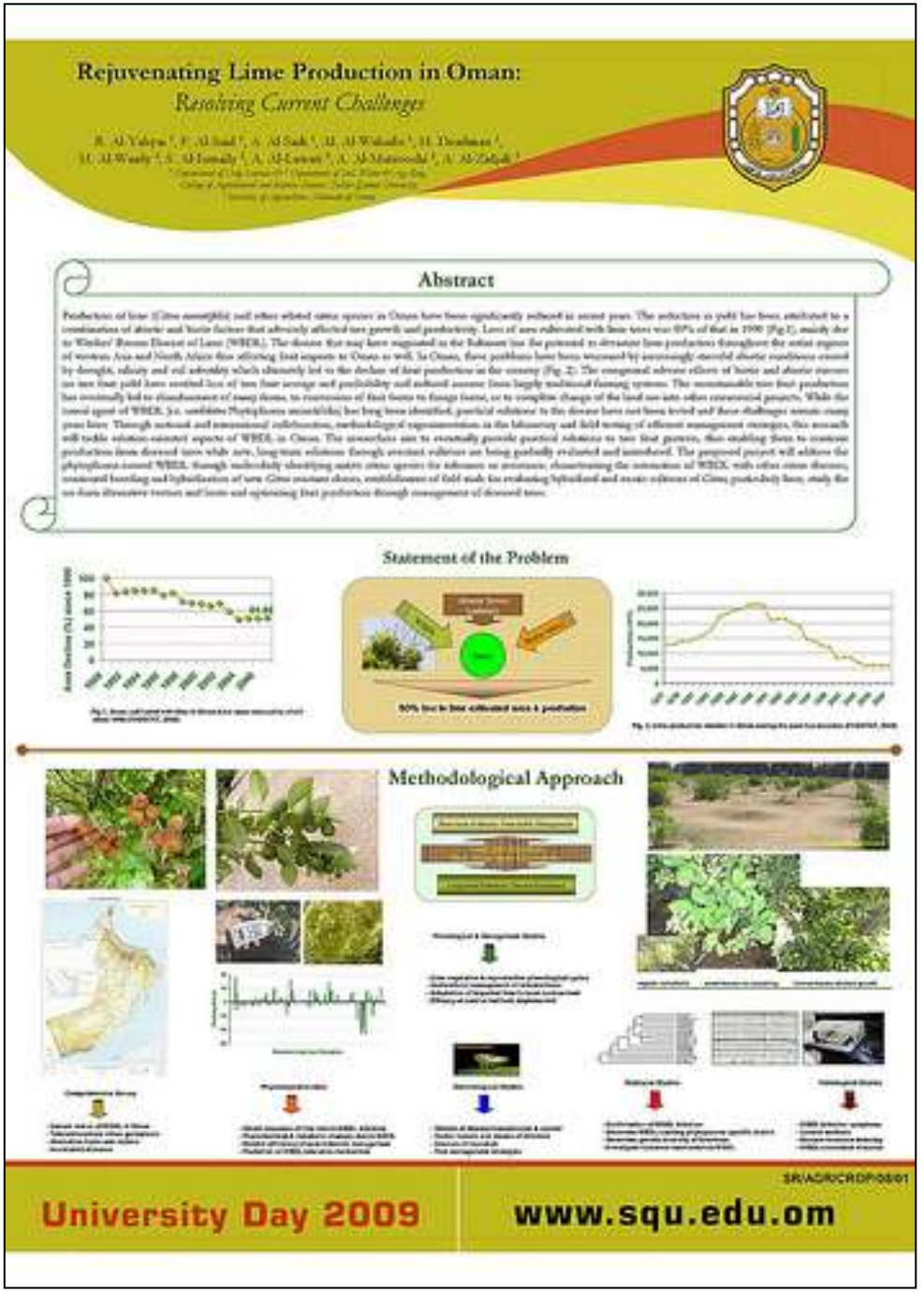
Constructed:
- Construction completed in 1964

Style:
- Abstracted Neoclassical details characterize the impressive four story façade
- Modeled after Elam Alexander's original design for Wesleyan College, which formerly stood on the property
- Designated by a squared cupola at its top
- Brick and Marble structure
- Functional post office needs grow out of the less formal rear

Impact:
- The building's referential design honors the city's history, while its Classical abstractions mark it as a modern regional business center.
- Dennis and Dennis proved their skill at infusing symbolism with their signature traditional language.
- The buildings ideal location on College Street insures that it is still a busy center today.

Dennis and Dennis Rendering of the Post Office

Alternative layout with top to bottom flow



# “Expected” layout for activities/experiences

participate create lead

USCCONNECT

## Title

**Student Name; Mentor Name**
**Department, University of South Carolina**

participate create lead

USCCONNECT

### USC Connect

*USC Connect* is leading the transformation of students' educational experiences through a university-wide focus on integrating learning within and beyond the classroom. The ultimate goal of *USC Connect* is for students to be thoroughly and deeply prepared with core knowledge, developed skills, and the dispositions to contribute and lead in home, community, and work settings. USC Connect strives to enhance the learning of all students by promoting participation in beyond the classroom experiences, and creating opportunities for reflection on these experiences.

### Community Service

One thing about me that sets me apart from many others is the dedication I put into my service work here at Carolina. I currently serve as Executive Director of the Waverly Afterschool Program, President of Students for Big Brothers Big Sisters, President of the USC Chapter of No Kid Hungry, Vice President of Make a Wish Organization, Vice President of Community Service for USC Connect Student Representative Board, as well as a host of other organizations. Besides serving, I have also completed two service-learning components as well.

### Reflection

The unique thing that I really enjoy about USC Connect is that the five pathways to success are all different, but connect to each other. Being involved with Community Service is a pathway that can connect you with anything whether you are studying abroad, doing research, or taking part in an internship! USC Connect emphasizes that service is a great way for us to reflect on helping our local and global community & address many grass root problems that fall through the cracks because there are not enough people to help address them.

### In Class Experience

In my School's in Community (EDFN 300) class I have been able to learn what it means to be an educator. I have researched several different regions and learned how education looks differently where ever you go. Being able to take the information I have learned inside the classroom has created a gateway to what I participate in outside the class. Learning strategies such as how to tutor students makes a difference.

### Waverly Program

I take the most pride in the transformation the Waverly program has taken since I started to work with it. The 2012-2013 school year was the first year that I took over the program as Executive Director! I have been able to improve the program. We not only expanded our volunteer base, but we also expanded the program so that we could help even more students. This year, we partnered with St. Lawrence Place, a transitional shelter for single mothers, and brought the Waverly Program there so that their children could have access to the same resources as those who attend Melrose Park. Everyday I see significant similarities between what I have learned in my classes and the work that I do with Waverly. Being able to make a connection between the two helps a lot, especially since the work I do directly correlates to my future career plans. Waverly embodies what USC Connect stands for when it comes to outside experiences.

### Reflection

In my work with Waverly I am preparing myself to be an educator. My goals consist of expanding the program I have grown as well as working more on learning exactly what it means to be an educator.

### Community Service in Action

In my Service Learning in South Carolina class (Univ 201) we took an alternate spring break trip to Allendale, SC. In this photo I am working to restore an abandoned home so it can be turned into an educational facility for community members.

In my Speech 140, class I was taught the skills to communicate with any audience. In the photo to the **right** I am reading a book to a group of kindergarten students at an elementary school.

In the photo **below** I am tutoring a local high school student who participates in the Waverly Program.

### Contact information

### Conclusion

When I created an e-portfolio I was able to look back at all the work and accomplishments I have participated lin and reflect on those experiences. Creating an e-Portfolio not only helps me reflect on what I learned, but may also help me attract future employers.

### What I Learned?

I have learned the art of true reflection from working on this project. I was able to take one pathway from USC Connect—Community Service, and expand on the one aspect of how everything we do inside the classroom connects with what we do outside. I learned that you should always keep a journal of every organization and event that you take part in. It is important to record the purpose of the event and what you got out of it.

### Future Career

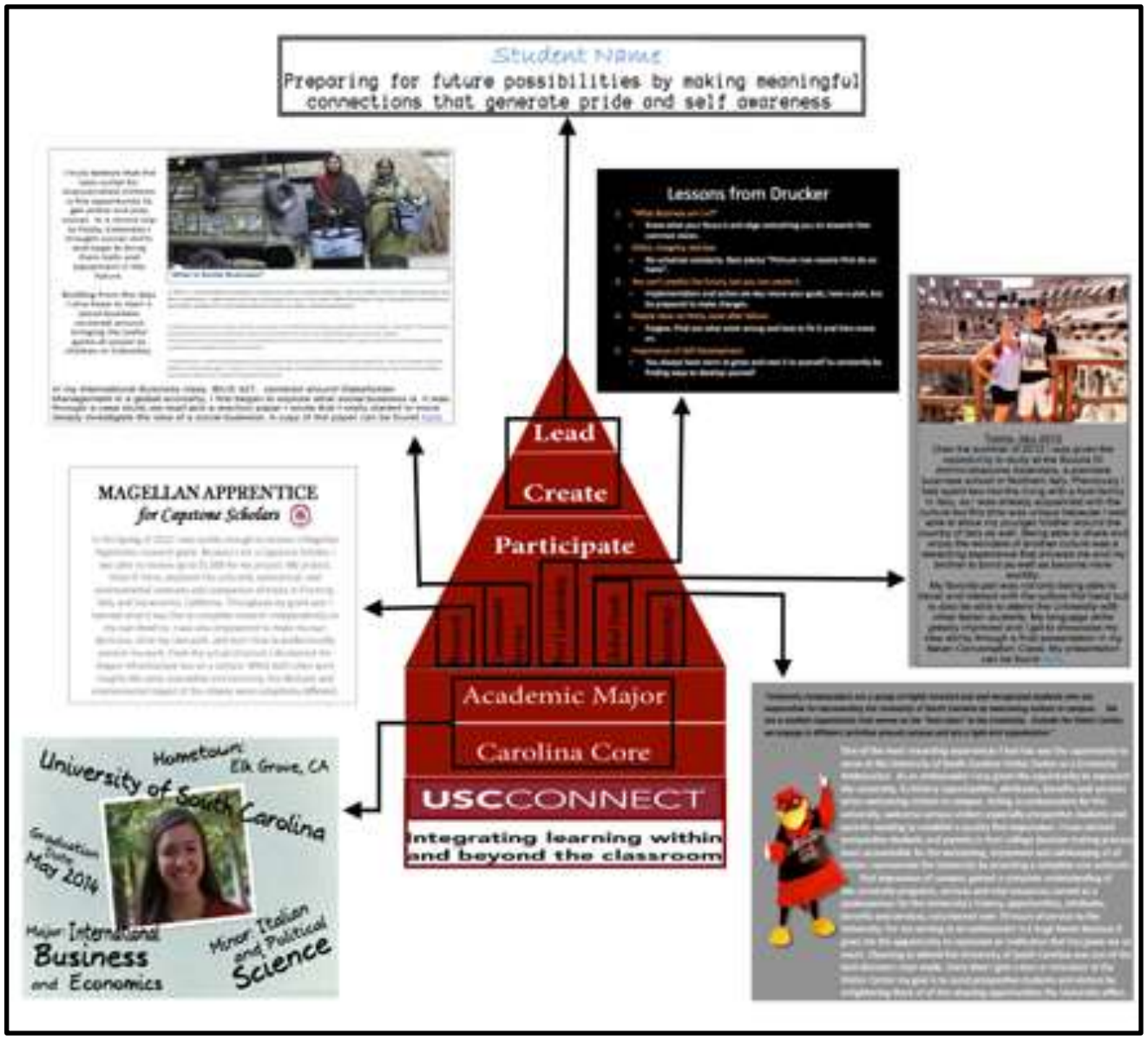
I have learned that everything I do helps prepare me for when I have my own class and am teaching. Working both at the Waverly center combined with my experiences inside the classroom helps to ensure that I have the proper tools needed to be a successful educator.

### Learning Never Stops

What I will take away from this experience is that learning never stops. As I learn within my classes, I am able to use that information in my community service position. As I work with students, I am constantly learning from: How a particular teaching style works, how to create lasting relationships with students, and how to appeal to their learning styles. I know that as I begin my career as an educator, I will repeat this cycle. I will reflect on my experiences I will be able to use what I learned to create a great learning environment.

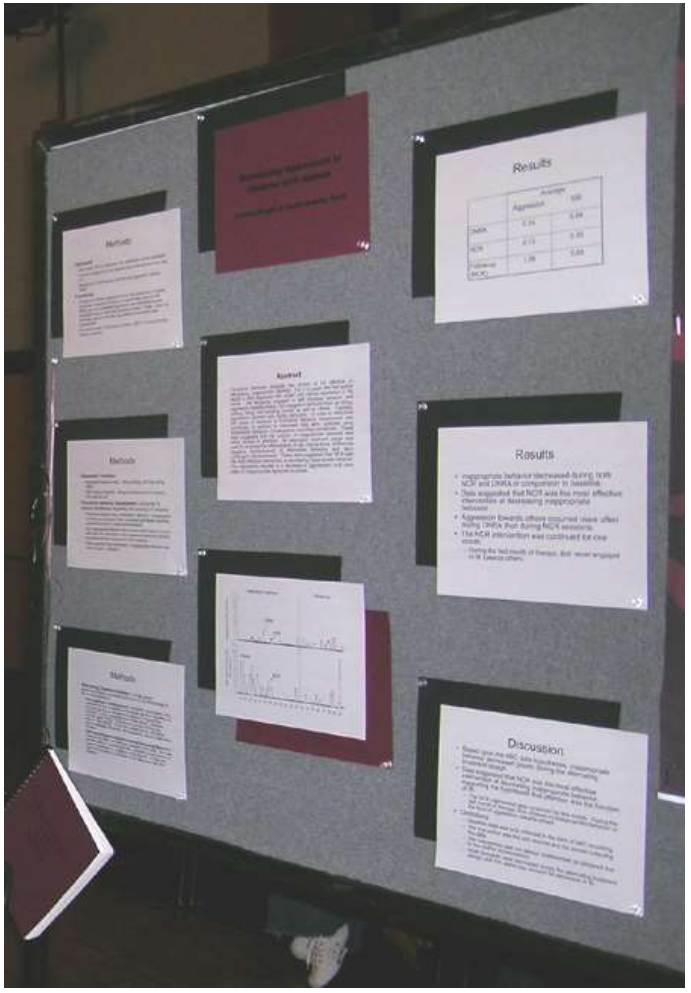
Alternative layout with top to bottom flow for activities/ experiences

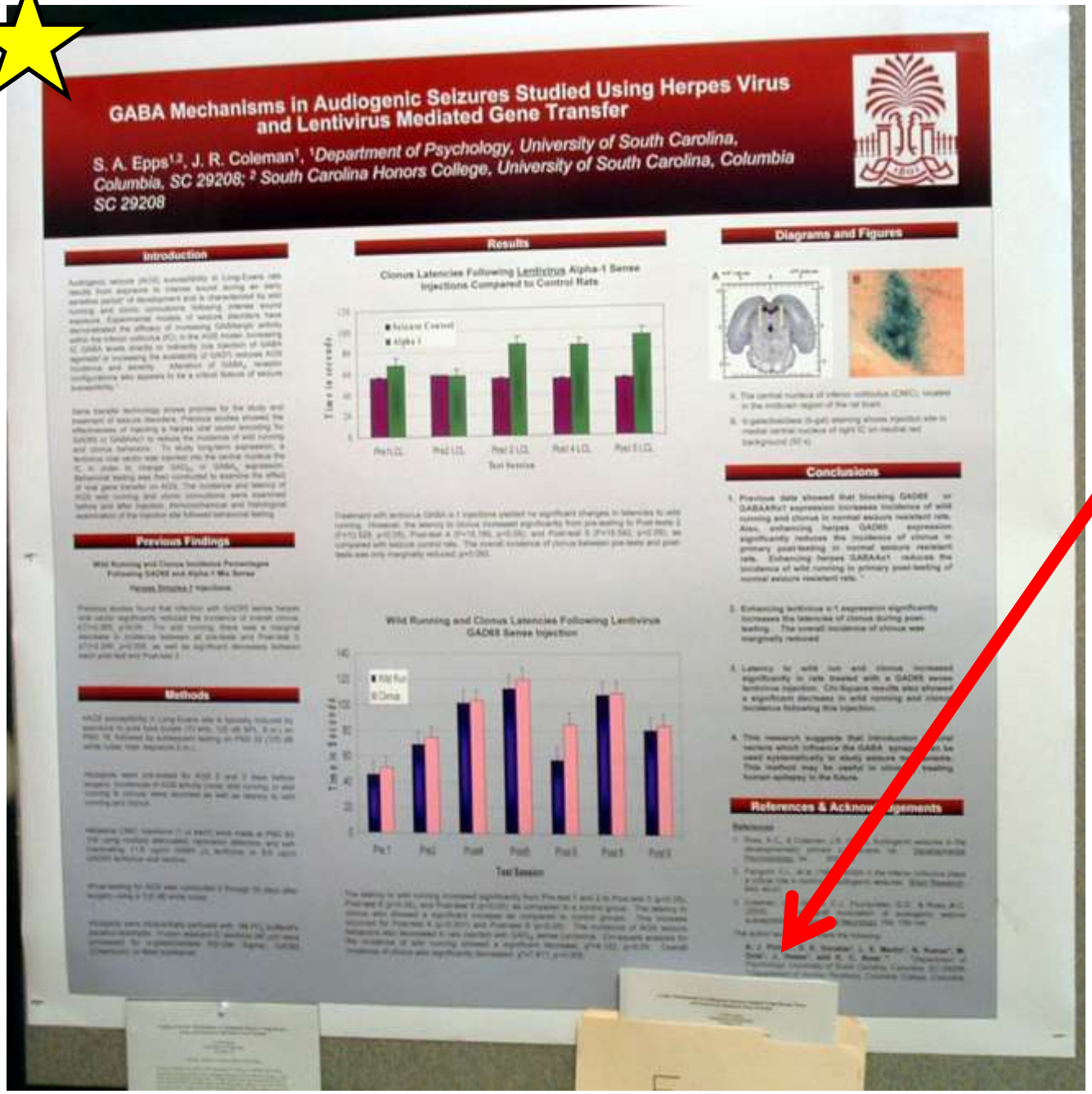
# Non-traditional layout for activities/experiences



OPTION to avoid the cost of a full size poster print: Create individual “slides” of information in powerpoint using the traditional sections expected in a poster; print out each “slide” on standard 8.5”x11” paper; attach to display board in separate pieces

**MUST bring your own push pins or thumbtacks**




Want to provide additional information or handouts during your presentation?
*-add a folder or envelope of info to bottom of the display board*

**MUST bring your own push pins or thumbtacks**



- YES, you can have a laptop or display WITH your poster.
- Tables ONLY provided if requested with abstract submission.
- You may only use half of the table (the area below your poster).
- No electricity available.

UNIVERSITY OF SOUTH CAROLINA

# How To:

## Planning your poster

# Planning:

#1

REMEMBER:

You are not in this alone – talk with your mentor!

**ASK for assistance!**

# Planning: Identify Message

#2

What do you want the audience to know when finished?

**Identify your message!**

# Planning: Support Message

#3

What information is CRITICAL to understanding this message?

**Include ONLY message supporting information!**

# Planning: Outline Information

#4

Outline your message and supporting information

**The abstract is a good starting point**

# Planning: Outline Information

#4 continued

## Possible questions/issues to consider in your outline:

1) Clarify your message
2) What activities or results support message
3) What information is needed to understand the results/experience and how you got to those results
4) Are there images that can help explain or support the message
5) Introduce or explain the activity to put it in context
6) Are there any future plans or next steps
7) Review "typical" sections (Slide #10)

**Stay message focused!**

# Planning: Mapping Poster

#5

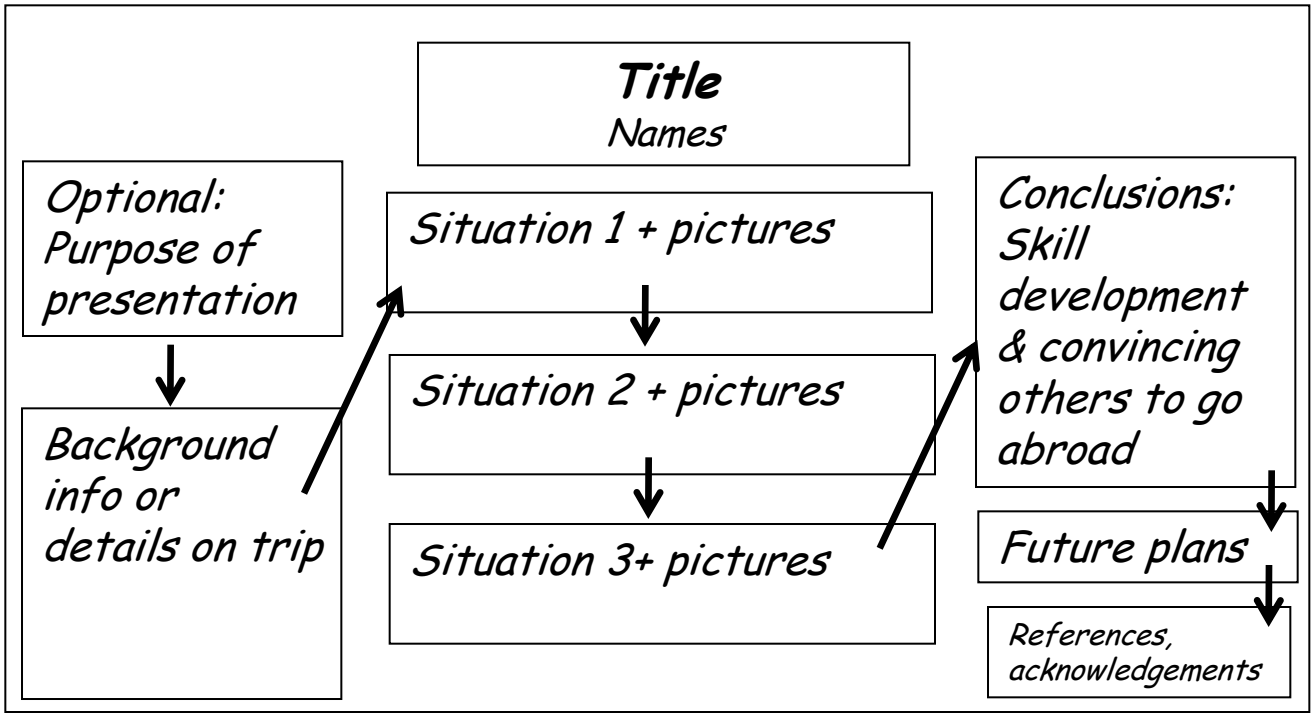
Map your outline into poster format on paper

**Review critically; focus on the message!**

# Planning: Mapping Poster

## EXAMPLE

#5 continued




**Review critically; focus on the message!**

# Planning: Resources

#6

- *Creating Effective Poster Presentations* by George Hess, Kathryn Tosney, Leon Liegel http://www.ncsu.edu/project/posters/
- *How to Write a Research Poster* by Lorrie Faith Cranor http://xrds.acm.org/resources/how-to-write-research-poster.cfm
- *Building Your Presentation Poster* by Dr. Linda Vick http://www.npuphysics.org/resources/comp/building_your_poster.pdf
- *Poster Design Resources: Design & Presentation* by UNC Health Sciences Library http://guides.lib.unc.edu/poster_design

UNIVERSITY OF SOUTH CAROLINA

# How To:

## Creating your poster

# PowerPoint Resources: Web links

*Poster-making 101* by Brian Pfohl and Greg Anderson, Bates College http://abacus.bates.edu/~bpfohl/posters/

*Designing Effective Posters* by UNC Health Sciences Library http://guides.lib.unc.edu/posters

*Creating a Poster in PowerPoint* by Eastern Michigan University http://www.emich.edu/apc/guides/apcposterpowerpoint2010.pdf

**Discovery Day Poster Size (MAX):**
**48in (H) x 42in (W)**

# PowerPoint Resources: Video links

## YouTube videos: Creating posters in PowerPoint

*Creating posters using PowerPoint 2010 (part 1 of 2)*
by University of North Carolina Chapel Hill Health Sciences Library tutorial
https://www.youtube.com/watch?v=0xBQ1F4EMyE

*Creating posters using PowerPoint 2010 (part 2 of 2)*
by University of North Carolina Chapel Hill Health Sciences Library tutorial
https://www.youtube.com/watch?x-yt-cl=85114404&v=4rekTy8iFbk&x-yt-ts=1422579428

*Making an academic research poster using Power Point*
by Jerry Overmyer (Mathematics and Science Teaching Institute (MAST), College of Natural and Health Sciences, University of Northern Colorado)
http://www.youtube.com/watch?v=MqgjgwIXadA

**Discovery Day Poster Size (MAX):**
**48in (H) x 42in (W)**

# InDesign Resources: Video links

## Creating posters in InDesign

*Create professional posters using Adobe InDesign*
by University of North Carolina Chapel Hill Health Sciences Library tutorial
http://guides.lib.unc.edu/c.php?g=8592&p=44030

**Discovery Day Poster Size (MAX):**
**48in (H) x 42in (W)**

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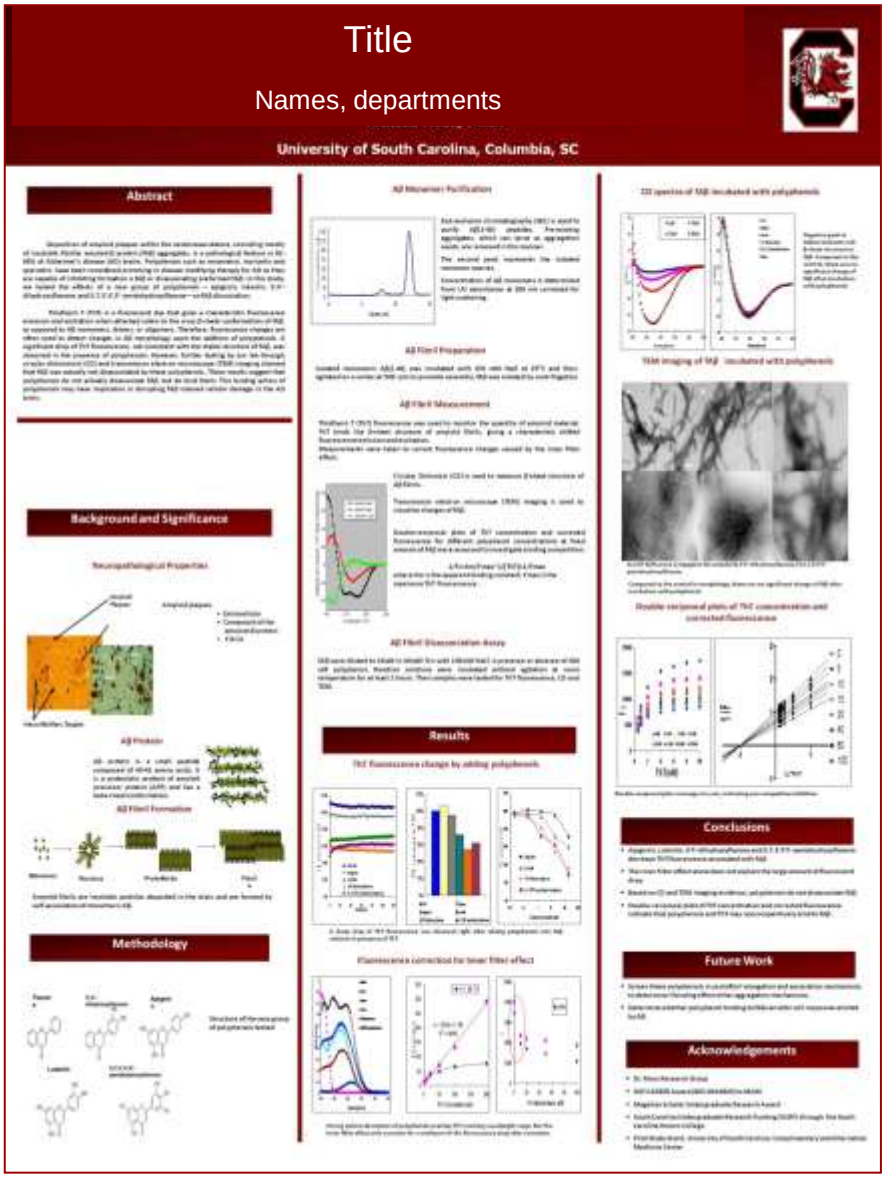
# How To:

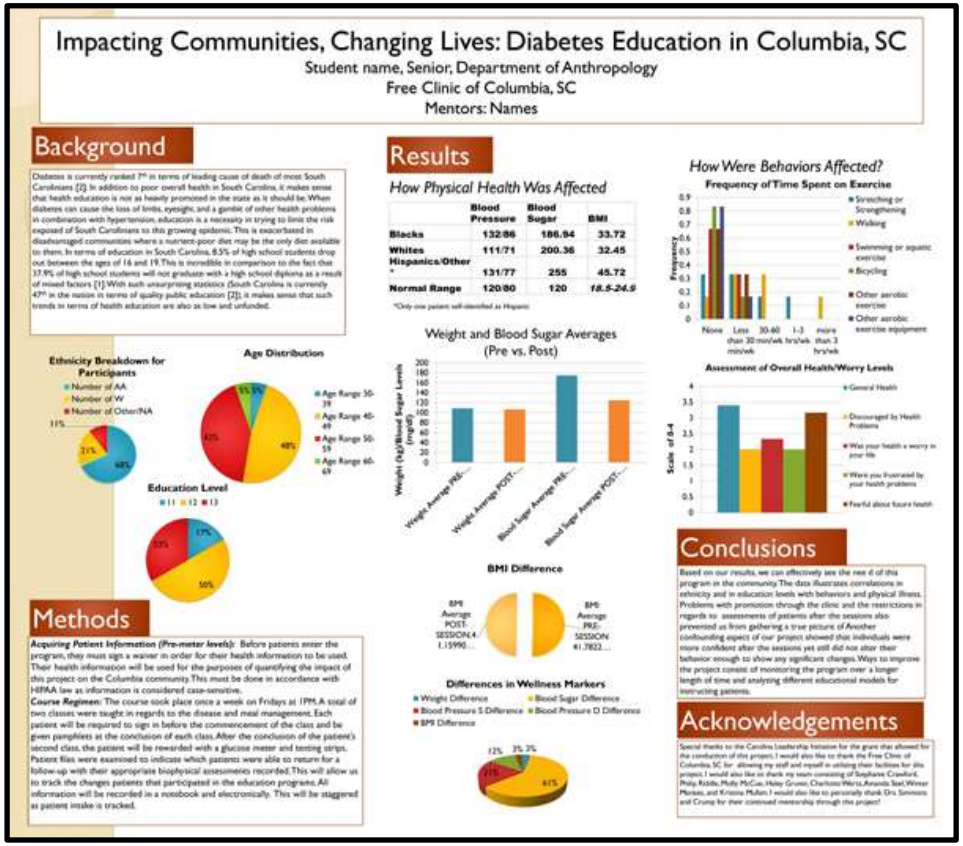
## Details: Making it GREAT

# Guidelines: Color

Use color, photos, charts, and graphs to **support** your poster and message.

**Remember**: A little color goes a long way. Stick to two or three colors **for text**.




GOOD:

1) use of color to highlight and separate sections;
2) uses color and pictures effectively in results;

BAD: text small

# Guidelines: Color

When choosing colors for your poster, err on the side of conservatism.

- Chartreuse and pink? **Not so much!**

Certain colors "vibrate" when side-by-side, making text difficult to read:

| Headache | Yikes |
| --- | --- |

# Impacts of sea-level rise on Seattle, WA

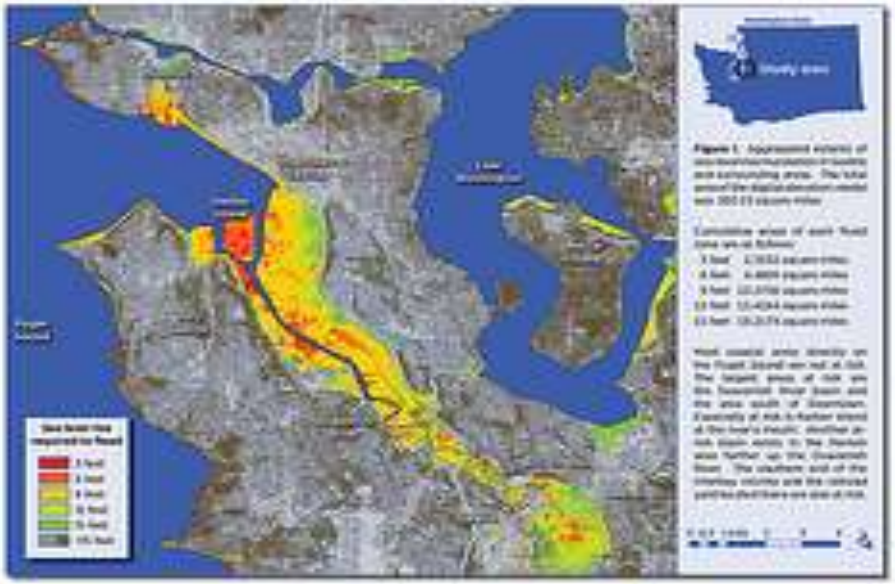
DANIEL MAHR • BROWN UNIVERSITY • GEO132 • DECEMBER 12, 2009

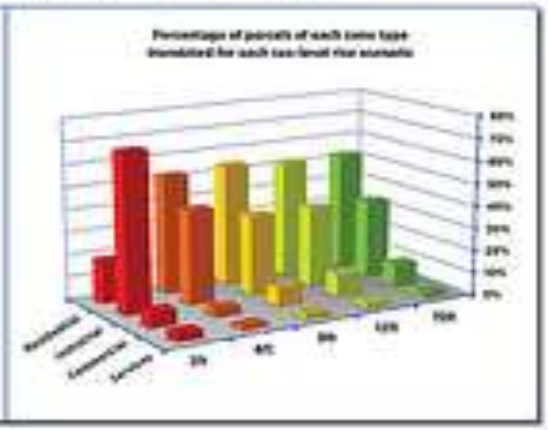
## Introduction

## Data

## Methods

## Results






## Discussion

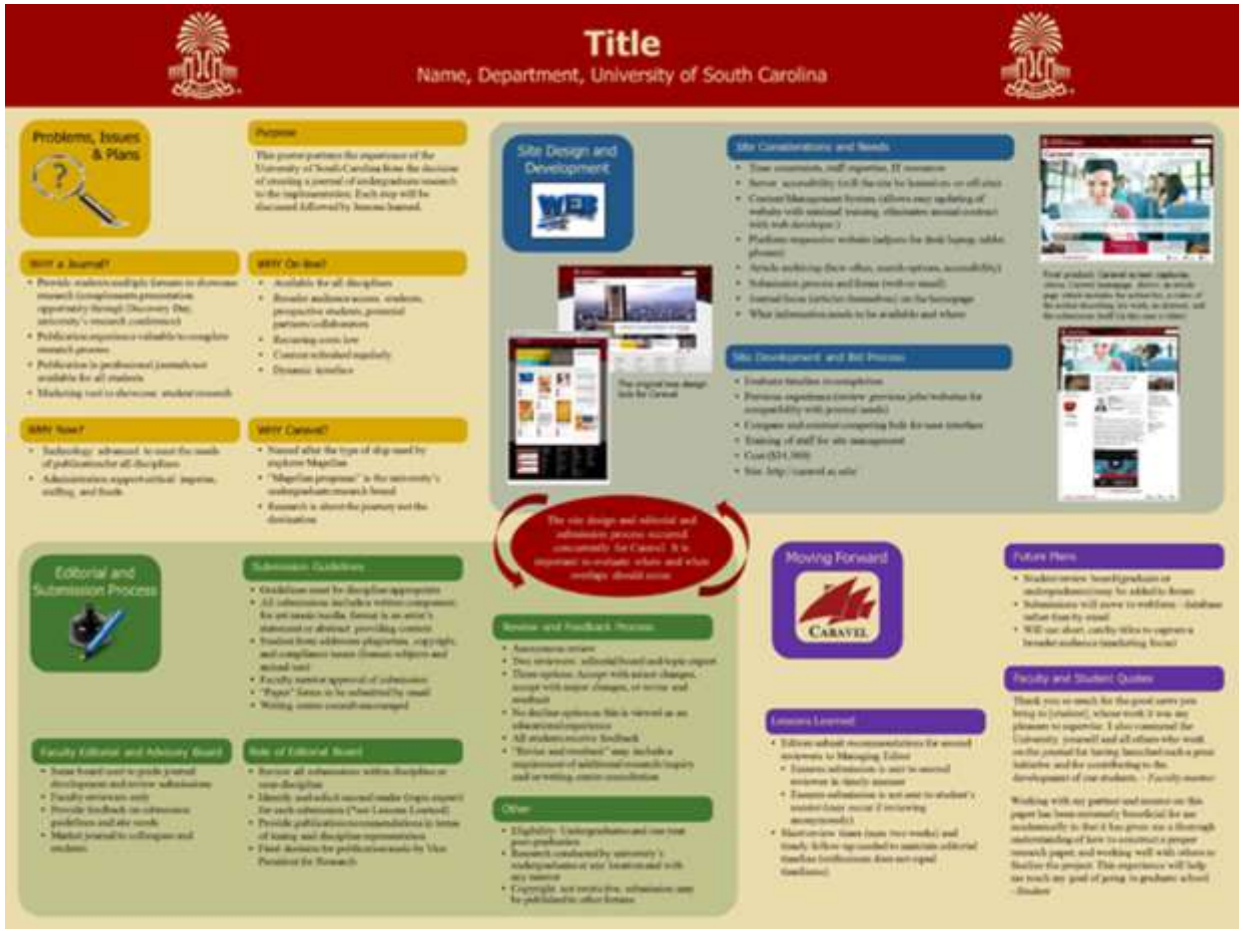
## Conclusions

## Acknowledgements

GOOD: 1) use of color and contrast; 2) sections highlighted and separated for emphasis; 3) good focus on data/results; BAD: too much text

# Guidelines: Color

Color can be used to accentuate, separate, and/or highlight information



# Guidelines: Color

Avoid

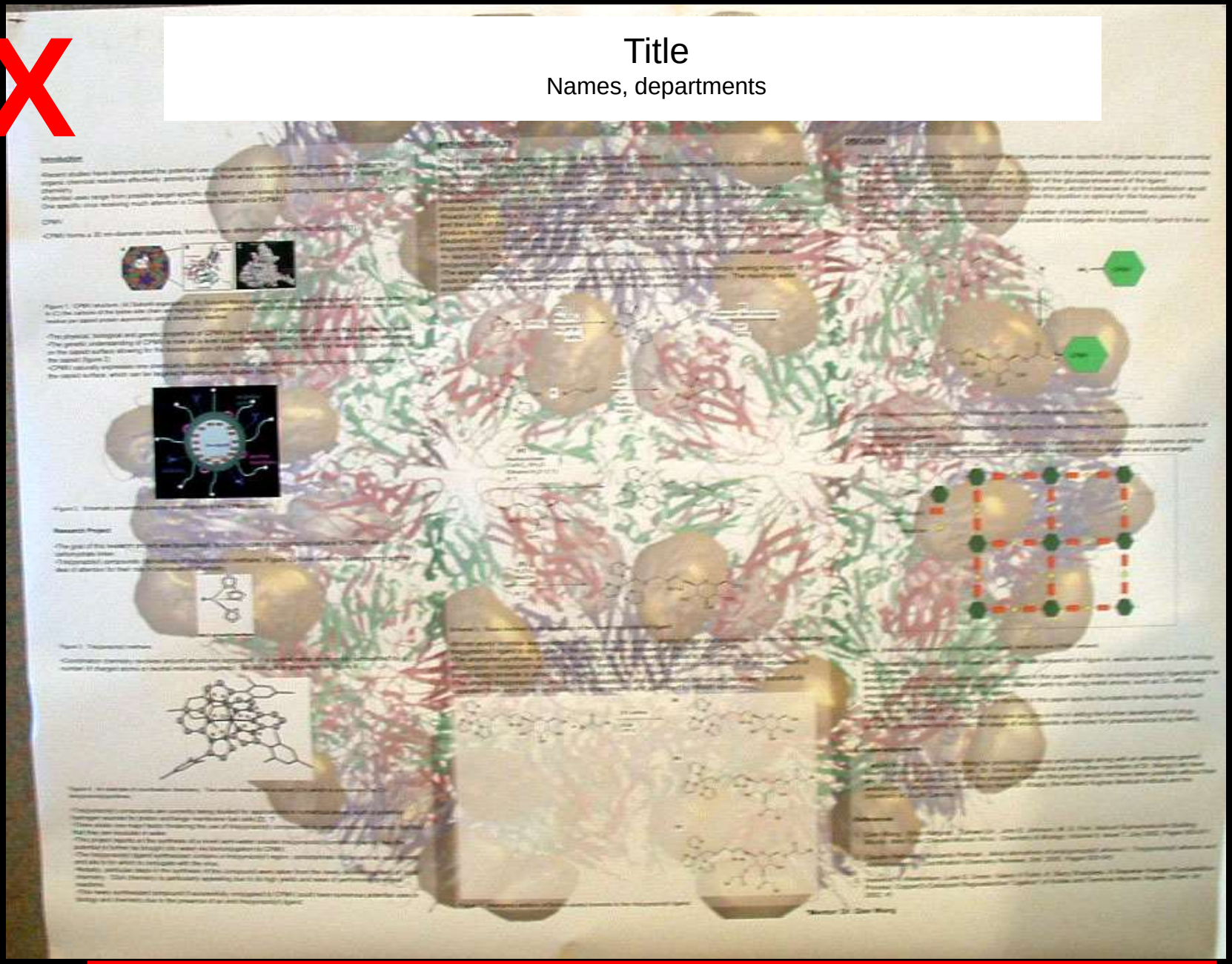
background

pictures!

X

# Title

Names, departments



Background overwhelming text; text too small

X

# Title

Names, departments

## Introduction

Play behavior in juvenile rats is important for the recognition of social cues and behaviors in adulthood. One of the biggest indicators of play in juveniles is pinning (Panksepp & Beatty 1980), which is when one play partner is laying dorsal-side down with another partner laying on top (Vanderschuren et al 1997). Pins are usually preceded by contact with the dorsal area of the pinned rat.

In the past, play has been shown to be affected in models of Fetal Alcohol Syndrome (FAS) (Meyer & Riley 1986). While FAS models show that alcohol affects both duration and rate of social behavior (Kelly et al 2000), relatively little research has been done on play.

Siviy & Panksepp (1987) found that juvenile rats with their dorsal body surface anesthetized show a concentration-dependent reduction in play behavior. The current experiment uses an FAS model to analyze the effect of alcohol exposure on play behavior in rats with varying degrees of sensory impairment induced by local anesthetic.

## Treatment

Prenatal and postnatal alcohol exposure administration was done via intragastric intubation (see table below)

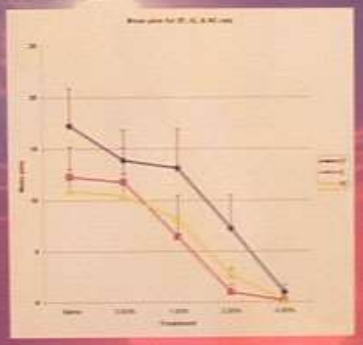
| Group | Treatment of Dams (GD1-Birth) | Treatment of Pups (PD2-PD10) |
|---|---|---|
| Ethanol Exposed (ET) | | |
| Intubated Controls (IC) | | |
| Nonintubated Controls (NC) | | |

## Procedure

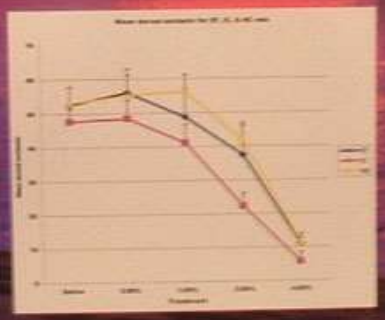
Two males and two females were used from each litter. Rats were weaned at postnatal day (PD) 21 and housed separately at PD 27. On PD 32 to 34, rats were habituated for five minutes to play in an isolated area. On PD 35, rat pairs began testing. Five doses of xylocaine, a local anesthetic, were used: 0.00%, 0.50%, 1.00%, 2.00% and 4.00%. .2 ml were administered dorsally in four places: behind each ear, and laterally at each side above the ribcage. The treatments were administered in randomized fashion over five days of testing.

## Results

The amount of mean pins for each xylocaine treatment in the ET group was significantly more than the IC or NC groups, except for 0.50% & 4.00%. These data are collapsed across sex.



The mean dorsal contacts for each group followed the general pattern of peaking at 0.50% and decreasing, except for NCs, who peaked at 1.00%. These data are collapsed across sex.



## Conclusions & Future Directions

The data at this point suggest that the effect of xylocaine treatment did not interact with group. This suggests that the change in play behavior seen here in ethanol-exposed rats is not a function of somatosensory processing changes, and instead must be a function of some other aspect of the social behavior system.

The heightened number of pins in the ET group suggests that either the ethanol-exposed rats are more motivated to engage in play behavior, are more sensitive to play initiation by another animal, or are more likely to exhibit play responses. The lack of differences in dorsal contacts across groups suggests that there are no differences in play responses and the lack of interaction between group and xylocaine dose suggests no differences in sensory sensitivity to play initiation. Therefore, it may be that motivation to play is altered in alcohol-exposed animals. This suggests that alcohol exposure may be altering social motivation during the juvenile period. FAS is known to increase the likelihood of impulsive, and subsequently delinquent, behavior, at least in males (Tremblay et al 1994), and this may be due to changes in motivation.

## References




Background overwhelming & inconsistent with message;
too much text and too small

# Guidelines: Text

## Break text into easy-to-read chunks:

- Use paragraphs sparingly
- Use lists/bullets
- Use audience appropriate language
- Use distinctive section headers
  - Emphasize with text size, color, or font

# Title

Names, departments

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## Introduction

### Wireless Networks

- Wireless networks are expected to be available and reliable at all times and all locations
- Environmental conditions like walls, weather, and large crowds cause problems

### Smartphones

- Smartphones have a variety of sensors built into them that can gather information about the surrounding environment
- These sensors include accelerometers, compasses, light detectors, and proximity detectors
- They also have wifi radios and GPS

### Goals

- This project aimed to use the readings from the sensors to detect situations that will cause reduced signal strength
- It may be possible to predict when the user is going to have poor reception so the phone can plan accordingly

### Other Work

- A number of other projects are underway that also make use of the sensors available on smartphones
  - Mobile Assistant for Inattentive Drivers (MAID)
  - Increasing the reliability of natural interaction systems such as Microsoft's Kinect

## Methods

### Android App

- An app was developed for Android phones that would automatically collect data every 15 minutes
  - This interval was chosen to balance frequency of collection with battery life
- The app was allowed to run constantly on the user's phone to collect data in real world situations
- The app uploaded data after each collection to a MySQL database

### Data Collected

- Data collected included: time, proximity, battery level, location, cellular signal strength, and wifi signal strength
- The data were downloaded from the database into an Excel spreadsheet
- The correlation function in Excel was used to determine if acceleration, magnetic field, proximity, battery charge, or light appeared to have an influence on cellular and wifi signal strengths
- The data points corresponding to wifi signal strength were plotted on a map and color coded to indicate the signal strength of the University wireless network, "uscstudent" at that location

## Results and Discussion

### Accelerometer

- Cellular Strength: 0.146
- Wifi Strength: 0.069
- These low correlation values indicate the absence of a relationship between acceleration and both cellular and wifi signal strengths

### Magnetic Field

- Cellular Strength: -0.123
- Wifi Strength: -0.022
- These correlation values were even smaller than the ones for acceleration, so there is again little evidence to suggest a relationship between magnetic field and the signal strengths

### Proximity

- Cellular Strength: -0.302
- Wifi Strength: -0.289
- These values are much stronger than the previous two and are the strongest observed.
- There is a possibility of a slight negative correlation
- The relatively strong correlation could also be explained by the phone being in a pocket versus in the open

### Battery Charge

- Cellular Strength: -0.291
- Wifi Strength: -0.193
- These values are weaker than the proximity values and slightly negative
- There may be a negative correlation between battery charge and the signal strengths

### Light

- Cellular Strength: 0.205
- Wifi Strength: 0.017
- These values were opposite the proximity values and much weaker
- This difference supports the possibility of being in the pocket reducing signal strength and being in the open increasing it

### Figure 1: Wifi Map

- The map reveals the clustering of the data points
- As the project continues, a more even distribution of data points will be collected
- Wifi signal strength appears to be stronger inside than outside

ARENA

Arena for Research on Emerging Networks and Applications

## Wifi Map

Figure 1: Map of Wifi Signal Strength

Detail of LeConte

Detail of Swearingen

## Ongoing and Future Work

### Signal Correlations with Other Sensors

- Use newer sensors such as gyroscopes, barometers, and thermometers
- Collect data in diverse scenarios using multiple phones

### Mobile Assistant for Inattentive Drivers (MAID)

- Link the phone to the car's diagnostics port to get real-time data from the car's sensors
- Identify the fingerprint for each event and create the abstract sensor modules
  - *Reckless*: detect reckless driving
  - *Speed*: detect when the driver is going too fast
  - *Turn signal*: detect if the driver properly signaled before turning
  - *Stop*: detect if the driver obeyed a stop sign
  - *Lost*: detect when the driver appears to be lost
  - *Yield*: detect if the driver properly yielded at a yield sign
  - *Clog*: detect if the driver is causing traffic to back up behind him
  - *Drunk*: detect drunken driving
  - *Lane change*: detect lane changes
- Identify additional situations that might be detectable using the phone's sensors

### Enhancing Kinect with Smartphones

- Wii uses accelerometer and gyroscope to detect motion
- Kinect uses video and depth cameras to detect motion
- Combine the two methods together to make a more robust system
  - Use the phone in the pocket in place of the Wii remote
    - Use its accelerometer/gyroscope sensors to aid Kinect
  - Allow players Kinect cannot see to interact with the system
  - Help the system identify players from a crowd

Good use of color and contrast; sections highlighted and separated for emphasis; bulleted lists easier to read

# Guidelines: Text

Use an easy-to-read font for all text at a minimum size of 24pt.

Avoid ALL-CAPS for extended blocks of text, as they are HARD TO READ.

# Guidelines: Text

Studies show that serifed fonts are easiest to read for long blocks of text.

Limit yourself to two fonts – generally one serifed and one non-serifed.

# Guidelines: Text

Use “standard” fonts, such as:

## Serif:

- Times New Roman
- Garamond
- Georgia

## Sans Serif:

- Arial
- Calibri
- Verdana

## Symbols, math:

Use only the most basic symbols needed

# Guidelines: Text

Using “standard” fonts limits printing concerns

Unknown fonts might be changed during the printing process, resulting in changes to your design and layout

*To avoid font substitution, see “how to” docs for embedding fonts prior to printing*

# Guidelines: Text

Suggested font sizes:

- Title - sans serif, Title Case, 90-120pts
- Sub Titles (names, etc) - sans serif, 72 pts
- Section Titles - sans serif, 45 pts
- Main Text - serif font, minimum 24pts (bigger is better!)

# Guidelines: Images

Pictures, graphs, etc = **GOOD**!

Clip art = **BAD**!!!!

If your work depends on illustrations but you can't draw to save your life, make friends with someone who can or do without.

# Guidelines: Images

- Check the quality of your image, picture, graph, etc. BEFORE printing (check it at 100% size – find this under "View" in PowerPoint)
- Avoid pixilated pictures and graphs!

# Guidelines: Images

Don't use images you find on the internet for your poster unless you know:

1. The images are not copyrighted

2. The images are large enough to print well on your poster

# Guidelines: Aesthetic

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Simplify!

Excellent example of image use and extremely limited text

# Modular Nano-Enabled Sorption Cartridge for Water Treatment

Student Name; Mentor Name
Civil and Environmental Engineering, University of South Carolina, Columbia, SC

## Motivation:

- World-wide potable water crisis needs affordable treatment technologies
- Nanomaterials have promising capabilities (sorption/filtration)
- Lack of strategy for useful application


## Objectives:

STEP 1. *Immobilize* Carbon Nanomaterial in a Water Filter

+

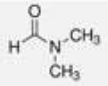
STEP 2. *Optimize* Nanomaterial Distribution within Filter

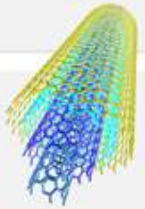
➡

STEP 3. *Analyze* Contaminant (e.g. BPA, Lead, Arsenic, etc.) Removal Efficiency

## Materials:

- Carbon Nanotubes (CNTs)
- Organic Solvent: N,N-Dimethylformamide
- Commercial Water Filter

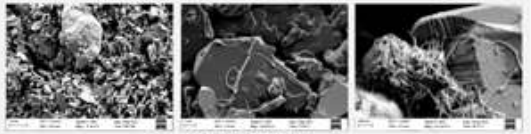




## Methods:


## Results:

(a) Control Filter



(b) MWNT-Enabled Filter

Figure 1: SEM Images

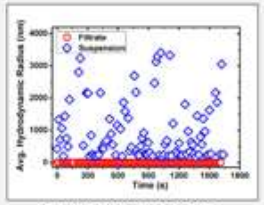


Figure 2: Hydrodynamic Radius

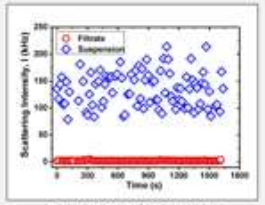


Figure 3: Scattering Intensity

## Underlying Mechanism:

Untreated Filter Surface (No Affinity)

Chemically Treated Filter Surface (Thermodynamic Affinity)

## Conclusions:

- CNTs can be deposited on functionalized surfaces
- The attachment is irreversible thus results in immobilized CNT coated surfaces

*Invention Disclosure (SCRF# 00930): Carbonaceous Nanomaterials Immobilized on Porous Matrices to Remove Organic Contaminant from Water*

# Guidelines: Aesthetic

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## Question everything!

- Does it support the message
- Is the language understandable
- Is it too wordy
- Is it too busy

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# How To:

## Viewing and Editing

# Viewing and Editing

Throughout the process, view layout and contents at full size and overall!

In PowerPoint:

- To view full size: View-Zoom-100%
- To view overall: View – “fit-to-window”

# Viewing and Editing

## Share drafts with mentor and peers:

- HONEST opinions
- Editing assistance (grammar, spelling, language usage, layout, aesthetics, etc)

In PowerPoint:

- Email PowerPoint file
- Convert to PDF (Office button-Save As-PDF)
- Print on 8.5x11 paper (Office button-Print-check box: Scale to fit paper-preview to confirm-Print)

# Viewing and Editing

## Full size editing:

If possible, it's a great idea to print out a full size draft for editing

HOW: (tips under "how to": http://www.sc.edu/our/discovery.shtml)

- Printers
- Adobe Acrobat
- Publisher
- Excel
- Other?

# Formatting and Printing (1 of 2)

Poster size (MAX) 48in H x 42in W (not a typo!)

*Contact the printer BEFORE to confirm printing requirements, issues, etc*

Where to print - Columbia:

- USC printing (COUPON!) http://printing.sc.edu/
- CAS – Gambrell Hall http://artsandsciences.sc.edu/technology/computingcenter
- Marine Science – ask in department
- Engineering and Computing? Ask student services or the computing center
- Honors fellowship recipient? Contact Susan Alexander
- School of Medicine http://dba.med.sc.edu/price/irf/PosterP.htm
- FedEx - $$

# Formatting and Printing (2 of 2)

## Where to print - Aiken: (3 options, ask mentor)

- Biology/Geology department: Students mentored by Bio/Geo faculty print for free, others $25 per poster
- Instructional Services department: $35/poster
- USCA Operations: $25/poster

## Where to print - Upstate:

- Contact Adrian Hayes (AHAYES@USCUPSTATE.EDU) for options

## Where to print – All Campuses:

- USC printing (COUPON!) http://printing.sc.edu/

# Remember:

A successful poster…

- conveys a clear message,
- by high-impact visual information,
- with minimum text

…grabs attention!

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# How To:

## Presenting

#1

# The TALK

- Prepare a 30sec, 2min, and 5min overview of your project/activity
- Possible topics (think message and outline):
  - the context of your problem/experience and why it is important (Introduction/Background)
  - your objective and what you did
  - what you discovered or results
  - what the answer means in terms of the context or the impact

**Spread the message!**

#2

# Consider Audience

- Be prepared to talk with experts and non-experts
- Know definitions
- Critically review your poster and talk for potential questions
- Don't be scared of "I don't know," "I hadn't thought of that," and "Great idea!"

**Don't assume knowledge!**

#3

# Engage the viewer

- Invite the viewer to ask questions or offer to "walk them through it"
- Use the poster as a visual aid to emphasize points and share information (point to things)
- Don't stand in front of your poster (can move in while pointing to things)

**Be welcoming!**

#4

# Attitude

- If you are bored – your audience will be bored!
- Show your enthusiasm for your topic

**Share your passion!**

#5

# Appearance

- Don't distract the audience with your own appearance
- Be neatly neutral OR complement colors
- Business casual (suits not required)
- Sensible shoes (remember standing!)

**Don’t clash!**

# Presentation Resources

- Creating Effective Poster Presentations: Present Your Poster by George Hess, Kathryn Tosney, Leon Liegel
  http://www.ncsu.edu/project/posters/PresentPoster.html

  In video form (this is great, but a little long):
  https://www.youtube.com/watch?v=vMSaFUrk-FA

- A Guide to Presenting a Poster by the Cain Project in Engineering and Professional Communication
  http://www.owlnet.rice.edu/~cainproj/presenting.html

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# DISCOVERY DAY

...a forum for
student ingenuity!