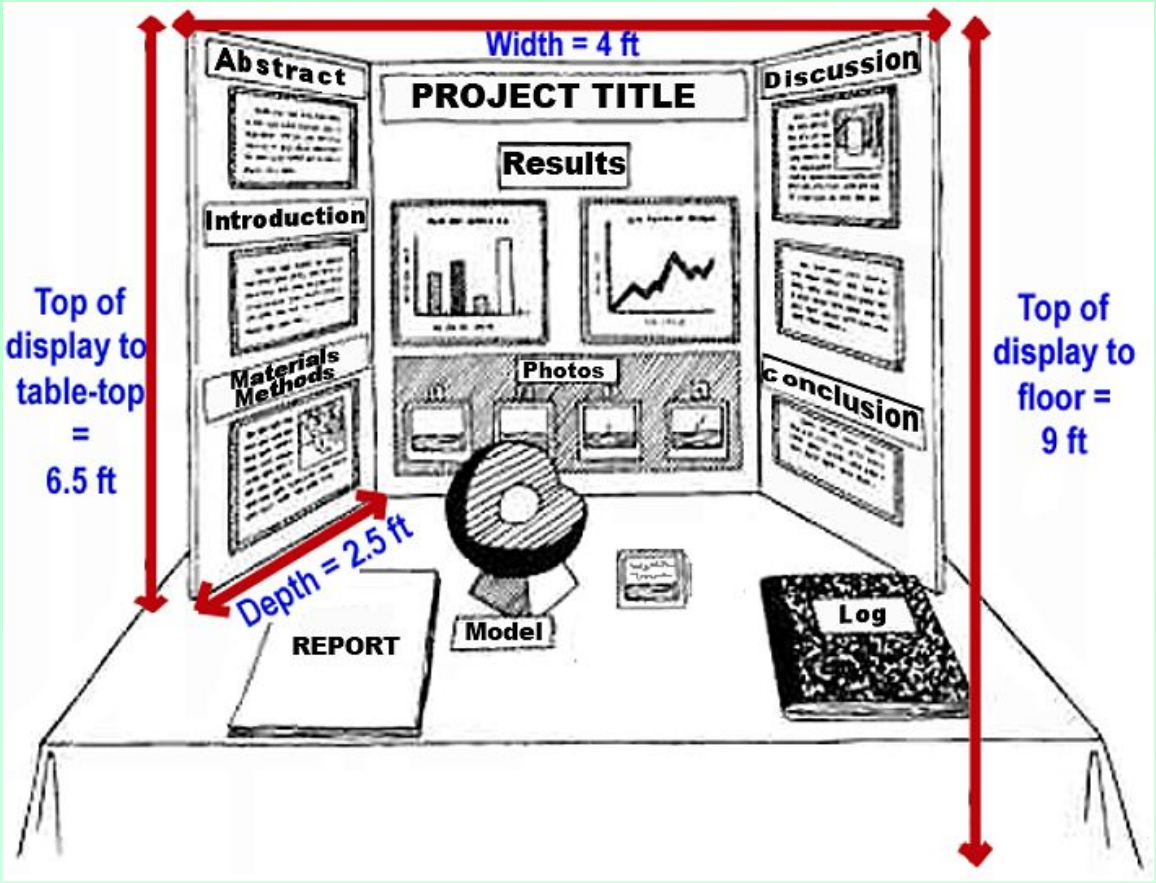
How to Create Award-Winning Displays

Displays will be Handmade for 2024

Uploading a <u>Digital Display</u> will still be necessary, for judges to preview

Mandatory Sections (Sr)

- Abstract
- Introduction
- Materials & Methods
- Results
  - Data Tables
  - Graphs
  - Observations
- Discussion
- Conclusion *(optional)*
- Name/school on back



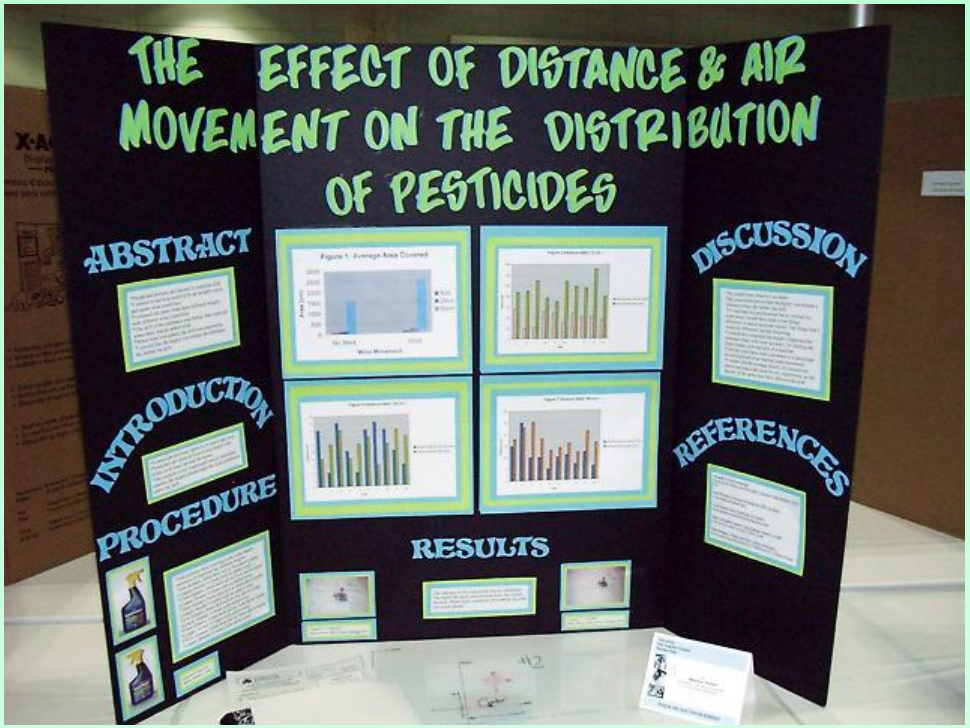
Displayed on table:

- Log Book/Journal
- Research Report w/References
- Acknowledgements *(optional)*

Mandatory Sections (Jr)

(Jr. Division has more latitude in section titles…)

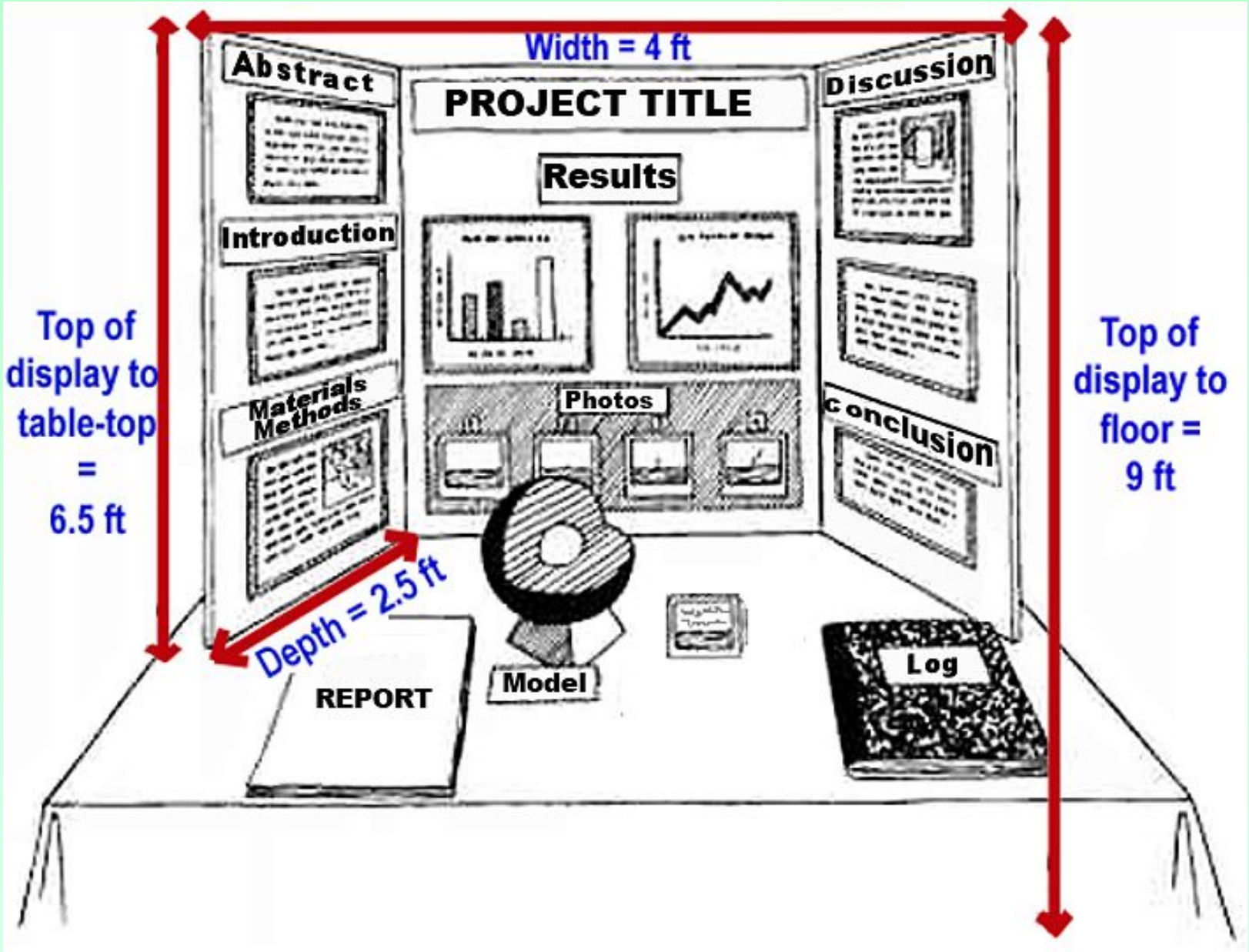
- Abstract
- Problem & Hypothesis
- Introduction/Background
  - Materials & Methods/ Procedure)
- Results (Data)
  - Data Tables & Graphs
  - Observations
- Discussion
- Conclusion *(optional)*
- Acknowledgments *(optional)*
- Name & school on back
  - ***Displayed on table:*** Log Book/Journal Research Report w/ references



Hand-made Display Rules

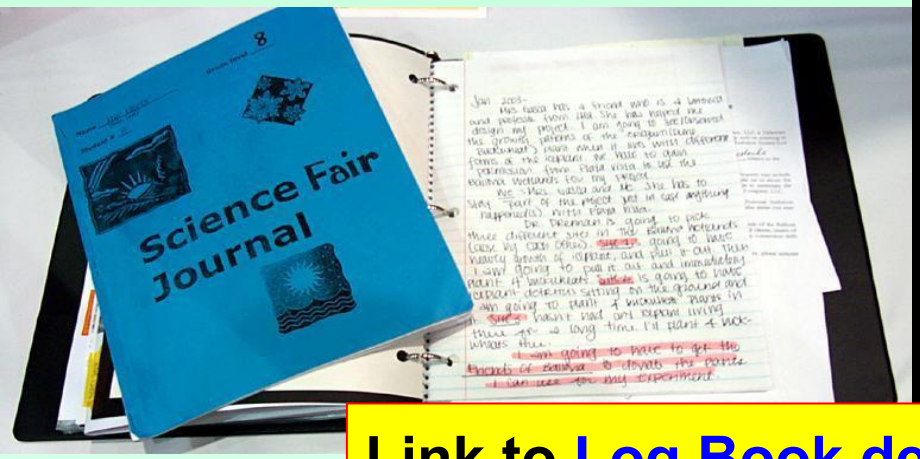
- The exhibit – including the display board – must be able to be placed on the designated table space and <u>all</u> materials must fit within that space.
- Oversized exhibits *will not be eligible to be judged* for awards and <u>*may*</u> not be able to be displayed.
  - **Other materials and equipment *may be shown during student interviews***

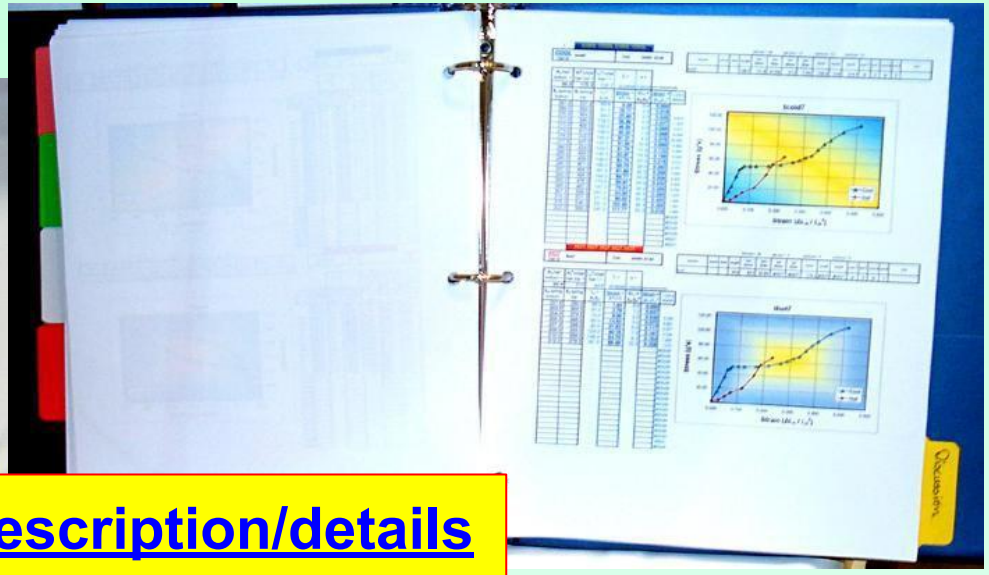
Display Board Sizes



Have Your Log Book Present

- A hand-written **"journal"**, detailing all activities: ~~cross-out~~, **don't erase** changes
- Include actual data collected, relevant materials
- 2-3 pages need to be **scanned** and **uploaded** for judging *(exact details will be sent closer to fair)*

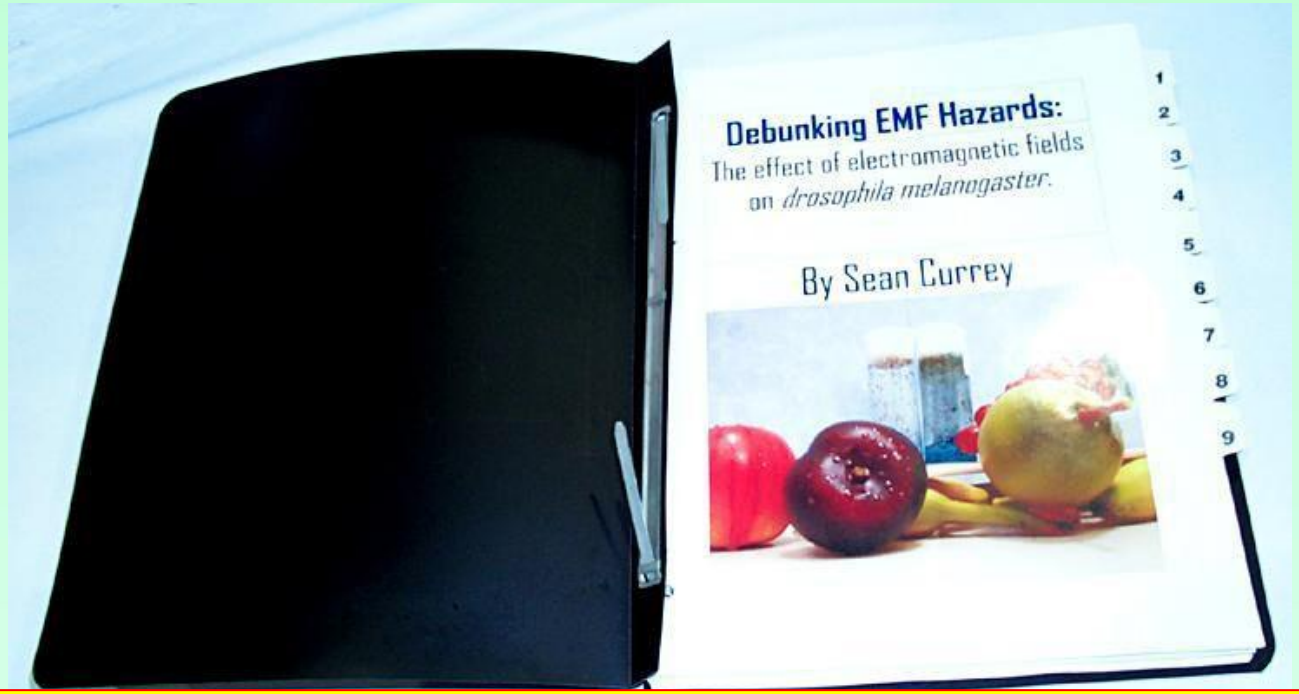




Link to Log Book description/details

Include a Formal Report

- ALL reports should be typed
- Follow format and sequence (see **"Writing Reports"** on Padlet)

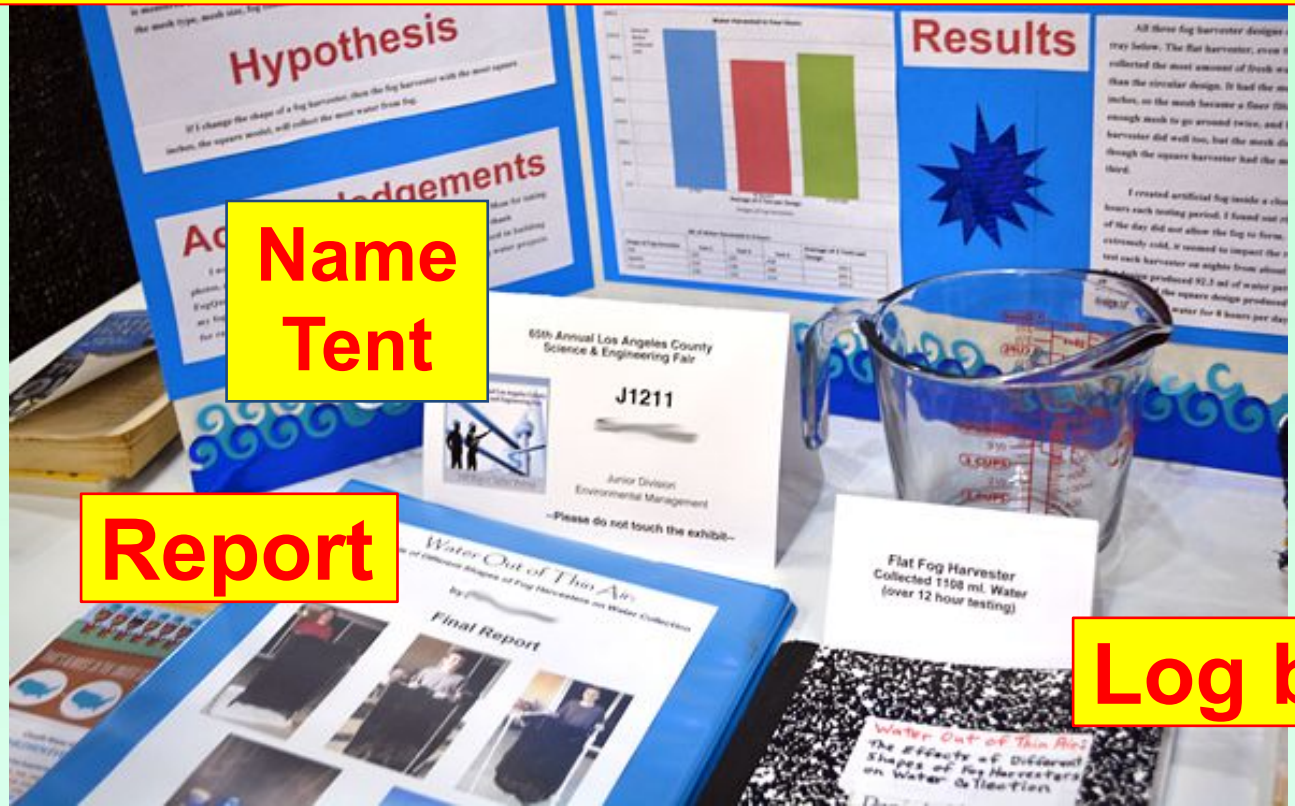


2024: PDF of Written report needs to be uploaded for judging

Display All Elements

- Log Books should follow proper format and sequence

Log Books should be hand written for 2024: 2-3 key pages scanned and uploaded for judging

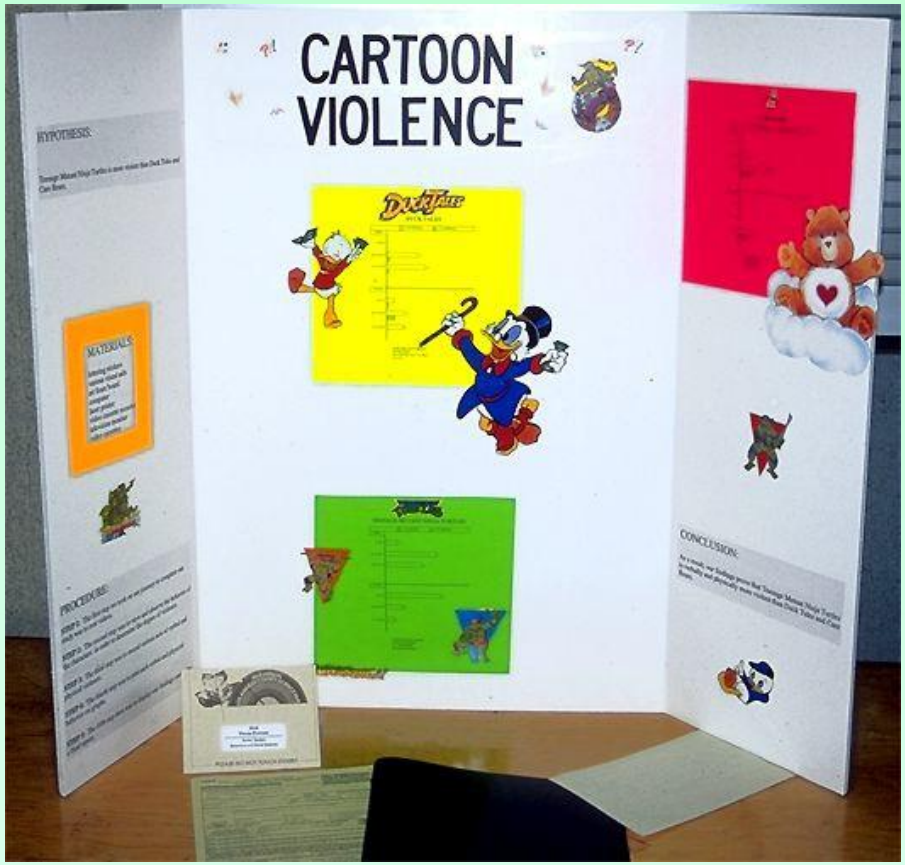


Display Regulations

- **Display fits** within the prescribed space
- Uses a **title descriptive of your study**
  - Subtitles may be used for clarification
- **NO live animals or plants** on display
- **NO tissues or microorganisms** on display *(use pictures or a model instead…)*
- **NO** photos which show procedures **hurtful to animals.**

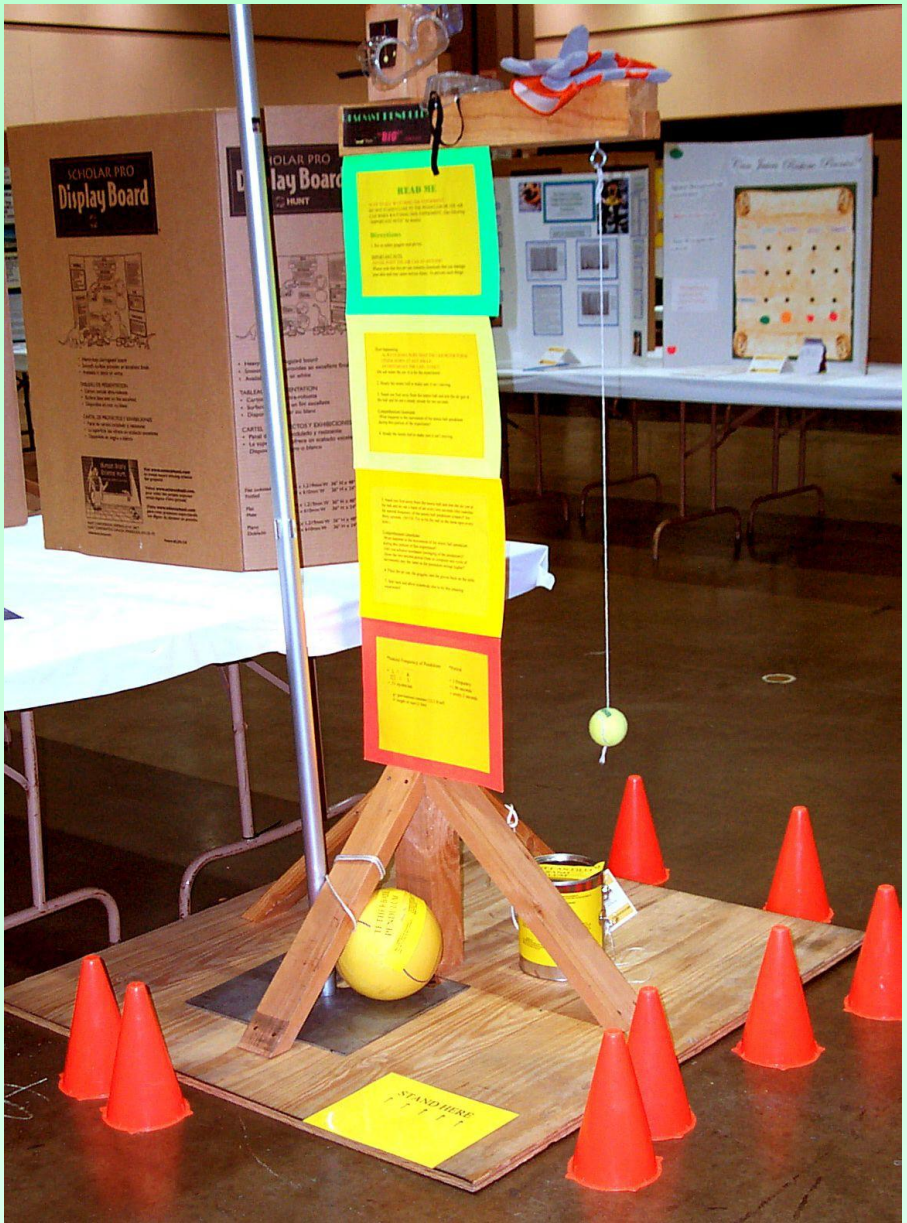
Too Tall to Read

Too Small



Floor Displays

- Must be safe and keep to height requirements **(9 ft)**



Display Size

- Stay within fair space requirements
  - Board size
  - Table size

You cannot spill over onto another student's project area, even if they are "no shows."

Construction

- Display should **stand alone**
- Pieces should ***NEVER*** fall off!

Common Materials

- Foam Core Board
- Colored Cardboard
- Plywood or particle board

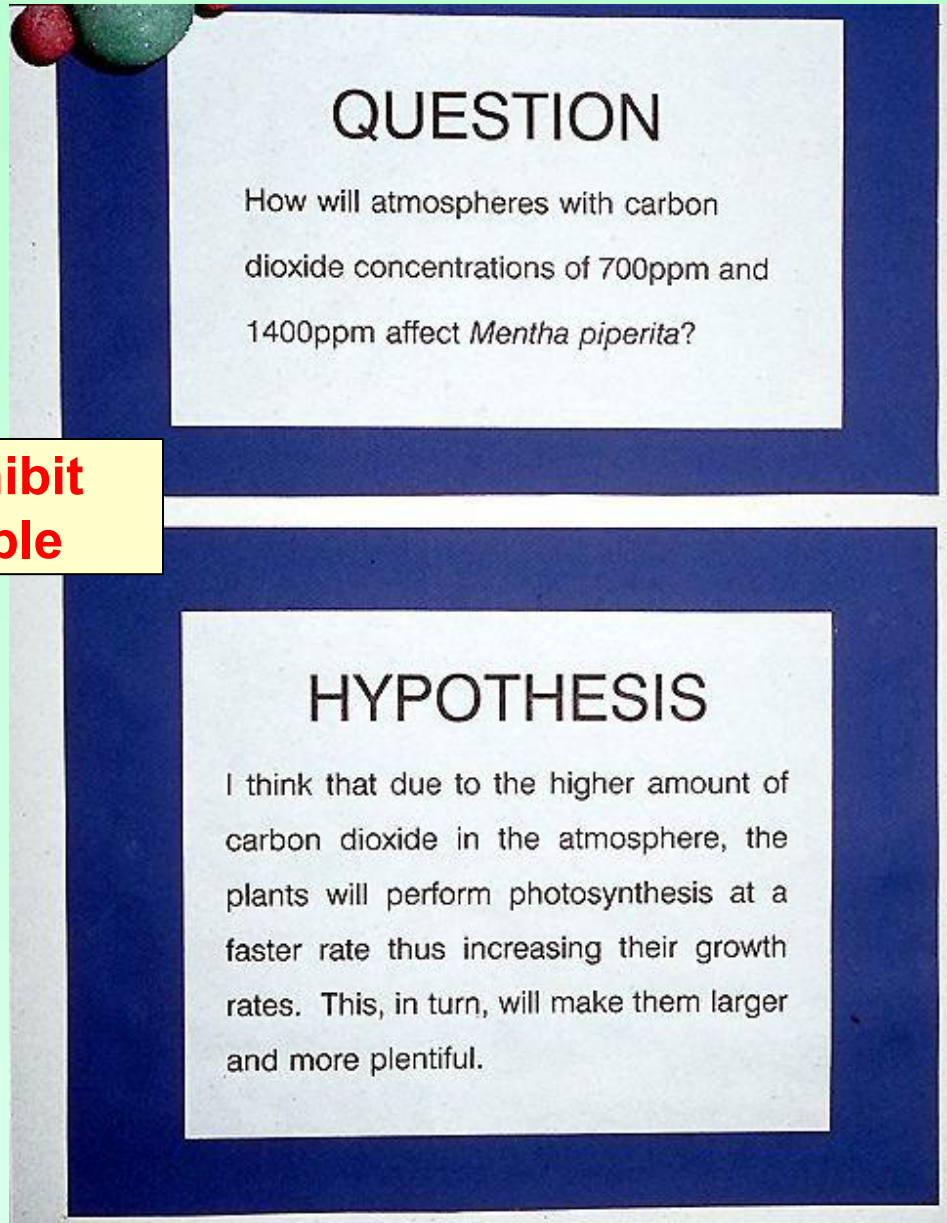
Uncommon Materials

- PVC Piping
- Lattice Fencing
- Peg-board
- Plastic

Titling Size & Content

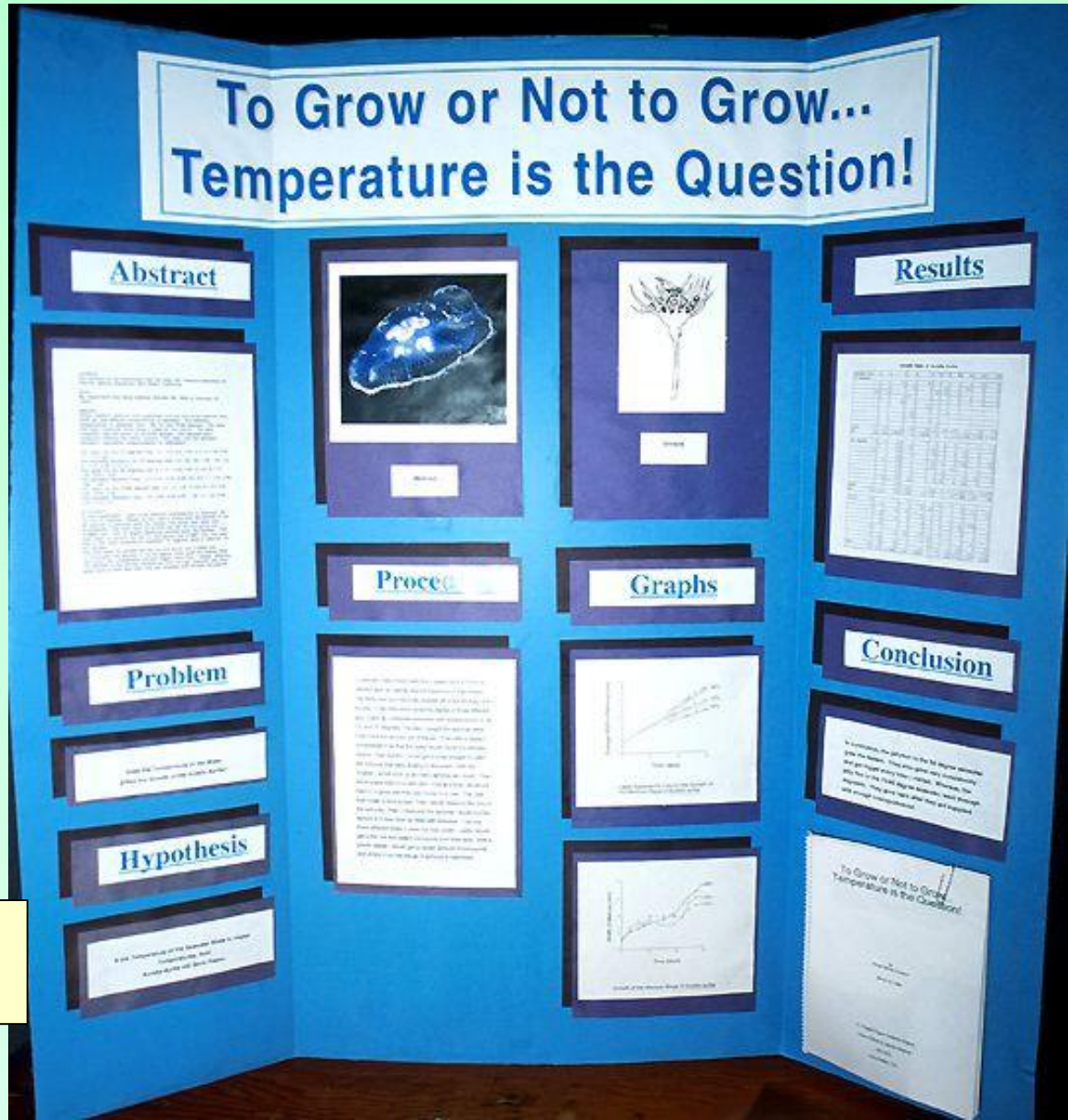
- **Main Title:** *3+ in*
- **Subtitles:** *2+ in*
- **Text:**
  - 14+ font
  - Bold
  - Concise
  - *Understandable*

JR exhibit example



Formatting

- Make sure all sections are neatly & **clearly displayed**
- Be **concise**

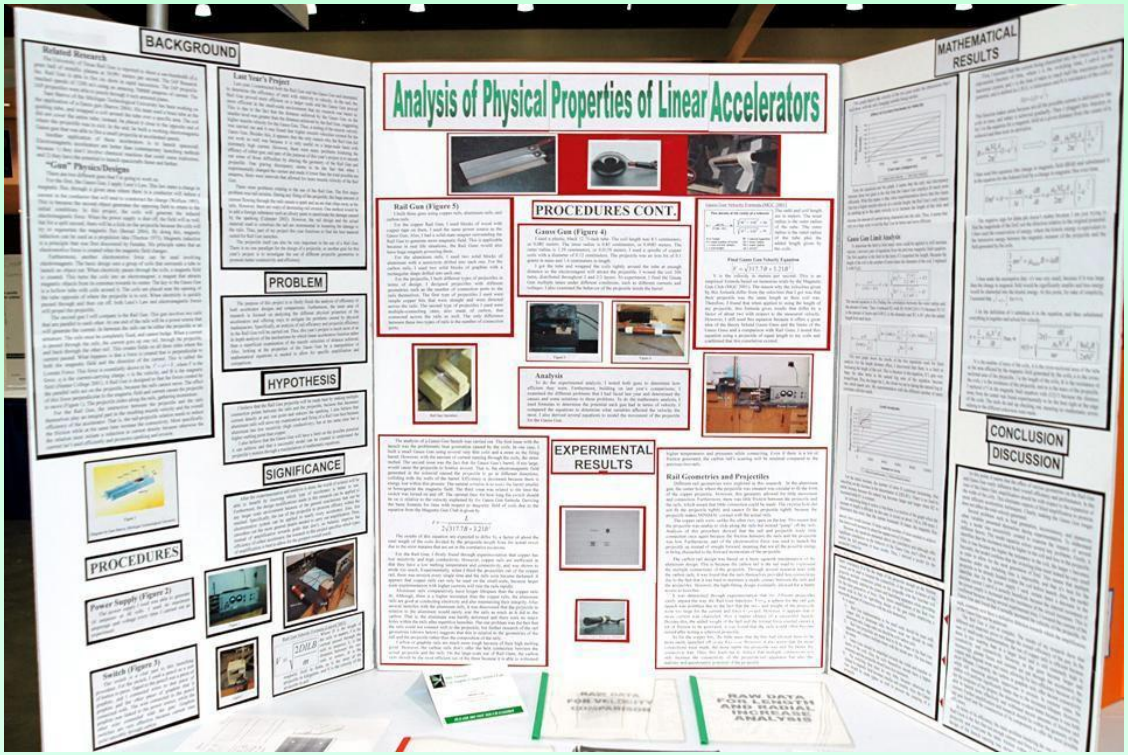


JR exhibit example

Be Selective

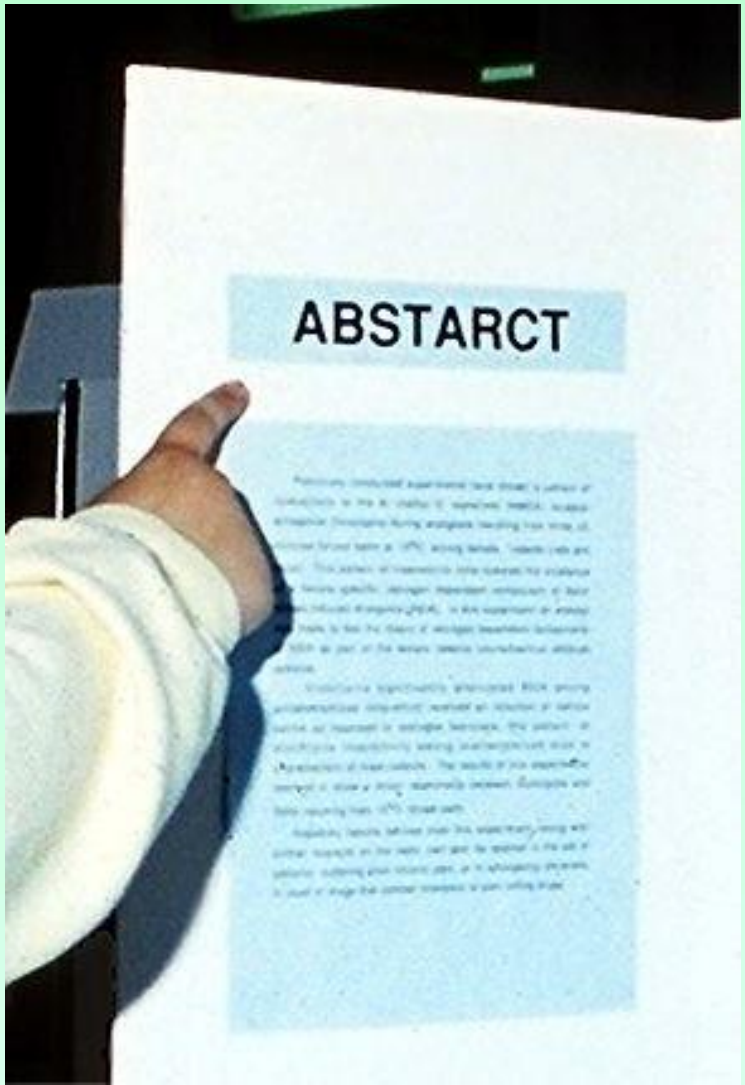
- ***Don't put EVERYTHING*** from your report on to the display
- The report is there to read…

Don't overkill



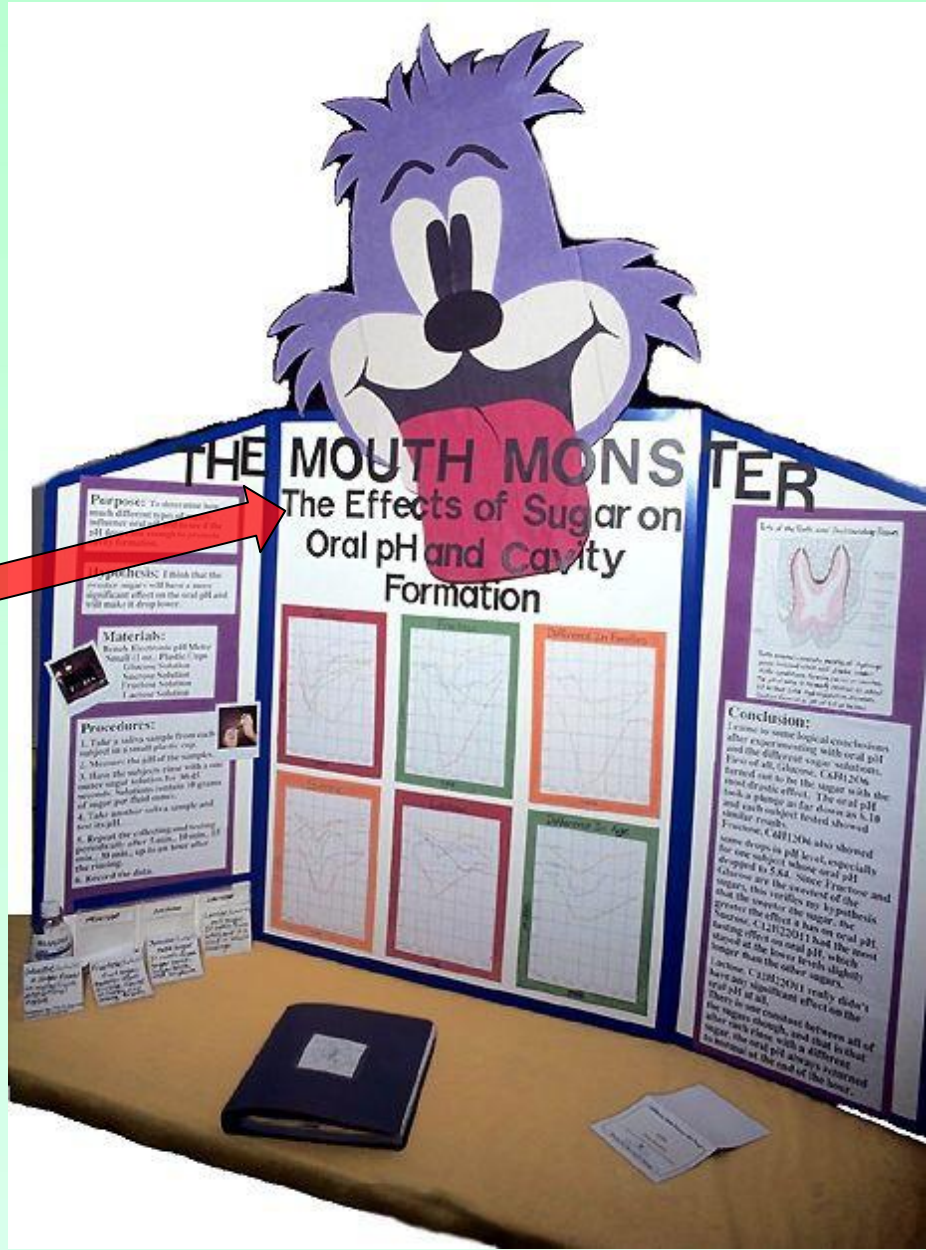
Titling and Text

- **TYPED & PROOFREAD!!**
  - *Spelling counts…*
  - *Neatness counts*



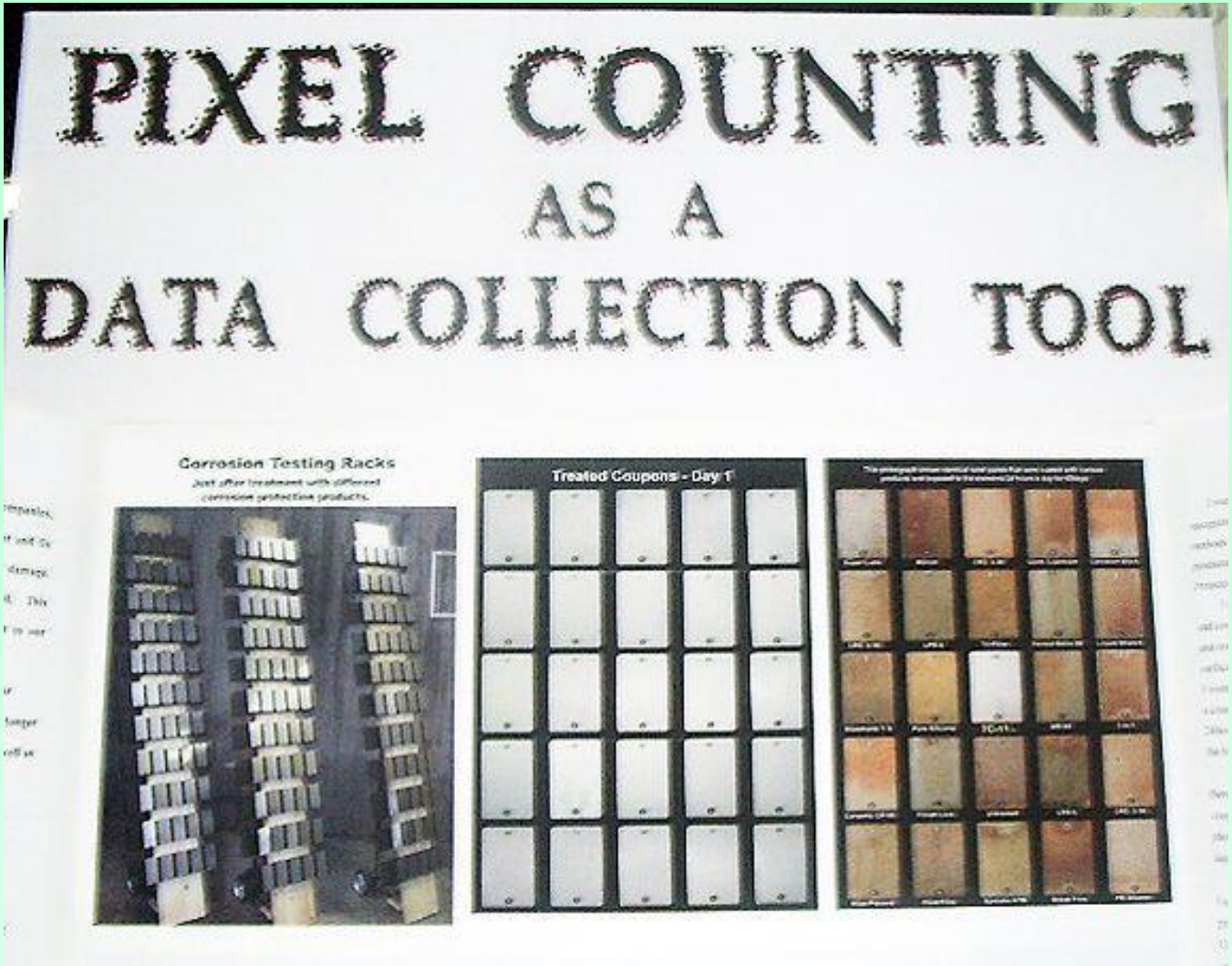
Explanatory Title

- Make sure your title is not confusing
- If necessary, use a **sub-title** for a clear explanation

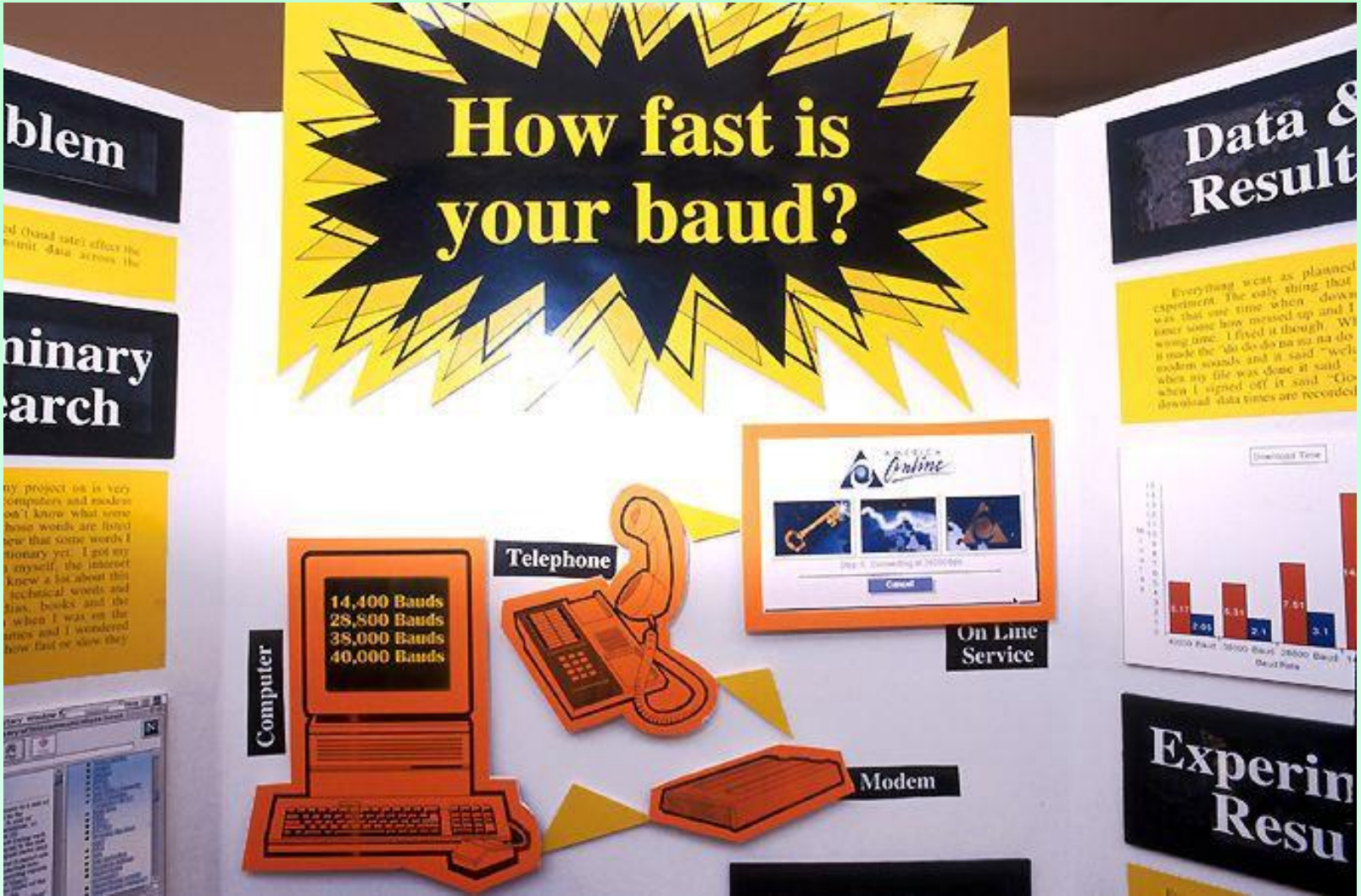


Titling Enhancement

- Use novel ways to make titles “pop”

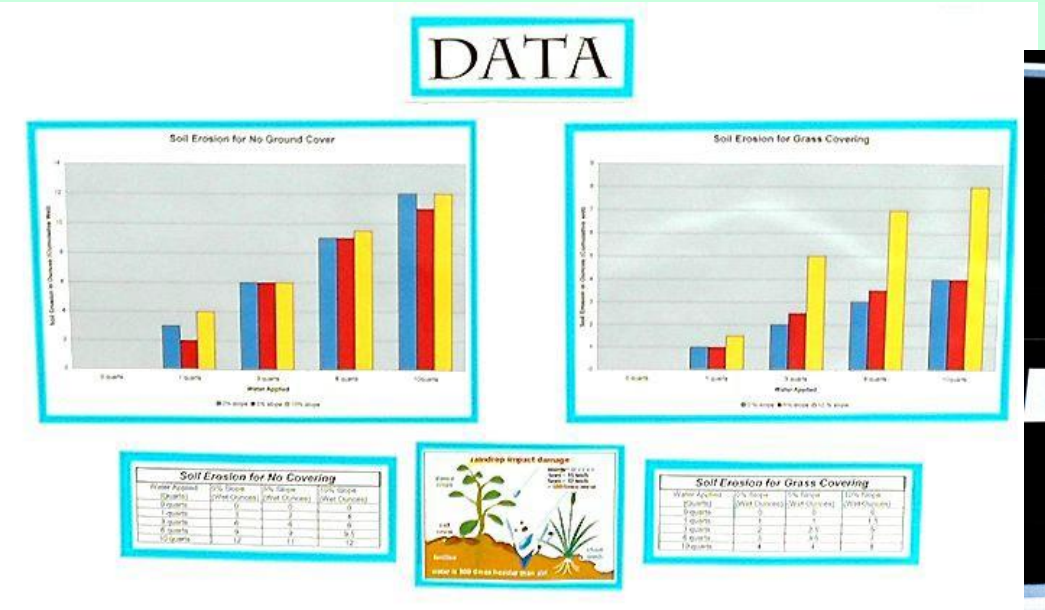


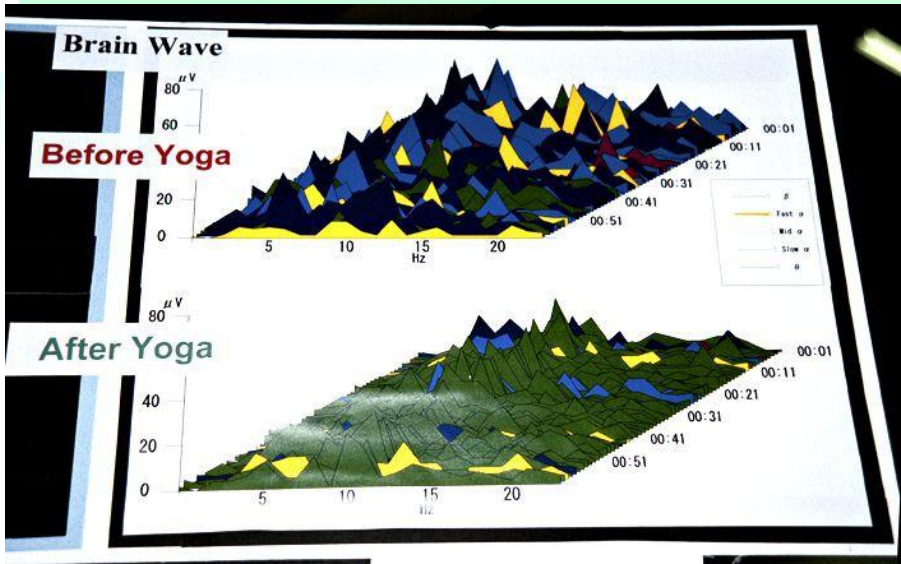
Extra Foam Core Board & Computer Graphics



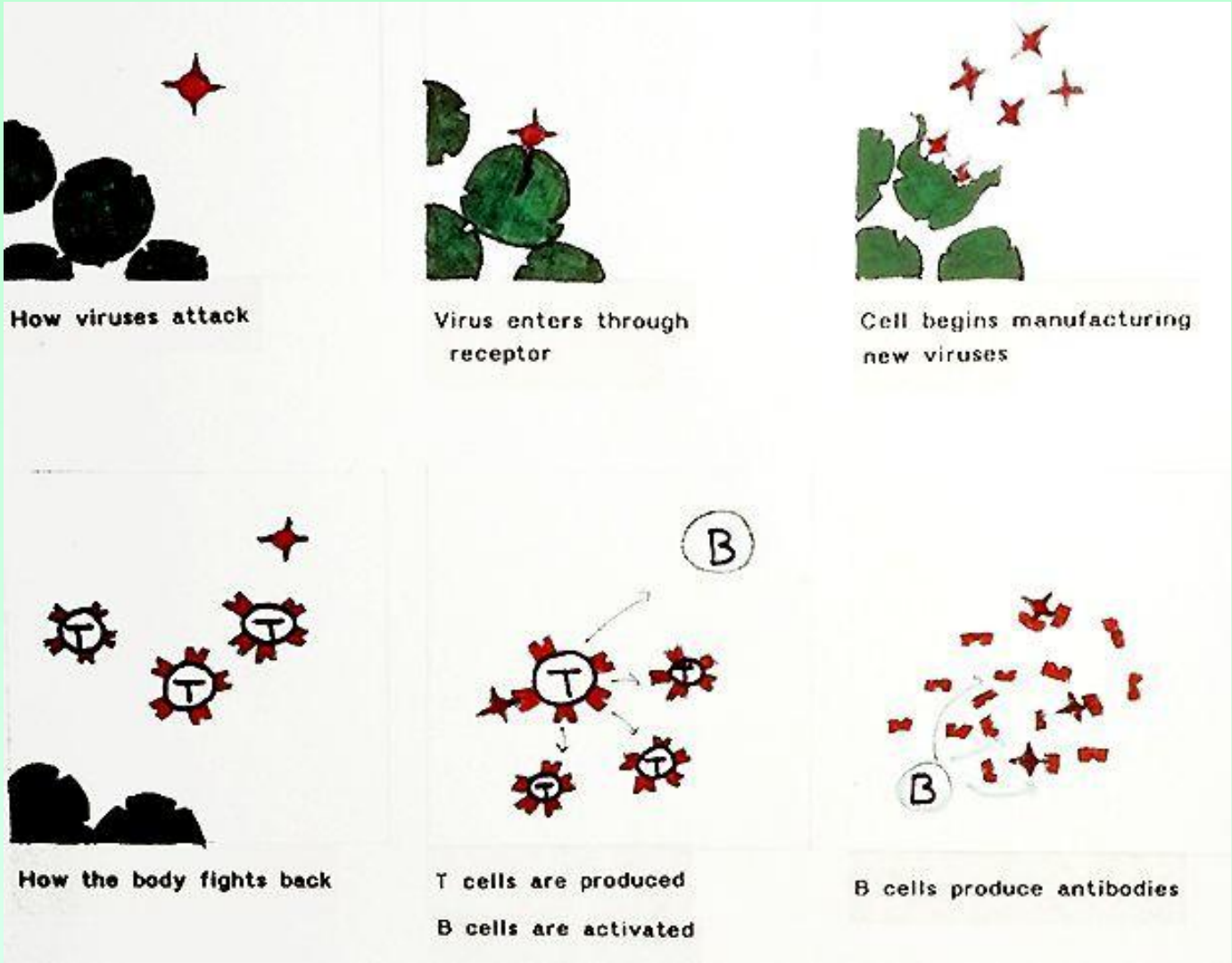
Graphs and Figures

- **Keep Graphs**
  - Large — Properly labeled
  - Interesting — Readable
- **Keep data increments** comparable



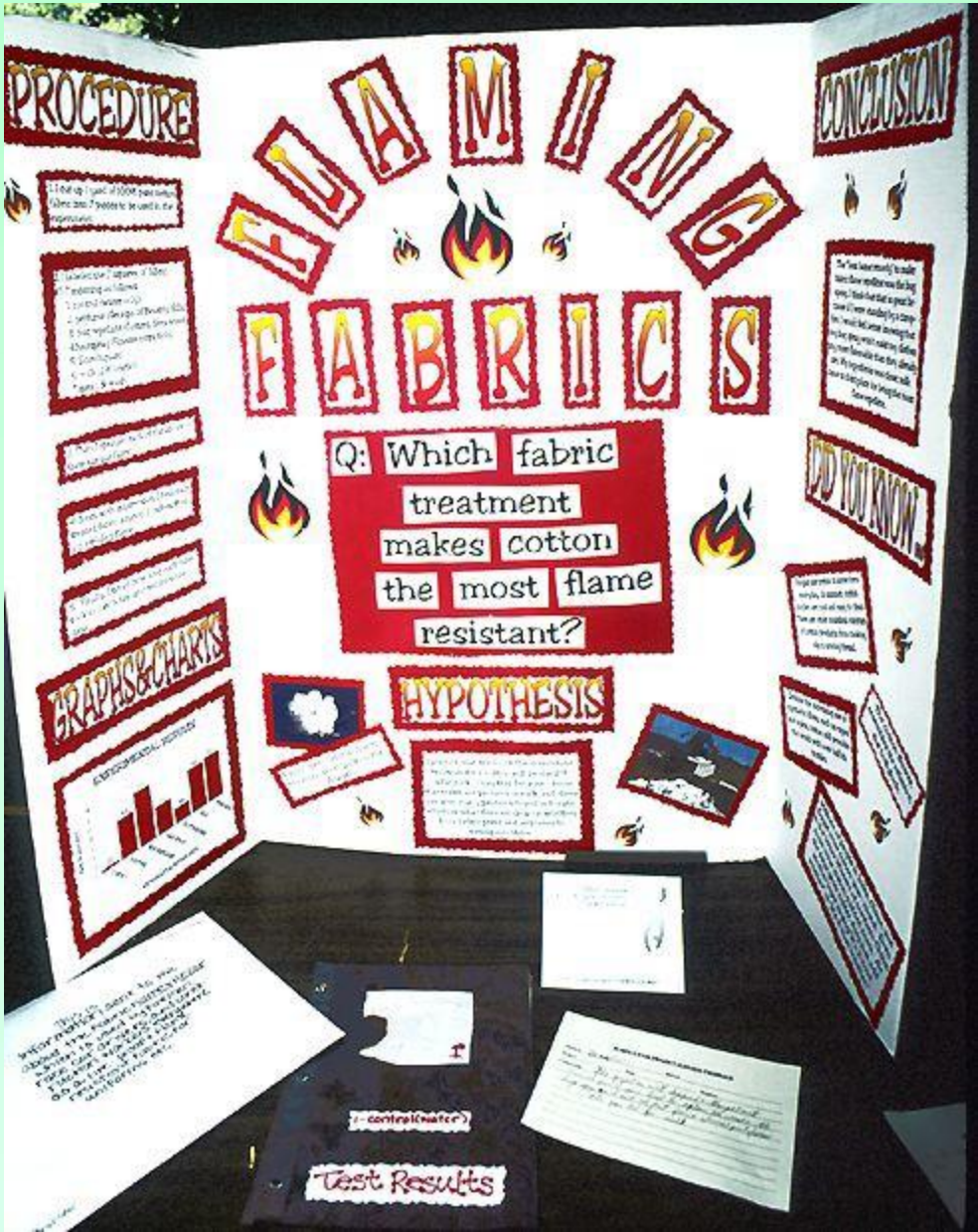


Use Drawings to Explain Difficult Concepts



Pick a Unifying Theme

- Fonts, background and/or graphics that go with the **theme** of your project



Picking a Font

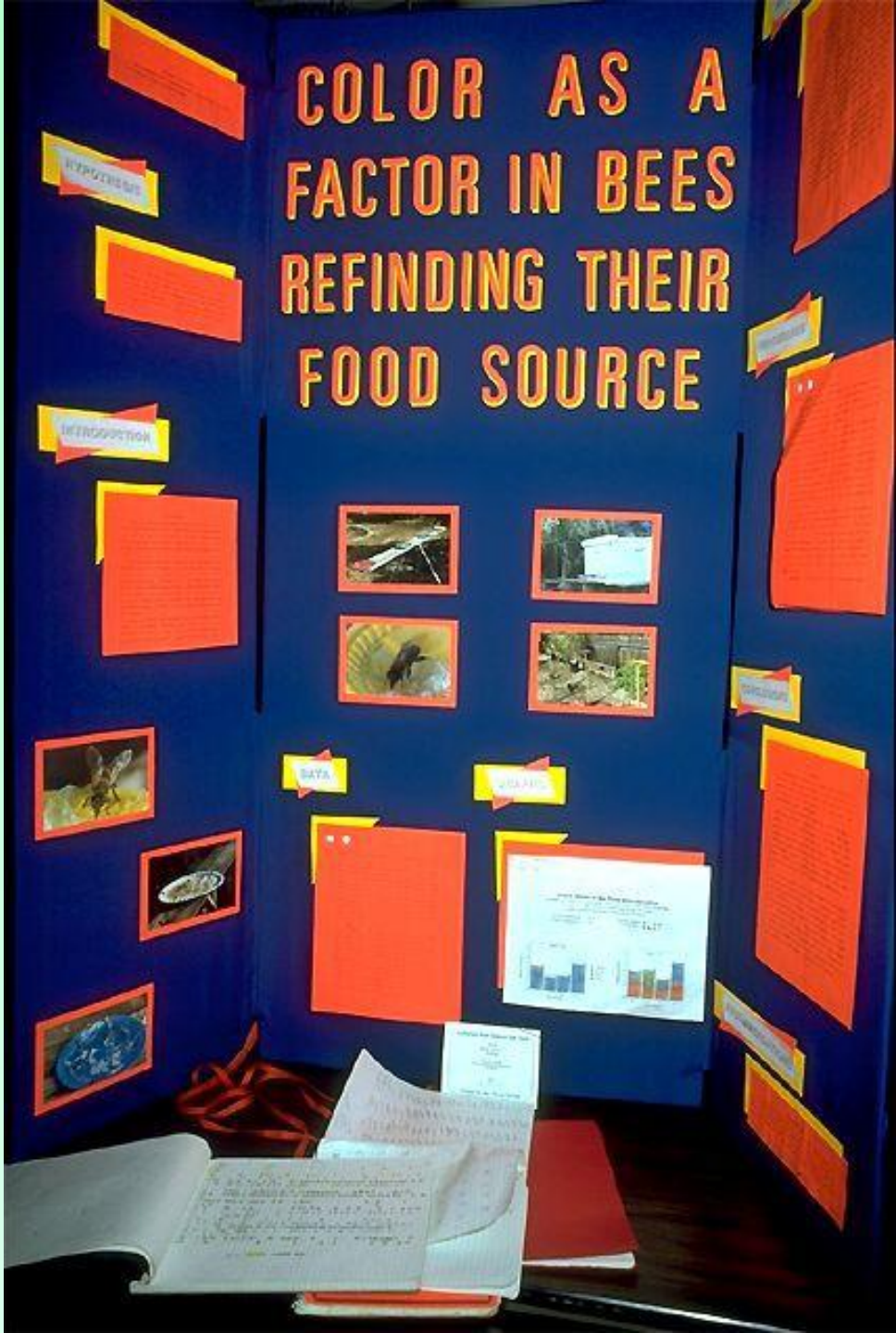
- Don't use *extra* fancy fonts
- You want judges to be able to read & focus on your ***information***

Color

- Color use **tied to the project**
- Recommended:
  - No more than

    3 colors

    - *Dominant*
    - *Accent*
    - *Background*

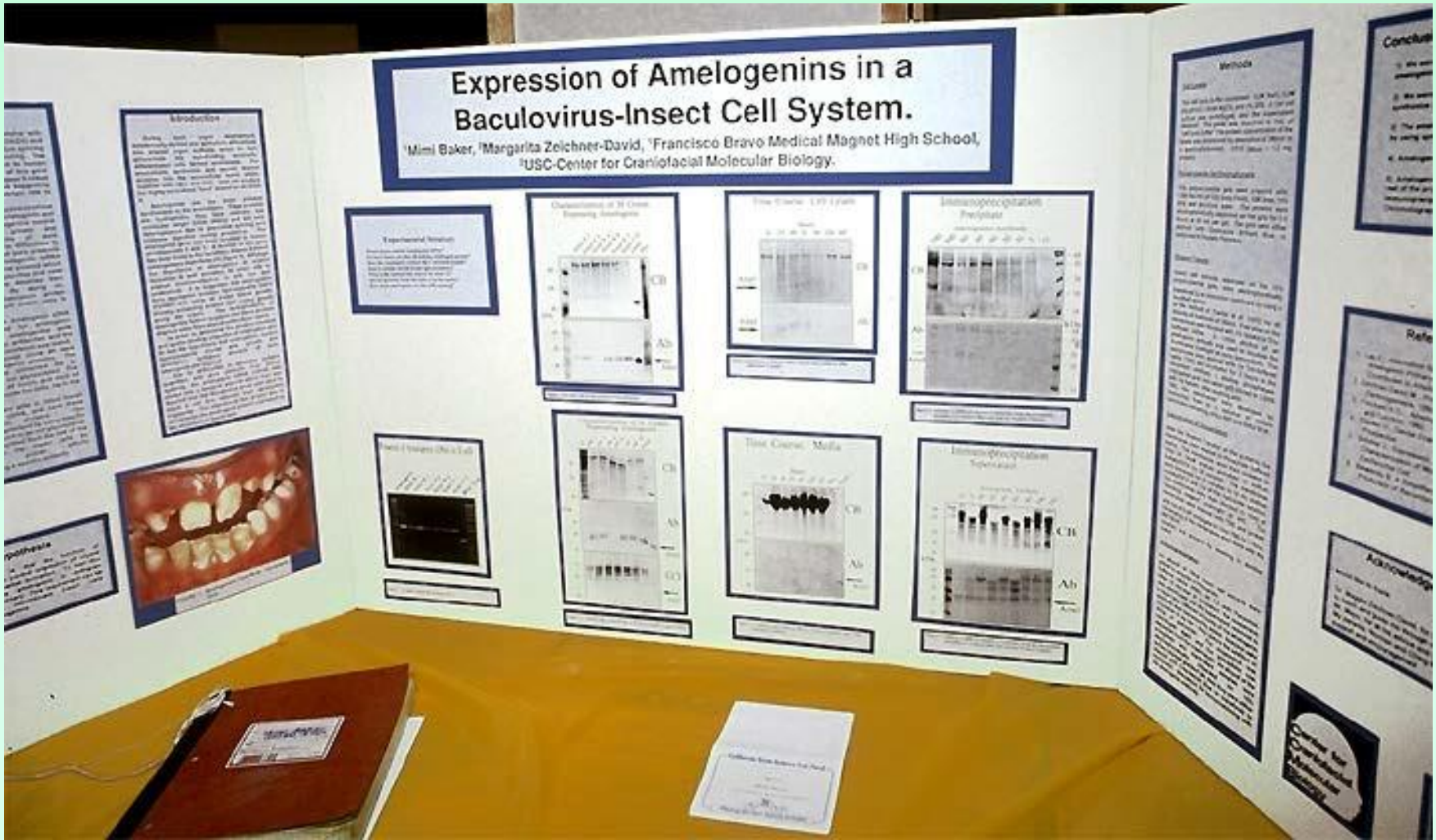


Too *MUCH* Color!

- Your eye doesn't know *where* to land
- No focal point
- *Disturbing*

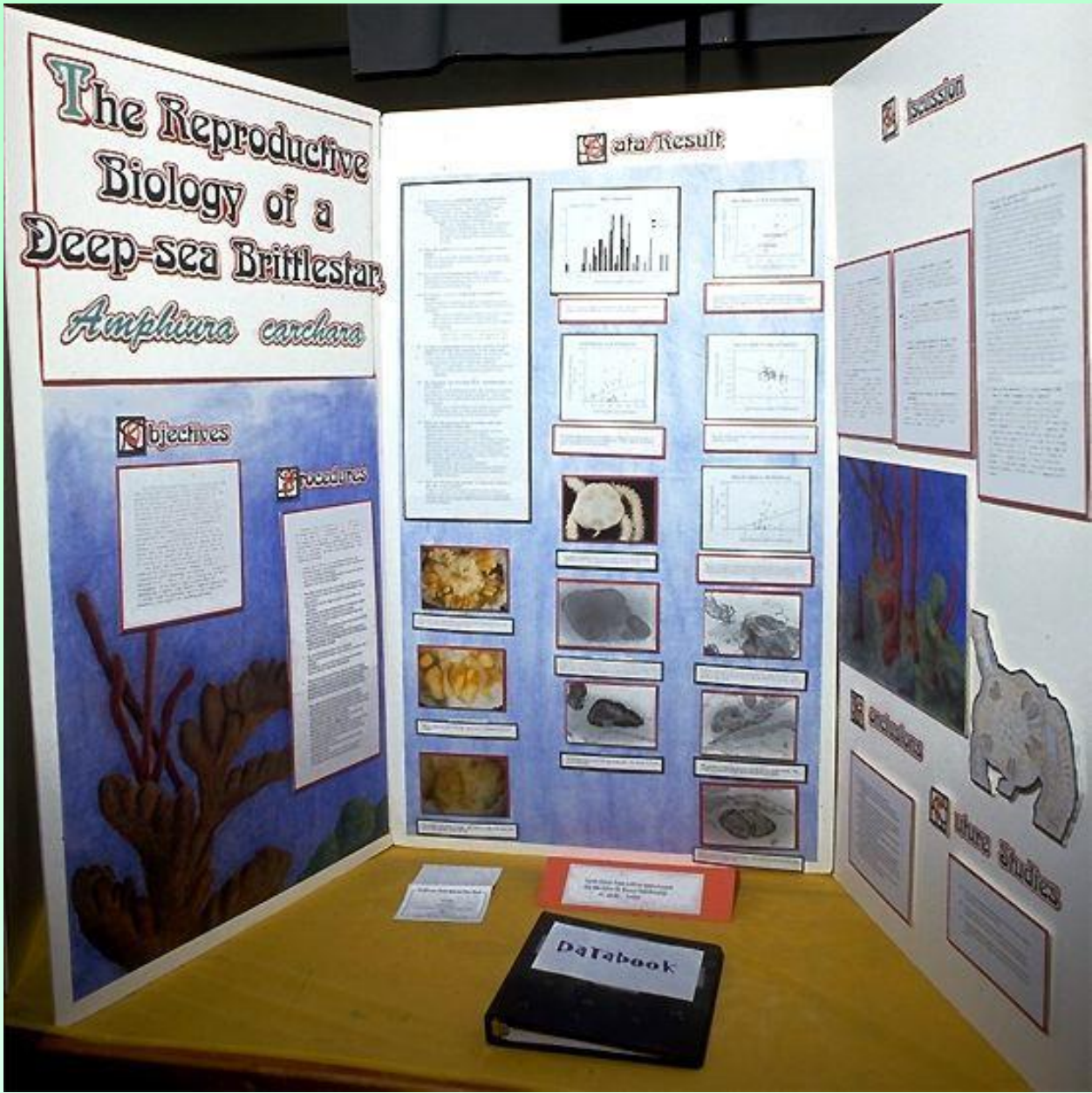
Graphics

- **Liven up** a presentation



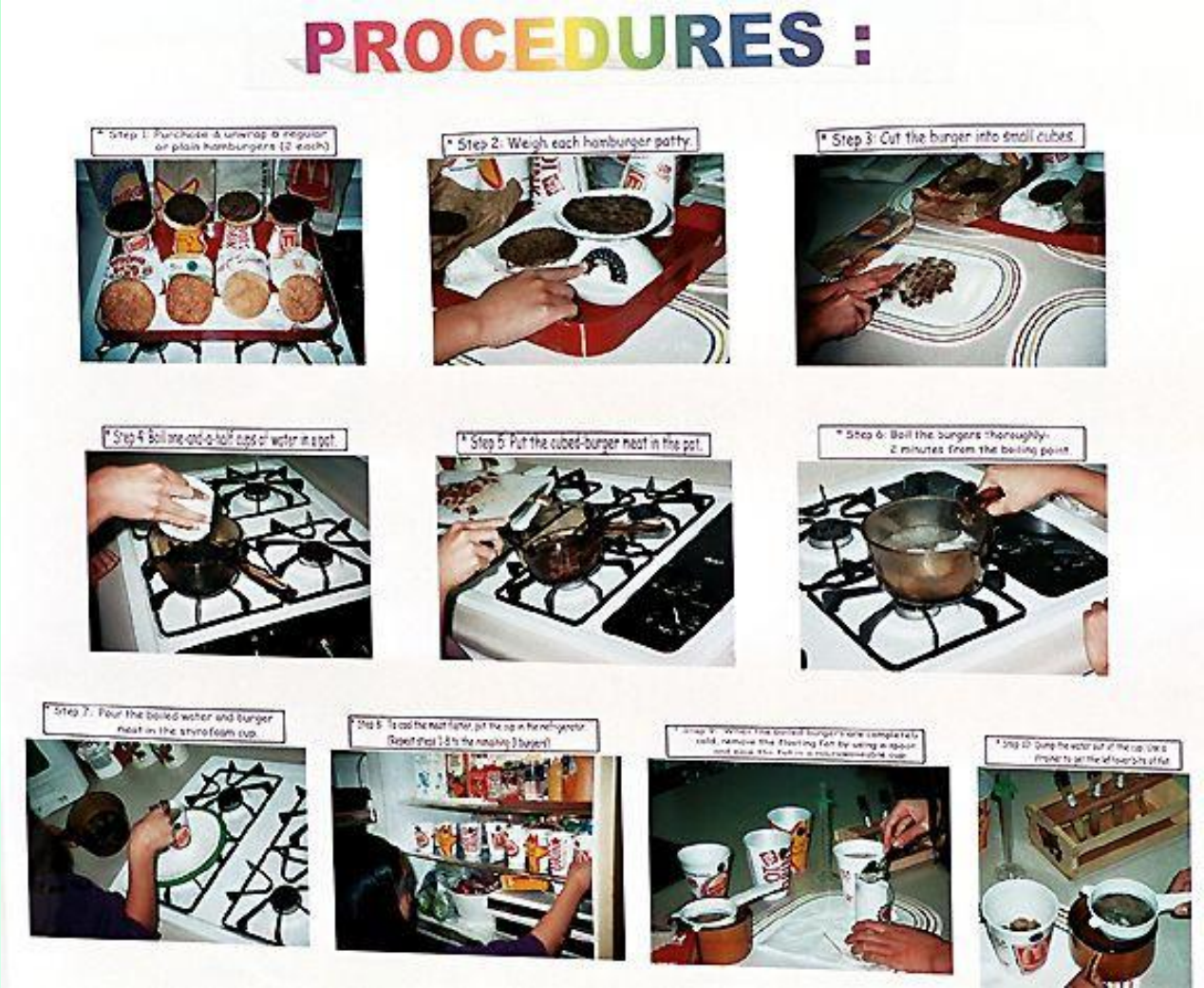
Background Graphics

- Make the display board represent a **study site**



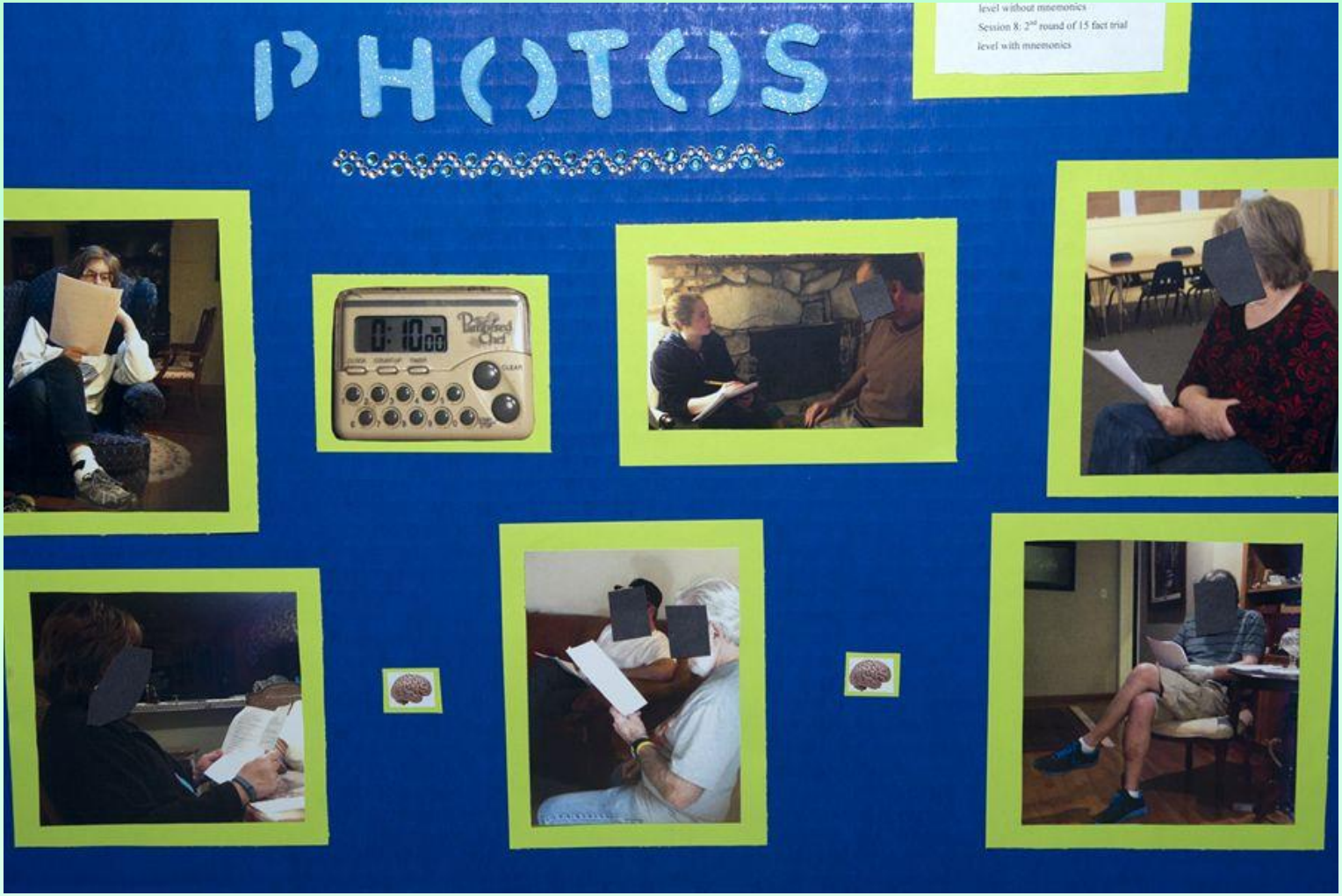
Photos

- Can **visually** demonstrate procedures



Photos

- Must protect the identity of participants!



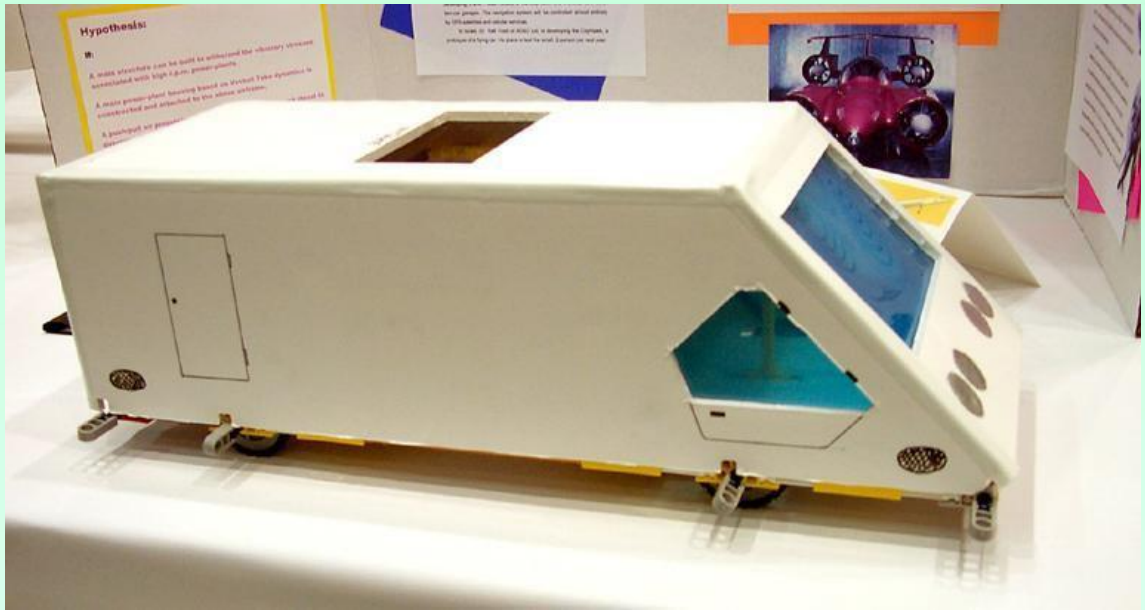
3-D Displays

- 3-D Displays are **encouraged!**

- If you can, display the **actual equipment** you used to test your hypothesis or invention.

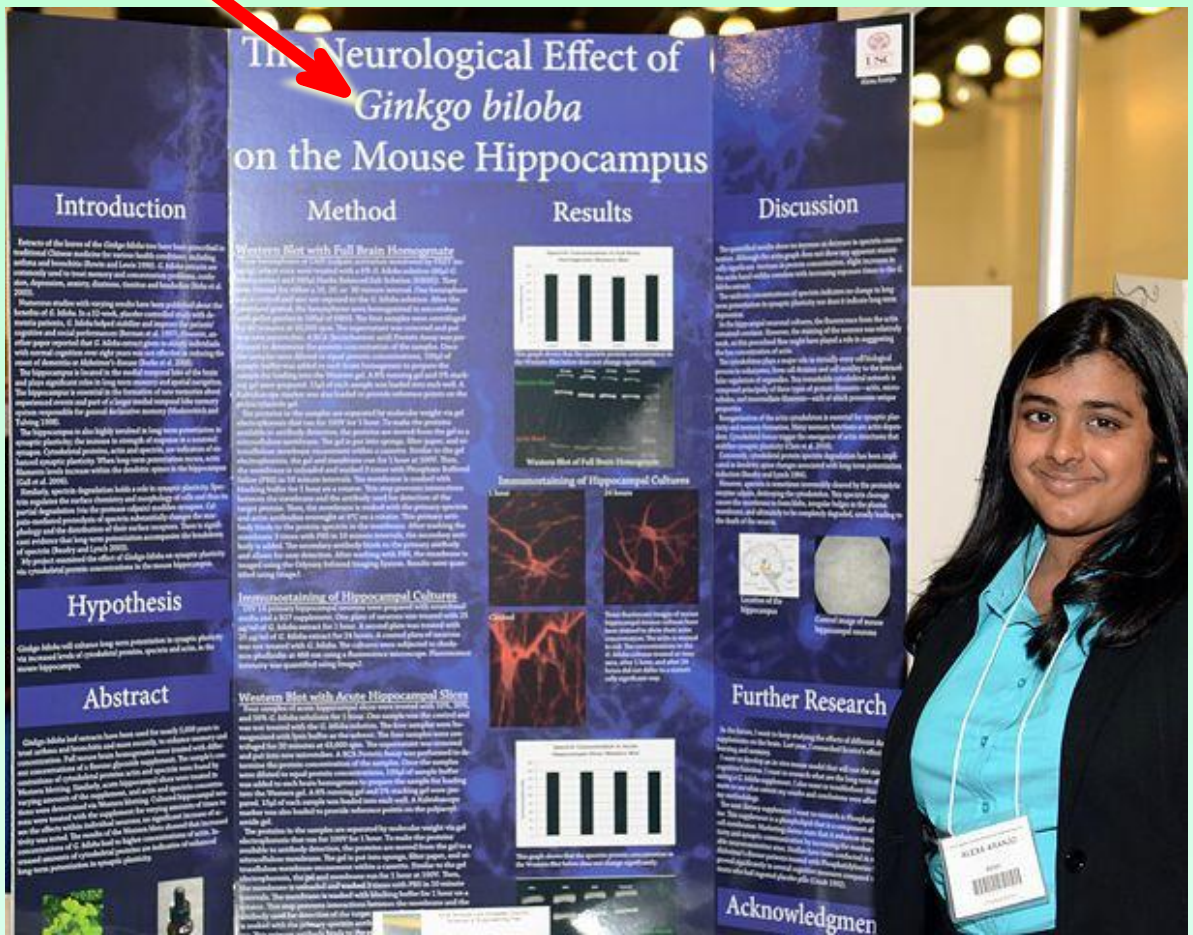
3-D Displays

- Should be **student-designed**
- **Directly tied** to the project
- **Follow rules** on what may be displayed



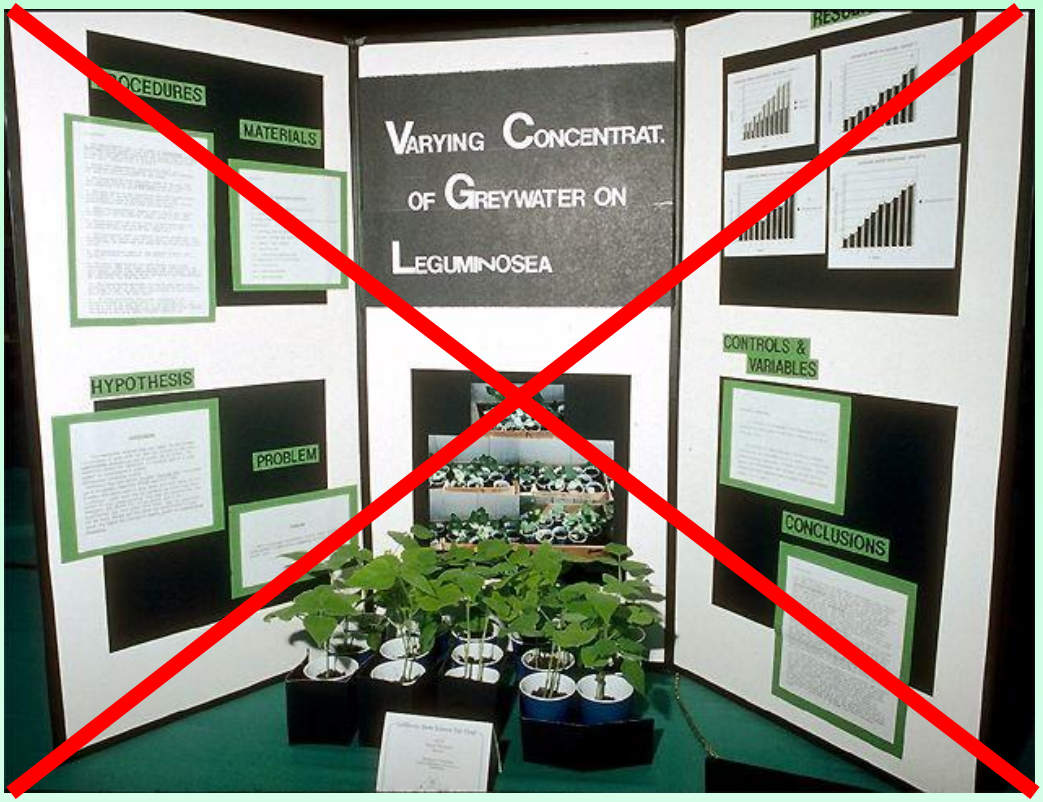
Scientific Naming

- When living organisms are the subject of the study, their **SCIENTIFIC NAME** should be displayed on the board at least once (within text); ***italicized*** or **underlined**



NO Live Organisms

- **NO living organisms** (including plants) can be displayed: ***use a substitute***



DON'TS

- Don't include **living or dead bacteria, viruses or fungi** in your display
  - *Use photos or models instead*

Display “DON’TS”

- **NO LASERS**…period

- **NO un-insulated electrical devices** *above 12 Volts*

- **NO LIQUIDS** (as part of the display)

- **NO FOOD** (as part of the display)

NO Hazardous Materials

- **NO toxic** materials

- **NO drugs** (of any kind)

- **NO radioactive or hazardous** materials

- **NO caustic** materials (acids, bases)

DON'TS

Don't include **highly expensive pieces** *unless you are willing to remove them* ***immediately*** *after the interview*

Mechanical Devices

Bolt down any devices that could injure someone if it fell or was mishandled.

Be Aware…!

We **cannot** be responsible for small, <u>easily stolen</u> items you leave *at your own risk*

We **cannot** be responsible for <u>easily broken</u> items you leave *at your own risk*.

Photos/drawings are excellent options!!

For Judging

- Uploading a **Digital Display** will **still be necessary**, for judges to preview before in-person Interviews.
- ***Notifications will be made by January, 2024***
- Instructions follow

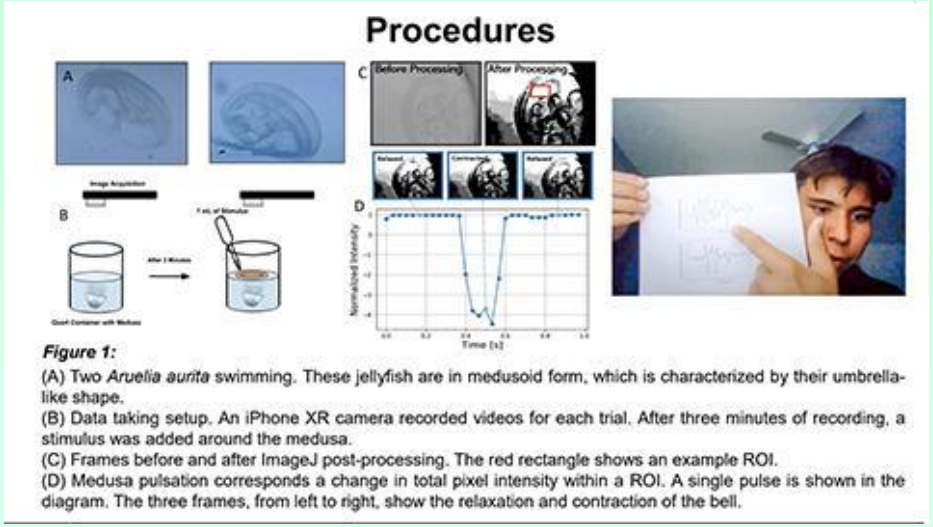
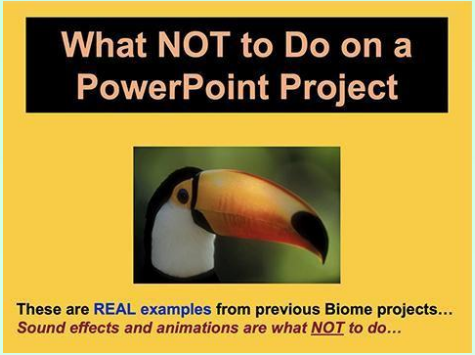


Figure 1:
(A) Two *Aruelia aurita* swimming. These jellyfish are in medusoid form, which is characterized by their umbrella-like shape.
(B) Data taking setup. An iPhone XR camera recorded videos for each trial. After three minutes of recording, a stimulus was added around the medusa.
(C) Frames before and after ImageJ post-processing. The red rectangle shows an example ROI.
(D) Medusa pulsation corresponds a change in total pixel intensity within a ROI. A single pulse is shown in the diagram. The three frames, from left to right, show the relaxation and contraction of the bell.

Criteria for Virtual Displays

- Create in Google Slides, PowerPoint or Keynote
- To be uploaded during **Student Registration**
- Document Name for uploading must include Student Name
- **Maximum** slide limit - **15 slides**
- *"Pictures are better than words"* - show clear photos of you working on your project
- **Photos** must be *by student or parents*; other graphics must have credits
- Explore the **"What NOT to do in PPT"** (Powerpoint) presentation before you create your presentation...



Virtual Display Template may be downloaded **from Padlet**

Digital Slides Formatting

- Use the **SLIDES with *white backgrounds* in this template** as your Virtual Science Project Display for Judging
- **Follow the directions on each slide**: type over the directions when you are ready.
- **Don't change the slide titles** (these will be the same for all students)
- **Title Fonts**: 35pt, choice of style, color (must be readable!)
- **Body Fonts:** Arial
- **Body Font size**: Minimum = 18pt
- **Slide Backgrounds** should not be busy – text *easy to read*
- Slide animations and transitions **should not be used** as they cannot be replicated on a backboard.

Remove Criteria and Formatting Slides 1 and 2 for your final presentation.
Save this ppt **with a your name: keep the original** for directions

STEM Project

Replace text above with a Creative Title for your project

Sub-title (if necessary)

Replace “sub-title” text above with a title that really explains **what your project is about**

Insert cool photo of your project or use a creative background that pertains to your project

Your name

Your teacher’s name

Your school

Abstract

Write the abstract **last**, after all your results and analysis are finished

The abstract is a summary (**250 words or less**) of your project and must include:

- **Problem**
- **Procedures**
- **Data** and brief analysis (no graphs)
- **Conclusion** (State whether and WHY your hypothesis or proposed solution was or was not validated).

Problem

- This is the **Problem Statement**, *written as a question* - - *What is the problem to be solved?* You may add a graphic or photo to explain the problem.
  - According to the “Science and Engineering PRACTICES": In Science, we refer to a question to be solved and written in the form of a question that includes both the independent and dependent variables.
    - **Example:** *How does (independent) affect (dependent)?*
  - **In Engineering, Math, Computer Science,** it is usually stated AS A PROBLEM:
    Examples:
    - Problem: Controlling hillside erosion in our city; or
    - Problem: Removing flood water from orange tree orchard; or
    - Problem: Removing litter from Alameda Bay sea floor.

Introduction (Background Research)

- Brief summary of the background research needed to understand your problem.
- **For engineering**, include the criteria/constraints necessary to solve your problem. Example: size, reusability, safety; time, money, materials that must or may not be used.
- Include citations when referencing other scientists' work.
- Optional: an explanatory graphic, species photo, map of field research location, etc.

Hypothesis

- For **Science Projects,** based on the research you have done, you will be writing an answer – your best educated guess – to your question.

One way to write a hypothesis:

*"**If** [this is done, **then** [this] will happen." (Fill in the blanks with the appropriate information from your own project.)*

Another way to write a hypothesis:

"I think _____ *because* _____

- For **Engineering, Computer or Math projects;** draw and label the **solution/prototype model** to the problem that you are testing. Briefly explain **WHY** you chose this solution to test.

Materials

- Type a **bulleted list** of the items you needed to complete your project.
- **Be specific** about the amounts used.

Procedure

- **List and number** all of the steps used in completing your project, including any retesting you did.
- **Draw and label** a drawing/photo of any prototype or set-up that you used to test your solution.
- **Optional: Add photos** (with captions) to show the steps of your procedures.
- Up to 2 slides **if absolutely necessary**

Procedure (Contin.)

- **OPTIONAL:** 2nd slide **if absolutely necessary**

Results

- Include any data you collected while testing your hypothesis or prototype.
- If your testing procedures had repeated trials, make a **data table AND/or graph**(s) to show your results.
- Add your written **qualitative observations** (color, smell, behavior, etc.) as well.
- **For Engineering, Computer or Math projects,** if you changed your solution/prototype after testing your original solution, then:
  - include any new data from the re-testing
  - also include labeled drawings of your REVISED solution/prototype and WHY you made those changes
- Up to 2 slides **if absolutely necessary**

Results (Contin.)

- **OPTIONAL:** 2nd slide **if absolutely necessary**

Discussion

- **Summarize** and **ANALYZE** your data including trends, **errors** and variables that could have influenced the results.
- **Develop arguments** for and against your hypothesis or solution/final prototype, using statistics *(average, % error, a variety of statistical tests.)*
- Relate your findings to **other studies** and cite those studies.

(Up to 2 slides **if absolutely necessary** – OK to add graphics)

Discussion (Contin.)

- **OPTIONAL:** 2nd slide **if absolutely necessary**

Conclusion

- Type a **brief summary** here of what you discovered based on the results of your testing. You need to indicate whether or not the data supports your hypothesis or proposed solution and the reason for your conclusion. **(no more than 250 words)**

Reflection/Application

Things you might want to reflect on:

- *What did you learn from doing this project?*
- *What you might have done differently?*
- *What would be your next steps for researching this problem?*
- *How can your results be applied in everyday life?*
- *How could your results be applied to other studies?*
- ***Teams:*** *what were the benefits/challenges of working as a team to find a solution?*

References Cited

- Be sure to include both print and electronic sources and put them in alphabetical order.
- **Use APA Citation formatting**
- ***Make sure your references match any citations in your Introduction or Discussion.***
  - Jr Projects = Minimum 3 references
  - Sr Projects = Minimum 5 references

Remember...

- No matter <u>how</u> fancy & eye-catching the display…

★ *It can't take the place of* ***solid, well-documented and analyzed research!***

Designed & Photographed by

Anne F. Maben

Science & Education Consultant
Executive Board Member, LACSEF

for the

LA County Science & Engineering Fair