Font sizes for the entire poster….
- Headings of the main sections should be size 60-80
- Main bullet font size 24-32.
- Sub bullet font size 18-24 (sub bullet font must be smaller than main bullet)

Entire poster should be made up of bulleted text and not full sentences or paragraphs. Remember the poster is an "outline" of your project, broken up into different sections that you will use to TEACH about your project. It should not look like or read like a paragraph based, written paper.

See "*Top 10 things to remember when creating poster presentations*" guide for what else to include/not include These are also listed on the 2nd slide of this presentation.

Title

Do NOT include the name of your school, mentor, the location of research, logos or QR codes anywhere on your poster

Introduction / Background

BRIEF section should be:
- Clear and concise summary of the topic
- Approximately 4-6 text bullets plus a graphic/figure that helps to teach a brief overview of the general area/problem
- Include statistics or interesting data/trend to introduce and justify the problem (cited all sources but not general knowledge)

Review of Literature

Select three research/journal articles that are related to your project.

For each article:
- List the full citation for the article in APA format (font size 8-12)
  - Do not list these as active links. If it is blue then it is a link. You can remove this by highlighting it and then going to the menu and clicking "remove link"
- List the Goals (font size 24-32)
- List the Results/Findings (font size 24-32)
- If you have a sub-bullet/text for either the Goal(s) or Finding(s) then use font size 18-24 (sub bullet font must be smaller than main bullet)
- Include at least one graphic/figure from each article to help (visually) teach the material from each
- Remember that this section helps you to "funnel" down from the general topic through what has been done and what has been found to what still needs to be done ("Problem Statement")

Remember:
- Be sure to "teach" the background information in an enthusiastic way that helps the judge understand the topic and appreciate what is already known and what still needs to be done.

Problem Statements

- Using bulleted text (not paragraphs), clearly explain the problem (gap/void) left by the previous studies
- If you list more than one Problem Statement then number each of them and have them match the multiple Goals
- If you completed phase two of the same/similar project then clearly label the Prob. Goal and Hypo for each phase

Goals

- Using bulleted text (not paragraphs), clearly explain the goals of the research and the possible impact on the overall problem
- If you have more than one Goal then number each of them and have them match the multiple Problem Statements

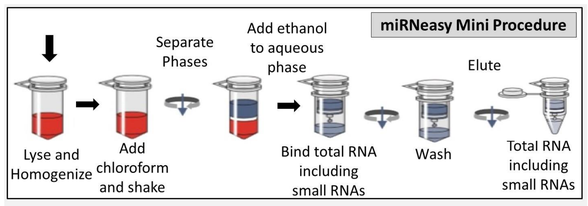
Hypothesis

- Using bulleted text (not paragraphs), clearly explain what you thought would happen
  - Some engineering projects may not need a hypothesis but require clear objective(s)
- Be sure to justify/explain why you thought this might be the outcome. It is 100% ok if your hypotheses were refuted and not supported.
  - If possible, refer to previous research (ex. Smith, 2002) as part of the justification for your hypo(s)
- If you have more than one Goal then you should have more than one Hypotheses. Be sure to number each of them so that they match the multiple Goals.

If the Problem Statement(s), Goal(s) and Hypothesis(es) don't fit on the bottom of the left panel then you can put them side by side on the top of the middle panel

Methodology & Materials

- Clearly differentiate between the parts you did versus the work you had assistance on (from your parents or other adults). You can even have a subsection called "Role of Mentor vs. Role of Student". This will help all judges to fully understand what you did vs. what your mentor did. Include the length of time that you spent on the project
- Break up the Methodology into subsections with clear and concise but descriptive sub headings. This will help the judge to follow along better as you explain each of the different subsections of the methodology
- Use bulleted format, not paragraphs, but Include sufficient detail for someone to be able to carry out the experiment just from your directions on the poster. However, you do not have to include exact dosages or amounts.
- Write all bulleted text in "passive voice". Try not to use words like "I", "We", "Me", "Our" on the poster.
  - Ex. instead of *"I added the soda to the coins and then I checked every day to see the amount of decay"* say *"The soda was added to the coins and then the coins were observed every day to see the amount of decay"*
- Justify and explain why certain steps were taken in relation to the Goals and/or Hypotheses
- Include many pictures/figures to help "teach" the methodology and refer to them in the bulleted (methodology) text.
  - Use arrows, boxes or circles to draw attention to important aspects in the figures
  - Examples below are from previous high school research posters. Each is from a different student's poster



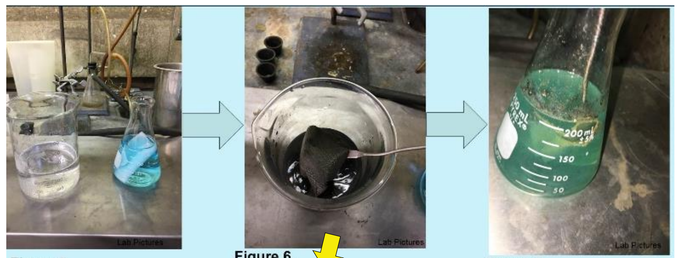
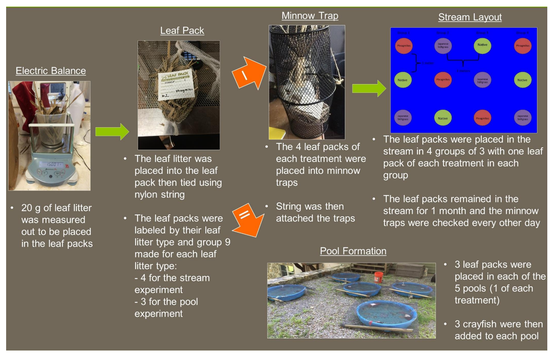


Figure 5. Solutions of Copper II Chloride with cotton fabric and Sodium Borohydride/1-Dodecanethiol

Figure 6. The cotton fabric after it has been moved from the Copper II Chloride solution into the Sodium Borohydride and 1-dodecanethiol solution

Figure 7. Cotton fabric after it has been moved back into the Copper II Chloride solution



Results / Discussion / Analysis

- You do NOT have to break up the Results from the Discussion/Analysis section. If you feel that it would help more to show the results and then incorporate the Discussion/Analysis then that is fine. However, you should call the main section "Results/Discussion/Analysis"
- Break up the Results into subsections (even if you incorporate the Discussion and Analysis with the results) with clear and concise sub headings that match the subsections of the Methodology
- Potential limitations, including confounding variables, are reviewed objectively including how different aspects may have impacted the results.
  - Do not use "Unfortunately…", "However...", etc.
- Highlight relevant failures and/or challenges that you overcame
- Explain how the data was analyzed including if statistical tests were include.
  - Why those tests were used?
  - What was the statistical significance?
- Be sure NOT to include any of the following:
  - Non-scientific statements, non-supported statements, confusing or vague statements.
- Present the data and/or observations using charts, tables, graphics that include descriptive titles, labeled axis and clear, explanatory captions. See examples below.
- Review the hypothesis/hypotheses and indicate, clearly, whether it/they were supported or refuted
  - Remember, we NEVER "Prove" or "Disprove" anything
  - Engineering projects without a hypothesis refer back to objective.
  - Each hypothesis is supported or refuted such as "*The first hypothesis was supported as the data indicated that*….." (include statistical support ex. p<.05)

- Samples of data **tables**

Notice that with Tables, the title and information is on the top and there are only 3 horizontal lines

Table 1. Effect of Temperature on Rate of Solubility.

Temperature of solvent (°C)	Rate of Solubility (g/sec)
-20	0.0
-10	0.0
0	0.0
10	0.0
20	0.0
30	0.0
40	0.0
50	5.3
60	6.7
70	8.8
80	11.4

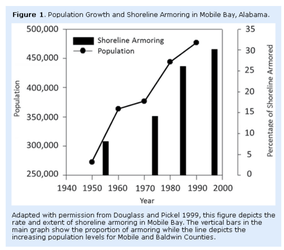
Table 1. Boyle's Law Experiment: Measuring Volume as a Function of Pressure.

Trial	1	2	3	4
Length of air sample (mm)	122.5	116.2	114.4	106.2
Hg height difference (mm)	51.0	94.4	126.7	174.3

https://writingcenter.unc.edu/tips-and-tools/scientific-reports/

- Sample of data **figure**

Notice that with Figures (graphs), the title and information is on the bottom and all parts are labeled



https://www.editage.com/insights/tips-on-effective-use-of-tables-and-figures-in-research-papers

If you need more room for the Results/Discussion/Analysis than just the bottom of the middle part, you can put some information here (top of the right panel)

Applications/Implications

- This could be considered a subsection of the Discussion and could be titled "*Discussion – Applications*"
- Explain the potential impact of your findings?
  - That can be a clear "*application*" or it may be more of a help towards the next step of research and therefore be an "*implication*"
- If possible, mention past studies & how your research was different
  - Specific reference to how the results of this study were similar, different and improved upon previous studies. "*Similar to Smith in 2014, .." or "Unlike Jones in 2010, ...*"
- How can your results be applied to a current situation? Who/How can they help?
- If you truly found something new, check with your mentor first and then say so: "We report a novel finding..." or "This result is heretofore unreported in the literature..."

Future Research

- Explain what the next steps/phase of research should be AND why
  - Be sure to justify the reason WHY those future studies are important and what they may reveal

Conclusion

- Remember, All material on poster, including the conclusion, is presented with bulleted text and not lengthy sentences or paragraphs.
- The conclusion section can be a very effective way to review the entire poster in 30 seconds helping anyone that missed a part to gain insight quickly and effectively.
- List 1-2 brief bulleted text points for each of the following:
  - **Goal (1 bullet)**
  - **Methodology (1-2 bullets)**
  - **Findings/Results (1-2 bullets)**
  - **Application/Implication 1-2 bullets)**
- Be sure to include the subtitles, in bold, so everyone can follow along and gain insight if they missed a part of the presentation.

We do NOT list a full Works Cited/Bibliography section here!! The 3 most relevant articles should have been fully cited in the "Review of Literature".

No judge is impressed because you list multiple cited sources here. However, they may be impressed that you read the background/related information/research and then addressed a gap/void in the current knowledge.

Top 10 things to remember when creating poster presentations

1. **Never use pre-set templates or pre-set text boxes.**
   - Pre-set templates almost always limit the usable space on a slide and do little to enhance the presentation. Instead of this, start with a blank slide and then add your own background image and insert your own text boxes.
   - Pre-set text boxes are automatically set to reduce the size of the font to allow it to fit in the pre-set space. This can send a very misleading message. For example, in a presentation about vitamins, if on one slide you have a little information about vitamin A the font may end up being a size 20 but if on the next slide you have more information about vitamin C, the font may default to size 12 making it appear like it was less important than the text for vitamin A.
2. **Never include any paragraphs, or even long sentences.**
   - No one will read those. This should never be looked at as the type of poster that is permanently hung up in a medical college or at a professional conference. This visual presentation is supposed to be an outline for the student to present with.
3. **Use the (vertical) "line spacing" to visually support the organization of the content.**
   - Sub-bullets should be closer (vertically) to each other and to the main bullet that they are supposed to be "connected" to and a bit further away from the next main bullet below them.
   - Basic steps:
     - Highlight a set of bulleted text.
       - Fact 1 blah blah…
       - Fact 2 blah blah…
       - Fact 3 blah blah…
     - Bring up the menu and click on "paragraph" then "line spacing" and then add approx. a size 6-12 spacing "after".
     - This will spread the bullets out vertically so that they are not so squished (vertically).
     - You may have to uncheck "Don't add space between paragraphs of the same style".
     - You may also have to add more spacing "after" the final sub-bullet so that there is more room between it and the next main bullet.
4. **Sub-bullets should be a smaller font than the main bullet**
   - This allows the viewer to easily understand that this is information that is under the "umbrella" of the main bullet. The visual clarity will help a lot in the hierarchy of your presentation.
5. **Never break up ideas across a line break and try to never have just one word on a line by itself.**
   - People read in chunks so it is essential that you don't break up ideas just because the space on a line runs out. It is also important not to "waste" a line on just one word.
   - Basic steps:
     - Do NOT use the space bar. Instead, you can just hit "enter" and push the first word of this idea down to the next line.
     - If that causes a double-spaced line or other formatting issues then just hit "shift" + "enter" to push that first word to the next line.
     - You can also line up bullets and sub-bullets by highlighting them and sliding the "pointers" on the top ruler
   - An additional tool to help with this may be to stretch the text box a bit wider or change the margins of the text box
6. **Never include any logos, QR codes or names of specific people or places (mentor, teacher, lab assistant, location of research, etc.)**
   - These are all not allowed by most regional and/or state science fairs and are certainly against the rules at all ISEF events.
7. **All sections on poster, other than "Future Research" must be in past tense**
8. **Never include your abstract as a part of your poster**
   - In most ISEF-affiliated and JSHS-affiliated competitions, the abstract on the official form must be displayed, typically in a frame on the table. However, no other form of the abstract is allowed.
   - While you are allowed to display the abstract on the official form on the poster, it is truly a waste of valuable space.
9. **Cite every picture, data chart, figure with a full citation (URL)**
   - If a picture was found on the internet, then the full website address must be listed in a small font below.
   - If a picture was taken by the student, then list "photo by (first initial last name)".
   - If a picture was taken by someone else, then you must have written consent to use it in this setting.
   - If a picture was taken that shows the face of another person, then you must have their photo consent or blur out/cover their face.
   - If a data chart or figure was created by the student then list that in the citation. This is even the case in the results section when displaying data from the student's actual project.
   - If a data chart or figure comes from another source (ex. prev. research) then cite it fully directly below.
10. **Match the main section titles to a standard science fair rubric (scientific method)**
    - Introduction & Background
      - Explain the general info./background using bulleted text and pictures
    - Review of Literature
      - Explain how previous research led to a gap in knowledge (problem statement).
      - List the "Goals" and "Findings" of 2-3 previous research articles and cite the article fully directly above the bulleted notes.
    - Problem Statements / Goals / Hypotheses
      - Briefly explain the Problem Statement (gap in current knowledge)
      - Briefly explain the Goals and how they addressed the Problem Statement
      - List at least 1 hypothesis per goal (match them by number to the goals) and justify why it was believed that would be the outcome.
    - Methods / Materials
      - Briefly explain how this unique approach/concept was inspired and/or developed
      - Explain the difference between the role of the student and the role of the mentor
      - Clear, sequential plan as to how the methods addressed the goals, "This was done in order to…".
      - Include Graphics/Pictures/Flow Charts to help teach the methodology.
      - List and explain controls and variables
      - If a survey was used, list sample questions and how they helped to address the problem
    - Results / Analysis / Discussion
      - Explain what the results showed in relation to the original goals
      - Data should be represented using charts, tables, graphics that include descriptive titles, labeled axis and clear, explanatory captions.
      - Explain how the data/observations were analyzed including what tests (lab tests and/or statistical tests) were used and why
      - Review whether the results supported or refuted the hypothesis(es)
    - Application
      - Essential to list the possible applications or implications of the research
    - Conclusion
      - Instead of a summary paragraph, consider listing bulleted text reviewing the goal, the methods, the findings and the application/importance
    - Future Research