I. PAPERWORK
   a. All projects involving Human Subjects, Vertebrate Animals, and/or Potentially Hazardous Biological Agents MUST obtain project approval by an Institutional Review Board (IRB) or Scientific Review Committee (SRC) prior to starting the project.
   b. This process remains the same as prior years and will be reviewed by the Scientific Review Committee (SRC) to confirm eligibility for competition.
   c. Make sure to submit the Grade 5-8 Research Plan and SRC Approval Form in zFairs for review by the judges.

II. PROJECT PRESENTATION
   a. The project presentation replaces the project poster used during in-person fairs. Appendix II provides complete instructions of the format requirements and recommendations.
   b. There are three suggested templates based on project type:
      i. Science Projects
      ii. Engineering Projects
      iii. Mathematics/Computer Science Projects
   c. Project presentations MUST be submitted by March 14, 2022 and will then be locked for Display & Safety inspection prior to competition.

III. LAB NOTEBOOK IMAGE/EXCERPT
   a. Students are encouraged to upload a PDF of no more than 4 pages of their lab notebook as a record of their research timeline and process. The lab notebook may include drawings and other information that are not able to be included in the presentation but are important in understanding the student’s work.
   b. It is strongly advised NOT to share the notebook in totality to protect your intellectual property.

ADDITIONAL OPTIONAL MATERIALS

I. QUAD CHART
   a. The quad chart summarizes the project in a single page for a quick overview by the judges.
   b. Appendix III provides complete instructions with format requirements and recommendations as well as sample templates.

II. PROJECT VIDEO 2 MINUTE MAXIMUM
   This video should summarize your project.

III. VIDEO DEMONSTRATION/SIMULATION/ANIMATION 1 MINUTE MAXIMUM
   If a project is best explained by showing a demonstration, simulation or animation, you may include a short video.
I. PAPERWORK REQUIREMENTS
Elementary and Junior Division students should ensure the Grades 5-8 Research Plan and SRC Approval Form is complete and submitted by 11:59 PM on March 14, 2022.

II. DIGITAL PAPERWORK AND SIGNATURES
a. Digital signatures are permissible but must have a verification system via login and have a time and date stamp to indicate this authentication.

b. Paperwork submitted to AzSEF must be scanned and submitted via zFairs online portal.

III. DISPLAY & SAFETY
Display & Safety inspections will include a review of all submitted materials and enforcement of the display guidelines as published in the International Rules and Guidelines. This includes:

a. Providing appropriate credits for all photographs, graphs and other visuals

b. Having signed and uploaded (in zFairs) permission forms of individuals depicted in any project materials (on the board, slides or in the video)

c. Ensuring no offensive or inappropriate photos or images are included

APPENDIX I. SUBMISSION AND REVIEW PROCESS

APPENDIX II. PROJECT PRESENTATION INSTRUCTION

Project Presentations for Virtual AzSEF 2022 should be created using Google Slides, Microsoft PowerPoint, or Keynote and submitted as a PDF. The final document submitted for display to the judges and the public must satisfy the following requirements.

I. FORMAT REQUIREMENTS
a. The Project Presentation must be a single PDF document limited to no more than 12 pages.

b. The PDF document must open with default magnification “Fit Page” so that the entire page is visible at the same time. Recognizing that almost all judges will view your Project Presentation on screens that are wider than they are tall, you should create all pages in landscape mode.

c. Your presentation must not include page transitions and embedded videos or animations. (You can submit an optional one-minute video if you need something to move in order to illustrate your project.)

d. The page background color must be light in color so all text is easily readable.

e. Text color must be predominantly black, but limited color for emphasis is acceptable.

f. All text should be readable easily when viewing the entire page at once. The smallest allowable font size of body text is 14 pt. Exception: You may use a smaller font size, down to 10 pt., for figure captions or photo credits.

g. All Project Presentation elements must conform to D&S rules as if placed on a physical poster for display to judges and the public. Passing a Display & Safety inspection will be required to compete.

II. FORMAT RECOMMENDATIONS
a. Do not use non-standard fonts or colors to “stand out from the crowd” or to be entertaining. It is recommended that you use a font such as Arial, Calibri, Helvetica or Century Gothic that is easy to read.

b. Page titles should all be the same size. That size should be larger than headings within each page. In turn, headings should be larger than body text.

c. Avoid long expository paragraphs. State your points succinctly.
d. Use bullets to set out individual points of interest. Use numbered lists when the ordering of points of interest is important (e.g., instructions to be followed in order, or items needing a reference anchor for citation elsewhere in your Presentation).

e. All body text should adopt a common font style and size. Similarly, all heading text should adopt a common font style and size. There is no recommendation for the style and size relation between body and heading text.

PROJECT PRESENTATION TEMPLATES

Choose one of the following templates to create your presentation. Do not include information not specified in this template. If you are submitting a continuation project, include only information related to this year’s research unless otherwise directed in the instructions below. You may include graphical elements as they would explain or illustrate your work and can be contained within the overall page limits.

Each of the seven (7) required sections in each template must start on its own page. Each section may use as many pages as you want, as long as all formatting instructions above (such as page count) are satisfied.

- **TEMPLATE I: Science Projects**
- **TEMPLATE II: Engineering Projects**
- **TEMPLATE III: Mathematics/Computer Science Projects**
I. PROJECT ID AND TITLE
   a. The following should be included:
      i. Project ID This ID will be assigned by zFairs
      ii. Project Title
   b. Do NOT include your name or school

II. INTRODUCTION WHAT IS YOUR RESEARCH QUESTION?
   a. Explain what is known or has already been done in your research area. Include a brief review of relevant literature.
      If this is a continuation project, a brief summary of your prior research is appropriate here. Be sure to distinguish your
      previous work from this year’s project.
   b. What were you trying to find out? Include a description of your purpose, your research question, and/or
      your hypothesis.

III. METHODS EXPLAIN YOUR METHODOLOGY AND PROCEDURES FOR CARRYING OUT YOUR PROJECT IN DETAIL.
   a. What did you do? What data did you collect and how did you collect that data? Discuss your control group and the
      variables you tested.
   b. DO NOT include a separate list of materials.

IV. RESULTS WHAT WERE THE RESULT(S) OF YOUR PROJECT?
   a. Include tables and figures which illustrate your data.
   b. Include relevant statistical analysis of the data.

V. DISCUSSION WHAT IS YOUR INTERPRETATION OF THESE RESULTS?
   a. What do these results mean? Compare your results with theories, published data, commonly held beliefs, and
      expected results.
   b. Discuss possible errors. Did any questions or problems arise that you were not expecting? How did the data vary
      between repeated observations of similar events? How were results affected by uncontrolled events?

VI. CONCLUSIONS WHAT CONCLUSIONS DID YOU REACH?
   a. What do these results mean in the context of the literature review and other work being done in your research area?
      How do the results address your research question? Do your results support your hypothesis?
   b. What application(s) do you see for your work?

VII. REFERENCES
   a. This section should not exceed one page. Limit your list to the most important references.
   b. List the references/documentation used which were not of your own creation (i.e., books, journal articles).
I. PROJECT ID AND TITLE
   a. The following should be included:
      i. Project ID This ID will be assigned by zFairs
      ii. Project Title
   b. Do NOT include your name or school

II. INTRODUCTION WHAT IS YOUR ENGINEERING PROBLEM AND GOAL?
   a. What problem were you trying to solve? Include a description of your engineering goal.
   b. Explain what is known or has already been done to solve this problem, including work on which you may build. You may include a brief review of relevant literature.
   c. If this is a continuation project, a brief summary of your prior work is appropriate here. Be sure to distinguish your previous work from this year’s project.

III. METHODS EXPLAIN YOUR METHODS AND PROCEDURES FOR BUILDING YOUR DESIGN.
   a. What did you do? How did you design and produce your prototype? If there is a physical prototype, you may want to include pictures or designs of the prototype.
   b. If you tested the prototype, what were your testing procedures? What data did you collect and how did you collect that data?
   c. DO NOT include a separate list of materials.

IV. RESULTS WHAT WERE THE RESULT(S) OF YOUR PROJECT?
   a. How did your prototype meet your engineering goal?
   b. If you tested the prototype, provide a summary of testing data tables and figures that illustrate your results.
   c. Include relevant statistical analysis of the data.

V. DISCUSSION WHAT IS YOUR INTERPRETATION OF THESE RESULTS?
   a. What do these results mean? You may compare your results with theories, published data, commonly held beliefs, and/or expected results.
   b. Did any questions or problems arise that you were not expecting? Were these problems caused by uncontrolled events? How did you address these?
   c. How is your prototype an improvement or advancement over what is currently available?

VI. CONCLUSIONS WHAT CONCLUSIONS DID YOU REACH?
   a. What do these results mean in the context of the literature review and other work being done in your research area? How do the results address your research question? Do your results support your hypothesis?
   b. What application(s) do you see for your work?

VII. REFERENCES
   a. This section should not exceed one page. Limit your list to the most important references.
   b. List the references/documentation used which were not of your own creation (i.e., books, journal articles).
I. PROJECT ID AND TITLE
   a. The following should be included:
      i. Project ID  This ID will be assigned by zFairs
      ii. Project Title
   b. Do NOT include your name or school

II. INTRODUCTION WHAT IS YOUR RESEARCH QUESTION?
   a. Explain what is known or has already been done in your research area. Include a brief review of relevant literature.
   b. If this is a continuation project, a brief summary of your prior work is appropriate here. Be sure to distinguish your
      previous work from this year’s project.

III. FRAMEWORK NOTATION AND FRAMEWORK.
   a. Introduce the concepts and notation needed to specify your research question, methods, and results precisely.
   b. Define relevant terms, and explain prior/background results. (Novel concepts developed as part of your project
      can be presented here or in Section 4, as appropriate.)

IV. FINDINGS PRESENT YOUR FINDINGS AND SUPPORTING ARGUMENTS.
   a. What did you discover and/or prove? Describe your result(s) in detail. If possible, provide both formal and
      intuitive/verbal explanations of each major finding.
   b. Describe your methods in general terms. Then:
      i. Present rigorous proofs of the theory results – or, if the arguments are long, give sketches of the proofs that
         explain the main ideas.
      ii. For numerical/statistical results, include tables and figures that illustrate your data. Include relevant
         statistical analysis. Were any of your results statistically significant? How do you know this?

V. CONCLUSIONS WHAT IS YOUR ASSESSMENT OF YOUR FINDINGS?
   a. How do the results address your research question? And how have you advanced our understanding relative to
      what was already known?
   b. Discuss possible limitations. Did any questions or problems arise that you were not expecting? What challenges do
      you foresee in extending your results further?
   c. What application(s), if any, do you see for your work?

VII. REFERENCES
   a. This section should not exceed one page. Limit your list to the most important references.
   b. List the references/documentation used which were not of your own creation (i.e., books, journal articles).
A “quad chart” is a single page divided into four quadrants providing a high level summary of the project. It is intended to be more visual than detailed in order to quickly introduce your judges to what is important about your project. Follow the model below that corresponds to the Project Presentation template you selected.

a. The Quad Chart should be created so the entire page is visible at the same time. The chart should be created in landscape mode and saved as a pdf.

b. The page background color must be light in color and not interfere with readability.

c. Text color must be predominantly black, but limited color for emphasis is acceptable.

d. The minimum allowable font size is 14 pt. Exception: You may use a smaller font size, down to 10 pt., for figure captions or photo credits.

e. All four quadrants of your Quad Chart should each be the same size with a single border line delimiting each, as in the examples below. The Title section should be only as tall as necessary to include your project title and other identifying information (see section on Quad Chart Title).

f. The Quad Chart should include all appropriate photo/graph/chart credits, should NOT include a bibliography, references, or acknowledgements, and must adhere to all Display & Safety rules.

### SCIENCE PROJECT QUAD CHART

<table>
<thead>
<tr>
<th>SCIENCE PROJECT QUAD CHART TITLE</th>
<th>PROJECT ID #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1: SCIENTIFIC QUESTIONS</td>
<td>Q3: DATA ANALYSIS &amp; RESULTS</td>
</tr>
<tr>
<td><img src="image1.png" alt="Image" /> CREDIT</td>
<td><img src="datachart1.png" alt="Data Chart" /> CREDIT</td>
</tr>
<tr>
<td>Q2: METHODOLOGY</td>
<td>Q4: INTERPRETATION &amp; CONCLUSIONS</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /> CREDIT</td>
<td><img src="credit2.png" alt="Credit" /></td>
</tr>
</tbody>
</table>

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## ENGINEERING PROJECT QUAD CHART

<table>
<thead>
<tr>
<th>ENGINEERING PROJECT QUAD CHART TITLE</th>
<th>PROJECT ID #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1: ENGINEERING PROBLEM &amp; PROJECT OBJECTIVES</td>
<td>Q3: DATA ANALYSIS &amp; RESULTS</td>
</tr>
<tr>
<td>Q2: PROJECT DESIGN</td>
<td>Q4: INTERPRETATION &amp; CONCLUSIONS</td>
</tr>
</tbody>
</table>

## MATH & COMPUTER SCIENCE PROJECT QUAD CHART

<table>
<thead>
<tr>
<th>MATH &amp; COMPUTER SCIENCE PROJECT QUAD CHART TITLE</th>
<th>PROJECT ID #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1: ENGINEERING PROBLEM &amp; PROJECT OBJECTIVES</td>
<td>Q3: DATA ANALYSIS &amp; RESULTS</td>
</tr>
<tr>
<td>Q2: PROJECT DESIGN</td>
<td>Q4: INTERPRETATION &amp; CONCLUSIONS</td>
</tr>
</tbody>
</table>

### QUAD CHART TITLE

a. In the upper right-hand corner, list the Project ID (**Do NOT include your name**)

b. Line one is the title of your project

### QUADRANT 1 RESEARCH QUESTION/ENGINEERING GOAL

a. This should reflect material in #2 of the Project Presentation Template.

b. Please state the research question or engineering problem being addressed.

c. A leading core graphic or visual is encouraged, but not required.

### QUADRANT 2 METHODOLOGY/PROJECT DESIGN

a. This should reflect material in #3 of the Project Presentation Template.

b. Please provide a succinct, bulleted summary of the methodology/project design.

### QUADRANT 3 DATA ANALYSIS & RESULTS

a. This should reflect material in #4 and 5 of the Project Presentation Template.

b. It is advised that this quadrant should primarily be a graphic representation of relevant data and results.

c. Text should be kept to a minimum.

### QUADRANT 4 INTERPRETATION & CONCLUSIONS

a. This should reflect material in #5 and # 6 of the Project Presentation Template.
The video will not be viewed during project judging, but it will be available for public viewing once judging is complete.

Record a video (maximum duration 2 minutes) explaining your project. The target audience for this video is members of the general public who will visit the fair on Public Day.

I. WHAT TO INCLUDE IN YOUR VIDEO
   a. Introduce Yourself: State your full name and your school. Rather than reciting your project title, consider explaining your project in a single sentence.
   
   b. Explain Your Project: Summarize your research into main points:
      i. What did you do?
      ii. What did you find?
      iii. What conclusions did you draw?
   
   c. To note:
      i. We recommend that you are prominently displayed in the video (as opposed to the video being predominantly your slides).
      
      ii. You can use any props or visuals you may have that are within the Display & Safety guidelines. Tip: This video is a summary statement about your project and the scientific or engineering process you followed. It is not intended as an advertisement or sales pitch.
      
      iii. Do not include anyone in your video other than the student researchers of the project.

II. BEST PRACTICES FOR FILMING
   These videos will not be edited. To ensure your video is the best representation of your work, please keep these best practices in mind while filming:
   
   a. Please speak in English.
   
   b. Film yourself in a well-lit and non-distracting environment so the viewer’s focus stays on you and your work.
   
   c. For best results, film your video horizontally (landscape).
   
   d. Keep the camera still and in place during filming.
   
   e. Speak clearly and loudly enough that the recording is able to pick up every word you say.
   
   f. Avoid long pauses.
   
   g. Listen to your video after recording to ensure your voice is clear and audible, and that the video has not picked up too much background noise.