



# Louisville Regional Science & Engineering Fair

## **LRSEF 2023 PreFair Review Milestone Guidelines – with Appendix**

*adapted from the 2022 Regeneron Guidelines*

**LRSEF PreFair Review Milestone is Required by all on or before February 15, 2023.**

Include these elements:

- 1, Abstract
2. Project Outline / Presentation, of up to 12 pages in PDF. (See Appendix for details)
3. Optional Video of no more than 2 minutes

**Note: These are the ONLY materials that LRSEF will release to the Scientific Review Committee (SRC) and to the Special Awards Judges for online review of your project in advance of the fair. This MILESTONE IS REQUIRED from all students and will be released to SRC and Judges on Feb 18, 2023.**

**On Saturday, March 4, during Category Judging Interviews at University of Louisville, you may present any additional or updated materials that you choose on your Project Board. All materials for that day must meet all Display & Safety & Guidelines.**

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### 1. Abstract: (250-word format)

The abstract summarizes the information contained in the rest of this document. An abstract includes: (a) the research question or engineering problem, (b) procedures used, (c) data, (d) interpretation and (e) conclusions. It also may include any possible research applications. It should be limited to these essential elements.

### 2. Project Outline/ Presentation—up to a 12-page document (See Appendix for Templates.)

- a. The project presentation is the primary vehicle to present the content of your project, **it can be used to make the tri-fold project poster that you bring to in-person fair.**
- b. There are three **suggested templates** you can follow based on your project type:
  - i. Science Project,
  - ii. Engineering Project **OR**
  - iii. Mathematics/Computer Science Project.

3. Optional - Project Video (2-minute maximum) (See Appendix for Details.)
  - a. In this video you should summarize your project at a high level.
  - b. The video should feature you prominently on screen, this is NOT the format to show your slides.
  - c. Judges will have the option to view your video for Special Awards, they are not required to watch your video.

#### **A. Project Outline/ Presentation Instructions:**

You may prepare your Project Presentation for LRSEF 2023 using any software tools that you desire, but the final document submitted as a PDF and must satisfy the following requirements.

#### **Format Requirements:**

1. The Project Presentation must be uploaded to LRSEF STEM Wizard PreFair Review Milestone as images (JPG, PNG or similar). You are limited to **no more than 12 pages**.
2. The pages should be created including all elements listed in the suggested templates for Science, Engineering OR Math/Computer Science Projects.
3. Create each page in Landscape mode so that the entire page is visible at the same time.
4. Your pages must **be without animation or active hyperlinks**.
5. The page background color must be a light color and should not affect readability.
6. Text color must be **predominantly dark** to support readability.
7. All text should be readable easily when viewing the entire page at once. The smallest allowable font size of body text is 14 pt., and an **18-pt. font is recommended**. *Exception:* You may use a smaller font size, down to 10 pt., for figure captions or photo credits.

#### **8. Format Recommendations:**

- a. Avoid long expository paragraphs. **State your points succinctly.**
- b. 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.
- c. Page titles should all be the same size. That size should be larger than headings within each page. Headings should be larger than body text.
- d. 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 relation between body and heading styles.
- e. 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).

#### **Project Presentation Templates (See Appendix.)**

Choose one of the templates in the Appendix to create your presentation. Do not include information not specified in the template. You may include graphical elements as long as they explain or illustrate your work and can be contained within the overall 12-page limit.

If you are submitting a continuation project, include only information related to this year’s research.

Each of the sections must start on its own page. Titles per section are provided as recommended titles, but alternate titles may be used. Each section may extend beyond one page if the total does not exceed 12 maximum pages.

TEMPLATE I: Science Projects

TEMPLATE II: Engineering Projects

TEMPLATE III: Mathematics/Computer Science Projects

## **B. Display & Safety Rules for Project Presentation Materials:**

All Project Presentation elements must conform to all ISEF Display and Safety rules as if content was being placed on a physical poster for display to the judges. This includes **providing appropriate credits for photographs, graphs, and other visuals**, and having any permissions of individuals depicted in any project materials (in the slides or in the video) available.

### **1) Photographs, visual images, charts, tables, graphs must be appropriate and credited.**

- a) Any photograph/visual image/chart/table and/or graph is allowed if:
  - i) It is not deemed offensive or inappropriate (which includes images/photographs showing invertebrate or vertebrate animals/humans in surgical, necrotizing or dissection situations) by the LRSEF Scientific Review Committee.
  - ii) It has a credit line of origin (“Photograph taken by...” or “Image taken from...” or “Graph/Chart/Table taken from...”).
  - iii) If all images, etc. displayed were created by the finalist or are from the same source, **one credit line prominently is sufficient.**

**All images MUST BE properly cited.** This includes background graphics, photographs and/or visual depictions of the finalist or photographs and/or visual depictions of others. If photos of others are included, *please have a signed photo/video release form from the person(s) featured in your photographs available upon request by the judges during your interview.*

### **2) What is NOT ALLOWED in your Presentation Materials:**

You may not list your postal addresses, web addresses, email and/or social media addresses, telephone and/or fax numbers OR the name or address of your school.

Any reference to an institution or mentor that supported your research. (That is provided in the official ISEF paperwork, most notably Form 1C.)

Information or items that are acknowledgments, self-promotions or external endorsements are NOT allowed.

- ii) The use of logos including known commercial brands, institutional crests or trademarks, flags. Personalized graphic/logos that are developed to indicate a commercial purpose or viability of an established or proposed business associated with the project. The only exception is a **student-created logo that may be displayed on the project materials only one time.**
- iii) Any reference to patent status of the project.
- iv) Highlight of any items related to your project such as disks, CDs, flash drives, brochures, booklets, endorsements, give-away items, business cards, printed materials or food items

### **C. LRSEF Forms and Files Milestone:**

**All LRSEF projects must have signed and uploaded ISEF Checklist Form 1, Student Checklist Form 1A, Project Plan/Summary & Approval Form 1B and the LRSEF Parent/Teacher /Guardian Permission Form.**

Once your project title is inserted in Stem Wizard and you go through the Rules Wizard, these forms will be available in a drop-down menu.

Other ISEF Forms that might be used for LRSEF would be the following:

#### **Regulated Research Institutional Setting Form 1C** (if applicable)

*This form is required for work done at a Regulated Research Institution or Industrial Setting and is to be completed after experimentation by the adult supervising. In 2021-2022, when many Regulated Research Institution laboratories and facilities are closed to student researchers, the ISEF SRC has suggested that a Form 1C be used when support from mentors and those in a laboratory setting has been provided, even when the student received this support remotely. This can also include situations in which a high school teacher is supporting laboratory activities on behalf of a remote student to help clarify the student's involvement in each step of the project.*

#### **Continuation Form 7** (if applicable)

*Any project that is a continuation of a previous year's work must document that additional research is new and different on Continuation Form 7.*

## APPENDIX:

### LRSEF 2023 Project Presentation Template: **Science Project**

*Adapted from 2022 Regeneron Materials*

#### **1. Project Title and Name**

- The following should be included:
  - o Project Title
  - o Your Name and Names of your Team members if you are part of a Team Project

#### **2. INTRODUCTION - What is your research question?**

- What were you trying to find out? Include a description of your purpose, your research question, and/or your hypothesis.
- 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.

#### **3. METHODS - Explain your methodology and procedures for carrying out your project in detail.**

- 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.
- DO NOT include a list of materials.

#### **4. RESULTS - What were the result(s) of your project?**

- Include tables and figures which illustrate your data.
- Include relevant statistical analysis of the data.

#### **5. DISCUSSION - What is your interpretation of these results?**

- What do these results mean? Compare your results with theories, published data, commonly held beliefs, and expected results.
- 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?

#### **6. CONCLUSIONS - What conclusions did you reach?**

- Do your results support your hypothesis? How do the results address your research question? What do these results mean in the context of the literature review and other work being done in your research area?
- What application(s) do you see for your work?

## **7. REFERENCES**

- This section should **not exceed one page**. Limit your list to the most important references.
- List the references/documentation used which were not of your own creation (i.e., books, journal articles).

## LRSEF 2023 Project Presentation Template: **Engineering Project** *Adapted from 2022 Regeneron Materials*

### **1. Project Title and Name**

- The following should be included:
  - Project Title
  - Name and Names of your Team members if this is a Team Project.

### **2. INTRODUCTION - What is your engineering problem and goal?**

- What problem were you trying to solve? Include a description of your engineering goal.
- 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.
- **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.

### **3. METHODS - Explain your methods and procedures for building your design.**

- 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.
- If you tested the prototype, what were your testing procedures? What data did you collect and how did you collect that data?
- DO NOT include a separate list of materials.

### **4. RESULTS - What were the result(s) of your project?**

- How did your prototype meet your engineering goal?
- If you tested the prototype, provide a summary of testing data tables and figures that illustrate your results.
- Include relevant statistical analysis of the data.

### **5. DISCUSSION - What is your interpretation of these results?**

- What do these results mean? You may compare your results with theories, published data, commonly held beliefs, and/or expected results.
- Did any questions or problems arise that you were not expecting? Were these problems caused by uncontrolled events? How did you address these?
- How is your prototype an improvement or advancement over what is currently available?

### **6. CONCLUSIONS - What conclusions did you reach?**

- Did your project turn out as you expected?
- What application(s) do you see for your work?

## **7. REFERENCES**

- This section **should not exceed one page**. Limit your list to the most important references.
- List the references/documentation used which were not of your own creation (i.e., books,

journal articles).

## LRSEF 2023 Project Presentation Template: **Mathematics/Computer Science** *Adapted from 2022 Regeneron Materials*

### **1. Project Title and Name**

- The following should be included:
  - o Project Title
  - o Name and Names of the members of your Team if this is a Team Project

### **2. INTRODUCTION - What is your research question?**

- 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 work is appropriate here. Distinguish your previous work from this year's project.

### **3. FRAMEWORK - Notation and framework.**

- Introduce the concepts and notation needed to specify your research question, methods, and results precisely.
- Define relevant terms and explain prior/background results. (Novel concepts developed as part of your project can be placed here or in Section 4.)

### **4. FINDINGS - Present your findings and supporting arguments.**

- What did you discover or prove? Describe your result(s) in detail. If possible, provide both formal and intuitive/verbal explanations of each major finding.
- **Describe your methods in general terms. Then:**
  - o Present rigorous proofs of the theory results – or, if the arguments are long, give sketches of the proofs that explain the main ideas.
  - o 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?

### **5. CONCLUSIONS - What is your assessment of your findings?**

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

### **6. REFERENCES**

- **This section should not exceed one page.** Limit your list to the most important references.

- List the references/documentation used which were not of your own creation (i.e., books, journal articles).

## **LRSEF 2023 Optional Project Video Instructions:**

*Adapted from Rengeneron 2022 guidelines.*

### **Record a video (maximum duration 2 minutes) explaining your project.**

The target audience for this video are the Special Awards Judges.

- While judges will have access to this video, they are NOT Required to view it. This video must comply with all Display & Safety Rules, particularly those involving logos, acknowledgements, and properly crediting images/graphs/photos.
- Videos can either be uploaded directly to LRSEF STEM Wizard PreFair Review Milestone or you can embed a YouTube video. The YouTube link will need to be public, but it is not required that it be listed. It is recommended that the video be named the project short title. If uploading directly, videos must be less than 500 MB in size.

### **What to include in your video?**

**1. Introduce Yourself and your Project theme:** State your full name but NOT your school's name. Rather than reciting your project title, consider explaining your project in a single sentence.

**2. Explain Your Project:** Summarize your research into main points:

- a. What did you do?
- b. What did you find?
- c. What conclusions did you draw?

**3. Please note:**

- We encourage **you to be prominently visible in the video**. This is not the format to show your slides.
- You can use any props or visuals you may have that are within the Display & Safety guidelines.
- This video is a summary statement about your project and the scientific or engineering design process you followed; it is not intended as an advertisement or sales pitch.
- Do not include anyone in your video other than yourself, the student researcher.

### **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:

- Please speak in English.
- Film yourself in a well-lit and non-distracting environment so the viewer's focus stays on you and your work.
- For best results, film your video horizontally (landscape).



- Keep the camera still and in place during filming.
- Speak clearly and loudly enough that the recording can pick up every word you say.
- Avoid long pauses.
- 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.
- Confirm the size of the video is less than 500 MB.