

Virtual Regeneron ISEF 2021—Revised for LRSEF (12/10/2020)

Project Material Guidelines

LRSEF will be using the following Guidelines for all students for the LRSEF 2021 Virtual Fair, we have edited the original ISEF document to relate to LRSEF to be held online on March 6, 2021.

All registration materials and fees must be submitted by students to <https://lrsef.stemwizard.com> by 11:59 pm February 17, 2021. No late materials will be accepted. Teachers and Judges can also register at this link.

ISEF Background: The staff of Society for Science & the Public have consulted with the Judging Advisory Committee as well as with the SRC and D&S Committees to establish the project materials that will be used during judging at the Regeneron International Science and Engineering Fair (ISEF) in 2021. These guidelines have been established to address a judging process that will occur remotely and through a digital medium. [The International Rules & Guidelines](#) remain as the guide of what is eligible and allowable; all written materials are to be provided in English.

REQUIRED Items for LRSEF 2021: Upload in the LRSEF Virtual Fair Milestone

I. Regeneron ISEF Paperwork for LRSEF

- a. This process remains the same and be reviewed by the Scientific Review Committee (SRC) to confirm eligibility for competition.
- b. On display for the judges will be:
 - i. **Official Abstract** (250 words)
 - ii. **Regulated Research Institutional Setting Form 1C** (if applicable)
 - iii. **Continuation Form 7** (if applicable)

II. Project Presentation for LRSEF

- a. **The project presentation replaces the project poster used during in-person fairs.**
- b. Appendix II provides complete instructions of the format requirements and recommendations.
- c. There are three suggested templates based on project type:
 - i. Science Projects,
 - ii. Engineering Projects **or**
 - iii. Mathematics/Computer Science Projects.
- d. **Project presentations will be required to be submitted to LRSEF by Feb 17, 2021 and will then be locked for Display & Safety inspection prior to competition.**

III. A Quad Chart for LRSEF

- 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.

IV. Project Video (2-minute maximum) **Optional but recommended by LRSEF**

- a. This video summarizes the project at a high level and will be used primarily for the online advanced judging of your project for Special Awards and reviewed by Category judges.
- b. While judges will be given access to all materials submitted, their training will emphasize items I, II, and III above. **Judges are NOT required to watch your video.**

LRSEF-- Additional OPTIONAL materials:

All judges will have access to these optional materials, just as they would at your physical display on fair day. but be sure all key information is provided in the required materials as outlined above. The items listed below ARE NOT REQUIRED and are **considered supplemental**.

1. 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. This video must meet all Display & Safety regulations.

2. Research Paper

LRSEF and Regeneron ISEF do not require any project to include a research paper. However, many finalists have completed such a paper through the research process and would include it at their booth during an in-person fair. If you have prepared such a paper, you may upload it to share with judges, **though judges are not required to review it.**

3. Lab Notebook Image/Excerpt

LRSEF and Regeneron ISEF do not require any project to submit a laboratory notebook. However, many finalists have this record of their research timeline and process and typically have it available at their booth. **A student may upload a PDF of up to 4 pages of a lab notebook to provide evidence of its use, but it is strongly advised NOT to share the notebook in totality to protect your intellectual property.**

Appendix I. LRSEF Milestones that must be submitted for the Review Process

LRSEF Forms & Files Milestone:

All LRSEF projects must have [Checklist Forms 1](#), [Student Checklist Form 1A](#), Project Plan/Summary and [Approval Form 1B](#) and the **LRSEF Teacher/Parent/Guardian Permission Form**. Once a student goes through the Rules Wizard in the LRSEF FILES & FORMS Milestone, these forms will be available to each student online.

LRSEF Virtual Fair Milestone:

The only items that are to be made available in the LRSEF Virtual Fair Milestone the judges to review are the [Official Abstract](#) and the [Regulated Research Setting Form 1C](#) and/or the [Continuation Form 7](#). **(if applicable)** and your Project Presentation and link to optional video.

- **Official Abstract** approved by SRC (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 (d) conclusions. It also may include any possible research applications. It should be limited to these essential elements.
- **Regulated Research Institutional Setting Form 1C** (if applicable)
In 2020-2021, 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. Note that projects that were conducted between January 2020 and March 2020 that competed at an ISEF-affiliate fair, may not be presented in 2021 without meeting the continuation criteria.
- **Project Presentation (limited to 12-page PDF)**
- **Link to your Optional Video (2-minute limit)**

LRSEF Safety Milestone:

Display & Safety inspections will include a review of all submitted materials and enforcement of the display guidelines as published by Regeneron ISEF in the [International Rules and Guidelines](#). This includes meeting all the format and size requirements, providing appropriate credits for photographs, graphs and other visuals and in having any permissions of individuals depicted in any project materials (on the board, slides or in the video) available. Each student must fill out this milestone and certify that they have followed all the Safety & Display rules.

Appendix II. Project Presentation Instructions

You may prepare your Project Presentation for LRSEF Virtual Fair 2021 **using any software tools that you desire**, but the final document submitted for display to the judges must satisfy the following requirements.

Format Requirements

1. The Project Presentation must be a **single PDF document limited to no more than 12 pages.**
2. You must use a page size no larger than either American standard 8½"X11" or European standard A4.
3. The PDF document must open with default magnification "Fit Page" so that **the entire page is visible at the same time.** The pages should be created in Landscape mode.
4. Your PDF document must be without animation or active hyperlinks. The document must not have instructions to open in "full screen mode." Eliminating this mode automatically precludes page transitions and embedded videos or animations, so do not attempt to include these in your Presentation. (There is provision elsewhere in your submission for an optional video if you need something to move in order to illustrate your project.)
5. The page background color must be a light color, not affect readability and comply with all Display & Safety rules.
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. 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.

Format Recommendations:

1. 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.
2. 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.
3. Avoid long expository paragraphs. State your points succinctly.
4. 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).
5. 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 and be in the order provided. Titles per section are provided as recommended titles, but alternate titles may be used. Each section may extend beyond one page as long as the total does not exceed 12 maximum pages.

TEMPLATE I: Science Projects

TEMPLATE II: Engineering Projects

TEMPLATE III: Mathematics/Computer Science Projects

Project Presentation Template: Science Project

1. Title

- The following should be included:
 - Project Title
 - Finalist Name (s)

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 research is appropriate here. Be sure to distinguish your previous work from this year's project.
- What were you trying to find out? Include a description of your purpose, your research question, and/or your hypothesis.

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?

- 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?
- 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).

Project Presentation Template: Engineering Project

1. Title

- The following should be included:
 - Project Title
 - Finalist Name (s)

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).

Project Presentation Template: **Mathematics/Computer Science**

1. Title

- The following should be included:
 - Project Title
 - Finalist Name (s)

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.
- 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. Be sure to 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 presented here or in Section 4, as appropriate.)

4. FINDINGS - Present your findings and supporting arguments.

- 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.
- Describe your methods in general terms. Then:
 - Present rigorous proofs of the theory results – or, if the arguments are long, give sketches of the proofs that explain the main ideas.
 - 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?

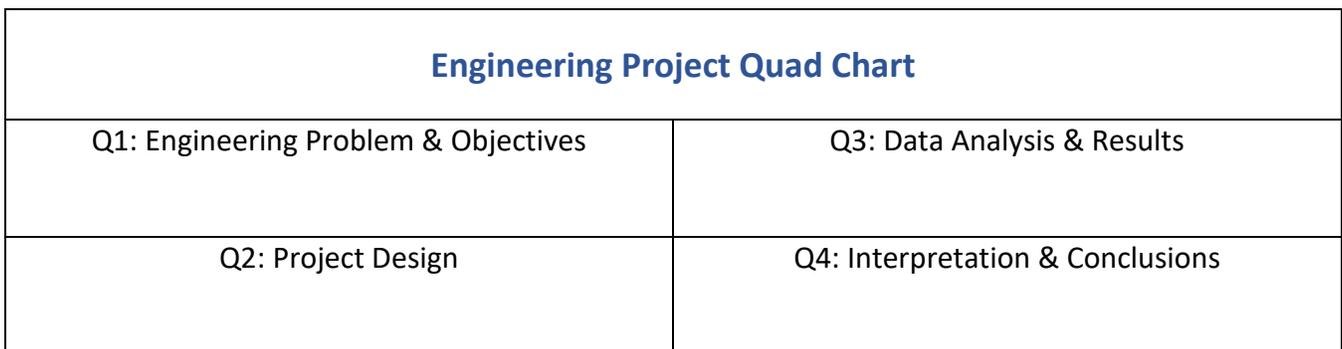
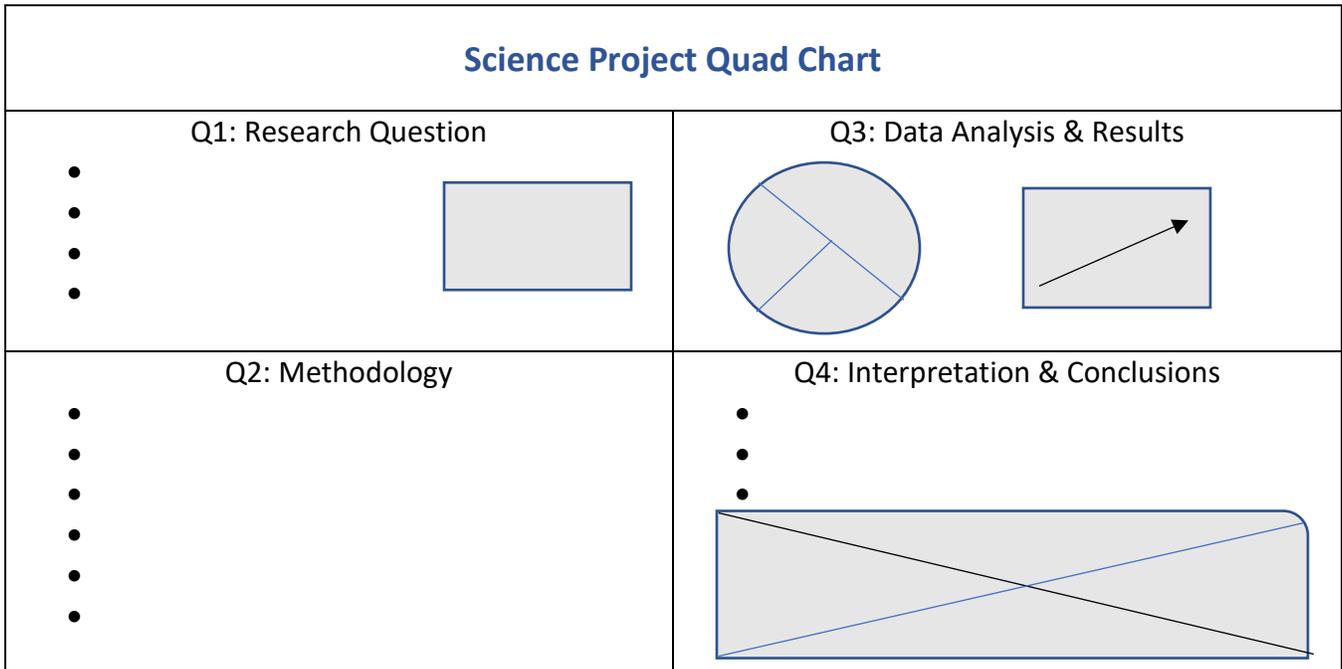
6. REFERENCES

- 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).

Appendix III. Quad Chart Instructions

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 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.

1. **You must use a wide-screen page format like the American Legal standard 8½”X14” and arranged in Landscape orientation.**
2. The page background color must be a light color and text color must be predominantly dark to support readability.
3. The minimum allowable font size is 13 pt. *Exception:* You may use a smaller font size, down to 9 pt., for figure captions or photo credits.
4. 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).
5. The Quad Chart should not include a bibliography, references, or acknowledgments.
6. All Display & Safety rules must be followed.



Math/Computer Science Project Quad Chart	
Q1: Problem or Question	Q3: Findings
Q2: Framework	Q4: Interpretation & Conclusions

Quad Chart Title:

- Line one is the title of your project and your name.

Quadrant 1: Research Question/Engineering Objectives

- This should reflect material in #2 of the Project Presentation Template.
- Please state the research question or engineering problem being addressed
- A leading core graphic or visual is encouraged, but not required.

Quadrant 2: Methodology/Project Design

- This should reflect material in #3 of the Project Presentation Template.
- Please provide a succinct, bulleted summary of the methodology/project design

Quadrant 3: Data Analysis & Results

- This should reflect material in #4 and 5 of the Project Presentation Template.
- It is advised that this quadrant should primarily be a graphic representation of relevant data and results.
- Text should be kept to a minimum.

Quadrant 4: Interpretation & Conclusions

- This should reflect material in #5 and # 6 of the Project Presentation Template.

Appendix IV. Project Video Instructions

Record a video (**maximum duration 2 minutes**) explaining your project. **Link to your video in the LRSEF 2021 Virtual Milestone**, on or before 11:59 pm February 17, 2021.

Category Awards judges will have access to this video, but it is Optional for them to view it in advance of your panel interview on March 6, 2021. Special Awards judges will also have access to this video, if you choose to do one.

What to include in your video?

1. Introduce Yourself: State your full name and your city/state/country. 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?

To note:

- You can use any props or visuals you may have that are within the Display & Safety guidelines.
- Do not include anyone in your video other than the student researchers of the project.

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 or provide English sub-titles.
- 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 is able to 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.

NOTE: This document is revised from the ISEF master requirements published for Regeneron 2021 Virtual Fair. Adapted for use by Louisville Regional Science and Engineering Fair to be held on March 6, 2021 for virtual Category Judging and for Special Awards advance judging.

All materials are due from students by 11 59pm Wednesday February 17, 2021, no late materials will be accepting. Materials must be uploaded in the student registration. <https://lrsef.stemwizard.com>

Please email LRSEF at <mailto:info@lrsef.org> with questions, we do NOT have a phone number, Mailing address is PO Box 8184, Louisville KY 40257