

Virtual Science and Engineering Fair of Houston 2021

Project Competition Guidelines

The staff of Science and Engineering Fair of Houston have consulted with the Judging Committee as well as with the SRC (Scientific Review Committee) and D&S (Display & Safety) Committees to establish the project materials that will be used during judging at SEFH (Science and Engineering Fair of Houston) 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 materials listed below must be submitted electronically by the indicated due dates. Participants who fail to meet the due dates will not be considered for SEFH and be disqualified.

REQUIRED Items:

I. **Scienteer Documents**

- a. All students must advance to SEFH through Scienteer no later than January 29, 2021.
- b. The Scienteer process remains the same as prior years and will be reviewed at all levels by the Scientific Review Committee (SRC) to confirm eligibility for competition.
- c. The following documents must be downloaded from Scienteer and uploaded to an external SEFH site (link to be released by mid-January):
 - i. **Official Abstract**
 - ii. **Regulated Research Institutional Setting Form 1C** (if applicable)
 - iii. **Continuation Form 7** (if applicable)

II. **Project Presentation**

- a. The project presentation replaces the project poster boards used during in-person fairs. Programs such as PowerPoint or other sister programs may be used. Appendix II provides complete instructions of the format requirements and recommendations.
- b. We recognize that each STEM field conducts and presents scholarly work with slight variance. As such, there are three suggested templates based on project type:
 - i. Science Projects,
 - ii. Engineering Projects and
 - iii. Mathematics/Computer Science Projects.
- c. Project presentations will be required to be submitted by February 5, 2021 and will then be locked for Display & Safety inspection prior to competition.

III. **Presentation Video (7-minute maximum)**

- a. This video replaces the student's verbal presentation and will be used for judging and the main resource for Special Awarding Agencies judging.
- b. It is advised that the video should include key information of your project. Appendix III provides complete instructions of the format requirements and recommendations.
- c. The presentation used in the video should be an exact replica of what is created in Section II (above).

- d. It is not advisable that your presentation be a recording of you directly reading from your presentation slide.

While judges will be given access to all materials submitted, their training will emphasize items I, II, and III above.

Additional OPTIONAL materials:

All judges will have access to these optional materials but it is advised that key information be provided in the required materials as outlined above and that these materials be considered supplemental.

Electronic Lab Notebook

SEFH does not require any project to submit a laboratory notebook. However, many students have this record of their research timeline and process and typically have it available at their table. A student may upload a PDF of up to 500MB 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 IV provides complete instructions of the format requirements and recommendations.

Appendix I. Scienteer Submission and Review Process

Regeneron ISEF Paperwork

All students must advance to SEFH through Scienteer. Scienteer assist in collecting necessary ISEFH forms such as Checklist Forms 1, Student Checklist Form 1A, Project Plan/Summary and Approval Form 1B. Including the forms that have traditionally been visible for the judges to review such as the Official Abstract and if applicable, the Regulated Research Setting Form 1C and/or the Continuation Form 7.

- **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)**

Due to the effects of COVID-19, many Regulated Research Institution laboratories and facilities are closed to student researchers, as such, the ISEF (International Science and Engineering Fair) 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.

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 meeting all the format and size requirements for videos and PDF documents, providing appropriate credits for photographs, graphs, and other visuals and in having any permissions of individuals depicted in any project materials (on slides or in the video) available.

Calendar of Processes

The final timing of the judging process is being developed with the intention that it will be between February 12 and February 28. The following deadline dates attempt to provide the framework for the timing as we understand it currently. Look for updates on the SEFH website as plans are finalized.

- Deadline for advancing projects to SEFH through Scienteer: January 29, 2021, by 5:00 pm
- Final deadline for Competition Materials by all students: February 5, 2021, by 5:00 pm
- Final deadline for abstract rewrites: Once a project is approved by SRC, no abstract rewrites will be accepted.

- SRC Review Corrections: Completed by February 8, 2021, by 5:00 pm
- Display & Safety inspections of presentation materials and needed corrections: Completed by February 12, 2021, by 5:00 pm

Appendix II. Project Presentation

You may prepare your Project Presentation for Virtual ISEF 2021 using any software tools that you desire such as PowerPoint or Google Slides, 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 500 MB.
2. Your PDF presentation document must be without animation or active hyperlinks.
3. 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. (This provision should be reserved in your video presentation video if you need something to move to illustrate your project.)
4. The page background color must be a light color, not affect readability and comply with all Display & Safety rules.
5. Text color must be predominantly dark to support readability.
6. All text should be easily readable when viewing the entire page at once. The smallest recommended 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.
7. 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.
8. All photos, images, and graphics must be properly cited as stated in the Display & Safety rules and regulations.

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

The following templates is provided as a guideline and follow the recommendations of the ISEF and Texas Science and Engineering Fair.

Choose one of the following templates that is most appropriate for you to create your presentation. 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 PowerPoint presentation.

It is recommended that each section in each template start on its own page. Titles per section are provided as suggested titles and may be further delineated into subsections. Do keep in mind, alternate titles may be used and each section may extend beyond one slide.

TEMPLATE I: Science Projects

TEMPLATE II: Engineering Projects

TEMPLATE III: Mathematics/Computer Science Projects

TEMPLATE I: Science Projects

1. TITLE SLIDE (required)

- The following must be included:
 - Project Title
 - Student Name (s)

2. INTRODUCTION

- Problem/ Question - Describe and state your project purpose and research question.
- Hypothesis - Do you have a hypothesis?
- Background Research - 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.
- Procedures - What did you do/ what procedures did you take to test your project?
- Data/Observations - What data did you collect and how did you collect that data?
- Variables - Discuss your control group and the variables you tested.
- Materials - You do not need to include an exhaustive list of materials.

4. RESULTS

- What were the result(s) of your project?
- Charts/Graphs - Include tables and figures which illustrate your data.
- Include relevant statistical analysis of the data.
- Photos - Include relevant photos.

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).

TEMPLATE II: Engineering Projects

1. TITLE SLIDE (required)

- The following must be included:
 - Project Title
 - Student Name (s)

2. INTRODUCTION

- Problem - What is your engineering problem and goal? What problem were you trying to solve? Include a description of your engineering goal.
- Background Research - 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.
- Procedures - If you tested the prototype, what were your testing procedures? What data did you collect and how did you collect that data?
- Materials - You do not need to include an exhaustive list of materials.

4. RESULTS

- Data/Observations - What were the result(s) of your project?
- How did your prototype meet your engineering goal?
- Charts/Graphs - 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).

Template III: Mathematics/Computer Science

1. TITLE SLIDE (required)

- The following must be included:
 - Project Title
 - Student Name (s)

2. INTRODUCTION

- Problem/Question - What is your research question?
- Background Research - 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. Presentation Video

Record a voiceover presentation (maximum duration of 7-minutes) explaining your project. This video must be submitted as a YouTube link. Remember to explain your video in plain language as the judges may not be a direct content expert of your field of study.

The video presentation is a replacement of the judge interview component of face-to-face judging. As such, be sure to structure your voiceover presentation utilizing the same structure as your Presentation. However, avoid reading directly from your Presentation. Instead, use the Presentation as a guide to highlight important key aspects of your project.

Earlier, it was mentioned that the Presentation should not include any video clips. If you feel a video clip is necessary to demonstrate your project, it would be appropriate to include short clips during your voiceover video presentation. Ensure that your video presentation is within the Display & Safety guidelines. It is highly recommended that you do not include anyone in your video other than the student researchers of the project.

Although it is not required for participants to use PowerPoint slides (or sister programs), it is recommended.

Do note, once a video is submitted, SEFH will not edit or alter any video.

Best Practices for creating your Voiceover Presentation/Filming:

These recordings will not be edited. To ensure your recording is the best representation of your work, please keep these best practices in mind:

- Please speak clearly and do your best to eliminate all unnecessary background noise.
- If you include yourself in the video, be sure to film yourself in a well-lit and non-distracting environment so the viewer's focus stays on you and your work.
- Keep the camera still and in place during filming.
- Before you record, make sure to adjust your microphone correctly. Correctly setting your microphone volume is one of the most important improvements you can make in your recordings.
- Turn off phones and notifications that could cause distractions during recording.
- 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.

Appendix IV. Electronic Laboratory Notebook

SEFH 2021 participants may submit a digital laboratory notebook for the judges to review. This notebook can be made in a program like Word, Google Docs, OneNote, etc. and then converted to a **single PDF** for submission. While a virtual lab notebook is highly recommended, participants may also scan and upload clear images of their physical notebook in a **single PDF file**. File size may not exceed 500 MB.

Participants should include the following information (as deemed applicable) about their research in their notebooks:

- Project Title
- Problem/Question
- Hypothesis
- Variables
- Background Research
- Materials
- Procedure
- Data/Observations
- Photos
- Charts/Graphs
- Results
- Conclusion

To achieve the recommended notebook format, follow the suggested steps below:

1. Choose one of the following two options.
 - a. Virtual notebook on Word, Google Docs, OneNote, etc.
 - b. Physical notebook. You will scan the relevant pages of this physical notebook to submit.
2. When developing your laboratory notebook, follow the guidelines below.
 - a. Page headers may include: Project Title, Problem/Question, Hypothesis, Variables, Background Research, Materials, Procedure, Data/Observations, Photos, Charts, Graphs, Results, Conclusion.
 - b. **Follow Display and Safety guidelines.** Include a Works Cited or References page, appropriate photos, and photo credits for all used photos, images, and graphics.
 - i. Your notebook may **NOT** include any offensive or inappropriate images or photographs.
 - ii. If your notebook contains photographs with people other than the researcher/participant, you must have photo releases.
 - c. **Fonts should be 12 pt. or larger** (12 pt. font is recommended for the body of your text).
 - d. Use a **readable, professional font** like Times New Roman or Calibri. If you have a physical notebook, write legibly.
 - e. Your notebook may **NOT** include embedded animations, hyperlinks, or videos.
 - f. Do **NOT** include any links to external sites or videos in the body of your text. You may have links in your citations, but note that judges will not click and follow any links to external sites.
 - g. Your notebook may **NOT** include any personal information such as an email address, home address, phone number, or social media contacts.
3. Once you are finished developing your notebook, convert your file to a PDF for submission. If you have a physical notebook, scan the pages, and convert the file to a PDF. Note – you may submit only **ONE PDF file**. As such, you may need to use Adobe or another online converter/compiler to compile multiple files into a single PDF.