

High School Science & Engineering Fair

TENTATIVE 2023-2024 Information and TimeLine

Dates are subject to change and teachers may add additional checkpoints.

A student or pair of students will complete a Science Fair project following the ISEF guidelines. Includes logbook, research paper, experiment, abstract, tri-board display, and ISEF forms. This project involves selecting a high school level topic that **MUST BE APPROVED**. The topic should be one that will involve in-depth research and experimentation.

Aug 3	Students review INTEL rules and guidelines located at https://www.societyforscience.org/isef/international-rules/ Students review the categories and subcategories located at https://www.societyforscience.org/isef/categories-and-subcategories/all-categories/
Aug 8	First set of Topics Due: TWO High School level topics submitted unless the student is continuing a project from the previous year. [NOTE continuation project topics MUST include Continuation/Research Progression Projects Form (7) AND previous abstract]
Following Tuesdays ... (weekly)	Return topic selection sheets to students. Students modify topic choice if they received a recommendation from science teachers. If topics are NOT approved students must resubmit TWO topics by the following Tuesday.
Once the topic is approved	After receiving the approved topic, the student begins background research and completion of the required form. Use forms wizard and save forms electronically https://ruleswizard.societyforscience.org/
One week after the topic is approved	Submit the required forms. ALL projects need Form 1, Form 1A, Form 1B, Risk Assessment (Form 3)
Two weeks after topic approval	Submit Research Plan must be submitted within two weeks of topic approval. The research plan MUST be reviewed by the teacher prior to the start of experimentation.
Sep 2-7	Projects which might need ordering of materials need to meet with respective teachers.
Sep 2	ALL students SHOULD have approved topic
Sep 9	Annotated bibliography due. Minimum 5 sources: no encyclopedias, at least one internet source, 2-3 books, 2-3 journal articles (electronic or paper).
Sep 12	Projects requiring SRC/IRB approval MUST have forms, and a research plan submitted This included projects that involve/use: bacteria, vertebrate animals, and human participants.
Sep 17	ALL students SHOULD have submitted research plan
Oct 31	Last day to submit required forms
Nov 7th	Last day to submit research plans (will NOT be accepted late and student will receive a zero in infinite campus)
Nov 18	Students who submit a project before the break will receive 10 bonus points for each submitted component [log book, display board, abstract, research paper]
Nov 27	Project DUE Final Research Paper, Log Book, Abstract, Complete Paperwork.
Nov 27	Virtual Classroom Presentations
Nov 30	Bring Display board Impact on Cafe day
Dec 4-5	Projects selected for school fair announced.
Dec 13	Students progressing onto the Henry County Regional Science and Engineering Fair MUST have paperwork completed and submitted to Mrs. Raines in room 324
Dec 14-20	Students progressing onto the Henry County Regional Science and Engineering Fair MUST meet with an assigned mentor for additional assistance in preparing for Regional Fair. (Students are responsible for scheduling time either during early release days, after school, or before school)
Semester Break	Students make modifications to projects based on feedback from judges and mentors.
Jan 11	Show modified project to mentor teacher prior to Regional Fair

NOTE: Teachers may add an additional due date for their specific classroom.

Science fair topic idea

The hardest part of a science fair is coming up with a topic idea. There are some general things to keep in mind when creating a topic for the High School Science fair topics that will make this process easier:

1. Start with something you enjoy, are active in, or are just curious about.
2. Look at the topic category list to get an idea of the areas that topics can fall within.
3. Look through high school textbooks (any science, math, engineering, agriculture ...) to see what spikes your interest.
4. Find a problem in your (or a family member's) life and develop a solution. [this would be an engineering project]
5. The topic/project must be challenging and a true experimental project (ie the answer is not already known).
6. If you can "Google" the answer to your idea then the topic will NOT be accepted.
7. High School level topics do NOT include product comparisons (for example which brand works better).
 - a. See [Topics to Avoid List](#)
8. High School level topics can create a use for current technology that it was not originally intended for.
9. Our science fair occurs during the fall months and projects that involve growing plants may not be possible during this time frame.
10. Search OLD INTEL abstracts <https://abstracts.societyforscience.org>
11. Check out the 21-22 ISEF Virtual Fair Pages <https://projectboard.world/isef/finalist-exhibit-hall?r=avckn> (click a category to see specific projects)
12. AVOID taking a project idea off the internet and presenting it {see #5 and 6 above}

Elements involved in the completed project:

The information stated below is a general guideline to use when creating the items required for the science fair. More specific detailed information may be provided by your teacher.

1. **Logbook:** A bound book used to record everything you research, things you do, and meetings you have. EVERYTHING must be recorded in your logbook. Each entry must include a date. It must be in blue or black ink. Mistakes should have only one line across them. Do not rip out pages. A logbook is documentation of your thought processes and progress throughout your project. It is okay if it is messy!! Logbook can include direct data, charts/graphs printed from another source, photos, ect... For specific instructions on setting up your logbook refer to your teacher's guidelines.
2. **Experiment:** Do the experiment following your detailed procedure
3. **Research paper:** Generally include the following sections labeled
 - **Title Page** [*Project Title, Name, Teacher, Class, Period*]
 - **Table of Contents** [*Separate page*]
 - **Introduction:**
 - a) Defining the problem (paragraph minimum)
 - b) Background research: Review published materials related to your problem or question. A minimum of 8 sources must be used, and 3 must be non-internet sources. Background research should be 2-4 pages long.
 - c) Stating the hypothesis (closing paragraph): Close the introduction section by summarizing your main research leading to the development of your hypothesis. The closing sentence should be your hypothesis. Be sure your hypothesis is correctly worded by showing the groups and variables in a clear, concise, testable statement.
 - **Experimental Design:**
 - a) In a paragraph or two, summarize or describe how your experiment will be designed. Clearly, state (or list) what the control and experimental groups are, what the independent variable and dependent variables are, and as many important constants as you can think of.
 - b) Procedure: describe your procedure in step-by-step detail. The procedure should include instructions on how to build any apparatus or equipment used in your experiment.

- c) The procedure should be a numbered list that is clear and concise, easy enough for someone to follow to repeat your experiment.
- d) You must include *at least* three trials, but more is recommended as it increases the validity of your results. If your experiment involves people you MUST have a minimum of 35 people per item tested. [IE if comparing gender must have 35 males and 35 females]

- **Results:**

- a) Data tables: Include all pertinent tables from your experiment. Be sure to include a data table title above the table and a short description or explanation of the data underneath.
- b) Graphs: translate all of your tables into graphs. Try to quantify all of your results and create line graphs if possible. Be sure to title all of your graphs above the graphs, label the axes (using units) and include a short description or explanation for each graph.

- **Analysis:** Use this section to answer the following four things: a paragraph or two should be used to address all four concluding topics:

- a) Using background research and knowledge you gained throughout the experiment, describe why you got the results you did.
- c) Describe any errors that occurred throughout the experiment, even if they are small and seem insignificant. It will NOT be a deduction from your grade if errors were made, but if they are not reported, your project could suffer.
- d) Based on your experiment, how does it relate to the world? What kinds of experiments could you do to further your interest and knowledge on this topic?

- **Conclusion:**

- a) Summarize the results of your experiment. Do NOT introduce any new data
- b) What was your hypothesis and was it supported or not? What data supported it and which didn't?
- c) Can include information about how you could extend or change your project for next year.

- **Bibliography:** You must have at least 5 sources, one of which must be non-internet. All should be documented in APA style format

4. **Abstract:** A description of your experiment in 250 words or less that must be completed on the current form.

5. **Display:** Create a display: Your display must have the following clearly listed with words and visuals

- Title
- Problem or Purpose
- Hypothesis
- Procedure
- Specify control, experimental groups with Independent and Dependent variables listed.
- Results showing the most important data tables and graphs and a paragraph explaining them
 - Be sure to title all of your graphs and tables also label the axes/column headings (using units)
- Photos of the experimental process, equipment or other items relevant to the project
- Shortened version of conclusion

6. **Forms:** All proper forms are completed on time.

Required Forms for ALL projects

- Form 1 Checklist for Adult Sponsor (1/group)
- Form 1A Student Checklist (1/group)
- Form 1 B Approval Form (1/student)
- Form 3 Risk Assessment
- Research Plan Research Plan according to directions on Student checklist (1/group)
- Abstract Form Abstract [after experimentation is concluded]

Project Specific Forms

- Form 1 C Regulated Research Institution/Industrial Setting Form
- Form 2 Qualified Scientist Form
- Form 4 Human Subjects and Informed Consent Form
- Form 5 Vertebrate Animal Form (5A and 5B)
- Form 6 A Potentially Hazardous Biological Agents Form
- Form 6 B Human and Vertebrate Animal Tissue Form
- Form 7 Continuation Project Form

Forms Resource

Form Wizard: This "wizard" asks a series of questions about your planned project and will provide a list of forms that you need to complete. <https://ruleswizard.societyforscience.org/>

Additional Resources

Rules <https://student.societyforscience.org/international-rules-pre-college-science-research>

Display Board <https://www.societyforscience.org/isef/international-rules/display-safety-rules/>

Other Project Idea Resources

- <https://www.greatbusinessschools.org/10-great-inventions-dreamt-up-by-children/> (you will need to scroll down to see the ideas)
- <https://www.stem-by-design.com/teen-inventors-who-are-changing-the-world/>
- 10 Amazing Inventions by Teens https://www.oddee.com/item_99064.aspx
- Inspiring Stories from the Society Blog <https://www.societyforscience.org/research-at-home/inspiring-blogs/>