About the YES Fair

The Youth Engineering and Science Fair is an organized exhibit of student projects in the areas of science, research, technology, mathematics, and engineering. The YES Fair is affiliated with the International Science and Engineering Fair (ISEF) and follows its rules and guidelines.

In 1984, Sulphur springs Valley Electric Cooperative (SSVEC) Foundation produced and sponsored the first YES Fair with 17 participants. Since then, involvement has grown to approximately 200 students in grades 5-12, who compete for prizes, scholarships, trips, and awards.

Statement of Purpose

To stimulate student interest and create awareness in science, technology, and the environment.

To motivate, encourage, and inspire the desire for scientific applications, experimentation, and discovery.

To offer the opportunity for the display of youthful ingenuity and fresh ideas or approaches to current scientific and engineering problems or challenges.

To encourage talented youth to explore careers in science and engineering fields, thereby contributing to the welfare of our nation and world.

The SSVEC Foundation

The SSVEC Foundation is the primary producer and sponsor of the YES Fair. The Foundation is funded through moneys (deposits, membership fees, member equity) which the cooperative is unable to return to members because they cannot be located. Prior to the establishment to the Foundation, these funds were surrendered to the State of Arizona. The Foundation also accepts donations.

Getting the Project Done

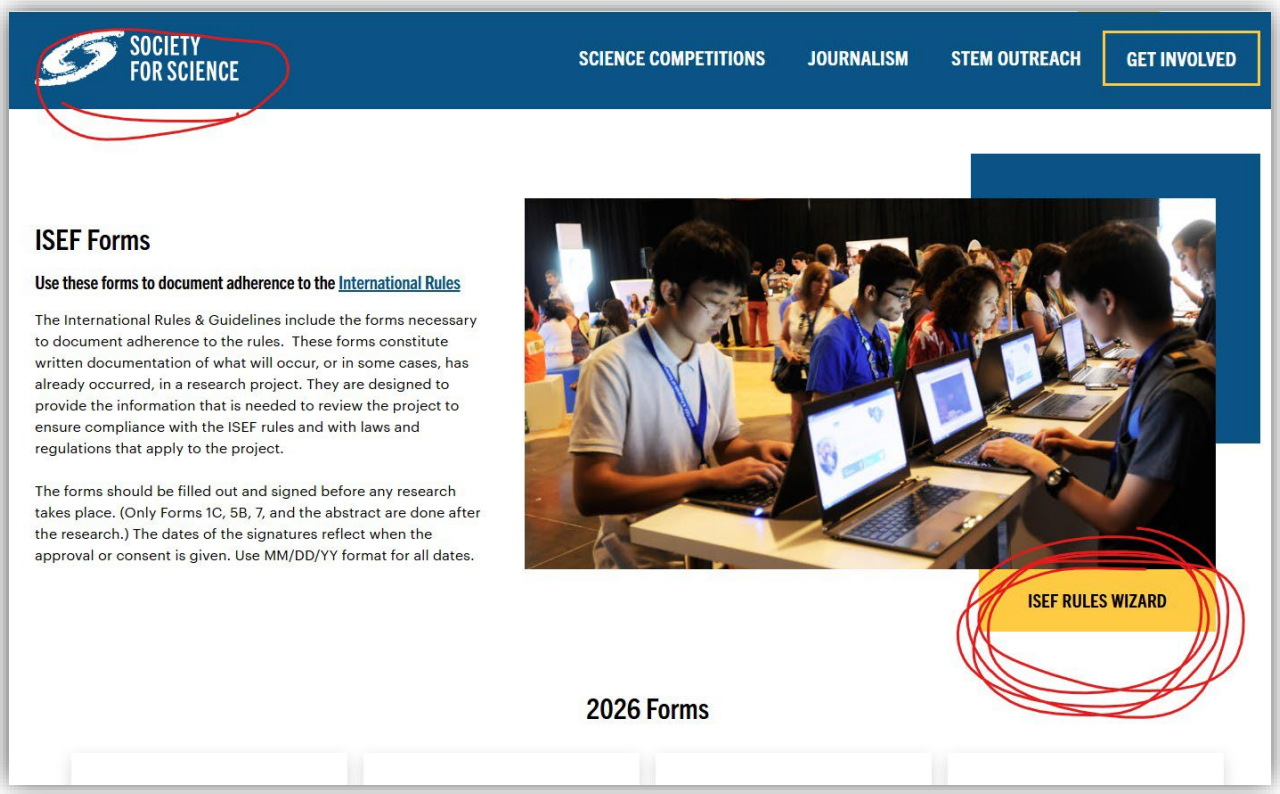
1. DECIDE ON A PROJECT. It should be something you are interested in. Science Buddies is a great resource: www.sciencebuddies.org or, review ISEF 9-12 Finalists at www.isef.net/home
2. SELECT an adult sponsor, teacher or mentor.
3. COMPLETE REGISTRATION by in Feb 8th: Yes Fair entry form is online at www.yesfair.com
    a. *Attn: Projects involving human or animal participants*
        i. *(includes surveys, questionnaires, games, as well as tissue, skin cells, etc.)*
        ii. *Turn in your project entry forms (YES Fair Safety Assessment Form 1) prior to experimentation for human or animal participant projects. You must have prior consent before starting any testing involving humans or animals.*

4. RESEARCH: Experiment and collect information. Write your findings down in your project Notebook.
5. ABSTRACT: Write an Abstract. Use your project notebook to write your abstract. See sample abstract on the last page of this document. Remember to make a copy of the abstract to place on your project table when it is set up. You should include it on your board.
6. MAKE YOUR PROJECT BOARD: Assemble the information in an attractive, colorful, and attention-getting way. Ask an art teacher or other adult to look over your project for visual appeal.
7. Redact your name(s) from your workbooks, notes, abstract, and any other place. Your name must not be anywhere on the project, except the back where it cannot be seen by our judges.
8. When you arrive at the YES Fair, you will be directed to set up your project.
9. After judging is complete, the SSVEC volunteers will ensure that your name appears on your project with a 3x5 index card.

FORMS WIZARD: For Division 9-12

It is highly recommended for high school students to go to the Society for Science Forms Wizard to ensure they are filling out all appropriate forms for their projects. The Wizard can be found at

https://www.societyforscience.org/isef/forms



Grade Level Divisions and Categories

Students will be divided into three grade level divisions:

Grades 5 & 6

Grades 7 & 8

Grades 9 through 12

Grades 5-6 and 7-8 Divisions will compete in SIX basic categories as an individual or team project:

1. **EARTH AND SPACE:** Paleontology, Geology, Oceanography, Meteorology, Astronomy, Climatology, Seismology, Atmospheric Sciences.
2. **ENERGY & PHYSICS**: Projects that investigate the principles of: Electricity, Energy, Renewable Energy, Energy Efficiency, Alternative Fuels, Electric & Magnetic Fields, Thermodynamics, Acoustics, Optics, Lasers, Aerodynamics, Hydrodynamics. Not sure if your project goes in Energy & Physics vs. Technology & Engineering? If your project's goal is to test a device that already has been invented, or testing a scientific theory related to energy, it will go in this category.
3. **PLANTS, ANIMALS, & LIFE SCIENCES:** Botany, Ecology and Ecosystems, Life Sciences, Biology, Horticulture, Plant Physiology, Animal Biology, Animal Science, Animal Husbandry, Selective Breeding, Veterinary Science, Agriculture, Ecology, Plant Genetics.
4. **HUMAN BIOLOGY & HEALTH:** Nutrition & Food, Human Biology, Human Behavior, Medicine & Health, Human Genetics, Human Disease, Psychology.
5. **TECHNOLOGY & ENGINEERING:** Math, Robotics, Circuitry, Computer Science, Material Science, Ai, Engineering. Projects that design, build or optimize devices. If your project's goal is to invent a new product or device, or improve on an already existing device, chances are, it is a Tech & Engineering project.
6. **CHEMISTRY:** All Types. Organic, Inorganic, Biochemistry, Analytical Chemistry, etc.

Grades 9-12

Categories for grades 9 through 12 are the same as those by the International Science and Engineering Fair, but will be judged as one division.

Individual and team projects compete for awards as one division. Individual and Team projects are all available contenders for the Grand Prize Award trip to ISEF.

TEAMS CAN HAVE NO MORE THAN 3 STUDENTS.

Rules & Guidelines

Eligibility: Students in grades 5-12 who attended during this school year a public, private, charter, home, or parochial school within SSVEC's service area in Cochise, Graham, Pima, or Santa Cruz Counties are eligible to compete. Students attending Bisbee, Douglas, Nogales, and Tombstone Public Schools are eligible, as are students whose homes are served by SSVEC but are attending schools not otherwise eligible. Students must not reach the age of 20 before May 1 of the year of the Fair.

Exhibit space and limited volunteers for judging requires the YES Fair to limit entries in grades 5-6 & 7-8 Divisions

5-6 Grade Division	
Total Student Population in 5 & 6 Grades Combined	Projects allowed per 5/6 Division
Less than 30 students	6
31-50 students	8
51-75 students	10
76 students or more	14

7-8 Grade Division	
Total Student Population in 7 & 8th Grades Combined	Projects allowed per 7/8 Division
Less than 30 students	6
31-50 students	8
51-75 students	10
76 students or more	14

High School Division	
Total Student Population grades 9-12	Projects allowed per High School Division
No limit on project entries	No Limit on project entries

Each grade division project allocation functions independently.

For example: If your school has 55 students in the 5/6 Grade Division and 49 students in the 7/8 Grade Division, your school can enter 10 projects in the 5/6 Division AND can enter 8 projects in the 7/8 Division, for a total of 18 projects.

Team projects may have *up to* 3 team members. Teams of 4 or more will not be able to enter their project in YES Fair.

1. All entries will be by individual students or a team consisting of up to three students per team. A student may enter only one time and in one category. A student may not enter an individual project and a team project in the same fair. Team membership cannot be changed during a given

research year including converting from an individual project or vice versa, but may be altered in subsequent years. Entries to the Fair will be completed on-line at the YES Fair website, (yesfair.com). INCOMPLETE ENTRY FORMS WILL DISQUALIFY THE PROJECT.

2. The only identification permitted on an entry will be a 3 by 5 card (provided by the YES Fair) with the student's name, address, grade level, and school which will be included in the registration packet. The card should be taped so that it may be flipped to the front of the exhibit after judging is complete. The card must be placed at the back upper right corner of the exhibit as you view the exhibit from the front. Names should not appear on any research records or abstracts. It is a good idea to make a personal copy of these materials.
3. One copy of an abstract of the research, using less than 250 words, and including the purpose, procedure, results, data, conclusions, reflections or applications will be displayed with the project. The student's name and/or school must not appear on the abstract. Abstracts for students in the 9-12 division must be typed or word processor generated. You are encouraged to use the on-line abstract on the ISEF website.
4. The adult sponsor's role is to guide and advise, encouraging creative thinking on the part of the student. The adult sponsor may be an educator from the school in which the student is enrolled or an adult mentor. The student is not restricted in seeking additional guidance from other individuals, but the adult sponsor is to be the primary and official counselor. Should a question or problem concerning a project arise which the adult sponsor cannot resolve, the student may seek assistance from SSVEC's YES Fair Coordinator. In that event, SSVEC may refer the student to local science professionals for additional advice.
5. A project must not be an identical repetition of one shown by the same individual or team at a previous YES Fair. However, a project may be a continuation of research from a project from a previous YES Fair. Previous Grand Prize winners are eligible for International Science and Engineering Fair (ISEF) competition.
6. All safety precautions and rules must be observed. Projects in the 5-6 and 7-8 levels must fill out the YES Fair Form 1 Safety Assessment and include it with your project documents.
7. All experiments involving animal and humans must conform to the International Science and Engineering Fair's rules and regulations. See current applicable rules and regulations are on the ISEF website. These projects require pre-approval by your schools Institutional Review Board (IRB) or the YES Fair's Scientific Review Committee (SRC).
8. Projects must be registered the day of the fair before they are set up in the exhibit hall. Projects must be left in place until the designated pick-up time after the awards presentation the last day of the Fair. Participants in the 9-12 division must be available at the designated time for their interview with the judges. See the YES Fair Schedule posted on the website (yesfair.com) for dates and times. The rules and guidelines for the Youth Engineering and Science Fair are consistent with the rules of the International Science and Engineering Fair with which SSVEC is affiliated. Please contact SSVEC's YES Fair Director if you have any questions.

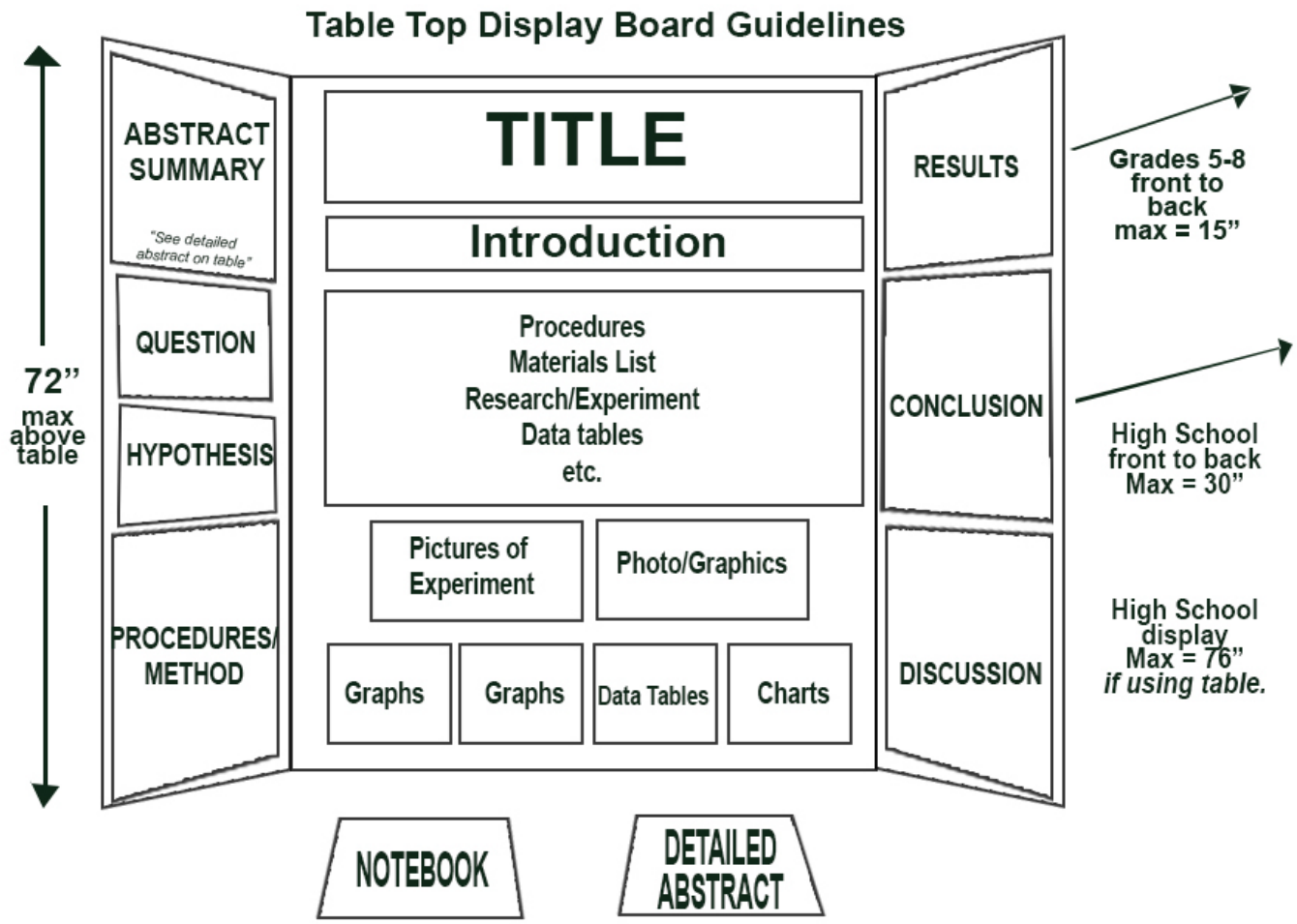
Display 5/6 and 7/8 Division

Project Size Limits Students in the 5-6 and 7-8 divisions will be allowed a space 15” deep, 30” wide, and 76” high. This allows more students to participate in the YES Fair.

Display 9-12 Division

For Students in the 9-12 division, exhibit size is limited to 76 cm (30 in.) deep, front to back; 122 cm (48 in.) wide, side to side; and 274 cm (108 in.) high, floor to top. Tables are 76 cm high. If a display utilizes the table, the table height is included in the height of the project display. Any exhibit exceeding these dimensions will be disqualified at the YES Fair and at the ISEF. It is the responsibility of the exhibitor to care for his or her exhibit during the time it is on display. Projects should be durable enough to stand up well without repair, but normal wear and tear on exhibits is to be expected during the time of judging and when the fair is open to the public. For this reason, each contestant is advised to protect his or her exhibit. SSVEC will assume no liability for damages done to the exhibit during set-up, display, or removal. However, SSVEC will make reasonable efforts to secure and protect exhibits during the Fair. In the 9-12 Division, displays may be a flat pop up banner, foam core, or any other material approved by ISEF, however the display must stand on its own without the assistance of a back wall. Consult the ISEF rules and regulations for further information.

It is recommended to put your ABSTRACT as part of your display board. However, you can put an ABSTRACT SUMMARY on the board with “SEE DETAILED ABSTRACT ON TABLE”. Abstracts should be no more than 250 words.



Grades 5-8 Project Width: Max 30"

Grades 5-8 Project Depth (front to back): Max 15"

High School Project Width: Max 48"

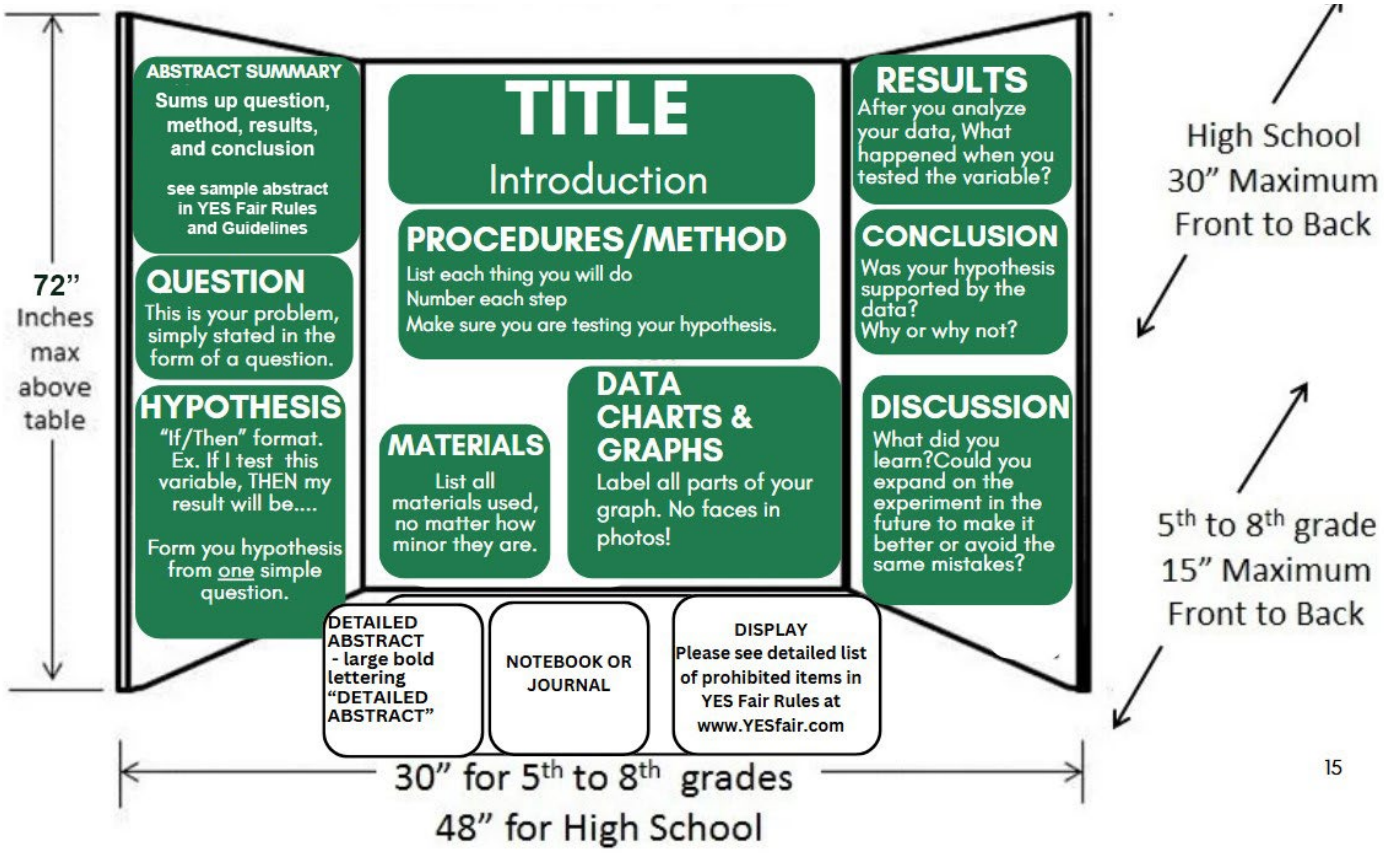
High School Project Depth (front to back): Max 30"

X

A standard project board is 36-38 inches.

Max height for grades 5-8 = 72 inches *including* the table.

This means that your project board should not exceed 40" in height.



Please keep in mind that because YES Fair is affiliated with the International Science and Engineering Fair, we have many rules and regulations regarding project displays. In general, it is best to photograph your display rather than bringing the display to YES Fair.

Max heights

For 5-6: 72" max height (including the table. Tables are generally 32" tall)

For 7-8: 72" max height (including the table. Tables are generally 32" tall)

For 9-12: Choose a table top banner display, tri-fold table-top display, or free standing banner display (shown next page).

9-12 max height = 104" *including* the table. If you are going this high, it is your responsibility to ensure that it is stable and secure.

Free Standing Banner Displays for HIGH SCHOOL ONLY.

High School Free Standing Display

Max Height = 104”
From floor to top of Display

If you are using the table, the table height must be subtracted from your max display height. A standard table is 32” tall, so your maximum display height would be 72”

Max Width = 48”

We’ve seen an increasing number of High School Students at ISEF use free-standing banner displays.

This is also now acceptable at YES Fair.

Please limit display sizes to specified measurements.

Note that height is measured from the floor, which *includes* the banner stand.

Animal Displays*

- No live animals, preserved vertebrate/invertebrate animals, taxidermy specimens or parts including embryos, may be exhibited. Research involving the use of animals may display drawings, charts, or graphs to illustrate the conditions, developments, and results of the investigations. Sealed insect collections will be permitted on display.
- Photographs and other visual presentations of surgical techniques, dissection, necropsies and/or other laboratory techniques depicting vertebrate animals in other than normal conditions may not be displayed on the student's project, but may be contained in an accompanying notebook to be shown only during the judging. Photographs of special needs human subjects require signed consent, as per federal regulations.

Human Tissue*

The exhibition of human parts is prohibited. Please use photographs to document your experiment on the display board.

*All International Science and Engineering Fair rules pertaining to vertebrate/invertebrate animals and human participation and human tissue or subjects must be followed. The Scientific Review Committee of the YES Fair or an Institutional Review Board (following ISEF rules) must approve all projects involving humans or animals before the project is started.

Electricity

Electricity may be available on a limited basis for the 5-6 or the 7-8 divisions, however, be prepared in the event that electricity is not available.

Assembly

Each student is responsible for the assembly of his or her own project display board. YES Fair personnel are not responsible for any assembly of any project.

Lasers

Only Class I and Class II lasers may be displayed and operated at the YES Fair and the ISEF. If a Class II laser is operated, the individual must observe the following restrictions:

1. The student must be present at all times the Class II laser is operating.
2. A sign must be displayed reading as follows:
3. "LASER RADIATION-DO NOT STARE INTO BEAM"
4. The Class II laser must have a protective housing or barricade which, when in place, prevents human access to the beam during operation. The Class III and Class IV lasers may be displayed, but are not be operated at any time and must have no means of electrical connection.

For more information about laser standards and research, write to the Food and Drug Administration, Office of Compliance and Surveillance, 7519 Standish Place, Rockville, MD 20855-2773 (telephone 240-402-7001).

General Rules for Displays

There are a lot of rules regarding what experimentation materials can be on display at an ISEF affiliated fair. It is strongly encouraged to include photographs of your experimentation set up on your display board, ***instead*** of bringing the actual experiment to the fair.

The Display and Safety Committee will review your project for any items listed below and will remove them from the display area. The decisions of the Display and Safety Committee are final. YES Fair personnel are not responsible for the loss or damage of any experiment items. Anything which could be hazardous to the public is prohibited from display. The intent of this rule is to protect the public and other students, not to hinder the students' ability to present their project to the judges.

The prohibited items at YES Fair include:

1. All live materials including plants and microbes
2. Water samples (even if in an airtight container, and even if it is plain tap water)
3. All soil and liquid samples and materials
4. All chemicals for display (Empty chemical containers and nonfunctional apparatus are also discouraged.)
5. Food, either human or animal
6. Syringes, pipettes and similar devices
7. Any flames, open or concealed
8. Highly flammable display materials
9. Batteries of any kind
10. Biohazards, tissue samples, mold, etc.
11. Tanks which have contained combustible gases, including butane and propane, unless they have been purged with carbon dioxide
12. Class III or IV lasers
13. Photographs depicting faces.
14. Photographs depicting the faces of the team members of the project or the solo project owner.

NOTE: Students are encouraged to use photographs, drawings, and diagrams to illustrate the research and results of their science project, instead of bringing the items to YES Fair. All photos must include appropriate photo credits on the display.

SAFETY

Proper attention to safety is expected of all Fair participants, including compliance with the following requirements for all operating exhibits:

1. Any exhibit producing temperatures exceeding 100 C (212 F) must be adequately insulated for its surroundings.

2. Batteries with open top cells are not permitted. Other types of batteries may be used for electric power provided they are enclosed in a battery case, such as a flashlight case, to prevent contact by observers.

3. High voltage wiring, switches, and metal parts must be located out of reach of observers and designed with an adequate overload safety factor.

4. Electric circuits for 110-volt AC must have an Underwriters Laboratories (UL) approved cord of proper load-carrying capability, which is at least nine feet long.

5. All wiring must be properly insulated. Nails, tacks, or un-insulated staples must not be used to fasten wiring.

6. Electrical connections in 110-volt circuits must be soldered or fixed under approved connectors and connecting wires properly insulated.

Safety precautions for substances are presented in the American Chemical Society booklet, Safety in the High School. For a copy, write to the American Chemical Society, Career Publications, 1155 16th Street N.W., Washington, DC 20036 (telephone 1-800-333-9511)

What We Judge

Projects are judged on the quality of work done by the students. The projects will be compared to other projects in the same category at this fair. The quality of the investigations and how well the student understands the project he/she has completed are of the greatest importance. **The project board is the "splash page" for the project. It will be judged as part of the project. However, the Judges concentrate on the information contained in the Notebook (or workbook/journal) to determine the completeness of the project and the student's understanding of the work.**

DAUNTING ISEF FORMS

Grades 5-8 only need to compete Form 1 and 1A.

High School Division, see all forms to determine what is required by ISEF. Or, as stated earlier in this manual, use the Society for Science FORMS WIZARD to determine what you need to succeed.

Judging Rubric – Science Projects 100 pts

30 Pts Presentation/Display

Content is paramount by good presentation may suggest an attention to detail.

- 10 pts Neatness: Clarity with appropriate use of text, images, graphics, tables, and graphs
- 10 pts Completeness: Includes Title, Introduction, Method, Results, Discussion, Conclusion, Abstract
- 10 pts: Abstract: Concisely sums up the question, method, results, and conclusion

10 pts Notebook Completeness

- Title
- Introduction
- Abstract
- Question
- Hypothesis
- Method/Procedure
- Experimentation Data / notes with dates
- Results / Data Analysis
- Discussion / Conclusion
- References

10 pts Notebook Record of Activities

- 10 pts. Does the record demonstrate progress over time?

50 pts Project Quality from Conception to End

- 10 pts. Introduction: Description of purpose, the research question, and hypothesis
- 10 pts. Methodology: The data collected and how it was collected. The control group and the variables tested
- 10 pts. Results: Review the tables and figures which illustrate data. Evaluate the statistical analysis of the data
- 10 pts. Discussion/Conclusion: Evaluate the interpretation of these results, discussion of errors, unexpected problems, uncontrolled events, etc. Do the results address the research question? Do your results support the hypotheses? Are there possible applications?
- 5 pts. Creativity: Were there new, different approaches used? Is there evidence of syntheses across disciplines?
- 5 pts. References: Extent of references with proper bibliographies. URLs not acceptable

Judging Criteria for Engineering Projects 100 pts

Presentation/Display Content is paramount, but good presentation may suggest attention to detail

10 pts Neatness

- Clarity, logical organization of material
- Graphics, legends, tables, graphs are clear/concise

10 pts Completeness: These 6 elements present on display board

- Abstract
- Introduction
- Method
- Results
- Discussion
- Conclusion

10 pts Abstract: Concisely sums up the problem, proposed solution, results, and conclusion

- Logical organization of material
- Graphics and legends are clear and concise
- Supporting documentation is displayed and available

Notebook

10 pts Notebook includes 9 elements

- Abstract
- Introduction
- Problem
- Design Methods
- Results
- Discussion
- Conclusions
- References/

10 pts Record of Activities

- Does the record demonstrate progress over time?

Overall Project Quality from Conception to Review

10 pts Research Problem

- Description of a practical need or problem to be solved with
- Clear definition of criteria for the proposed solution

- Explanation of constraints

10 pts Methodology

- Review of alternative solutions, identification of proposed solution, development of model or prototype

10 pts Execution/Construction/Testing/Results

- Model (prototype) demonstrates intended design,
- Prototype was tested in multiple conditions or trials,
- Prototype demonstrates engineering skills and completeness

10 pts Discussion

- Evaluate the analysis of the data collected. Did the design meet the expectations? If not, why or why not? Were unexpected or uncontrolled events identified?

5 pts Creativity

- Is there something unique, clever, or different? Demonstrates creativity in one or more of the above criteria

5 pts References

- Extent of references with proper bibliographies. URLs are not acceptable.

How to write an ISEF Abstract

What is the purpose of the abstract?

The abstract should give a quick overview of the research design and findings. It should highlight the question(s), experimental procedures/method, data, and conclusions in a way that is concise and precise. The Abstract should be easy to understand. It will be reviewed by judges to determine whether the projects stands out within its category or qualifies it for regional awards.

250 words or less.

Do not discuss specific aspects of the research in great detail. Do not discuss the experimental procedures or statistical methods in great detail.

If the project is a continuation from a previous year, the abstract should summarize the current year's work only.

If the abstract text includes special characters, such as mathematical symbols, which won't be translated electronically, please spell out the symbol

Do not include acknowledgements in the abstract. Do not include references to mentors, institutional facilities, awards, or patents received. Acknowledgements and references should be in your notebook, but not in the abstract.

All abstracts must be submitted on the ISEF online system (for HIGH SCHOOL Grant prize winners only).

What should the Abstract Include?

- Project Title
- Introduction: Purpose/Problem/Statement
    - Did you motivate the reader by explaining why this research is important?
- Method/Procedure
- Observations/Data/Results
- Conclusions

See sample abstract next page

Sample Abstract (226 words)

Snot Science: How Far Does a Sneeze Travel?

Viruses that cause colds and influenza, are spread via droplets of mucus that are produced when an infected person sneezes or coughs. Using thick and thin modeled mucus and a model sneeze, we tested the hypothesis that thin mucus will travel farther than thick mucus.

Procedure

Thin mucus was represented by 1-milliliter volumes of colored water. Thick mucus was represented by 1-milliliter of colored water with corn syrup and gelatin. Fluid was squirted from a plastic dropper with enough force to model a sneeze. Each sample was analyzed for maximum distance traveled and distribution of droplets. Data was analyzed.

Observation/Data/Results

Compared to thick mucus (mean distance of 110.8 cm,SD 103.7 cm, n-26/group), thin mucus squirted a greater mean distance (302.4 cm, SD 45.06 cm,n=26/group, p<0.0001, Cohen's d 2.395). Thick mucus traveled a maximum of 310 cm. Thin mucus traveled a maximum of 400 cm. Thick mucus also formed fewer visible droplets concentrated closer to the origin of the "sneeze".

Conclusions

This study showed that thin mucus travels farther than thick mucus in the plastic dropper sneeze model. Thin mucus traveled a maximum of 400 cm, suggesting a potential spread of virus-containing particles of up to 4 meters in our tests. Further experiments will clarify differences in viscosity between thick and thin mucus and potential differences in droplet size.

Please note that the abstract *does not* include a bibliography. This is a summary of ***your*** work, not someone else's work, theories, or publications. Your bibliography and references should be on a separate page, inside your notebook/journal.