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Rule Book

Sponsored by Sulphur Springs Valley Electric Cooperative Inc.

Revised February 2018 for use at the 2019 YES Fair

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Copies of the ISEF rules and forms can be obtained at their web page.
https://student.societyforscience.org/intel-isef

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About the YES Fair

The Youth Engineering and Science (YES) 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 sponsored the first YES Fair with 17 participants. Since then, involvement has grown and students compete for prizes, scholarships, and awards worth approximately $20,000.

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 the scientific and engineering fields thereby contributing to the welfare of our nation and the world.

The SSVEC Foundation

The Sulphur Springs Valley Electric Cooperative Foundation provides cash prizes, equipment for students and adult sponsors, and travel expenses for the individuals who advance to the International Science and Engineering Fair. The Foundation is funded through moneys (deposits, membership fees, capital credits) which the cooperative is unable to return to members because they cannot be located. Prior to the establishment of the Foundation, these funds were surrendered to the State of AZ. The Foundation also accepts donations.

Getting It Done: A Step-By-Step Reference

1. Decide on a project that involves something you are interested in.
2. Select an adult sponsor.
3. In the 9-12 division, if your planned project involves humans or animals, you must have prior approval from your schools Institutional Review Board (IRB) or the YES Fair Scientific Review Committee (SRC) before starting your project. Please refer to the current ISEF rules for complete requirements. Complete an SSVEC YES Fair entry form and all ISEF forms that apply to your human or animal project. It is highly recommended that SSVEC receive animal or human project entry forms prior to December 15 for review. For Projects in the 5-6 or 7-8 division, YES Fair Safety Assessment Form 1 is all that is required.
4. For projects not involving humans or animals YES Fair Entry Forms must be received at any SSVEC office by the first Monday in February. All 9-12 grade division applicants, not doing a project involving animals or humans, must also complete ISEF entry forms and follow the ISEF rules. ISEF rules and forms are available at their Web site (https://student.societyforscience.org/international-rules-pre-college-science-research) following the document library link.
5. Do your research, collect the information and write an abstract (sample on page 11). Remember to make a copy of the abstract to place on your project when it is set up. Have someone proofread your abstract for spelling and grammatical errors.
6. 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. When you arrive at the YES Fair, a 3 by 5 card with your name and school will be provided for you to place on the upper right-hand corner of the back of the project. That 3 by 5 card is the only place that your name may appear on the project. Please do not use names in your workbook. After the judging, the card will be flipped to the front of the project so your name will be proudly displayed.

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 five basic categories as an individual or team project:

- **Energy & Engineering** - The study of renewable energy sources, energy efficiency, and alternative fuels. Includes: Aerospace and Aeronautical Engineering, Aerodynamics, Alternative Fuels, Fossil Fuel Energy, Renewable Energies. Engineering studies the design, manufacture, and operation of machines, structures, processes, and systems. Includes Robotics, Material Science, Electrical, Mechanical, Computer, Civil, Construction, Industrial, Processing, and Solar Engineering.
- **Technology** – subjects including electricity, electronics, mathematics, and computers.
- **Physical Science**– subjects including chemistry, and physics.
- **Earth & Space Science** - The study of sciences related to the planet Earth and anything in the universe beyond it. Includes: astronomy, weather and meteorology, solar and planetary systems, geology, mineralogy, oceanography, climatology, speleology, seismology, paleontology, geography, and atmospheric sciences.
- **Biological Science** – subjects including animal husbandry, agriculture, biochemistry, biology, botany, environmental sciences, home economics, medicine and health, microbiology and zoology

Categories for grades 9 through 12 are the same as those by the International Science and Engineering Fair and individual and team projects compete for awards and the Grand Prize Award for trip to the ISEF.

TEAMS CAN HAVE NO MORE THAN 3 STUDENTS.

Rules and Guidelines

Eligibility: Students in grades 5-12 who attended during this school year a public, private, 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, i.e. Salpointe or St. Gregory's. Students must not reach the age of 21 before May 1 of the year of the Fair. Exhibit space requires the YES Fair to limit project entries in the 5-6 and 7-8 grades Division. We provide grants to schools for local Science and Engineering Fairs with your winners advancing to the YES Fair. See chart below:

Students per Division (5/6 or 7/8)	Projects allowed
Less than 30	6
31→50	8
51→75	10
76 and higher	12

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.

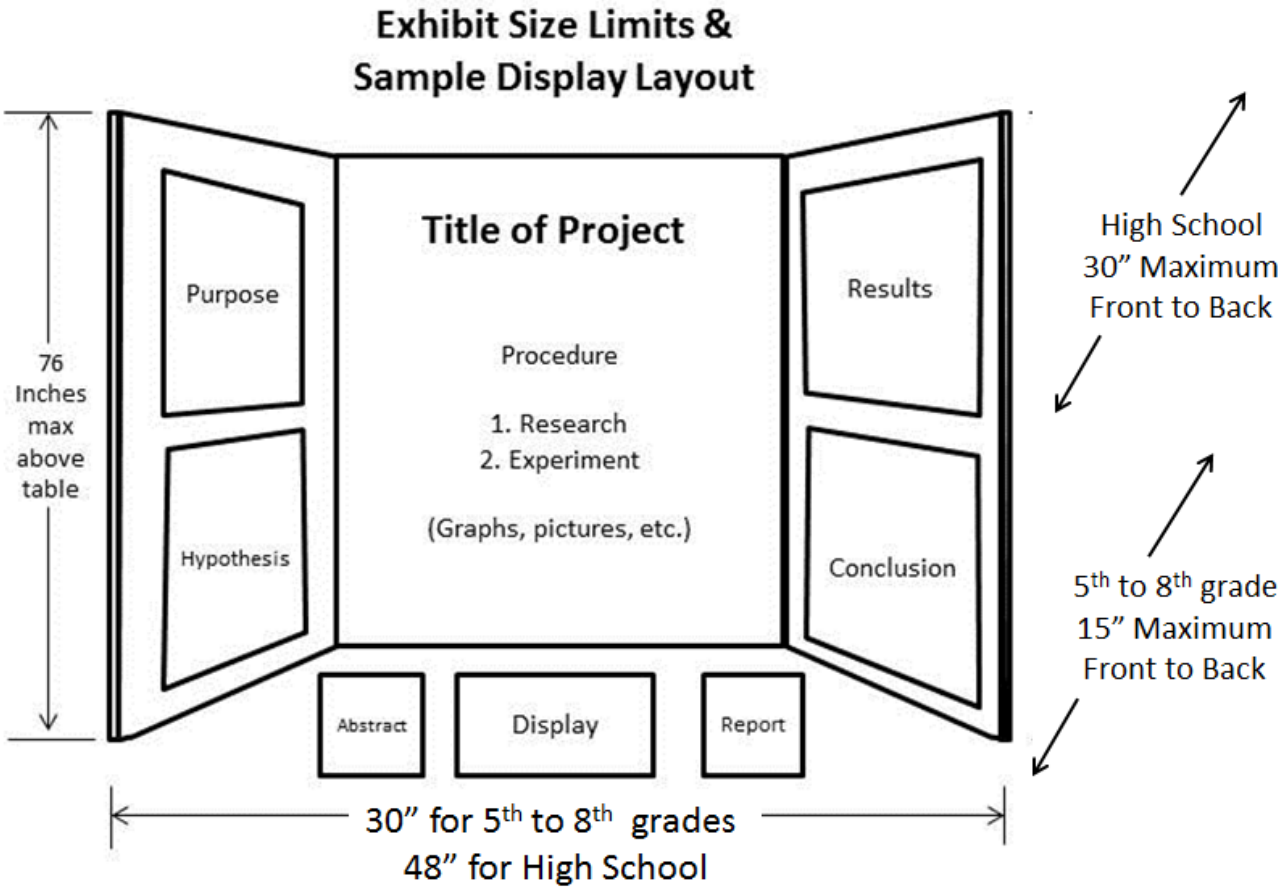
Display and Safety

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 will allow more students to participate in the YES Fair.

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. 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.



Animal Displays*

a. 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.
b. 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 except teeth, hair, nails, histological sections, and liquid tissue slides properly acquired.

*All International Science and Engineering Fair rules pertaining to vertebrate/invertebrate animals 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

Normally, 110-volt AC, single-phase service with 500 watts per project will be available. . Any electric devices on display must be Underwriters Laboratory (UL) approved. Electricity will not be available for the 5-6 or the 7-8 divisions.

Assembly

Each student is responsible for the assembly of his or her own project. 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 Display and Safety

The Display and Safety Committee will review the need for the student to have any of the items listed below that are required to demonstrate the experimental concepts of the student's project during the judging interview only. The decisions of the Display and Safety Committee are final.

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 and not to hinder the students' ability to present their project to the judges. The prohibited items include:

1. All live materials including plant and microbes
2. All soil and waste sample and materials
3. All chemicals including containers filled with water for display (Empty chemical containers and nonfunctional apparatus are also discouraged.)
4. Food, either human or animal
5. Syringes, pipettes and similar devices
6. Any flames, open or concealed
7. Highly flammable display materials
8. Tanks which have contained combustible gases, including butane and propane, unless they have been purged with carbon dioxide
9. Operation of a Class III or IV laser

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

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 Judges concentrate on the information contained in the workbook/journal to determine score for the project. This is the process used by the Judges:

Step one: What did they do?

Definition	Level 1 (acceptable)	Level 2 (fair)	Level 3 (good)	Level 4 (excellent)
Experiment Investigation undertaken to test one or more hypothesis.	Duplication and reporting of an experiment to test a previously confirmed hypothesis.	Extension of a known experiment through modification of its procedure, data collection, analysis or application.	A new approach to the design, modification or application of an existing experiment with control of some variables.	A new experimental approach to a research problem in which most of the significant variables are controlled.
Study A collection and analysis of data showing evidence of a correlation, or pattern of scientific interest. Variables are identified and controlled.	Study and presentation of printed material related to the basic issue.	Study of material collected through compilation of or expansion of existing data and through observation. The study attempts to address a specific issue.	Study based on new observations and research of a previously studied topic. Appropriate analysis of data and correlations made.	A new approach to the study of a problem which correlates information from a number of sources. The report also offers new insights or solutions to the problem.
Innovation The development and evaluation of models or innovative devices, using techniques or approaches from the field of technology or engineering.	Building models or other devices that duplicate existing technology; minimal reporting.	Make improvement to an existing technology or use an existing technology for new applications.	Design and build an innovative adaptation of an existing technology for a new application.	Build a novel technology or integrate technologies to form an innovative system that has commercial or human benefit.

Step two: How well did they do?

Definition	Level 1 (acceptable)	Level 2 (fair)	Level 3 (good)	Level 4 (excellent)
Experiment Investigation undertaken to test one or more hypothesis.	Duplication and reporting of an experiment to test a previously confirmed hypothesis.	Extension of a known experiment through modification of its procedure, data collection, analysis or application.	A new approach to the design, modification or application of an existing experiment with control of some variables.	A new experimental approach to a research problem in which most of the significant variables are controlled.

Evaluate Display:

Display Part B Skill • Is the content clearly and logically presented? • Is workmanship neat and carefully done? • Is lettering clear? • Are colors strong and suitable? • Is the layout complete, logical and self-explanatory?	**B**	Circle Score 0 1 2 3 4 5 6 7 8 9 10
Display Part C Visual Appearance • Is the display simple and visually balanced? • Does it capture attention? • Does it have impact? • Is there good balance and use of contrasts? • Do the blackboards, table and displays meld together?	**C**	Circle Score 0 1 2 3 4 5 6 7 8 9 10

Documentation:

Notebook / Work Journal • Is the notebook clear, concise and neat? Missing =0 • Is it different from the backboard display? • Is it well organized? • Is there a bibliography? • Is there a journal summarizing actual work noting both successes and failures? • Are there acknowledgements?	**D**	Circle Score 0 4 6 8 10 12 14 16 18 20
Abstract • Is the abstract present? missing abstract =0 points • Does the abstract contain all aspects of the project? • Is the information concise, complete, and accurate? • Is the abstract well written? (grammar, syntax and spelling)	**E**	Circle Score 0 1 2 3 4 5 6 7 8 9 10

Feedback to the Student:

Comments for Students (check any that apply)

- ☐ (1)Good use of photos
- ☐ (2) Excellent display
- ☐ (3) Interesting topic explore it more for next year
- ☐ (4) Run the experiment more times to see if the trend continues.
- ☐ (5) Text is hard to read
- ☐ (6) Increase the size of your ☐ (7) control group ☐ (8) sample group
- ☐ (9) Good Graphs
- ☐ (10) Be careful about spelling
- ☐ (11) Great Job
- ☐ (12) You need more quantifiable data
- ☐ (13) Missing Abstract
- ☐ (14) Missing Workbook
- ☐ (15) Good Teamwork
- ☐ (16) Other : (add on reverse Side)

Project #

Judge #

How to Write an Intel ISEF Abstract

https://student.societyforscience.org/how-write-intel-isef-abstract

What is the purpose of the abstract?

The abstract should be a brief, yet comprehensive synopsis of the research project. It should seek to highlight the research question(s), experimental procedures, data, and conclusions in a way that is concise and easy to understand. It will be reviewed by Special Award Organization and Grand Award Judges to determine whether the project stands out within its category or qualifies for special awards. The general public and other Intel ISEF visitors read the abstract for a quick overview of the research design and findings.

Rules for completion:

The abstract should be 250 words or less. Do not discuss specific aspects of the research in great detail, including experimental procedures and statistical methods. Any information that is unnecessary to include in a brief explanation should be saved for the written research paper or the project exhibit board.

If the project is a continuation from a previous year, the abstract should summarize the current year's work only. If mention of supporting research from previous year(s) is necessary, it must be minimal.

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. This includes any references to mentors, institutional facilities, and awards or patents received.

All abstracts must be submitted on the Intel ISEF online system. Many regional and state fairs also use the Intel ISEF Official Abstract Form, which can be found on the Intel ISEF Forms page. This form is not necessary for most local fairs.

What should the abstract include?

Title

Finalist's Name (or names, if a team project)

School Name, City and State, Country
Purpose

- An introductory statement providing background, namely the reason, for investigating the project topic.
- A statement of the problem the research is looking to solve or the questions being tested.

Procedure

- A brief overview of how the investigation was conducted, highlighting key points, and including methods and resources used.

- Do not provide details about materials used in the research unless they greatly influenced the procedure or were needed to conduct the investigation.
- An abstract should only include procedures done by the Finalist. Do not include work done by a mentor (such as surgical procedures) or work done prior to the Finalist's involvement.

Observations/Data/Results

- This section should provide key results that lead directly to the conclusions you have drawn.
- Do not include unnecessary data or observations about the results, nor tables, charts, graphs or other images. While these belong in the research paper or the project board, they do not belong in the formal Intel ISEF abstract.
- Unless significant, do not include any of the experimental design difficulties encountered in research.

Conclusions

- This section should be confined to a short summary in 1-2 sentences. It is a reflection on the research process and results, which may include conclusive ideas, important applications, and implications of the research.
- The Intel ISEF abstract does not include a bibliography. The Intel ISEF requires the bibliography as part of the research plan to be provided on Form 1A.

Best practices:

Remember- Revision is Key

- Make sure that the abstract includes all parts outlined in this guide
- Omit unnecessary details and discussions
- Use the past tense in descriptions
- Write in short, but complete sentences
- Avoid extra jargon and any slang
- Use concise wording throughout, especially when expressing concepts and processes with scientific language
- Check for correct spelling, grammar, and punctuation
- Ask for writing help from an English teacher or librarian. Writing an abstract is an exercise in using language effectively to convey scientific ideas and procedures.
- It never hurts to have an extra pair of eyes glance it over

Sample abstract

Please view the following example abstract, which is displayed two ways: In paragraph form, as will be presented at the Intel ISEF, and divided in parts to show how it would fit the general abstract template.

Snot Science: How far does a sneeze travel?

Bethany Brookshire, Ph.D.

Science News for Students, Society for Science & the Public, Washington, D.C.

ABSTRACT

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

Thin and thick mucus were represented by 1-milliliter volumes of colored water or a mixture of corn syrup and gelatin, respectively. 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 using a two-tailed t test.

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, and droplets concentrated closer to the origin of the "sneeze."

This study showed that thin mucus travels farther than thin 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.

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Procedure: Thin and thick mucus were represented by 1-milliliter volumes of colored water or a mixture of corn syrup and gelatin, respectively. 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 using a two-tailed t test.

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, and droplets concentrated closer to the origin of the "sneeze."

Conclusions: This study showed that thin mucus travels farther than thin 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.

Works consulted

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