North Dakota State Science & Engineering Fair

Science Review Committee Handbook

April 4-5, 2024

https://engineering.und.edu/outreach/k-12/ndssef.html

REGENERON ISEF
A PROGRAM OF SOCIETY FOR SCIENCE

LOS ANGELES California

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Introduction

The North Dakota State Science & Engineering Fair (NDSSEF) provides students from all area high schools in North Dakota the opportunity to showcase their multi-year, STEM research projects in a competitive venue. The students are judged by local experts in the fields of life science, physical science, environmental studies, psychology and engineering.

Last year, 145 students participated as qualifiers from the four North Dakota Regional Fairs and over 50 percent of the presenters won an award. The grand prizes are trips to the International Science & Engineering Fair (ISEF) which brings together hundreds of science fair winners from all over the world to compete against each other.

NDSSEF and their corporate donors provide opportunities that help support and build STEM education while also shaping the futures of hundreds of students throughout North Dakota.

Project Categories

Many projects could easily fit into more than one NDSSEF category. We highly recommend that you review the entire listing of the categories on the ISEF site before carefully choosing the category that most accurately describes your project.

NDSSEF Categories	
Animal Science (AS): Includes all aspects of animals and animal life, animal life cycles, and animal interactions with one another or with their environment.	**Behavioral Science (BE):** The science or study of the thought processes and behavior of humans and other animals in their interactions with the environment studied through observational and experimental methods.
Biochemistry (BI): The study of the chemical basis of processes occurring in living organisms, including the processes by which these substances enter into, or are formed in, the organisms and react with each other and the environment.	**Cellular & Molecular Biology (CB):** This is an interdisciplinary field that studies the structure, function, intracellular pathways, and formation of cells. Studies involve understanding life and cellular processes specifically at the molecular level.
Chemistry (CH): Studies exploring the science of the composition, structure, properties, and reactions of matter not involving biochemical systems.	**Computational Biology & Bioinformatics (CBIF):** Studies that primarily focus on the discipline and techniques of computer science and mathematics as they relate to biological systems.
Computer Science (CO): The study or development of software, information processes, or methodologies to demonstrate, analyze, or control a process/solution.	**Earth & Planetary Science (ES):** Studies of Earth and other planetary systems and their evolution.
Engineering (ENG): Studies that focus on the science and engineering that involve movement or structure. The movement can be by the apparatus or the movement can affect the apparatus. Additionally, projects that involve the application of engineering principles and design concepts.	**Environmental Science (ENV):** Studies of the environment and its effect on organisms/systems, including investigations of biological processes such as growth and lifespan.
Mathematics (MA): The study of the measurement, properties, and relationships of quantities and sets, using numbers and symbols. The deductive study of numbers, geometry, and various abstract constructs, or structures.	**Medicine & Health (ME):** This category focuses on studies specifically designed to address issues of human health and disease.
Microbiology (MI): The study of microorganisms, including bacteria, viruses, fungi, prokaryotes, and simple eukaryotes as well as antimicrobial and antibiotic substances.	**Neuroscience (NS):** Projects related to neurology and cognitive neuroscience.
Physics & Astronomy (PHAST): Physics is the science of matter and energy and of interactions between the two. Astronomy is the study of anything in the universe beyond the Earth.	**Plant Science (PS):** Studies of plants and how they live, including structure, physiology, development, and classification. Includes plant cultivation, development, ecology, genetics and plant breeding, pathology, physiology, systematics and evolution.

Rules for Participating in NDSSEF

Ethics Statement

Scientific fraud and misconduct are not condoned at any level of research or competition. This includes plagiarism, forgery, use or presentation of other researcher's work as one's own and fabrication of data. Fraudulent projects will fail to qualify for competition in affiliated fairs and the ISEF. NDSSEF reserves the right to revoke recognition of a project subsequently found to have been fraudulent.

Eligibility

1. Any student in grades 6-12 or equivalent, enrolled in a public, private, parochial, or home school who has qualified through a regional fair associated with NDSSEF is eligible to participate in NDSSEF.
2. Team projects may have a maximum of three team members. Each team is encouraged to appoint a team leader to coordinate the work and act as spokesperson. However, each member of the team should be able to serve as spokesperson, be fully involved with the project, and must be familiar with all aspects of the project. The final work should reflect the coordinated efforts of all team members and will be evaluated using similar rules and judging criteria as individual projects.
3. Projects that are demonstrations, 'library' research or informational projects, 'explanation' models or kit building are not appropriate for the NDSSEF.
4. Projects completed in conjunction with supplemental educational organizations are not allowed. This includes but is not limited to: STEM Camp, Internships, Science Workshops, Governor's School, etc.
5. A research project **may not** be a part of a larger study performed by professional scientists.

General Requirements

1. All students competing in NDSSEF must adhere to all of the rules as set forth in this document.
2. All projects must adhere to the **Ethics Statement** above.
3. It is the responsibility of the student researcher(s) and the Adult Sponsor to evaluate the study to determine if the research will require forms and/or review and approval prior to experimentation, especially projects that include human participants, vertebrate animals, or potentially hazardous biological agents.
4. Projects must adhere to local, state and U.S. Federal laws, regulations and permitting conditions. In addition, projects conducted outside the U.S. must also adhere to the laws of the country and jurisdiction in which the project was performed.
5. The use of non-animal research methods and the use of alternatives to animal research are strongly encouraged and must be explored before conducting a vertebrate animal project.
6. Introduction or disposal of non-native and/or invasive species (e.g. insects, plants, invertebrates, vertebrates), pathogens, toxic chemicals or foreign substances into the environment is prohibited. It is recommended that students reference their local, state or national regulations and quarantine lists.
7. Projects involving any human consumption (i.e. taste testing, caffeine vs. heart rate, color affect taste, etc) must include a full medical work up of each individual prior to the study as well as a full medical work up after the study is complete. Any human consumption

projects that do not include complete medical work ups from a licensed healthcare professional will be disqualified. The extent of the medical work up necessary should be deemed sufficient by both the State SRC and the medical professional. Only FDA approved foods and drinks are allowable in NDSSEF projects. Any projects containing the consumption of homemade foods and drinks will be disqualified.

8. NDSSEF projects must adhere to ISEF display and safety requirements.
9. All students participating in NDSSEF must be present to set-up their project during the project set-up window. Teachers, parents, etc. May assist students with set-up, but students must be present for questions that may arise from the SRC Review Committee. Students who are not present, will be disqualified from competition.
10. All students participating in NDSSEF are required to sign up for and attend the campus tours. The University of North Dakota spends countless hours and utilizes several resources to prepare these tours for students. Students who do not participate in campus tours will be disqualified from competition.
11. All NDSSEF participants must present in-person. No video recordings or virtual presentations are allowed. The appointed SRC Committee reserves the right to waive this requirement in the case of emergency circumstances.

Project Display

Maximum Size of Project

Depth (front to back):
30 inches or 76 cm

Width (side to side):
48 inches or 122 cm

Height (floor to top):
108 inches or 274 cm

Please be aware when ordering posters that the mechanism that supports the poster should conform to the maximum size limitations stated above.

- All project materials and support mechanisms must fit within the project dimensions.
- At NDSSEF, fair-provided tables will not exceed a height of 36 inches (91 centimeters).
- If a table is used it becomes part of the project and must not exceed the allowed dimensions.

Display Content for Projects Conducted at a Research Institution

The display must reflect only the work conducted by the finalist. Minimal reference to mentor's or other researcher's work must only reflect background information or be used to clarify differences between finalist's and others' work.

Photograph/Image Display Requirements

Display of photographs of people other than that of the student researcher must have a photo release signed by the subject, and if under 18 years of age, also by the guardian of the subject.

Sample consent text: "I consent to the use of visual images (photos, videos, etc.) involving my participation/my child's participation in this research." (These forms must be available upon request, but shall not be displayed.

Roles & Responsibilities of Students & Adults

The Student Researcher(s)

The student researcher is responsible for all aspects of the research project including enlisting the aid of any required supervisory adults (Adult Sponsor, Qualified Scientist, etc.), obtaining necessary approvals (SRC, IRB, etc.), following the Rules & Guidelines of the ISEF, and performing the experimentation, engineering, data analysis, etc.

Scientific fraud and misconduct are not condoned at any level of research or competition. This includes plagiarism, forgery, use or presentation of other researcher's work as one's own, and fabrication of data. Fraudulent projects will fail to qualify for competition. NDSSEF reserves the right to revoke recognition of a project subsequently found to have been fraudulent.

The Adult Sponsor

An Adult Sponsor may be a teacher (preferred), parent, professor, and/or other professional scientist in whose lab the student is working. This individual must have a solid background in science and should have close contact with the student during the course of the project. The Adult Sponsor is responsible for ensuring the student's research is eligible for entry in the ISEF.

Qualified Scientist

A Qualified Scientist should have earned a doctoral/professional degree in a scientific discipline that relates to the student's area of research. Alternatively, the SRC may consider an individual with extensive experience and expertise in the student's area of research as a Qualified Scientist. The Qualified Scientist must be thoroughly familiar with local, state, and federal regulations that govern the student's area of research.

Designated Supervisor

The Designated Supervisor is an adult who is directly responsible for overseeing student experimentation. The Designated Supervisor need not have an advanced degree, but must be thoroughly familiar with the student's project, and must be trained in the student's area of research. The Adult Sponsor may act as the Designated Supervisor.

Scientific Review Committee (SRC)

The NDSSEF Scientific Review Committee (SRC) is a group of qualified individuals that is responsible for evaluation of student research, certifications, research plans and exhibits for compliance with the rules, applicable laws and regulations at each level of science fair competition. Most proposed research projects involving vertebrate animals and/or potentially hazardous biological agents must be reviewed and approved BEFORE experimentation. Local or regional SRC prior review is not required for human studies previously reviewed and approved by a properly constituted IRB.

ALL projects, including those previously reviewed and approved by an IRB must be reviewed and approved by the SRC after experimentation and before competition in an Affiliated Fair. Projects conducted at a Regulated Research Institution (not home, high school, or field) that are reviewed and approved by the proper institutional board before experimentation, must also be approved by the Affiliated Fair SRC.

While reviewing projects at NDSSEF, the NDSSEF SRC will be comprised of one representative from each Affiliated Fair as well as three state appointed committee members. Projects in question will be voted upon by the entirety of the committee with any tie-breaking occuring by the state appointed committee members.

Institutional Review Board (IRB)

An Institutional Review Board (IRB), is a committee that must evaluate the potential physical and/or psychological risk of research involving humans. All proposed human research must be reviewed and approved by an IRB before experimentation begins.

This includes review of any surveys or questionnaires to be used in a project.

Federal regulations require local community involvement. Therefore, it is advisable that an IRB be established at the school level to evaluate human research projects. An IRB must consist of a minimum of three members including the following: an educator, a school administrator (preferably principal or vice principal), and a medical or mental health professional.

To avoid conflict of interest, no Adult Sponsor, parent or other relative of the student, the Qualified Scientist, or Designated Supervisor who oversees the project may serve on the IRB reviewing that project

Message from the NDSSEF Scientific Review Committee

Prior to attempting to complete any documentation for entry to NDSSEF, we strongly recommend that students communicate with mentors and/or adult sponsors to firmly grasp the extent of the research and the necessary documentation that NDSSEF requires for the student's project.

To help guide you with the appropriate forms, before you start your research, we strongly suggest you use the Rules Wizard available at: https://ruleswizard.societyforscience.org/

Top NDSSEF Paperwork Problems to Avoid:

1. Research plan lacks sufficient details and fails to provide thorough information to support the documentation provided. A properly written research plan must include:
    - the proposed and actual start & end dates on Form 1A
    - a detailed research plan - projects which cannot be assessed because the research plan is not sufficient will fail to qualify.
    - all work site information completed
2. Missing Form 3 - Risk Assessment
    - Must be completed for projects that involve chemicals, equipment, or other potential hazards
    - Often missing, and often incomplete without description of safety precautions taken
3. Missing IRB or incomplete with missing signatures on Human Subjects Form 4
4. Research project lacks original student generated data.
5. Projects involving human consumption which do not contain a full medical work-up prior to and after experimentation or which contain homemade foods and drinks.
6. Using projects which are part of a larger study, occur during an internship, Governor's School, etc.

Questions? Email the NDSSEF SRC

garret.roemmich@k12.nd.us or tana.schafer@k12.nd.us

Common Reasons a Project Would "Fail to Qualify" at NDSSEF/ ISEF:

1. **Human, vertebrate animal, or PHBA studies that did not have pre-approval**
   - Need IRB pre-approval for human participant studies
   - Need SRC or IACUC pre-approval for vertebrate animal studies
   - Need SRC or IBC pre-approval for PHBA studies

2. **Prohibited Vertebrate Animal Studies**
   - Studies done at home/school/field that should have been done at a regulated research institution
   - Studies that caused more than momentary pain, suffering, or stress -- or designed to kill
   - Induced toxicity studies
   - Predator/vertebrate prey experiments
   - Studies where student performed euthanasia on a vertebrate animal
   - Studies with an animal death in any group or subgroup due to the experimental procedures
   - Studies where animals have a weight loss greater than or equal to 15%
   - Studies where there was an inappropriate restriction of water or food
   - Studies treated as embryonic studies that were actually vertebrate studies

3. **Prohibited Studies using Potentially Hazardous Biological Agents (PHBA's)**
   - Microorganisms were cultured at home
   - BSL-2 studies (including opening plates or containers of unknown microorganisms) done in a BSL-1 lab
   - Studies using human and other primate established cell lines without SRC pre-review and approval

4. **Prohibited Human Participant Studies**
   - Studies where the IRB required written documentation of consents which were not obtained
   - Studies where the student used surveys/questionnaires without IRB pre-review and approval
   - Studies which include ingested foods which are not FDA approved
   - Studies including ingested food where Doctor pre/post observation did not occur or was not documented

5. **Eligibility Problems**
   - Project does not show independent data collection
   - Student worked with a partner or team but competed as an individual, or vice versa
   - Project was more than 1 year in length or was too old
   - More than three students on a team
   - Student was from outside of our affiliate region, must attend a different ISEF affiliated fair
   - Student missed deadlines for registration, paperwork, or entry fee
   - Failed to set-up poster display on Friday before NDSSEF

6. **Scientific Misconduct**
   - Plagiarism
   - Student presented mentor's research as his/her own
   - Falsification of data
   - Student did not generate original data beyond library research/ literature review

7. **Research Plan**
   - Lacks details of research
   - Rationale section is missing
   - Forms submitted do not reflect research plan submitted

Frequently Asked Questions

Why does the research plan have to be in the future tense?
The research plan indicates all the aspects of the research to be conducted and determines the necessary documentation that the student will need to conduct the research. It is critical that it establishes what the student's actual role in the research and other individuals that will contribute to the research.

What is the difference between the fair (NDSSEF) SRC and an institution's SRC?
The NDSSEF SRC uses the guidelines established by the ISEF SRC to determine if the project qualifies for NDSSEF. Meanwhile, an institution's SRC typically refers to the "body" that oversees projects conducted at that particular research institution. Procedures approved by institution SRC can still conflict with ISEF SRC rules—for example those involving pain tolerance or the death of animals. Thus, it is very important to make mentors aware of ISEF/NDSSEF rules and regulations when planning research.

Can NDSSEF SRC approve a project before it starts? After it ends?
The NDSSEF SRC can approve a project with proper documentation in place before the project begins as long as procedures are not modified during the time research is carried out. All projects must be approved by NDSSEF SRC after it is conducted and this must occur prior to NDSSEF presentation.

Can NDSSEF SRC disqualify a project that has been approved by an institution's SRC?
Yes, since it is possible that a project that can be approved by an institution with rules differing from those made by ISEF which is focused on high school researchers and thus has stricter rules.

Can any school form their own IRB committee?
Yes, as long as they follow the rules and regulations provided by ISEF.

Can a student who submitted to STS fail to qualify for NDSSEF?
Yes, STS does not have a scientific review committee (SRC) that reviews each project. Furthermore, there are notable differences in the qualifications of each competition.

When should a project be classified as a continuation project?
A continuation project is one in which the project goes beyond one calendar year.

Does ISEF limit the time or length of a project?
Yes, all projects must be within a calendar year which runs from January 2023 to May 2024.

Are NDSSEF Rules the same as ISEF Rules?
NDSSEF rules are guided by ISEF rules, however they can differ based on our local needs. For instance, North Dakota State Science and Engineering Fair does not allow projects which occur during internships, Governor's School, or as part of a larger study performed by professional scientists.

Checklist for Adult Sponsor (1)

This completed form is required for ALL projects.

To be completed by the Adult Sponsor in collaboration with the student researcher(s):

Student's Name(s): ______________________________

Project Title: ______________________________

Fit as much of the title as possible

1. ☐ I have reviewed the ISEF ... delines, including the science fair ethics statement.
2. ☐ I have reviewed the studen... co... Checklist (1A) and Research Plan/Project Summary.
3. ☐ I have worked with the student and we have ... ssible risks involved in the project.
4. ☐ The project involves one or more of the following and ... ires prior approval by an SRC, IRB, IACUC or IBC:
   - ☐ Humans
   - ☐ Vertebrate Animals
   - ☐ Potentially Hazardous Biological Agents
     - ☐ Microorganisms ☐ rDNA ☐ Tissues
5. ☐ Items to be completed for **ALL PROJECTS**
   - ☐ Adult Sponsor Checklist (1)
   - ☐ Student Checklist (1A)
     - ☐ Regulated Research Institutional/Industrial Setting Form (1C) (when applicable; after completed experiment)
     - ☐ Continuation/Research Progression Form (7) (when applicable)
   - ☐ Research Plan/Project Summary
   - ☐ Approval Form (1B)

Additional forms required if the project includes the use of one or more of the following (check all that apply):

☐ **Humans,** including student designed inventions/prototypes. (Requires prior approval by an Institutional Review Board (IRB); see full text of the rules.)
- ☐ Human Participants Form (4) or appropriate Institutional IRB documentation
- ☐ Sample of Informed Consent Form (when applicable and/or required by the IRB)
- ☐ Qualified Scientist Form (2) (when applicable and/or required by the IRB)

Only check boxes that are appropriate to your research

☐ **Vertebrate Animals** (Requires prior approval, see full text of the rules.)
- ☐ Vertebrate Animal Form (5A) - for projects conducted in a school/home/field research site (SRC prior approval required
- ☐ Vertebrate Animal Form (5B) - for projects conducted at a Regulated Research Institution. (Institutional Animal Care and Use Committee (IACUC) approval required prior experimentation.)
- ☐ Qualified Scientist Form (2) (Required for all vertebrate animal projects at a regulated research site or when applicable)

☐ **Potentially Hazardous Biological Agents** (Requires prior approval by SRC, IACUC or IBC, see full text of the rules.)
- ☐ Potentially Hazardous Biological Agents Risk Assessment Form (6A)
- ☐ Human and Vertebrate Animal Tissue Form (6B) - to be completed in addition to Form 6A when project involves the use of fresh or frozen tissue, primary cell cultures, blood, blood products and body fluids.
- ☐ Qualified Scientist Form (2) (when applicable)
- ☐ The following are exempt from prior review but require a Risk Assessment Form 3: projects involving protists, archae and similar microorganisms, for projects using manure for composting, fuel production or other non-culturing experiments, projects using color change coliform water test kits, microbial fuel cells, and projects involving decomposing vertebrate organisms.

☐ **Hazardous Chemicals, Activities and Devices** (No SRC prior approval required, see full text of the rules.)
- ☐ Risk Assessment Form (3)
- ☐ Qualified Scientist Form (2) (required for ... nvolving DEA-controlled substances or when applicable)

☐ **Other**
- ☐ Risk Assessment Form (3)

☐ **I attest to the informati... ve and that I have read and agree to abide by the scien... ement.**

This is usually the Sci. Res. teacher NOT the mentor

This must be dated **BEFORE** the "Actual Start Date" on form 1A

Adult Sponsor's Printed Name	Signature	Date of Review (mm/dd/yy)
Phone	Email	

International Rules: Guidelines for Science and Engineering Fairs 2023–2024, **societyforscience.org/ISEF** Page 31

Student Checklist (1A)

This form is required for ALL projects.

1. a. Student/Team Leader: _____ Grade: _____

   Email: _____ Phone: _____

   b. Team Member: _____ c. Team Member: _____

2. Title of Project: _____

   _____

3. School: _____ School Phone: _____

   School Address: _____

   _____

4. Adult Sponsor: _____ Phone/Email: _____

5. Does this project need SR[illegible] IRB/IACUC or other pre-approval? ☐ Yes ☒ No Ten

6. Is this a continuation/progression from a previous year? ☐ Yes ☒ No

   If Yes:

   a. Attach the previous year's ☐ Abstract **and** ☐ Research Plan/Project Summary

   b. Explain how this project is new and different fro[illegible] previous ye[illegible]

   ☐ Continuation/Research Progression Form (7[illegible]

7. This year's experimentation/data collection:

   _____ _____

   Actual Start Date: (mm/dd/yy) E[illegible]ate: (mm/dd/yy)

8. Where will you conduct your experimentation? (check all that apply)

   ☐ Research Institution ☐ School ☐ Field ☐ Home ☐ Ot[illegible]r: _____

9. Source of Data:

   ☐ Collected self/mentor ☐ Other Describe/url: _____

10. List the name and address of all non-home and non-school work sit[illegible] nether you worked there virtually or on-site:

    Name _____ _____

    Address: _____ _____

    _____ _____

    Phone/email _____ _____

11. **Complete a Research Plan/Project Summary following the Research Plan/Project Summary instructions and attach to this form.**

12. **An abstract is required for all projects after experimentation.**

Fit as much of the title as possible

This should be the **teacher** not the mentor

IF the student has continued his/her project their poster should focus on the work from the current calendar year

This should be the date that the student started collecting data

NOTE this **NEW** field that should be filled out if appropriate

Research Plan/Project Summary Instructions

A complete Research Plan/Project Summary is required for ALL projects and must accompany Student Checklist (1A).

- All projects must have a Research Plan/Project Summary
  a. The Research Plan is to be written prior to experimentation following the instructions below to detail the rationale, research question(s), methodology, and risk assessment of the proposed research.
  b. If changes are made during the research, such changes can be added to the original research plan as an addendum, recognizing that some changes may require returning to the IRB or SRC for appropriate review and approvals. If no additional approvals are required, this addendum serves as a project summary to explain research that was conducted.
  c. If no changes are made from the original research plan, no project summary is required.
     - Some studies, such as an engineering design or mathematics projects, will be less detailed in the initial project plan and will change through the course of research. If such changes occur, a project summary that explains what was done is required and can be appended to the original research plan.
     - The Research Plan/Project Summary should include the following:
       a. **RATIONALE:** Include a brief synopsis of the background that supports your research problem and explain why this research is important and if applicable, explain any societal impact of your research.
       b. **RESEARCH QUESTION(S), HYPOTHESIS(ES), ENGINEERING GOAL(S), EXPECTED OUTCOMES:** How is this based on the rationale described above?
       c. Describe the following in detail:
          - **Procedures:** Detail all procedures and experimental design including methods for data collection, and when applicable, the source of data used. Describe only your project. Do not include work done by mentor or others.
          - **Risk and Safety:** Identify any potential risks and safety pr
          - **Data Analysis:** Describe the procedures you will use to ar
       d. **BIBLIOGRAPHY:** List major references (e.g. science journal
       If you plan to use vertebrate animals, one of these referenc

Items 1–4 below are subject-specific guidelines for additional items to be ir applicable.

1. **Human participants research:**
   a. **Participants:** Describe age range, gender, racial/ethnic composition pregnant women, prisoners, mentally disabled or economically disa
   b. **Recruitment:** Where will you find your participants? How will they be
   c. **Methods:** What will participants be asked to do? Will you use any su did you obtain? Did it require permissions? If so, explain. What is the
   d. **Risk Assessment:** What are the risks or potential discomforts (physi participants? How will you minimize risks? List any benefits to societ
   e. **Protection of Privacy:** Will identifiable information (e.g., names, tele Will data be confidential/anonymous? If anonymous, describe how t are in place for safeguarding confidentiality? Where will data be stor the data after the study?
   f. **Informed Consent Process:** Describe how you will inform participan do, that their participation is voluntary and they have the right to sto
2. **Vertebrate animal research:**
   a. Discuss potential ALTERNATIVES to vertebrate animal use and prese
   b. Explain potential impact or contribution of this research.
   c. Detail all procedures to be used, including methods used to minimiz animals and detailed chemical concentrations and drug dosages.
   d. Detail animal numbers, species, strain, sex, age, source, etc., includ
   e. Describe housing and oversight of daily care.
   f. Discuss disposition of the animals at the end of the study.
- **Potentially hazardous biological agents research:**
   a. Give source of the organism and describe BSL assessment process
   b. Detail safety precautions and discuss methods of disposal.
4. **Hazardous chemicals, activities & devices:**
   a. Describe Risk Assessment process, supervision, safety precautions
   b. Material Safety Data Sheets are not necessary to submit with paperv

The research plan is the most important document because it provides the regional SRC board the necessary details of the planned research.

This detailed description of the research guides the SRC to be able to determine if the proper forms were completed and if they contain the correct information.

Must be VERY detailed and clearly delineate the role of the student vs. the role of the mentor

Entire Research Plan must be in FUTURE tense!!
Must include proposed and actual start and end dates
Must include detailed research plan
Must have all work site information completed
Must identify student and mentor role

Approval Form (1B)

A completed form is required for each student, including all team members.

1. To Be Completed by Student and Parent

a. **Student Acknowledgment:**

- I understand the risks and possible dangers to me of the proposed research plan.
- I have read the ISEF Rules and Guidelines and will adhere to all International Rules when conduct… this research.
- I have read and will abide by the science fair ethics statement.

Student researchers are expected to maintain the highest standards of honesty and integrity … misconduct are not condoned at any level of research or competition. Such practices includ… …ted to plagiarism, forgery, use or presentation of other researcher's work as one's own, and fabrica… …raudule… projects will fail to qualify for competition in affiliated fairs and ISEF.

This must be dated **BEFORE** the "Actual Start Date" on form 1A

This must be dated **BEFORE** the "Actual Start Date" on form 1A

Student's Printed Name	Signature	Date Ack… …wled… …) (Must b… …tion.)

b. **Parent/Guardian Approval:** I have read and understand the risks and possible dan… …the **Research Plan/Project Summary**. I consent to my child participating in this resea…

Parent/Guardian's Printed Name	Signature	Date Acknowledged (mm/dd/yy) (Must be prior to experimentation.)

2. To be completed by the local or affiliated Fair SRC

(Required for projects requiring prior SRC/IRB APPROVAL. Sign 2a or 2b as appropriate.)

a. **Required f… …jects that need prior S… …B approval BEFORE … …tion** (humans … …or potent… …logical…

The SRC/IRB … …search Plan/Project Summary** … …included. My signature indicates a… …n Plan/Project Summary** before … …tation.

Do NOT write anything in this space unless you are the SRC/IRB Chair or Designee

SRC/IRB …

Signature

Date of App… …mm/dd/yy)
(Must be prior to …xperimentation.)

OR

b. **Required f… …search conducted at a… …ulated Researc… …ns with no prio… …RB appro…**

This proj… …titution **(not home o…** …approved by the proper in… …nentation and complies with the I… …d any required **institutional appr…**

Do NOT write anything in this space

SRC Chair's …

Signature

Date of Signature (mm/dd/yy)
(May be after experimentation)

3. Final ISEF Affiliated Fair SR… …roval (Requi… …ALL Projects)

SRC Approval After Experimentation … …**/National Fair**

I certify that this project adheres to the ap… …**mary** and complies with all ISEF Rules.

Do NOT write anything in this space

Regional SRC Chair's Printed Name		Date of Approval (mm/dd/yy)
State/National SRC Chair's Printed Na… …e *(where applicable)*		Date of Approval (mm/dd/yy)

Regulated Research Institutional/Industrial Setting Form (1C)

This form must be completed AFTER experimentation by the adult supervising the student research either virtually or on site, conducted in a regulated research institution, industrial setting or any work site other than home, school or field.

Student's Name(s) _____

Title of Project _____

To be completed by the Supervising Adult in the Setting (NOT the Student(s)) after experimentation:
(Responses must be on the form as it is required to be displayed at student's project booth; please do not print double-sided.)

Research was supported at my work site:

1. Did you or your proxy (e.g. graduate student, postdoc, employee) mentor or provide substantial guidance to the student researcher? ☐ Yes ☒ No
   a. If no, describe your and/or your institution's role with the student researcher and his/her project (e.g. supervised use of equipment on s and sign below.
   b. If yes, complete questions 2–5.
2. Is the student's research project a subset of your ongoing Use questions 3, 4 and 5 to detail how the student's projec different from ongoing research or work at your site. If this to be acknowledged, please list the grant statement here.
3. Describe the independence and creativity with which the s
   a. developed the hypotheses or engineering goals for the
   b. designed the methodology for his/her research projec
   c. analyzed and interpreted data

If any of the research was done at a standard research facility (college, pharmaceutical company, environmental testing facility, etc..) or a facility where advanced research is allowed (certain high schools or local labs) the 1C form IS required.

If the project is to be a data analysis only and the data is publicly available, then nothing else is needed

If data is covered by privacy rules/laws (ex. Patient data) or from a private source (ex. Proprietary data), then the student must show documentation of how the data became available and how/why they were allowed to view it and study it.

The best thing to do is have the mentor send a short letter on their letterhead explaining that there were no HIPAA violations. This is even if the data was de-identified.

See next page for more questions

(Continued on next page)

Regulated Research Institutional/Industrial Setting Form (1C) Continued

Student's Name(s) _____

4. Detail the student's role in conducting the research (e.g. data collection, specific procedures performed). Differentiate what the student observed and what the student actually did.

5. Did the student(s) work on the project as part of a group? ☐ Yes ☒ No
Were there other high school students present? If yes, please list the student names and describe how their work was related or different from the work of this project.

This should be the **Mentor** NOT the teacher

I attest that the studen… …e work as indicated above and that any require… review a… by institutional regula… …/ACUC/IBC) has been obtained. Copies are attache… …f app… acknowledge that the… …be presenting this work publicly in competition and … the student research … …requirements for my review and/or restrictions of w…

This must be dated **AFTER** the "End Date" on form 1A

Supervising Adult's Printed Name _____ Signature _____ Tit… _____

Institution _____ Date Signed (must be after experimentation) (mm/dd/yy) _____

Address _____ Email/Phone _____

Qualified Scientist Form (2)

May be required for research involving human participants, vertebrate animals, potentially hazardous biological agents, and hazardous substances and devices. Must be completed and signed before the start of student experimentation.

Student's Name(s) _____

Title of Project _____

_____

To be completed by the Qualified Scientist:

Scientist Name: _____

Educational Background: _____ Degree(s): _____

Experience/Training as relates to the student's area of research:

_____ _____

Position/Institution: Email/Phone:

1. Have you reviewed the ISEF rules relevant to this project and the science fair ethics statement relevant to this project? ☐ Yes ☐ No
2. Will any of the following be used?
   a. Human participants ☐ Yes ☐ No
   b. Vertebrate animals ☐ Yes ☐ No
   c. Potentially hazardous biological agents (microorganisms, rDNA and tissues, including blood and blood products) ☐ Yes ☐ No
   d. Hazardous substances and devices ☐ Yes ☐ No
3. Will this study be a sub-set of a larger study? ☐ Yes ☐ No
4. Will you directly supervise the student? ☐ Yes ☐ No
   a. If no, who will directly supervise and serve as the Designated Supervisor?
   b. Experience/Training of the Designated Supervisor: _____

To be completed by the Qualified Scientist:

I certify that I have reviewed and approved the Research Plan/Project Summary prior to the start of the experimentation. If the student or Designated Supervisor is not trained in the necessary procedures, I will ensure her/his training. I will provide advice and supervision during the research. I have a working knowledge of the techniques to be used by t student in the Research Plan/Project Summary. I un that a Designated Supervisor is require when th not conducting experimentation unde

Qualified Scientist's Printed Name

Signature Date of Approval (mm/dd/yy)

This must be dated **BEFORE** the "Actual Start Date" on form 1A

To be complete when the Quali supervise.

gnated Supervisor annot directly

I certify that I have reviewe lan/Project Summary and have been tra ues be used by this student, and I will provi

Designated Supervisor's Printed Name

Signature Date of Approval (mm/dd/yy)

Phone Email

If needed, this must be dated **BEFORE** the "Actual Start Date" on form 1A

Risk Assessment Form (3)

Must be completed before experimentation; recommended for all projects. May be required for projects involving Human Participants, Hazardous Chemicals, Materials or Devices or Potentially Hazardous Biological Agents.

Student's Name(s) _____

Title of Project _____

_____

To be completed by the Student Researcher(s) in collaboration with Designated Supervisor/Qualified Scientist: (All questions must be answered; additional page(s) may be attached.)

1. Identify and assess the risks and hazards involved in this project.

2. a) List all hazardous chemicals, activities or devices to be used; b) identify and list all microorganisms to be used that are exempt from pre-approval (see Potentially Hazardous Biological Agent rules).

3. Describe the safety precautions and procedures that will be used to reduce the risks.

4. Describe the disposal procedures that will be used (when applicable).

5. List the source(s) of safety information.

This must be dated **BEFORE** the "Actual Start Date" on form 1A

To be completed and signed by the Designated Supervisor (or Qualified Scientist, [illegible]):
I agree with the risk assessment and safety precautions and procedures described above. I certify tha[illegible]d the Research Plan/Project Summary and the International Rules, including the science fair ethics statemen[illegible]ovide direct supervision.

_____ _____ _____
Designated Supervisor's Printed Name | Signature | Date of Review (mm/dd/yy)

_____
Experience/Training as relates to the student's area of research

_____ _____
Position/Institution | Phone or email contact information

Human Participants Form (4)

Required for all research involving human participants not at a Regulated Research Institution. If at a Regulated Research Institution, use institutional approval forms for documentation of prior review and approval. (IRB approval required before recruitment or data collection.)

Student's Name(s) | Title of Project

Adult Sponsor | Phone/Email

MUST BE COMPLETED BY STUDENT RESEARCHER(S) IN COLLABORATION WITH THE ADULT SPONSOR/DESIGNATED SUPERVISOR/QUALIFIED SCIENTIST:

1. ☐ I have submitted my Research Plan/Project Summary which addresses ALL areas indicated in the Human Participants Section of the Research Plan/Project Summary Instructions.
2. ☐ I have attached any surveys or questionnaires I will be using in my project or other docu
   ☐ Any published instrument(s) used was /were legally obtained.
3. ☐ I have attached an informed consent that I would use if required by the IRB.
4. ☐ Yes ☐ No Are you working with a Qualified Scientist? If yes, attach the Qualified Scien

Even though your school IRB may have given approval, the study must conform to all ISEF regulations

BELOW – IRB USE ONLY

MUST BE COMPLETED BY INSTITUTIONAL REVIEW BOARD (IRB) AFTER REVIEW OF THE RESEARCH PLAN. ALL QUESTIONS MUST BE ANSWERED FOR THE APPROVAL TO BE VALID. (IF NOT APPROVED, RETURN PAPERWORK TO THE STUDENT WITH INSTRUCTIONS FOR MODIFICATIONS.)

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This form is to be filled out by the SCHOOL IRB and not the regional science fair review committee (SRC). However, be sure that your school IRB is aware of the rules and limitations of student research projects. For more information and the full list of rules: https://student.societyforscience.org/human-participants

Notice that there is no more "expedited review" in this section

☐ Yes ☐ No ☐ Not applicable (No participants 18 yrs or older in this study)

IRB SIGNATURES (All 3 signatures required) None of these individuals may be the adult sponsor, designated supervisor, qualified scientist or related to (e.g., mother, father of) the student (conflict of interest).

I attest that I have reviewed the student's project, that the checkboxes above have been completed to indicate the IRB determination and that I agree with the decisions above.

Medical or Mental Health Professional (a psychologist, medical doctor, licensed social worker, licensed clinical professional coun physician's assistant, doctor of pharmacy, or registered nurse) with expertise related to this project.

Printed Name | Degree/Professional Li nse

Signature | Date of Approval (M erimentation.) (mm/dd/yy)

This must be dated **BEFORE** the "Actual Start Date" on form 1A

This CANNOT be the same teacher that signed as the "Adult Sponsor"

Educator

Printed Name | Degree/Professional Lice e

Signature | Date of Approval (Mus mentation.) (mm/dd/yy)

This must be dated **BEFORE** the "Actual Start Date" on form 1A

School Administrator

Printed Name | Degree/Professional Licens

Signature | Date of Approval (Must perimentation.) (mm/dd/yy)

This must be dated **BEFORE** the "Actual Start Date" on form 1A

Human Informed Consent Form

Instructions to the Student Researcher(s): An informed consent/assent/permission form should be developed in consultation with the Adult Sponsor, Designated Supervisor or Qualified Scientist.
This form is used to provide information to the research participant (or parent/guardian) and to document written informed consent, minor assent, and/or parental permission.

- When written documentation is required, the researcher keeps the original, signed form.
- Students may use this sample form or may copy ALL elements of it into a new document.

If the form is serving to document parental permission, a copy of any survey or questionnaire must be attached.

Student Researcher(s): _____

Title of Project: _____

I am asking for your voluntary participation in my science fair project. Please [illegible]ormation about the project. If you would like to participate, please sign in the appropri[illegible]

Purpose of the project:

If you participate, you will be asked to:

Time required for participation:

Potential Risks of Study:

Benefits:

How confidentiality will be maintained:

This is just an example of a consent form. You MUST submit a copy of whatever consent form was used. If the survey was done online, submit a copy of all of the consent questions used as a part of that survey

If you have any questions about this study, feel free to contact:

Adult Sponsor/QS/DS: _____ Phone/email: _____

Voluntary Participation:
Participation in this study is completely voluntary. If you decide not to participate there will not be negative consequences. Please be aware that if you decide to participate, you may stop participating at any time and you may decide not to answer any specific question.

By signing this form I am attesting that I have read and understand the information above and I freely give my consent/ assent to participate or permission for my child to participate.

Adult Informed Consent or Minor Assent Date Reviewed & Signed: _____ (mm/dd/yy)

_____ _____

Research Participant Printed Name: Signature:

Parental/Guardian Permission (if applicable) Date Reviewed & Signed: _____ (mm/dd/yy)

_____ _____

Parent/Guardian Printed Name: Signature:

Vertebrate Animal Form (5A)

Required for all research involving vertebrate animals that is conducted in a school/home/field research site. (SRC approval required before experimentation.)

Student's Name(s)_____

Title of Project_____

_____

To be completed by Student Researcher:

1. Common name (or Genus, species) and number of animals used.

2. Describe completely the housing and husbandry to be provided. Include the cage/pen size, number of animals per cage, environment, bedding, type of food, frequency of food and water, how often animal is observed, etc. Add an additional page as necessary.

3. What will happen to the animals after experimentation?

4. Attach a copy of wildlife licenses or approval forms, as applicable

5. The ISEF Vertebrate Animal Rules require that any death, illness or unexpected weight loss be investigated and documented by a letter from the qualified scientist, designated supervisor or a veterinarian. If applicable, attach this letter with this form when submitting your paperwork to the SRC prior to competition.

To be completed by Local or Affiliate Fair Scientific Review Committee (SRC) BEFORE experimentation.

Level of Supervision Required for agricultural, behavioral or nutritional studies (select one):

- ☐ Designated Supervisor REQUIRED. Please have applicable person sign below.
- ☐ Veterinarian and Designated Supervisor REQUIRED. Please have applicable persons sign below.
- ☐ Veterinarian, Designated Supervisor and Qualified Scientist REQUIRED. Please have applicable persons sign below and have the Qualified Scientist complete Form (2).

The SRC has carefully reviewed this study and finds it is an appropriate study that may be conducted in a non-regulated research site.

Local or Affiliate Fair SRC Pre-Approval Signature:

SRC Chair Printed Name | Signat | Date of Approval (must b experimentation) (mm/d

This must be dated **BEFORE** the "Actual Start Date" on form 1A

To be completed by Veterinarian:

- ☐ I have reviewed this research and ani with the student before the start of experi
- ☐ I have approved the use and dosages drugs and/or nutritional supplements
- ☐ I will provide veterinary medical and case of illness or emergency. (Fees

Printed Name | Email/Pho

Signature | Date of Approval (mm/dd/yy)

To be completed by Designated Sup Qualified Scientist when applicable

- ☐ I have reviewed this research and an with the student before the start of exper I accept primary responsibility for the ing of the animals in this project.
- ☐ I will directly supervise the e

This must be dated **BEFORE** the "Actual Start Date" on form 1A

Printed Name | Email/Pho

Signature | Date of Approval (mm/dd/yy)

Vertebrate Animal Form (5B)

Required for all research involving vertebrate animals that is conducted in at a Regulated Research Institution. (IACUC approval required before experimentation. Form must be completed and signed after experimentation.)

Student's Name(s) _____

Title of Project _____

Title and Protocol Number of IACUC Approved Project _____

You MUST include a copy of the actual IACUC form with the protocol number

To be completed by Qualified Scientist or Principal Investigator:

1. Species of animals used: _____ Number of animals used: _____

2. Describe, in detail, the role of the student in this project: animal procedures and related equipment that were involved, oversight provided and safety precautions employed. (Attach extra pages if necessary.)

3. Was there any weight loss or death of any animal? If yes, attach a letter obtained from the qualified scientist, designated supervisor or a veterinarian documenting the situation and the results of the investigation.

4. Did the student's project also involve the use of tissues?
   - ☐ No
   - ☐ Yes; complete Forms 6A and 6B

5. What laboratory training, including dates, was provided to the student?

6. **Attach a copy of the Regulated Research Institution IACUC Approval.** A letter from the Qualified Scientist or Principal Investigator is not sufficient.

This must be dated **AFTER** the "End Date" on form 1A

Qualified Scientist/Principal Investigator

Printed Name

Signature Date (mm/dd

Potentially Hazardous Biological Agents Risk Assessment Form (6A)

Required for research involving microorganisms, rDNA, fresh/frozen tissue (including primary cell lines, human and other primate established cell lines and tissue cultures), blood, blood products and body fluids. SRC/IACUC/IBC approval required before experimentation.

Student's Name(s)_____

Title of Project_____

To be completed by the QUALIFIED SCIENTIST/DESIGNATED SUPERVISOR in collaboration with the student researcher(s). All questions are applicable and must be answered; additional page(s) may be attached.

SECTION 1: PROJECT ASSESSMENT

1. Identify potentially hazardous biological agents to be used in this experiment. Include the source, quantity and the biosafety level risk group of each microorganism.
2. Describe the site of experimentation including the level of biological containment.
3. Describe the procedures that will be used to minimize risk (personal protective equipment, hood type, etc.).
4. What final biosafety level do you recommend for this project given the risk assessment you conducted?
5. Describe the method of disposal of all cultured materials and other potentially hazardous biological agents.

SECTION 2: TRAINING

1. What training will the student receive for this project?
2. Experience/training of Designated Supervisor as it relates to the student's area of research (if applicable).

SECTION 3: For ALL CELL LINES, MICROORGANISMS AND TISSUES – To be completed by the QUALIFIED SCIENTIST or DESIGNATED SUPERVISOR - Check the appropriate box(es) below:

☐ Experimentation on the microorganisms/cell lines/tissues to be used in this study will NOT be conducted at a Regulated Research Institution, but will be conducted at a (check one) ☐BSL-1 or ☐BSL-2 laboratory (include a copy of the checklist for BSL-2). [This study has been reviewed by the local SRC and the procedures have been approved prior to experimentation.]

☐ Experimentation on the microorganisms/cell lines/tissues t d in this study will be conducted at a Regulated Research Institution and was approved by the appropri board prior to experimentation; institutional approval forms are attached.
Origin of cell lines:_____ C/IBC approval _____

☐ Experimentation on the microorgan /c sed in this study will be conducted at a Regulated Research Institution, which does n his type of study. The SRC has seen and approved the research plan and supporting docu edges the accuracy of the responses above.

This must be dated **BEFORE** the "Actual Start Date" on form 1A

CERTIFICATION – To be SIGNED by the Q NTIST or DESIGNATED SUPERVISOR

The QS/DS has seen this project's research ing documentation and acknowledges the accuracy of the information provided above. This study has been approved as a ( )☐BSL-1/☐BSL-2 study, and will be conducted in an appropriate laboratory.

QS/DS Printed Name _____ Date of review (mm/dd/yy)

SECTION 4: CERTIFICATION LO SRC

The SRC has seen this project's research plan nd acknowledges the accuracy of the information provided.

SRC Printed Name _____ Date of review (mm/dd/yy)

Do NOT write anything in this space

Human and Vertebrate Animal Tissue Form (6B)

Required for research involving fresh/frozen tissue (including primary cell lines, human and other primate established cell lines and tissue cultures), blood, blood products and body fluids. If the research involves living organisms please ensure that the proper human or animal forms are completed. **All projects using any tissue listed above must also complete Form 6A.**

Student's Name(s) _____

Title of Project _____

To be completed by Student Researcher(s):

1. What vertebrate animal tissue will be used in this study? Check all that apply.
   - ☐ Fresh or frozen tissue sample
   - ☐ Fresh organ or other body part
   - ☐ Blood
   - ☐ Body fluids
   - ☐ Primary cell/tissue cultures
   - ☐ Human or other primate established cell lines

2. Where will the above tissue(s) be obtained? If using an established cell line include source and catalog number.

3. If the tissue will be obtained from a vertebrate animal study conducted at a research institution attach a copy of the IACUC certification with the name of the research institution, the title of the study, the IACUC approval number and a copy of IACUC approval.

This must be dated **BEFORE** the "Actual Start Date" on form 1A

To be completed by the Qualified Scientist or Designated Supervisor:

☐ I verify that the student will work solely with organs, tissues, cultures or cells that will be supp…er by myself or qualified personnel from the laboratory; and that if vertebrate animals were euthanized the…nized for a purpose other than the student's research.

AND/OR

☐ I certify that the blood, blood products, tissues or body fluids in this project will be handle…h the standards and guidance set forth in U.S. Occupational Safety and Health Act, 29CFR, Subpar… Blood Borne Pathogens.

Printed Name	Signature	Date of Approval (mm/dd/yy) (Must be prior to experimentation.)
Title		Phone/Email
Institution		

Continuation/Research Progression Projects Form (7)

Required for projects that are a continuation/progression in the same field of study as a previous project. This form must be accompanied by the previous year's abstract and Research Plan/Project Summary.

Student's Name(s) _____

To be completed by Student Researcher: List all components of the current project that make it m previous research. The information must be on the form; use an additional form for previous year s.

If the project has been carried out (partially) before the start of 2022

Components	Current Research Project	Previous Researc
1. Title		
2. Change in goal/ purpose/objec- tive		
3. Changes in methodology		
4. Variable studied		
5. Additional changes		

Continuation projects **MUST** include this form. For the immediately prior year, researcher MUST include BOTH the Abstract & Research Plan. For any years farther back, the researcher MUST include the Abstract for each additional prior year's work.

For ALL projects that were conducted /began before January 1st, 2023

Attached are:

☐ Abstract and Research Plan/Project Summary, Year _____

I hereby certify that the above information is correct and that the current year Abstract & Certification and project display board properly reflect work done only in the current year.

Student's Printed Name(s)	Signature	Date of Signature (mm/dd/yy)