INTERNATIONAL RULES
FOR PRE-COLLEGE SCIENCE RESEARCH
GUIDELINES FOR SCIENCE AND ENGINEERING FAIRS 2022–2023
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## Engineering & Inventions Projects Guide

## Sources of Information

## Display & Safety Regulations

## Categories & Sub-Categories

## Information on Required Abstract

## Forms
The full text of the International Rules and forms in html and as a downloadable pdf.

ISEF RULES WIZARD
An interactive tool which asks questions about your intended project and provides a list of forms required.

ISEF RULES FAQs
Answers to questions that are commonly received in the email account src@societyforscience.org. We encourage you to submit suggestions.

THESE RULES ARE APPLICABLE FOR

The purpose of these rules is to:

- protect the rights and welfare of the student researcher
- protect the rights and welfare of human participants
- protect the health and welfare of vertebrate animal subjects
- protect and promote good stewardship of the environment
- ensure adherence to federal regulations
- ensure use of safe laboratory practices
- determine eligibility for competition in ISEF

For pre-review and approval of your project, find your fair at: https://findafair.societyforscience.org

For rules questions, contact the ISEF Scientific Review Committee: SRC@societyforscience.org

For general questions, contact: Society for Science Education Programs
1719 N Street, NW, Washington, DC 20036
office: 202-785-2255, fax: 202-785-1243
email: sciedu@societyforscience.org

The International Rules and Guidelines for Science Fairs is available at societyforscience.org/ISEF in multiple formats. Familiarity with the rules is critical for students, parents, teachers, mentors, fair directors and local and affiliated fair Scientific Review Committees (SRC) and Institutional Review Boards (IRB).

ETHICS STATEMENT
Student researchers, as well as adults who have a role in their projects, are expected to maintain the highest ethical standards. These standards include, but are not limited to:

- Integrity. Honesty, objectivity, and avoidance of conflicts of interest are expected during every phase of the project. The project should reflect independent research done by the student(s) and be free of fraudulent data and/or plagiarism and represent only one year's work.
- Legality. Compliance with all federal, state and local laws and regulations is essential. 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. All projects must be approved by a Scientific Review Committee (SRC), and when necessary must also be approved by an Institutional Review Board (IRB), Institutional Animal Care and Use Committee (IACUC), and/or Institutional Biosafety Committee (IBC). Native, genetically-altered, and/or invasive species, (e.g. insects, plants, invertebrates, vertebrates), pathogens, toxic chemicals or foreign substances reintroduced into the environment is prohibited. It is recommended that students reference their local, state or national laws and regulations.
- Respect for Confidentiality and Intellectual Property. Confidential communications, as well as patents, copyrights, and other forms of intellectual property must be honored. Unpublished data, methods, or results may not be used without permission, and credit must be given for all contributions to the research.
- Stewardship of the Environment. It is the responsibility of the researcher and the adults involved to protect the environment from harm. Introduction or disposal of native, genetically-altered, 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.

ACKNOWLEDGMENT OF RISKS. All projects involve some amount of risk. Everyone is expected to recognize the hazards, assess the risks, minimize the risks, and prepare for emergencies.

- Animal Care. Proper care and respect must be given to vertebrate animals. The use of non-animal research methods and alternatives to animal research are strongly encouraged and must be explored before conducting a vertebrate animal project. The guiding principles for the use of animals in research includes the following “Four R’s:” Replace, Reduce, Refine, Respect.
- Human Participant Protection. The highest priority is the health and well-being of the student researcher(s) and human participants.
- Potentially Hazardous Biological Agents (PHBAs). It is the responsibility of the student and adults involved in the project to conduct and document a risk assessment, and to safely handle and dispose of organisms and materials.

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 ISEF. Society for Science reserves the right to revoke recognition of a project subsequently found to have been fraudulent.

ELIGIBILITY/LIMITATIONS
1. Each ISEF-affiliated fair may send to ISEF the number of projects allocated and committed to within their affiliation agreement.
2. A student must be selected by an ISEF-affiliated fair, and meet both of the following:
   a. be in grades 9-12 or equivalent; and
   b. not have reached age 20 on or before May 1 preceding the fair year in which the student participates.
3. English is the official language of ISEF. Student project boards and abstracts must be in English.
4. Each student is only allowed to enter one project. That project may include no more than 12 months of continuous research, and may not include research performed before January 2022.
5. Team projects must have no more than three members. Teams competing at ISEF must be composed of the original members who competed at the ISEF-affiliated fair and must all meet ISEF eligibility requirements.
6. Students may compete in only one ISEF affiliated fair, except when proceeding to a state/national fair affiliated with ISEF from an affiliation agreement.
7. Projects that are demonstrations, ‘library’ research or informational projects, and/or ‘explanation’ models are not recommended or appropriate for ISEF.
8. All sciences and engineering disciplines are represented at ISEF, but fairs may choose to participate in only one of the 21 categories. Review a complete list of categories and sub-categories with definitions.
9. A research project may be a part of a larger study performed by professional scientists, but the project presented by the student must be only their own portion of the complete study.

REQUIREMENTS

GENERAL
1. All domestic and international students competing in an ISEF-affiliated fair must adhere to all rules as set forth in this document.
2. All projects must adhere to all of the tenets of the Ethics Statement.
3. It is the responsibility of the student and the Adult Sponsor to evaluate the study to determine which forms are required and whether approval by a committee must be obtained prior to experimentation.
4. Projects competing at ISEF must have an exhibit that adheres to ISEF Display & Safety requirements and is visible during all open hours of the exhibit hall without reliance on electricity or internet connections.
APPROVAL AND DOCUMENTATION

1. Project documentation should begin before experimentation with the current forms available. Projects involving human participants, vertebrate animals, and potentially hazardous biological agents must be reviewed and approved by a local or regional Institutional Review Board (IRB) or Scientific Review Committee (SRC) prior to the start of experimentation. Note: If a project involves the testing of a student designed invention, prototype or concept by a human, an IRB review and approval may be required prior to experimentation. See Human Participants Rules for details.

2. Every student must complete the Student Checklist (1A), a Research Plan/Project Summary and Approval Form (1B) and review the project with the Adult Sponsor in coordination with completion by the Adult Sponsor of the Checklist for Adult Sponsor (1).

3. A Qualified Scientist is required for all studies involving Biosafety Level 2 (BL2), hazardous substances, hazardous agents, DEA-controlled substances and is also required for many human participant studies and many vertebrate animal studies.

4. After initial IRB/SRC approval (if required), any proposed changes in the Student Checklist (1A) and Research Plan/Project Summary must be re-approved before laboratory experimentation/analysis.

5. Projects which are continuations of a previous year’s work and which require IRB/SRC approval may undergo the review process with the current year Research Plan/Project Summary prior to experimentation/data collection for the current year.

6. Any continuing project must document that the additional research is a substantive expansion from prior work (e.g. testing a new variable or new line of investigation). Repetition of previous experimentation with the same methodology and research question, even with an increased sample size, is an example of an unacceptable continuation.

7. The display board and abstract must reflect the current year’s work only. The project title displayed in the finalist’s booth may mention years (for example, “Year Two of an Ongoing Study”). Previous year’s database, research papers and supporting documents may be at the booth if properly labeled as such.

8. Longitudinal studies are permitted as acceptable continuations under the following conditions:
   a. The study is a multi-year study testing or documenting the same variables in which time is a critical variable. (Examples: Effect of high rain or drought on soil in a given basin, return of flora and fauna in a burned area over time.)
   b. Each consecutive year must demonstrate time-based change.
   c. The display board must be based on collective past conclusionary data and its comparison to the current year data set. No raw data from previous years may be displayed.

9. All projects must be reviewed and approved each year and forms must be completed for the new year.

TEAM PROJECTS

1. Team projects compete and are judged in the category of their research at ISEF. All team members must meet the eligibility requirements for ISEF.

2. Teams must have no more than three members. A team with members from different geographic regions may compete at an affiliated fair of one of its members, but not at multiple fairs. However, each affiliated fair holds the authority to determine whether teams with members outside of a fair’s geographic territory are eligible to compete, understanding that if the team wins the right to attend ISEF, all team members are strongly recommended for judging purposes. Regional or affiliated fairs may require a project data book and/or a research abstract (maximum) 250-word, one-page abstract which summarizes the student project.

3. 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 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 the same judging criteria as individual projects.

4. Each team member must submit an Approval Form (1B) to the Adult Sponsor for review. A copy of the Checklist for Adult Sponsor (1), a Student Abstract (1A), a Research Plan/Project Summary and other required forms.

5. Full names of all team members must appear on the abstract and forms.

ROLES AND RESPONSIBILITIES OF STUDENTS AND ADULTS

THE STUDENT RESEARCHER(S)

The student researcher is responsible for all aspects of the research project:

• Enlisting the aid of any required supervisory adults (Adult Sponsor, Qualified Scientist, etc.)

• Following the International Rules & Guidelines, obtaining all necessary approvals (SRC, IRB, etc.) and completing all appropriate documentation

• Performing the project (which may include, but is not limited to) experimentation, data collection, engineering, data analysis, and any other process or procedures related to the project

• Understanding and abiding by the Ethics Statement and any conditions dictated on Approval Form 1B. 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 SRC or IRB reviewing that project.

THE ADULT SPONSOR

Qualifications:

• An Adult Sponsor may be a teacher, parent, professor, and/or other professional scientist

• Should be knowledgeable in the area of student research, be familiar with the regulations around procedures and materials that pertain to the student project, particularly when working with human participants, vertebrate animals, potentially hazardous biological agents or hazardous chemicals, devices or activities.

• Should have close contact with the student throughout the timeline of the project.

Responsibilities:

• Working with the student to evaluate any possible risks involved in the experiment to ensure the health and safety of the student conducting the research and the humans and/or animals involved in the study.

• Reviewing the student’s Student Checklist (1A) and Research Plan/Project Summary to ensure that:
   a. experimentation follows local, state, and federal laws
   b. all forms are completed by other required adults
   c. any required Qualified Scientist meets the criteria as set forth in the ISEF Rules and Guidelines
   d. the student’s research is eligible for entry in ISEF

THE QUALIFIED SCIENTIST

Qualifications:

• Earned a doctoral/professional degree in a scientific discipline related to student’s area of research

• Individual with extensive experience and expertise in the student’s area of research

• Must be thoroughly familiar with the following regulations that govern the student’s area of research including all local, state, Federal and if applicable, non-U.S. national regulations and laws.

• Can also serve as the Adult Sponsor, if that person meets both sets of qualifications.

• May serve in this capacity and be not local to the student, in which case, a Designated Supervisor must be appointed and trained to serve as the onsite supervision as necessary for the specific student project.

Responsibilities:

The Qualified Scientist is responsible for:

• Reviewing the ISEF rules relevant to the project and approving the student’s research plan or engineering design prior to the start of experimentation

• Providing direct supervision throughout the timeline of the project or coordinating with a Designated Supervisor to serve in this capacity

• Ensuring the proper training of the Student Researcher and/or Designated Supervisor in the necessary procedures

• Completing the required documentation which will include the regulated Research Institutional Setting Form (1C), the Qualified Scientist Form (2) and the Risk Assessment Form (3), when applicable.

THE DESIGNATED SUPERVISOR (DS)

Qualifications:

• Does not need an advanced degree

• Must be familiar with the student’s project and agree to any and all required restrictions

• May also serve as the Adult Sponsor for the project

• If the project involves the use of Vertebrate Animals (where behavior/habitat is influenced by humans), must be
knowledgeable about the humane care and handling of the animals

Responsibilities:
- Providing direct supervision of the student experimentation
- Completing the required documentation — the Designated Supervisor box on the Qualified Scientist Form (2) when applicable
- Reviewing and completing the Risk Assessment Form (3) when needed

REVIEW COMMITTEES
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 or SRC reviewing that project or any other committee. Additional members are recommended to help avoid a potential conflict of interest and to increase the expertise of the committee.

AFFILIATED FAIR SCIENTIFIC REVIEW COMMITTEE (SRC)
A 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. Affiliated Fairs may authorize local SRCs to serve in this prior review capacity. The operation and composition of the local and Affiliated Fair SRCs must fully comply with the International Rules. Directions for obtaining preapproval are available from the affiliated fair. A list of fairs can be found at https://findfair.societyforscience.org/

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 which were conducted at a Regulated Research Institution, industrial setting or any work other than school, school field and which were reviewed and approved by the proper institutional board before experimentation, must also be approved by the Affiliated SRC.

An SRC must consist of a minimum of three persons, including the following:
- a biomedical scientist with an earned graduate degree
- an educator
- at least one additional member

Additional expertise: Many project evaluations require additional expertise (e.g., on biosafety and/or animal research). If the SRC needs an expert as one of its members and one is not in the immediate area, all documented contact with an exterior expert must be submitted. If animal research is involved, at least one member must be familiar with proper animal care procedures. Depending on the nature of the study, this person can be a veterinarian or animal care provider with training and/or experience in the species being studied.

A Scientific Review Committee (SRC) examines projects for the following:
- Evidence of proper supervision

FOR HUMAN PARTICIPANT PROJECTS REVIEW — THE INSTITUTIONAL REVIEWBOARD (IRB)
An Institutional Review Board (IRB) is a committee that, according to federal regulations (45-CFR-46), 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 support from the local community involvement. Therefore, it is advisable that an IRB be established at the school level to evaluate human research projects. If necessary, the local or ISEF-affiliated SRC can serve as an IRB as long as it has the required membership. An IRB must consist of a minimum of three members including the following:
- An educator
- A school administrator (preferably principal or vice principal)
- A medical or mental health professional. The medical or mental health professional may be a medical doctor, nurse practitioner, physician's assistant, doctor of pharmacy, registered nurse, psychologist, licensed social worker or licensed clinical professional counselor. The medical or mental health professional on the IRB may change depending on the nature of the study. This person must be knowledgeable about and capable of evaluating the physical and/or psychological risk involved in a given study.

Additional Expertise: If an expert is not available in the immediate area, documented contact with an exterior expert is recommended. A copy of all correspondence with the expert (e.g., emails) must be attached to Form 4 and can be used in lieu of the signature of that expert.

There exist at federally Regulated Research Institutions (e.g., universities, medical centers, NIH, correctional facilities). Prisoner advocates must be included on the IRB when research participants are incarcerated. The institutional IRB must initially review and approve all proposed research conducted at or sponsored by that institution. The Adult Sponsor and the local IRB are required to ensure that the project is appropriate for a pre-college student and adheres to ISEF rules. It is the responsibility of the members of the IRB to thoroughly review the Research Plan and collectively decide whether to approve the project, request revisions to the methodology, or reject it.
RULES

1. Student researchers must complete ALL elements of the Human Participants portion of the Research Plan/Project Summary Instructions and evaluate and minimize the physical, psychological, ethical, or privacy risks involved in the student-designed project. See Risk Assessment information on page 11 and the online Risk Assessment Guide (https://student.society forsience.org/ISEF-human-participants/ risk-assessment) for additional information.

2. Student research involving human participants must be reviewed and approved by an Institutional Review Board (IRB) (See page 6) before any interaction (e.g., recruitment, data collection) with human participants or if the research involves the potential risks to the participant(s) that are delineated in the Research Plan.

HUMAN PARTICIPANTS RULES

Rules involving human participants

The following rules were developed to help pre-college student researchers adhere to the federal regulations regarding human participants, and the student researcher. Health and well-being is of the highest priority when students conduct research with human participants.

According to Code of Federal Regulation 45, CFR 46, a human participant is a living individual about whom an investigator conducting research obtains information or data through intervention or interaction with individual(s) or (2) identifiable private information.

Examples of projects that are considered “human participant research” include:

- Participants in physical activities (e.g., physical exertion, ingestion of any substance, any medical procedure)
- Psychological, educational and opinion studies (e.g., surveys, questionnaires, tests)
- Studies in which the researcher is the subject of the research
- Testing of student designed invention, prototype or computer application by human participants other than student researcher
- Data/record review projects that include data that are not de-identified/anonymous (e.g., data set that includes name, birth date, phone number or other identifying variables)
- Behavioral observations that:
  a. involve any interaction with the observed individual(s) or where the researcher has modified the environment (e.g., post a sign, place an object).
  b. occur in non-public or restricted access settings (e.g., day care setting, doctor’s office)
  c. involve the recording of personally identifiable information.

b. Projects that are conducted at a Regulated Research Institution (IRI) (e.g., university, hospital, medical center, government lab) must have IRB approval from the RRI. A copy of the IRB approval for the project must be obtained. A letter from an adult mentor and/or Qualified Scientist is not sufficient documentation of the RRI IRB review and approval process.

3. The student must comply with all determinations made by the School or RRI IRB before beginning any interaction with human participants. For example:

- a. If the IRB requires a Qualified Scientist (QS), Form 2 must be completed by the QS before any interaction with human participants. The School IRB will review this completed form before approving the project.
- b. If the IRB requires a Designated Supervisor (DS), Form 3 must be completed before any interaction with human participants. The School IRB will review this completed form before approving the project.
- c. See rule #4 below regarding required procedures for obtaining informed consent/assent and/or parental permission.

4. Participation in research may begin only after research participants have voluntarily given informed consent/assent (in some cases with parental permission). Adult research participants may give their own consent. Research participants under 18 years of age and/or individuals not able to give consent (e.g. developmentally disabled individuals) give their assent, with the parent/guardian providing permission.

Project developers are responsible when the assent (parental permission may be a) verbal or b) must be written. See the Risk Assessment information on page 11 and the online Risk Assessment Guide for further explanation of informed consent.

a. Informed consent requires that the researcher provides complete information to the participant and (where applicable, parents or guardians) about the risks and benefits associated with participation in the research study, which then allows the participants and parents or guatyners to make an informed decision about whether or not to participate.

b. Participants must be informed that their participation is voluntary and that they are free to stop participating at any time (i.e., they may withdraw or sever participation, with no adverse consequences of non-participation or abstained participation).

Informed consent may not involve coercion.

When written parental permission is required and the study includes a survey, the survey must be attached to the consent form.

The student researcher may request that the IRB waive the requirement for written informed consent/parental permission in his/her research plan if the project meets specific requirements. See section on IRB waivers for more information about written parental permission and/or written informed consent can be waived by the IRB.

5. The research study must be in compliance with all privacy laws (e.g., U.S. Family Educational Rights and Privacy Act (FERPA) and Health Insurance Portability and Accountability Act (HIPAA)) when they apply to the project (e.g. the project involves medical information).

6. Students are prohibited from independently diagnosing medical conditions, providing medical treatment, or administering medication/treatment and/or performing medical procedures on human participants.

a. A student may observe and collect data for analysis of medical treatments, medication/treatment efficacy, and diagnosis of illness, only under the direct supervision of a licensed health care provider/professional.

b. This Healthcare provider/professional must be named in the specification of the project approved by the IRB. The IRB must also confirm that the student is not violating the appropriate practice act (medical, nursing, pharmacy, etc.) of the state or country in which he/she is conducting the research.

Students are prohibited from providing diagnostic or medical information to participants without direct supervision of a qualified medical professional. This includes publishing diagnostic apps on public websites or app stores without appropriate FDA approvals.

7. Student researchers may NOT publish or display information in a report that identifies the human participants directly or through identifiers linked to the participants (including photographs) without the written consent of the participant(s) (Public Health Service Act, 42, USC 241 (d)).

8. All surveys and instruments that will be used in the research must be reviewed and approved by the IRB (See Risk Assessment information on page 11 and the online Risk Assessment Guide for further explanation of IRB review and pre-approval is required when the student-designed invention, prototype, computer application, engineering/design consumer products, requires an IRB review to involve perception, cognition, or game theory, publications, or.regulate the collection, use and distribution of the test must be in accordance with the 标准 and/or legal requirements, including procurement of legal copies of the instrument.

9. Studies that involve the collection of data via use of the internet (e.g., email, web-based surveys) are allowed, but researchers should be aware that they pose challenges in collecting anonymous data, obtaining informed consent, and ensuring that participants are of the appropriate age to give informed consent.

a. Studies that involve the use of minors in conducting online surveys must have Informed Consent and the psychologist provide written parental permission before the survey may be given to the minor. The procedures used to obtain parental permission must be described in the Research Plan.

b. In order to protect the confidentiality of the participants, it may be necessary that IP addresses, as well as the data provided, be safeguarded. Precautions must be delineated in the Research Plan.

For suggestions as to how to comply with 9a and 9b above please see the Online Survey Consent Procedures.

10. After initial IRB approval, a student with any proposed changes in the Research Plan must repeat the approval process and reapply for approval with updated intervention (recruitment, data collection) with human participants.

11. After experimentation and before competition, the Affiliate Fair SRC will review for compliance with all rules.

12. The following forms are required for studies involving human participants:

a. Checklist for Adult Sponsor (1), Student Checklist (1A), Research Plan/Project, and Approval Form (1B)

b. Human Participants Form (4) for projects reviewed by the School IRB or IRB approval documentation from an RRI determined to be non-human participants and surveys (e.g., study of computer games, etc. that do not involve gathering personal information, invasion of privacy or potential for emotional distress.

b. Surveys, questionnaires, or activities that are determined by the IRB to involve perception, cognition, or game theory, etc. and that do NOT involve gathering personal information, invasion of privacy or potential for emotional distress.

b. Studies involving medical activity where the IRB determines that there is no minimal risk and where the probability and magnitude of harm or discomfort anticipated in the research are not greater than those ordinarily encountered in daily life, or usual medical practices.

If there is any uncertainty regarding the appropriateness of waiving written informed consent/parental permission, it is strongly recommended that documentation of written informed consent/parental permission be obtained.

HUMAN PARTICIPANT INVOLVEMENT IN STUDENT-DESIGNED INVENTION, PROTOTYPE, COMPUTER APPLICATION, ENGINEERING/DESIGN CONSUMER PRODUCTS & PROJECT TESTING

Student-designed invention, prototype, computer application, engineering/design projects and product testing that involve testing of the invention or consumer product by any human participant requires obtaining both the individual(s) testing or trying out the invention/prototype.

IRB review and pre-approval is required when the student-designed invention, prototype, application, etc. is tested by human participants other than the student researcher(s) or (2) identifiable private information.

Single student guardian/adult sponsor/QT/QS/DS when the testing requires an adult tester. This includes surveys conducted regarding the use of the internet, surveys, and/or questionnaires on consumer product and/or opinions regarding the product/project.

Human participants testing of an invention, prototype or project that involves a medical diagnosis or intervention (as defined by the FDA or Medical Practices Act) must adhere to Rule 6 of the Human Participant Rules regarding prohibition of medical procedures and be supervised by a health care professional with board certification and specialization in the area of medical diagnosis or intervention being studied.

3. A Risk Assessment Form 3 is required for all projects that involve human participant testing of any project involving student-designed inventions, prototypes or consumer products.
EXEMPT STUDIES (DO NOT REQUIRE IRB PREAPPROVAL OR HUMAN PARTICIPANTS PAPERWORK)

Some studies involving humans are exempt from IRB pre-approval or additional human participant forms. Exempt projects for ISEF and affiliated fairs are:

1. Student-designed Invention, Prototype, Computer Applications, Engineering/Design Project or Consumer Product Testing in which the student researcher is the only person testing the invention, prototype, computer application or consumer product and the testing does not pose a health or safety hazard.
   a. The exemption can also apply when the human participant testing is a single adult guardian or Adult Sponsor/DS/DS when the testing requires an adult tester.
   b. It is required that a Risk Assessment Form (3) be completed for all such projects.
   c. IRB review and pre-approval is required if the project involves more than the student researcher or any introduction of a human variable or factor in the testing of a consumer product/invention/prototype/application (e.g., amount of sleep, strength or endurance of tester, etc.).

2. Data/record review studies (e.g., baseball statistics, crime statistics) in which the data are taken from preexisting data sets that are publicly available and/or published and do not involve any interaction with humans or the collection of any data from a human participant for the purpose of the student’s research project.

3. Behavioral observations of unrestricted, public settings (e.g., shopping mall, public park) in which all of the following apply:
   a. the researcher has no interaction with the individuals being observed
   b. the researcher does not manipulate the environment in any way
   c. the researcher does not record any personally identifiable data.

4. Projects in which the student receives pre-existing/retrospective data in a de-identified/anonymous format which complies with both of the following conditions:
   a. the professional providing the data certifies in writing that the data have been appropriately de-identified before being given to the student researcher and are in compliance with all privacy and HIPAA laws, and
   b. the affiliated fair SRC ensures that the data were appropriately de-identified by review of the written documentation provided by the supervising adult(s).

HUMAN PARTICIPANT & IRB RESOURCES

Use this information to help determine the level of risk involved in a study involving human participants.

All human participant projects are considered to have some level of risk. More than minimal risk exists when the possibility of physical or psychological harm or harm related to breach of confidentiality or invasion of privacy is greater than what is typically encountered in everyday life. Most of these studies require documented informed consent or minor assent with the permission of parent or guardian (as applicable).

1. Examples of Greater than Minimal Physical Risk
   a. Exercise other than ordinarily encountered in everyday life.
   b. Ingestion, tasting, smelling, or application of a substance. However, ingestion or tasting projects that involve commonly available food or drink will be evaluated by the IRB which determines risk level based upon the nature of the study and local norms.
   c. Exposure to any potentially hazardous material.

2. Examples of Greater than Minimal Psychological Risk
   A research activity (e.g. survey, questionnaire, viewing of stimuli) or experimental condition that could potentially result in emotional stress. Some examples include: answering questions related to personal experiences such as sexual or physical abuse, divorce, depression, anxiety; answering questions that could result in feelings of depression, anxiety, or low self esteem; or viewing violent or distressing visual images.

3. Privacy Concerns
   a. The student researcher and IRB must consider whether an activity could potentially result in negative consequences for the participant due to invasion of privacy or breach of confidentiality. Protecting confidentiality requires measures to ensure that identifiable research data are not disclosed to the public or unauthorized individuals.
   b. Risk level can be reduced by protecting confidentiality or collecting data that is strictly anonymous. This requires the collection of research in such a way that it is impossible to connect research data with the individual who provided the data.

4. Risk Groups
   If the research study includes participants from any of the following groups, the IRB and student research must consider whether the nature of the study requires special protections or accommodations:
   a. Any member of a group that is naturally at-risk (e.g. pregnant women, developmentally disabled persons, economically or educationally disadvantaged persons, individuals with diseases such as cancer, asthma, diabetes, AIDS, dyslexia, cardiac disorders, psychiatric disorders, learning disorders, etc.)
   b. Special groups that are protected by federal regulations or guidelines (e.g. children/minors, prisoners, pregnant women, students receiving services under the Individuals with Disabilities Education Act (IDEA). See the online Risk Assessment Guide and Online Survey Consent Procedures for more detailed information on risk assessment.
RULES FOR ALL VERTEBRATE ANIMAL STUDIES

must be considered a vertebrate animal and the entire study is
However, regardless of time of treatment, survival past the 7 days
be used. Include methods and procedures, such as experimental design and
data analysis; description of the procedures that will minimize the potential for discomfort, distress, pain and injury to the animal during the course of experimentation, identification of the species, strain, sex, age, weight, source and number of animals proposed for use.

1. All vertebrate animal studies must be reviewed and approved before experimentation begins. An Institutional Animal Care and Use Committee, known as an IACUC, is the institutional governing body for all animal studies at a Regulated Research Institution. The local or affiliated fair SRSC serves in this capacity for vertebrate animal studies performed in a school field. Any SRSC meeting in this capacity must include a veterinarian or an animal care provider with training and/or experience in the species being studied.

2. Students performing vertebrate animal research must satisfy US federal law as well as local, state, and country laws and regulations of the jurisdiction in which research is performed.

3. Research projects which cause more than momentary or slight pain or distress are prohibited. Significant weight loss must be investigated and a veterinarian consulted to receive required medical care. This investigation must be documented on Vertebrate Animal Form 5A. A veterinarian, the Qualified Scientist or Designated Supervisor, who is qualified to determine the illness, or by a veterinarian. If the illness or distress is caused by the study, the experiment must be terminated immediately.

4. No vertebrate animal deaths due to the experimental procedures are permitted in any group or subgroup.

a. Studies that are designed or anticipated to cause vertebrate animal death are prohibited.

b. Any death that occurs must be investigated by a veterinarian, the Qualified Scientist or the Designated Supervisor who is qualified to determine if the cause of death was incidental or due to the experimental procedures. The project must be suspended until the cause is determined and then the results must be documented in writing.

c. If death was the result of the experimental procedure, the study must be terminated, and the study will not qualify for competition.

5. All animals must be monitored for signs of distress. Because significant weight loss is one sign of stress, weight must be recorded at least weekly with 15% being the maximum permissible weight loss or growth retardation (compared to control) of any experimental and/or control animal. Monitoring of weight loss must be done in a fashion that is safe for both the researcher and the animal, then an explanation and approval by an SRC or IACUC needs to be included in the research plan, as well as an alternative method(s) to address signs of distress. Additionally, body condition scoring (BCS) systems are available for most species of animals utilized in research and agriculture and are an objective method for assessing the overall health status of the research subject, with or without weight loss. A BCS system should be included in the design of any study utilizing live vertebrate animals and results regularly reviewed.

6. Students are prohibited from designing or participating in an experiment associated with the following types of studies on vertebrate animals.

a. Inquiry studies with known toxic substances that could cause pain, distress, or death, including but not limited to alcohol, acid rain, pesticides, or heavy metals or studies with the intent to study toxic effects of a specific industrial compound.

b. Experimental behaviors using with aversive stimuli, mother/infant separation or induced helplessness.

c. Studies of pain.

d. Studies/vertebrate prey experiments.

7. Justification is required for an experimental design that involves food or fluid restriction and must be appropriate to the species. If the restriction exceeds 18 hours, the project must be reviewed and approved by an SRC and conducted at a Regulated Research Institution (RRI).

8. Animals may not be captured from or released into the wild. If death was the result of the experimental procedure, the project must be suspended until the cause is determined and then the results must be documented on Vertebrate Animal Form 5A. A veterinarian, the Qualified Scientist or Designated Supervisor, who is qualified to determine if the cause of death was incidental or due to the experimental procedures. The project must be suspended until the cause is determined and then the results must be documented in writing.

9. If death is the result of the experimental procedure, the study must be terminated, and the study will not qualify for competition.

10. Additional Rules for Projects Conducted in a Regulated Research Institution

a. Animal studies performed in a Regulated Research Institution (RRI) must be conducted in a manner consistent with US Federal Animal Welfare Regulation. The research involves only non-invasive and non-intrusive procedures. The research involves only agricultural, behavioral, observational or supplemental nutritional studies on animals AND the research involves only non-invasive and non-intrusive methods that do not negatively affect an animal’s health or well-being.

b. All vertebrate animal studies that do not meet the criteria in Section A must be conducted in a Regulated Research Institution (RRI).

c. Animals must be housed in a clean, ventilated, comfortable environment appropriate for the species. They must be given a complete diet of commercially available diet and water and food supply. Cages, pens and fish tanks must be cleaned frequently. Proper care must be provided at all times, including weekends, holidays and vacations. An animal’s care must be observed daily to assess their health and well-being. For a project to be approved by the IACUC, it must be reviewed and approved by an SRC and conducted at a Regulated Research Institution (RRI).

11. Quality Assurance Manuals (QA) for the appropriate species.

a. Federal Animal Welfare Regulation

b. Guide for the Care and Use of Laboratory Animals

c. Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (Ag Guide)

d. Quality Assurance Manuals (for the appropriate species)

3. The local or affiliated fair Scientific Review Committee must determine if a veterinarian’s certification of the research and animal husbandry plan is required. This certification, as well as an SRC approval, is required before experimental procedures are documented on Vertebrate Animal Form 5A. A veterinarian must certify experiments that involve supplemental nutrition, administration of prescription drugs and/or activities that would not be ordinarily encountered in the animal’s daily life.

4. If an illness or emergency occurs, the affected animal(s) must receive proper medical or nursing care that is directed by a veterinarian. Students are not allowed to stop experimental procedures if there is unexpected weight loss or death in the experimental subjects. The experiment can only be resumed if the cause of illness or death is not related to experimental procedures and if appropriate steps are taken to eliminate the causal factors. If death is the result of the experimental procedure, the study must be terminated, and the study will not qualify for competition.

5. The final disposition of the animals must be conducted in a responsible and ethical manner, and must be described on Vertebrate Animal Form 5A.

6. Euthanasia for tissue removal and/or pathological analysis is not permitted for a project conducted in a school/home/farm setting.

7. Livestock or fish raised for food using standard agricultural/aquacultural production practices may be euthanized by a qualified adult for carcass evaluation.

8. The following forms are required:

a. Checklist for Adult Sponsor (1), Student Checklist (1A), Checklist for Adult Sponsor (2), Qualified Scientist Form (2), when applicable

b. Research Plan/Project Summary, and Approval Form (1B)

c. Vertebrate Animal Form (5A)

d. Qualified Scientist Form (2), when applicable

8. Additional Rules for Projects Conducted in a Regulated Research Institution

All studies not meeting the criteria in Section A that are otherwise permissible under ISEF rules must be conducted in a Regulated Research Institution (RRI). A Regulated Research Institution within the U.S. is defined as a professional research facility that is not necessarily inspected by the USDA and is licensed to use animals covered by the Animal Welfare Act and may also be subject to U.S.
students are permitted to do research projects with potentially hazardous biological agents meeting the conditions and rules described below which were designed to protect students and to ensure adherence to federal and international biosafety regulations and guidelines. When dealing with potentially hazardous biological agents, it is the responsibility of the student and all of the adults involved in a research project to conduct and document a risk assessment on Form (6A) to define the potential level of harm, injury or disease to plants, animals and humans that may occur when working with biological agents. The risk assessment determines a biosafety level which in turn determines if the project can proceed, and if so, the proposed laboratory facility is properly equipped and all personnel are trained and appropriate supervision is planned.

All projects involving microorganisms, recombinant DNA technologies and human or animal fresh/frozen tissues, blood or body fluids must adhere to the rules below AND, depending on the study, to the additional rules in Section A, B or C.

RULES FOR ALL STUDIES WITH POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS (PHBA)

1. Prior review and approval is required for the use of potentially hazardous microorganisms (including bacteria, viruses, viroids, prions, rickettsia, fungi, and parasitides), recombinant DNA (rDNA) technologies or human or animal fresh/frozen tissues, blood or body fluids.

2. Phi gress is submitted to the student after initial local or affiliated fair SRC approval. Representative examples include, but are not limited to the following major organisms: MRSA (Methicillin-Resistant Staphylococcus aureus), VISA/VRE (Vancomycin-Intermediate or Resistant Staphylococcus aureus), VRE (Vancomycin-Resistant Enterococci), CRE (Carbapenem-Resistant Enterobacteriaceae), ESBLs (Extended Spectrum Beta-Lactamase producing gram negative organisms), and fungi (yeasts or molds) with known resistance to antifungal pharmaceuticals.

3. Students are prohibited from performing research at a laboratory rated BSL-1 or higher unless the proposed laboratory facility is properly equipped and appropriate supervision is planned.

4. Research determined to be at Biosafety Level 1 (BSL-1) must be conducted in a BSL-1 or higher laboratory. The research must be supervised by a trained Designated Supervisor or a Qualified Scientist. The student must be properly trained in standard microbiological practices.

5. Research determined to be a Biosafety Level 2 (BSL-2) must be conducted in a laboratory rated BSL-2 or above (commonly limited to a Regulated Research Institution). The research must be reviewed and approved by the Institutional Biosafety Committee (IBC) if the Regulated Research Institution requires the review. For a high school BSL-2 laboratory, the SRC must review and approve. The research must be supervised by a Qualified Scientist.

6. Students are prohibited from designing or participating in BSL-3 or BSL-4 Research.

7. Laboratory studies designed to culture known clinically significant multidrug resistant organisms (MDROs) must have a written justification for usage and be conducted at a Regulated Research Institution laboratory with a minimum of BSL-2 containment and/or Institutional Biosafety Committee (IBC) review and approval. Representative examples include, but are not limited to the following major organisms: MRSA (Methicillin-Resistant Staphylococcus aureus), VISA/VRE (Vancomycin-Intermediate or Resistant Staphylococcus aureus), VRE (Vancomycin-Resistant Enterococci), CRE (Carbapenem-Resistant Enterobacteriaceae), ESBLs (Extended Spectrum Beta-Lactamase producing gram negative organisms), and fungi (yeasts or molds) with known resistance to antifungal pharmaceuticals.

8. Insertion of antibiotic resistance markers for the cloning selection of bioengineered organisms is permitted, with the following exceptions:

a. Students are prohibited from the insertion of antibiotic resistance traits or selection of organisms expressing traits that may affect the ability to provide effective treatment of infections acquired by humans, animals, or plants.

b. Students are prohibited from designing or selecting for multiple drug resistant organisms (MDROs) to investigate the pathology, development, or treatment of antibiotic-resistant infections.

9. Research determined to be at Biosafety Level 2 (BSL-2) or higher must be submitted to the student after initial local or affiliated fair SRC approval.

10. The culturing of human or animal waste, including sewage sludge, is considered a BSL-2 study.

11. Naturally-occurring plant pathogens may be studied (not cultured) at home, but may not be introduced into a home/garden environment.

12. All potentially hazardous biological agents must be properly disposed of at the end of experimentation in accordance with their biosafety level. For BSL 1 or BSL 2 organisms: Autoclave at 121 degrees Celsius for 20 minutes, use of a 10% bleach solution (1:10 dilution of domestic bleach), incineration, alkaline hydrolysis, biosafety pick-up and other manufacturer recommendations are acceptable.

13. Any proposed changes in the Research Plan/Project Summary by the student after initial local or affiliated fair SRC approval must be submitted subsequent SRC or IBC review and approval before such changes are made and before experimentation resumes.

14. The following forms are required:

a. Checklist for Adult Sponsor (1), Student Checklist (1A), Research Plan/Project Summary, and Approval Form (1B)
b. Regulated Research Institution Form (1C)
c. Qualified Scientist Form (2)
d. Vertebrate Animal Form (5B)
e. PHBA Risk Assessment Form (6A) for all studies involving tissues and body fluids.
f. Human and Vertebrate Animal Tissue Form (6B) for all studies involving tissues and body fluids.

g. All student research projects before experimentation begins. The initial risk assessment determined by the student researcher and adults supervising the project must be confirmed by the SRC, IBC or IACUC.

h. Experimentation involving the culturing of potentially hazardous biological agents, even BSL-1 organisms, is prohibited in a home environment. However, specimens may be collected at home as long as they are immediately transported to a laboratory with the BSL containment determined by the affiliated fair SRC.

i. Research determined to be at Biosafety Level 1 (BSL-1) must be conducted in a BSL-1 or higher laboratory. The research must be reviewed and supervised by a trained Designated Supervisor or a Qualified Scientist. The student must be properly trained in standard microbiological practices.

j. Research determined to be at Biosafety Level 2 (BSL-2) must be conducted in a laboratory rated BSL-2 or above (commonly limited to a Regulated Research Institution). The research must be reviewed and approved by the Institutional Biosafety Committee (IBC) if the Regulated Research Institution requires the review. For a high school BSL-2 laboratory, the SRC must review and approve. The research must be supervised by a Qualified Scientist.

k. Students are prohibited from designing or participating in BSL-3 or BSL-4 Research.

l. Laboratory studies designed to culture known clinically significant multidrug resistant organisms (MDROs) must have a written justification for usage and be conducted at a Regulated Research Institution laboratory with a minimum of BSL-2 containment and/or Institutional Biosafety Committee (IBC) review and approval. Representative examples include, but are not limited to the following major organisms: MRSA (Methicillin-Resistant Staphylococcus aureus), VISA/VRE (Vancomycin-Intermediate or Resistant Staphylococcus aureus), VRE (Vancomycin-Resistant Enterococci), CRE (Carbapenem-Resistant Enterobacteriaceae), ESBLs (Extended Spectrum Beta-Lactamase producing gram negative organisms), and fungi (yeasts or molds) with known resistance to antifungal pharmaceuticals.
A. Additional Rules for Projects Involving Unknown Microorganisms

Studies involving unknown microorganisms present a challenge because the concentration and pathogenicity of possible agents are unknown. In science fair projects, these studies typically involve the collection and culturing of microorganisms from the environment (e.g. soil, household surfaces, skin.)

1. Research with unknown microorganisms can be conducted in a BSL-1 study under the following conditions:
   a. Organism is cultured in a plastic petri dish (or other standard sterile container) and sealed.
   b. Experiment involves only procedures in which the petri dish remains sealed throughout the experiment (e.g., counting presence of organisms or colonies).
   c. The sealed petri dish is disposed of via autoclaving or disinfection under the supervision of the Designated Supervisor.

2. If a culture container with unknown microorganisms is opened for any purpose, (except for disinfection/disposal) it must be treated as a BSL-2 study and involve BSL-2 laboratory precautions.

B. Additional Rules for Projects Involving Recombinant DNA (rDNA) Technologies

Studies involving rDNA technologies in which microorganisms, plants and/or animals have been genetically modified require close review to assess the risk level assignment. Some rDNA studies can be safely conducted in a BSL-1 high school laboratory with prior review by a SRC.

1. All rDNA technology studies involving BSL-1 organisms and BSL-1 host vector systems, including commercially available kits, must be conducted in at least a BSL-1 laboratory under the supervision of a Qualified Scientist or Designated Supervisor and must be approved by the SRC prior to experimentation. Examples include cloning of DNA in E. coli K-12, S. cerevisiae, and B. subtilis host-vector systems.

2. An rDNA technology study using BSL-1 agents that may convert to BSL-2 agents during the course of experimentation must be conducted entirely in a BSL-2 facility.

3. All rDNA technology studies involving BSL-2 organisms and/or BSL-2 host vector systems must be conducted in a Regulated Research Institution and approved by the IBC prior to experimentation, where applicable.

4. Propagation of recombinants containing DNA coding for human, plant or animal toxins (including viruses) is prohibited. All genome editing studies that include alteration of germine cells, insertion of gene drives, use of rapid trait development systems (RTDS), etc., should be categorized as a BSL-2 study and must be conducted in an BSL-2 laboratory under the supervision of a Qualified Scientist. Known BSL-3 or BSL-4 organisms must be conducted in a BSL-3 laboratory or higher and must be supervised by a Qualified Scientist or trained Designated Supervisor.

5. The collection and examination of fresh/frozen tissues or body fluids (not including blood or blood products, see rule 7) from a non-infectious source with little likelihood of microorganisms present must be considered biosafety Level 1 studies and must be conducted in a BSL-1 laboratory or for research projects that are BSL-2 studies. The collection and examination of tissues, fluids, blood, or blood products before deciding upon the study must be considered a vertebrate animal project.

6. Human breast milk of unknown origin, unless certified free of HIV and Hepatitis C, and domestic unpasteurized animal milk are considered BSL-2.

7. All studies involving human or wild animal blood or blood products should be considered at a minimum a biosafety level 2 study and must be conducted in a BSL-2 laboratory under the supervision of a Qualified Scientist. Known BSL-3 or BSL-4 blood is prohibited. Studies involving domestic animal blood may be considered a BSL-1 level study. All blood must be handled in accordance with standards and guidelines set forth in the OSHA, 29CFR, Subpart Z. Any tissue or instruments with the potential of containing blood borne pathogens (e.g. blood, blood products, tissues that release blood when compressed, blood contaminated instruments) must be properly disposed of by autoclaving or disinfection.

8. Studies of human body fluids, where the sample can be identified with a specific person, must have IRB review and approval, and informed consent.

9. Any study involving the collection and examination of body fluids that may contain biological agents belonging to BSL-3 or BSL-4 is prohibited.

10. A project involving a student researching their own body fluids (if not cultured):
   a. can be considered a BSL-1 study
   b. must be conducted in a home setting
   c. must have IRB review if the body fluid is serving as a measure of an experimental procedure on the student researcher (e.g. studentamplerats diet and takes a blood or urine sample). An example of a project not needing IRB review would be collecting urine to serve as a deer repellent.
   d. must receive prior SRC review and approval prior to experimentation.

11. Studies involving embryonic human stem cells must be conducted in a Regulated Research Institution and reviewed and approved by the ESCRO (Embryonic Stem Cell Research Oversight Committee).

EXEMPT STUDIES (NO SRC PRE-APPROVAL REQUIRED)

The following types of studies are exempt from requiring SRC pre-approval as listed below, but may be subject to additional rules and/or be regulated dependent upon the design of the project. Student researchers and adult sponsors are required to refer to sections A, B, and C of this section to review additional rules for projects that involve unknown organisms, recombinant DNA (rDNA) technologies, tissues, fluids, blood, or blood products before deciding upon a final biosafety level (BSL) designation for projects.

a. Studies involving fermentation of baker’s yeast and/or decomposition of vertebrate organisms (such as in forensic projects)

b. Studies involving recombinant cell lines and tissue culture studies or use of antibiotic resistance genes

c. Studies involving recombinant retroviruses

d. Studies involving recombinant plasmids

e. Studies involving recombinant bacterial plasmids

f. Studies involving E. coli (and other strains of E. coli used solely as a food source for C. elegans) that are performed at school and are not subject to additional rules of recombinant DNA studies or use of antibiotic resistant organisms

EXEMPT TISSUES (NO SRC PRE-APPROVAL REQUIRED)

1. The following types of tissue do not need to be treated as potentially hazardous biological agents:
   a. Plant tissue (except those known to be toxic or hazardous)
   b. Plant and non-primate established cell lines and tissue culture collections (e.g., obtained from the American Type Culture Collection). The source and/or catalog number of the cultures must be identified in the Research Plan/Project Summary

2. Parents and/or guardians must sign appropriate forms to consent to the student researcher to themselves, blood collection from any other human participants must be reviewed and approved by an IRB.

3. Fresh or frozen meat, meat by-products obtained from food stores, restaurants, or packing houses and eggs or pasteurized milk.

4. Hair, hooves, nails and feathers

5. Teeth that have been sterilized to kill any blood-borne pathogens that may be present

6. Gossiped tissue or archeological specimens.

7. Sources of information are available as a separate section at the end of the document.
Risk assessment defines the potential level of harm, injury or disease to plants, animals, and humans that may occur when working with biological agents. The end result of a risk assessment is the assignment of a biosafety level which then determines the laboratory facilities, equipment, training, and supervision required.

Risk assessment involves:
1. Assignment of the biological agent to a risk group.
2. Studies involving a known microorganism must begin with an initial assignment of the microorganism to a biosafety level risk group based on information available through a literature search.
3. The study of unknown microorganisms and the use of fresh tissues relies on the expertise of the supervising adult(s).
4. Determination of the level of biological containment available to the student researcher to conduct the experimentation. (See “Levels of Biological Containment” for details.)
5. Assessment of the experience and expertise of the adult(s) supervising the student.

Classification of Biological Agents

Risk Groups

Biological agents are classified according to biosafety level risk groups. These classifications presume ordinary circumstances in the research laboratory, or growth of agents in small volumes for diagnostic and experimental purposes.

BSL-3 risk group contains biological agents that pose low risk to personnel and the environment. These agents are highly unlikely to cause disease in healthy laboratory workers, animals, and plants. Examples include: B. anthracis; Salmonella choleraesuis.

BSL-4 group are prohibited.

BSL-3 risk group contains biological agents that pose moderate risk to personnel and the environment. If exposure occurs in a laboratory situation, the risk of spread is limited and it rarely would cause infection that would lead to serious disease. Effective treatment and preventive measures are available in the event that an infection occurs. The agents require Biosafety Level 2 containment. Examples of BSL-3 organisms are: Agrobacterium tumefaciens, Micrococcus leuteus, Neurospora crassa, Bacillus subtilis.

BSL-2 risk group contains biological agents that pose low risk to personnel and the environment. If exposure occurs in a laboratory situation, the risk of spread is limited and it rarely would cause infection that would lead to serious disease. Effective treatment and preventive measures are available in the event that an infection occurs. The agents require Biosafety Level 2 containment. Examples of BSL-3 organisms are: Mycobacterium, Streptococcus pneumoniae, Salmonella choleraesuis.

BSL-3 risk group contains biological agents that usually cause serious disease (human, animal or plant) or that can result in serious economic consequences. Projects in the BSL-3 group are prohibited.

BSL-4 risk group contains biological agents that usually produce very serious disease (human, animal or plant) that is often untreatable. Projects in the BSL-4 group are prohibited.

Levels of Biological Containment

There are four levels of biological containment (Biosafety Level 1 – 4). Each level has guidelines for laboratory facilities, safety equipment and laboratory practices and techniques.

BSL-1 containment is normally found in water-testing laboratories, in high schools, and in colleges teaching introductory microbiology classes. Work is done on an open bench or in an appropriate biosafety hood. Standard microbiological practices are used when working in the laboratory. Decontamination can be achieved by treating with common disinfectants or by steam autoclaving. Lab coats and gloves are required. The laboratory work is supervised by an individual with general training in microbiology or a related science.

BSL-2 containment is designed to maximize safety when working with agents of moderate risk to humans and the environment. Access to the laboratory is restricted. Biological safety cabinets (Class 2, type A, BSC) must be available. An appropriate biohazard warning sign or decal must be displayed. Lab coats and gloves are required; eye protection and face shields must also be worn. The laboratory work must be supervised by a scientist who understands the risk associated with working with the agents involved.

BSL-3 containment is required for infectious agents that may cause serious or potentially lethal diseases as a result of exposure by inhalation. Projects in the BSL-3 group are prohibited.

BSL-4 containment is required for dangerous/exotic agents that pose high risk of life-threatening disease. Projects in the BSL-4 group are prohibited.

The following rules apply to research using hazardous chemicals, devices and activities. These include substances and devices that are regulated by local, state, country, or international law, most often controlled by the use of minor or DEA-controlled substances, prescription drugs, alcohol, tobacco, firearms and explosives. Hazardous activities are those that involve Level 3 biohazard agents and beyond that encountered in the student’s everyday life.

These rules are intended to protect the student researcher by ensuring proper supervision and the consideration of all potential risks so that the appropriate safety precautions are taken. Students are required to meet all standards imposed by ISEF, school, local, and/or regional fair(s).

RISK ASSESSMENT FOR ALL PROJECTS INVOLVING HAZARDOUS CHEMICALS, ACTIVITIES AND DEVICES

1. The student researcher must conduct a risk assessment in collaboration with a Designated Supervisor or Qualified Scientist prior to experimentation. This risk assessment should be documented in the research plan to include the risk assessment process, supervision, safety precautions and appropriate methods of disposal. This risk assessment is also documented on Risk Assessment Form 3.

2. The use of hazardous chemicals and devices in hazardous activities require direct supervision by a Designated Supervisor, except those involving DEA-controlled substances, which require supervision by a Qualified Scientist.

3. Student researchers must acquire and use regulated substances in accordance with all local, state, U.S. federal and country laws. For further information or classification for these laws and regulations, contact the appropriate regulatory bodies; students outside of the U.S. must adhere to the local, affiliated, and ISEF SRCs in their review prior to experimentation.

4. For all chemicals, devices or activities requiring a federal and/or state permit, the student/supervisor must obtain the permit prior to the onset of experimentation. A copy of the permit must be available for review by adults supervising the project and the local, affiliated, and ISEF SRCs in their review prior to competition.

5. The student researcher must minimize the impact of an explosive on the environment. Examples include using minimal quantities of chemicals that will require subsequent disposal, ensuring that all disposal is done in an environmentally safe manner and in accordance with good laboratory practices. (Proper chemical, sharps and other hazardous materials disposal must follow local, state, federal and ISEF SRCs regulations.)

6. The following forms are required:
   a. Checklist for Adult Sponsor (1), Student Checklist (1A), Research Plan/Project Summary and Approval Form (1B)
   b. Regulated Research Institution Form (1C), when applicable
   c. Qualified Scientist Form (2), when applicable
   d. Risk Assessment Form (3)

RISK ASSESSMENT FORM (3)

Use this information to complete PHBA Risk Assessment Form (6A).

1. Assignment of a biosafety level for the study based on risk group of biological agent, level of biological containment available and the expertise of the Qualified Scientist or Designated Supervisor who will be supervising the project.
2. Documentation of review and approval of study prior to experimentation:
   a. If a study is conducted at a non-regulated site (e.g., school), the SRC reviews the Research Plan/Project Summary.
   b. If the study was conducted at a Regulated Research Institution, and was approved by the appropriate institutional board (e.g., IBC, IACUC), the SRC reviews the institutional forms provided and documents SRC approval (Form 6A).
   c. If a PHBA study was conducted at a Regulated Research Institution but the institution does not require review for this type of study, the SRC must review the study and document approval on Form 6A that the student received appropriate training and the project complies with ISEF rules.

ADDITIONAL RULES FOR SPECIFIC REGULATED AREAS

There are additional rules for the following regulated areas:

A. DEA-controlled Substances
B. Prescription Drugs
C. Alcohol & Tobacco
D. Firearms and Explosives
E. Regulated Drones
F. Radiation

A. DEA-Controlling Substances

The Drug Enforcement Administration (DEA) regulates chemicals that can be diverted from their intended use to make illegal drugs. Other countries may have similar regulations. Students residing outside of the U.S. must adhere to their own country’s drug regulatory agency requirements in addition to U.S. DEA regulations. DEA-controlled substances and their schedule number are at the DEA website under Sources of Information. It is the responsibility of the student to consult this list if there is a possibility that substances used in experimentation could be regulated.

a. All studies using DEA-controlled substances must be supervised by a Qualified Scientist at a RRI (and must be conducted at a Regulated Research Institution) who is licensed by the DEA (or other international regulatory body) for use of the controlled substance.

b. All studies using DEA Schedule 1 substances (including marijuana) must have the research protocol approved by DEA before research begins. Schedule 2, 3 and 4 substances do not require protocol approval by DEA.

B. Prescription Drugs

In the United States, the Food and Drug Administration (FDA) regulates the issuance of prescriptions and thus they are controlled substances. State laws further regulate the use of prescription drugs and it is unlawful for any person knowingly or intentionally to possess a controlled substance unless it was obtained directly from a valid prescription or order of a practitioner while acting in the course of their professional practice. It is also unlawful to use the prescription for persons or purposes outside of the original prescription. All applicable federal, state and country laws must be followed.

1. Students are prohibited from the use of prescription drugs in the laboratory, in competition or otherwise.

2. Students are further prohibited from providing prescription drugs to human participants.

In the case of prescription drugs administered to vertebrate animals, this may only be done under a veterinarian’s supervision and with prescriptions provided for this specific purpose.
C. Alcohol and Tobacco

The U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB) regulates the production of alcohol and distribution of alcohol and tobacco products. Many such products are restricted by age for purchase, possession and consumption.

1. Fermentation studies in which minute quantities of ethyl alcohol are produced are permitted.
2. The Designated Supervisor is responsible for the acquisition, usage and appropriate disposal of the alcohol or tobacco used in the study.
3. Production of wine or beer by adults is allowable in the home and must meet TTB home production regulations. Students are allowed to design and conduct a research project, under direct parental supervision, involving the legal production of the wine or beer.
4. Students are prohibited from conducting experiments where consumable ethyl alcohol is produced by distillation. However, students are allowed to distill alcohol for fuel or other non-consumable products. To conduct the work, the work must be conducted at a school or a Regulated Research Institution and follow all local and country laws. See Alcohol and Tobacco Tax and Trade Bureau (TTB) website for details.

D. Firearms and Explosives

The U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), along with state agencies, regulates the purchase and use of firearms and explosives. A firearm is defined as a small arms weapon from which a projectile is fired by gunpowder. An explosive is any chemical compound, mixture or device, the primary purpose of which is to function by explosion.

Explosives include, but are not limited to, dynamite, black powder, pellet powder, detonators, and igniters. Explosives include, but are not limited to, dynamite, black powder, pellet powder, detonators, and igniters.

The purchase of a firearm by a minor is generally unlawful. The purchase of a firearm, without proper state certification, is illegal. Students should check the training and certification requirements of individual states and countries.

1. Projects involving firearms and explosives are allowable when conducted with the direct supervision of a Designated Supervisor and when in compliance with all federal, state and local laws.
2. A fully assembled rocket motor, reload kit or propellant modules containing more than 62.5 grams of propellant are subject to the permitting, storage and other requirements of federal explosive laws and regulations.
3. Potato guns and paintball guns are not considered firearms unless they are intended to be used as weapons. However, they must be treated as hazardous devices.

E. Regulated Drones

Projects involving unmanned aircraft systems (UAS)/drones must follow all state, federal and country laws. See the Federal Aviation Administration (FAA) for more details [faa.gov/uas/].

Current U.S. law requires all forms of drones to be registered with the FAA.

F. Radiation

Projects involving radionuclides (radioisotopes) and X-rays must involve a careful examination of the risks associated with the study and appropriate safety precautions must be taken. Depending upon the level of exposure, radiation released from these sources can be a health hazard.

1. All studies may not exceed the dose limits set by the Nuclear Regulatory Commission of 0.5 mrem/hr or 100 mrem/year of exposure.
2. If the voltage needed in the study is <10 kvolts, a risk assessment must be conducted. The study may be done at home or school, and SIRC preapproval is not required.
3. A study using 10-25 kvolts must have a risk assessment conducted and must be preapproved by the SIRC to assess safety. Such a study must be conducted in a metal-lined chamber using a camera only, not direct view through glass. A dosimeter or radiation survey meter is required to measure radiation exposure.
4. All studies using >25 kvolts must be conducted at an institution with a licensed Radiation Program and must be preapproved by the Institutions’ Radiation Safety Officer or the Committee which oversees the use of ionizing radiation to ensure compliance with state and federal regulations.

G. Guidance for Risk Assessment

PLEASE FIND BELOW GUIDANCE ON CONDUCTING RISK ASSESSMENT WHEN USING THE FOLLOWING:

HAZARDOUS CHEMICALS, HAZARDOUS DEVICES, RADIATION

1. Hazardous Chemicals

A proper risk assessment of chemicals must include review of the following factors:

a. Toxicity—the tendency of a chemical to be hazardous to human or environmental health.
   • Human health toxicity includes acute and chronic hazards when inhaled, swallowed, injected or in contact with the skin.
   • Environmental health includes aquatic toxicity (both acute and chronic), toxicity to mammals and birds, and impact on ecosystems.

b. Reactivity—the tendency of a chemical to undergo chemical change, including instability and reactivity with other reactions or conditions (i.e., reaction with water, air, temperature, pressure).

c. Flammability—the tendency for a chemical substance to ignite at ambient temperatures.

Environmentally Responsible Chemistry

The mission of environmentally responsible (green) chemistry is to avoid the use or production of hazardous substances during chemical process. The principles of green chemistry are described on the EPA website in the Sources of Information section. Whenever possible the following principles should be incorporated into the research plan.

• Waste prevention
• Use of the safest possible chemicals and products
• Design of the least possible hazardous chemical syntheses
• Use of renewable materials
• Use of catalysts in order to minimize chemical usage
• Use of solvents and reaction conditions that are safe as possible
• Maximization of energy efficiency
• Minimization of accident potential and avoiding the use of reactive substances

2. Hazardous Devices

The documentation of risk assessment (Form 3) is required when a student researcher works with potentially hazardous/dangerous equipment and/or other devices, in or outside a laboratory setting that require a moderate to high level of expertise to ensure their safe usage. Some commonly used devices (Bunsen burners, hot plates, saws, drills, etc.) may not require a documented risk assessment, assuming that the student researcher has experience working with the device. Use of other potentially dangerous devices such as high vacuum equipment, heated oil baths, NMR equipment, and high temperature ovens must have documentation of a risk assessment. It is recommended that all student designed inventions also have documentation of a risk assessment.

3. Radiation

A risk assessment (documented on Form 3) must be conducted when a student’s project involves radiation beyond that normally encountered in everyday life.

Non-ionizing radiation includes the spectrum of ultraviolet (UV), visible light, infrared (IR), microwave (MW), radiofrequency (RF) and extremely low frequency (ELF).

Corrosiveness—the tendency of a chemical, upon physical contact, to harm or destroy living tissues or physical equipment.

When assessing risk, the type and amount of exposure to a chemical must be considered. For example, an individual’s allergic and genetic disposition may have an influence on the overall effect of the chemical. The student researcher must refer to Safety Data Sheets provided by the vendor (SDS) to ensure that proper safety precautions are taken. Some SDS sheets (e.g., Flinn) rank the degree of hazard associated with a chemical. This rating may assist students and adult sponsors in determining risk associated with the use of a chemical.

A risk assessment (documented on Form 3) must include proper disposal methods for the chemicals used in an experiment. The Pinn Catalog (referenced in the Sources of Information section) provides information for the proper disposal of chemicals. If applicable, the student researcher must incorporate in the research plan disposal procedure required by federal and state guidelines.

The documentation of risk assessment (Form 3) is required when a student researcher works with potentially hazardous/dangerous equipment and/or other devices, in or outside a laboratory setting that require a moderate to high level of expertise to ensure their safe usage. Some commonly used devices (Bunsen burners, hot plates, saws, drills, etc.) may not require a documented risk assessment, assuming that the student researcher has experience working with the device. Use of other potentially dangerous devices such as high vacuum equipment, heated oil baths, NMR equipment, and high temperature ovens must have documentation of a risk assessment. It is recommended that all student designed inventions also have documentation of a risk assessment.

A risk assessment (documented on Form 3) must be conducted when a student’s project involves radiation beyond that normally encountered in everyday life. Non-ionizing radiation includes the spectrum of ultraviolet (UV), visible light, infrared (IR), microwave (MW), radiofrequency (RF) and extremely low frequency (ELF).
ENGINEERING AND INVENTION PROJECTS GUIDE

USE THIS INFORMATION TO HELP DETERMINE THE REQUIREMENTS OF ENGINEERING PROJECTS AND POTENTIAL AREAS THAT WILL REQUIRE PRE-APPROVAL AND/OR EXTRA SAFETY PRECAUTIONS.

A GUIDE TO ENGINEERING & INVENTION PROJECTS HAS BEEN DEVELOPED AS AN ADDITIONAL RESOURCE AND PROVIDES A SERIES OF QUESTIONS TO CONSIDER AS YOU BEGIN AND DESIGN AN ENGINEERING OR INVENTION PROJECT.

ENGINEERING AND INVENTION PROJECT CHECKLIST

CONSIDER THE ANSWERS TO THE QUESTIONS BELOW. IF THE RESPONSE IS YES, THEN THE PROJECT MAY FALL UNDER MORE SPECIFIC RULES AND THOSE SECTIONS OF THE INTERNATIONAL RULES & GUIDELINES SHOULD BE CONSULTED.

Hazardous Chemicals, Activities and Devices
- Will your project involve any of the following:
  - DEA-controlled Substances
  - Firearms and Explosives
  - Prescription Drugs
  - Alcohol & Tobacco
  - Regulated Drones
  - Radiation

If any are checked, see Hazardous Rules, page 19.

Device Testing with Human Participants
- Are you going to test your project (device, app, invention, prototype, etc.)? If yes, does it require persons to interact with it other than yourself or adult sponsor/supervisor?
- Do you intend to gather background knowledge through a survey or interviews to understand the potential use and needs for your project design?
- Are you going to ask for opinions or suggestions on your project design at any point of the project?
- Does your project intend to gather personal data/have a health benefit to the user?

If any are checked, see Human Participant Rules, page 8.

Vertebrate Animals
- Does your project include any interaction with vertebrate animals in any phase of the project?

If any are checked, see Vertebrate Animal Rules, page 12.

Potentially Hazardous Biological Agents
- Does your project include any collection, examination or handling of microorganisms, and/or fresh or frozen tissue, primary cell cultures, blood, blood products or body fluids?
- Are you going to culture or isolate any substance, known or unknown?

If any are checked, see Potentially Hazardous Biological Agents Rules, page 15.

Sources of Information for All Projects

1. United States Patent and Trademark Office
   - Customer Service: 1-800-786-9199 (toll-free);
   - 571-272-1000 (local), 571-272-9950 (TTY)
   - uspto.gov
   - uspto.gov/patents/process/index.jsp
   - Conducting a Patent Search:
     - https://patents.google.com/
     - http://www.freepatentonline.com/
     - https://worldwide.espacenet.com/

2. USPTO Resources
   - 7 Step Search Strategy Guide and Video Tutorial
     - https://www.uspto.gov/learning-resources
   - Pro Bono Program
   - Law School Clinic Certification Program
   - USPTO Pro Se Assistance Program
     - https://www.uspto.gov/learning-and-resources/newsletter/inventors-eye/pro-se-assistance-program

3. European Patent Office
   - www.epo.org
   - www.epo.org/applying/basics.html

4. Aquatic Nuisance Species (ANS) Task Force
   - www.anstaskforce.gov
   - www.anstaskforce.gov/Documents/ISEF.pdf

5. APHIS
   - https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/operational-activities/IA_Invasive/CT_Invasive_species/Animal_and_Plant_Health_Inspection_Service/Invasive_Species_List

6. Invasive Species Specialist Group
   - www.isssp.org
   - The Global Invasive Species database contains invasive species information supplied by experts from around the world.

7. Invasive Species Information
   - www.invasivepeciesinto.org/resources/lists.shtml
   - Provides information for species declared invasive, noxious, prohibited, or harmful or potentially harmful.

HUMAN PARTICIPANTS


2. NIH tutorial, “Protecting Human Research Participants”

3. Belmont Report, April 18, 1979

   - Washington, DC: AERA, APA, NCTME.
   - https://www.apa.org/science/programs/testing/standards

5. American Psychological Association
   - 750 First Street, NE
   - Washington, DC 20002-4242
   - phone: 202-336-5500, 800-374-2721
   - www.apa.org
   - Information for students:
     - https://www.apa.org/about/students
   - Information regarding publications:

6. Educational and Psychological Testing
   - Testing Office for the APA Science Directorate
   - phone: 202-336-6000
   - email: testing@apa.org

7. The Children's Online Privacy Protection Act of 1998 (COPPA)

VERTEBRATE ANIMALS

Animal Care and Use

1. Laboratory Animals, Institute of Laboratory Animal Research (ILAR), Commission on Life Sciences, National Research
   - https://www.nationalacademies.org/ilar/institute-for-laboratory-animal-research


3. Guidelines for the Care and Use of Mammals in Neuroscience and Behavioral Research (2003), Institute for Laboratory Animal Research (ILAR)

To order these ILAR publications contact:
- National Academies Press
  - 500 Fifth Street, NW
  - Washington, DC 20001
  - phone: 888-624-8373 or 202-334-3313; fax: 202-334-2451
  - https://www.nap.edu/content/help-with-ordering

4. Federal Animal Welfare Act (AWA)
   - 7 U.S.C. 2131-2157
   - Subchapter A - Animal Welfare (Parts I, II, III)
   - Document is available from:
     - USDA/APHIS/AC
     - 4700 River Road, Unit 84
     - Riverdale, MD 20737-1234
     - email: ace@aphis.usda.gov
     - phone: 301-734-7833, fax: 301-734-4978
     - https://www.nal.usda.gov/wvc
5. Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (Agri-Guide) Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International) https://www.aaalac.org/


ALTERNATIVE RESEARCH AND ANIMAL WELFARE


3. Institute of Laboratory Animal Resources (ILAR) provides a variety of information on animal sources, housing and handling standards, and alternatives to animal use through annotated bibliographies published quarterly in ILAR Journal. ILAR—The Keck Center of the National Academies 500 Fifth Street, NW, Keck 687 Washington, DC 20001 phone: 202-334-2590, fax: 202-334-1687 email: ILAR@nas.edu https://www.nationalacademies.org/ilar/institute-for-laboratory-animal-research


5. Johns Hopkins Center for Alternatives to Animal Testing (CAAT) has worked with scientists since 1981 to find new methods to replace, reduce, and refine the use of laboratory animals in experiments. Order from (first copy free of charge): American Chemical Society Publications Support Services 1155 16th Street, NW Washington, DC 20036 phone: 202-872-4000 or 800-227-5558 email: help@acs.org https://www.acs.org/content/acs/en/education.html


7. QUALITY ASSURANCE AND QUALITY CONTROL POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS


• American Society for Microbiology https://www.asm.org

• Microbiology Society 14-16 Meredith Street London EC1R OAB UK info@microbiologyociety.org microbiologysociety.org


HAZARDOUS CHEMICALS, ACTIVITIES OR DEVICES

GENERAL LAB/CHEMICAL SAFETY


2. General Howard Hughes Medical Institute has resources for working with cell cultures, radioactive materials and other laboratory materials. http://www.hhmi.org/developing-scientists/resources

3. Environmental Protection Agency (EPA) website for green chemistry www.epa.gov/greenchemistry

4. Safety and Data Sheets (SDS) https://www.chemical.com/safety/

• A directory of SDS sheets from Flinn Scientific Inc. that includes a ranking of hazard level and disposal methods. www.jcp.com/msds/index.html • A listing of numerous sites that have free downloads of SDS sheets. NIPFA (National Fire Protection Association) 704 Standard for guidance on Chemical Reactivity and Instability: https://en.wikipedia.org/wiki/NIPA_704

5. Pesticides National Pesticide Information Center http://npic.orst.edu/ingred/pesticide/pesticides/pesticides

• Describes the various types of pesticides and the legal requirements for labeling. Provides links and phone numbers to get additional information.

Environmental Protection Agency http://aspub.epa.gov/pagelaces/pesticides/f?p=PLS:2

• A database of product labels. Enter the product name or company name to view the approved label information of pesticide products sold with the agency.

6. DEA Controlled Substances Drug Enforcement Agency website: https://www.dea.gov Controlled Substance Schedules—a list of controlled substances: www.deadiversion.usdoj.gov/schedules


9. CDC Laboratory Safety Manuals https://www.cdc.gov/labs/8MLs.html

10. Occupational Safety and Health Administration www.osha.gov

• Safety and Health Topics: www.osha.gov/SLTC

• Hazard Communication: www.osha.gov/SLTC/hazardcommunication/index.html

• OSHA’s Hazard Prevention Program: www.osha.gov/SLTC/oashazardprevention.html

• OSHA’s Injury Prevention Program: www.osha.gov/SLTC/injuryprevention/index.html

DISPLAY & SAFETY COMMITTEE MISSION

The mission of this committee is to ensure that all competitors qualify for competition according to the rules established in conjunction with the Scientific Review Committee and Society for Science.

The ISEF Display & Safety inspection process can be initiated only when all items are present at the display. The Display & Safety Committee will offer guidance on Display & Safety issues for projects approved by the SRC to compete in ISEF. Occasionally, the ISEF Display & Safety Committee may require students to make revisions to conform to Display & Safety regulations. Persistent issues will be directed to a committee of individuals which may include Society for Science (the Society) personnel, Display & Safety (D&S) and/or Scientific Review Committee (SRC) executive committee members.

The following regulations must be adhered to when a finalist exhibits a project at ISEF. All projects must adhere to the Display & Safety requirements of the affiliated fair(s) in which they compete to qualify for participation in ISEF. Affiliated fairs may have additional restrictions or requirements. Knowledge of these requirements is the responsibility of the Finalist, Adult Sponsor, and Fair Director.

Display Regulations

Maximum Size of Project

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

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

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

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 (including table covers).

• Fair-provided tables at ISEF 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.

• Nothing can be attached to the rear curtain.

• All demonstrations must be done within the confines of the finalist’s booth space. When not being demonstrated, all project components must be returned to the project display and must fit within allowable dimensions as defined above.

• Projects can be continued under the table but this area is not to be used for storage.

Position of Project

The fair-provided table or freestanding display must be parallel to, and positioned at, the back curtain of the booth. Projects may NOT lean against the back curtain.

Forms Required to be Visible and Vertically Displayed at the Project Booth

The placement of the required forms may include the front edge of the table, the display board, or in a free-standing acrylic frame placed on the table top.

Forms required at all projects:

1. An original Official Abstract and Certification as approved (stamped/embossed) by the ISEF Scientific Review Committee.
   a. Upon SRC approval, the stamped/embossed Official Abstract and Certification will be provided.
   b. The official should be submitted to the International Science and Engineering Fair Abstract and embossed/ stamped by the SRC to be reviewed and approved.
   c. No other format or version of your approved Abstract & Certification will be allowed for any purpose at ISEF. Judges are provided the official Abstract and Certification digitally; no handouts are permitted.
   d. The term “abstract” may NOT be used as a title or reference for any informal display or materials at the project except as part of displaying the official stamped/embossed abstract.

2. ISEF Project Set-up Approval Form (received on-site at the Fair).
   a. This form documents the project as approved by the Scientific Review Committee and is used to document the Display & Safety Committee’s review process and final approval.
   b. This form must be signed by the finalist and the Display & Safety Committee member at the time of inspection.

Additional Forms required (only when applicable):

1. Regulated Research Institutional/Industrial Setting Form (IC)
   a. If work was conducted in a regulated research institution, industrial setting or any work site other than home, school or field at any time during the current ISEF project year, the Regulated Research Institutional/Industrial Setting Form (IC) must be completed and vertically displayed at the project booth.
   b. The information provided by the mentor on Form IC may be referenced to confirm that the information provided on the project board is that of the finalist. Only minimal reference to a mentor’s or another researcher’s work is allowable and must only reflect background information or be used to clarify differences between finalist’s and others’ work.

2. Continuation/Research Progression Projects Form (F)
   a. The study is a research project/research progression, the Continuation/Research Progression Projects Form (F) must be completed and vertically displayed at the project booth.
   b. The display board and abstract must reflect only the current year’s work. The project title displayed in the finalist’s booth may mention years of continuing research (for example, “Year Two of an Ongoing Study”).
   c. Reference to past work on the display board must be limited to summative past conclusive data and its comparison to the current year data set. No raw data from previous years may be publicly displayed; however, it may be included in the student research notebooks and/or logs if properly labeled.

Forms Required at Project but Not Displayed

1. Forms, excluding those listed above, that were required for the Scientific Review Committee approval should not be vertically displayed but must be available in the booth in case asked for by a judge or other ISEF official. These forms include, but are not limited to, Checklist for Adult Sponsor (F), Student Checklist Research Plan Approval Form (1B), and a photograph/video release form.

2. A photograph/video release form signed by the subject is required for visual images of humans (other than the finalist) displayed as part of the project.

Forms NOT to be at the Project Display Booth or in the Exhibit Hall

Completed informed consent/assent forms for a human participant study are NOT to be displayed and should NOT be present at the project display. The Finalist may include a sample (incomplete form) in their notebook; the completed form under NO CIRCUMSTANCE should include any information consent/assent forms or for a human participant be in the Exhibit Hall.

Photograph/Image Display Requirements

Any photograph/image/chart/table/student-created logo and/or graph is allowed if:

a. It is not deemed offensive or inappropriate (which includes images/photos showing invertebrate or vertebrate animals/humans in surgical, necrotizing or dissection situations) by the Scientific Review Committee, the Display & Safety Committee, or Society for Science

b. It has a credit line of origin (“Photograph taken by…” or “Graph/Chart/Table created by…”).

Any photographs and/or visual depictions of the finalist or others’ work.

• All visual depictions of others require a signed photo/video release form in a notebook or logbook at the project booth. These signed release forms must be available upon request during the set-up and inspection process, but may not be displayed.

• Sample release text: “I consent to the use of visual images (photos, videos, etc.) involving my participation/child’s participation in this research.”

2. Finalists using any presentation or demonstration outside of a project board must be prepared to show the entire presentation to the Display & Safety Inspectors before the project is approved. All aforementioned rules apply to this presentation and the presentation may not be altered in any way after the final Display & Safety inspection. Examples of presentations that require approval include, but are not limited to, Powerpoint, Prezi, Keynote, software program/simulation and other images and/or graphics displayed on a computer screen or other non-print delivery method.

Items/Materials Not Allowed on Display or at Project Booth

Any information on the project display or items that are self-promotions or external endorsements are not allowed in the project booth.

• The use of commercial logos including known brands, institutional logos, or any visual images of logos unless integral to the project and approved by the SRC via inclusion in the Official Abstract and Certification.

• Any reference to an instructor or mentor that supported the finalist’s research except as provided in an acknowledgement section of the poster and within official ISEF paperwork, most notably Form IC.

• Any reference to patent status of the project.

• Any items intended for distribution such as disks, CDs, flash drives, brochures, booklets, endorsements, giveaway items, business cards, printed materials or food items designed to be distributed to judges or the public.

• Any awards or medals, except for past or present ISEF medals that may be won by the finalist.

• Postal addresses, World Wide Web, email and/or social media addresses, QR codes, telephone and/or fax numbers of a project or finalist. Note: The only personal information that is permissible to include on the display is the finalist’s name, school, city, state/country, age and grade.

• Active Internet or email connections as part of displaying or operating the project at ISEF.

• Any changes, modifications, or additions to projects including any attempt to uncover, replenish or return removed language or items may not be approved by the Display & Safety Committee and the Scientific Review Committee has been received is prohibited.

• Display & Safety inspections will include recording photographic evidence of the approved Project Display and Project booth.

Finalists who do not adhere to this signed agreement on the ISEF Project Set-up Approval Form regarding this regulation may fail to qualify for competition.

I/we understand that the initial Display & Safety Inspection has been completed, but that additional reviews occur and that I/we should check back regularly. I/we will vertically display this signed form at our project at all
times. (We have not and will not store packing material under the booth. Live further understand that returning items that have been removed by the SRC or D&D and/or adding items that are not permitted after final clearance are grounds for failing to qualify for competition and/or forfeiture of all awards received.

SAFETY REGULATIONS

Not Allowed at Project or Booth
Note: In the case in which a Finalist's Project includes an item that is prohibited from display, please consider taking photographs and/or documenting the significance of the prohibited item through video.

1. Living organisms, including plants
2. Glass
3. Soil, sand, rock, cement and/or waste samples, even if permanently encased in a slab of acrylic
4. Taxidermy specimens or parts
5. Preserved vertebrate or invertebrate animals
6. Human or animal food
7. Human/animal parts or body fluids (for example, blood, urine)
8. Plant materials (living, dead, or preserved) that are in their raw, unprocessed, or non-manufactured state
9. All chemicals including water. Absolutely no liquids can be utilized in the Project Booth
10. All hazardous substances or devices (Ex: poisons, drugs, firearms, weapons, ammunition, relaying devices, grease/oil and sublimating solids such as dry ice)
11. Items that may have contained or been in contact with hazardous chemicals (Exception: Item may be permitted if professionally cleaned and documentation for such cleaning is available). Filters (including microbial) may not be displayed unless the Display & Safety Committee can reasonably determine that the device was cleaned or was never used (please include receipts in your notebooks and/or logbooks)
12. Sharp items (for example, syringes, needles, pipettes, knives)
13. Flames and highly flammable materials
14. Batteries with open-top cells or wet cells
15. Drones or any flight-capable apparatus unless the propulsion power source removed
16. 3D Printers unless the power source is removed
17. Inadequately insulated apparatus capable of producing dangerous temperatures are not permitted
18. Any apparatus with belts, pulleys, chains, or moving parts with tension or pinch points that are not appropriately shielded
19. Any display items that are deemed distracting (i.e. sounds, lights, odors, etc.)
20. Personal items or packaging materials stored underneath the booth
21. Any apparatus or project deemed unsafe by the Scientific Review Committee, the Display & Safety Committee, or the Society

Electrical Regulations

1. Electrical power supplied to the project is 120 or 220 Volt, AC, single phase, 60 Hz. No multi-phase will be available or shall be used. Maximum circuit amperage/wattage available is determined by the electrical circuit capacities of the exhibit hall and may be adjusted on-site by the Display & Safety Committee. For all electrical regulations, “120 Volt AC” or “220 Volt AC” is intended to encompass the corresponding range of voltage as supplied by the facility in which ISEF is being held.

2. Electrical devices must be protectively enclosed. Any enclosure must be non-combustible. All external non-current carrying metal parts must be grounded.

3. Energized wiring, switches, and metal parts must have adequate insulation and over-current safety devices (such as fuses) and must be inaccessible to anyone other than the finalist. Exposed electrical equipment or metal that may be energized must be shielded with a non-conducting material or with a grounded metal box to prevent accidental contact.

4. Decorative lighting or illumination is discouraged. If used, lighting must be as low a voltage as possible and must be LED lighting that does not generate heat. Incandescent and fluorescent light bulbs are prohibited. When student is not at the exhibit, all electrical power must be disconnected, or power bars must be switched off (Exemption: during pre-judging audio visual displays may be available.)

5. An insulating grommet is required at the point where any wire or cable enters any enclosure.

6. No exposed live circuits over 36 volts are allowed.

7. There must be an accessible, clearly visible on/off switch or other means of quickly disconnecting from the 120 or 220 Volt power source.

Laser/Laser Pointer Regulations
Any Class 1, Class 2, Class 3A, or Class 3R lasers are allowed to be used responsibly. No other lasers may be used or displayed.

1. Laser beams may not pass through magnifying optics such as microscopes and telescopes
2. Lasers shall be labeled by the manufacturer so that power output can be inspected. Lasers without labels will NOT be permitted.
3. Handheld lasers are NOT permitted.
4. Lasers will be confiscated with no warning if not used in a safe manner.

ISEF CATEGORIES AND SUBCATEGORIES

The categories have been established with the goal of better aligning judges and student projects for the judging at the site, regional, national, and international fairs. Finalists may or may not choose to use these categories, dependent on the needs of their area. Please check with your affiliated fair(s) for the appropriate category listings at that level of competition.

Please visit our website at https://www.societyforscience.org/isef/categories-and-subcategories for a full description and definition of ISEF categories.

ANIMAL SCIENCES (ANIM)
Animal Behavior
Animal Cell Biology
Animal Development
Animal Ecology
Animal Genetics
Animal Nutrition and Growth
Animal Physiology
Animal Systems and Evolution
Other

CHEMISTRY (CHEM)
Analytical Chemistry
Computational Chemistry
Environmental Chemical Engineering
Inorganic Chemistry
Materials Chemistry
Organic Chemistry
Physical Chemistry
Other

COMPUTATIONAL BIOLOGY AND BIOINFOMATICS (CBIO)
Computational Biomodeling
Computational Epidemiology
Computational Evolutionary Biology
Computational Neuroscience
Computational Pharmacology
Genomics
Other

EARTH AND ENVIRONMENTAL SCIENCES (EAV)
Atmospheric Science
Climate Science
Environmental Effects on Ecosystems
Geosciences
Water Science
Other

EMBEDDED SYSTEMS (EBED)
Internet of Things
Microcontrollers
Networking and Data Communications
Optics
Signal Processing
Other

ENERGY: SUSTAINABLE MATERIALS AND DESIGN (EED)
Biological Process and Design
Energy Storage
Hydrogen Generation and Storage
Other/Thermal Power
Solar Process, Materials, and Design
Thermal Generation and Design
Triboelectricity and Electrolysis
Wind
Wind and Water Movement Power Generation
Other

ENGINEERING TECHNOLOGY, STATICS AND DYNAMICS (ETS)
Aerospace and Aeronautical Engineering
Civil Engineering
Computational Mechanics
Control Theory
Ground Vehicle Systems
Industrial Engineering-Processing
Mechanical Engineering
Naval Systems
Other

ENVIRONMENTAL ENGINEERING (EEN)
Bioremediation
Land Reclamation
Pollution Control
Recycling and Waste Management
Water Resources Management
Other

MATERIALS SCIENCE (MATS)
Biomaterials
Ceramic and Glasses
Composite Materials
Computational Theory
Electronic, Optical and Magnetic Materials
Nanomaterials
Polymers
Other

MATHEMATICS (MATH)
Analysis
Combinatorics, Graph Theory, and Game Theory
Geometry and Topology
Number Theory
Probability and Statistics
Other

MICROBIOLOGY (MCRO)
Antimicrobials and Antibiotics
Applied Microbiology
Bacteriology
Environmental Microbiology
Microbial Genetics
Virology
Other

PHYSICS AND ASTRONOMY (PHYS)
Astronomy and Cosmology
Atomic, Molecular, and Optical Physics
Biological Physics
Condensed Matter and Materials
Mechanics
Nuclear and Particle Physics
Theoretical, Computational and Quantum Physics
Other

PLANT SCIENCES (PLNT)
Agriculture and Agronomy
Ecology
Genetics/Breeding
Growth and Development
Pathology
Plant Physiology
Systems and Evolution
Other

ROBOTICS AND INTELLIGENT MACHINES (ROBO)
Biomimetics
Cognitive Systems
Control Theory
Machine Learning
Robot Kinematics
Other

SYSTEMS SOFTWARE (SOFT)
Algorithms
Cybersecurity
Databases
Human/Machine Interface
Languages and Operating Systems
Mobile Apps
Other Learning
Other

TRANSITIONAL MEDICAL SCIENCES (TMD)
Disease Detection and Diagnosis
Disease Prevention
Disease Treatment and Therapies
Drug Identification and Testing
Pre-Clinical Studies
Other
INFORMATION ON REQUIRED ABSTRACT & CERTIFICATION FOR ALL PROJECTS AT ISEF

* This form may not be relevant for your regional or state fair; please refer to instructions from your affiliated fair.*

IN ADDITION TO THE BASIC FORM REQUIREMENTS FOR ALL PROJECTS AND ANY OTHER REQUIREMENTS DUE TO SPECIFIC AREAS OF RESEARCH, AN ABSTRACT & CERTIFICATION IS REQUIRED AT THE CONCLUSION OF RESEARCH. DETAILS ON THIS REQUIREMENT FOLLOW.

### Completing the Abstract

After finishing research and experimentation, you are required to write a (maximum) 250 word abstract. For ISEF, this abstract is written in the online Finalist Questionnaire portal and submitted electronically.

It is recommended that it include the following:

- a. purpose of the experiment
- b. procedure
- c. data
- d. conclusions

It may also include any possible research applications. Only minimal reference to previous research may be included.

An abstract must not include the following:

- a. acknowledgments (including naming the research institution and/or mentor with which you were working), or self-promotions and external endorsements
- b. logos or proper names of commercial products
- c. work or procedures done by the mentor

### Completing the Certification

**At the bottom of the Abstract & Certification form there are six questions. Please read each carefully and answer appropriately. The ISEF Scientific Research Committee will review and approve the abstract and answers to the questions.**

Revisions are permitted via the online Finalist Questionnaire portal and submitted electronically. The ISEF Scientific Research Committee approval seal before it is displayed or handed off must not include the student's name.

**NOTE:** Your abstract must be on the International Science and Engineering Fair Abstract & Certification form and have the ISEF Scientific Review Committee approval seal displayed or handed out. No other format or version of your approved Abstract will be allowed for any purpose at the ISEF.

---

### ISEF Sample Abstract & Certification

#### ABSTRACT BODY

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):
   - [ ] human participants
   - [ ] vertebrate animals
   - [ ] potentially hazardous biological agents
   - [ ] microorganisms
   - [ ] rDNA
   - [ ] DNA
   - [ ] tissue

2. This abstract describes only procedures performed by me/us, reflects my/our independent research, and represents one year's work only.
   - [ ] yes
   - [ ] no

3. I/We worked or used equipment in a regulated research institution or industrial setting.
   - [ ] yes
   - [ ] no

4. This project is a continuation of previous research.
   - [ ] yes
   - [ ] no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):
   - [ ] yes
   - [ ] no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.
   - [ ] yes
   - [ ] no

---

### 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:**

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

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)
- [ ] 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) (when applicable and/or required by the IRB)
- [ ] Potentially Hazardous Biological Agents (Requires prior approval by SRC, IACUC or IRB, 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)
- [ ] Other (No SRC prior approval required, see full text of the rules.)
- [ ] Risk Assessment Form (3)
- [ ] Qualified Scientist Form (2) (required for projects involving DEA-controlled substances or when applicable)

---

**Adult Sponsor’s Name:**

**Signature:**

**Date of Review (mm/dd/yy):**

**Phone:**

**Email:**

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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 SRC/IRB/IACUC or other pre-approval? □ Yes □ No
   Tentative start date: ____________

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 from previous years on
   □ Continuation/Research Progression Form (7)

7. This year’s experimentation/data collection:
    Actual Start Date: (mm/dd/yy) End Date: (mm/dd/yy)

8. Where will you conduct your experimentation? (check all that apply)
   □ Research Institution □ School □ Field □ Home □ Other: ________________

9. Source of Data:
   □ Collected self/mentor □ Other Describe/url: ____________________

10. List the name and address of all non-home and non-school work site(s), whether 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.
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 site without ongoing mentorship and sign below).
   b. If yes, complete questions 2–5.

2. Is the student's research project a subset of your ongoing research or work?  
   † Yes  † No
   Use questions 3, 4 and 5 to detail how the student's project was similar and/or different from ongoing research or work at your site. If this project is under a grant and needs to be acknowledged, please list the grant statement here.

Student's Name(s) ____________________________

Title of Project ____________________________

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 conducting 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. Scientific fraud and misconduct are not condoned at any level of research or competition. Such practices include but are not limited to 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 ISEF.

   b. Parent/Guardian Approval: I have read and understand the risks and possible dangers involved in the Research Plan/Project Summary. I consent to my child participating in this research.

   (Continued on next page)
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.

<table>
<thead>
<tr>
<th>Student's Name(s)</th>
<th>Title of Project</th>
</tr>
</thead>
</table>

**To be completed by the Qualified Scientist:**

Scientist Name: __________________________
Educational Background: __________________
Degree(s): ____________________________
Experience/Training as relates to the student’s area of research:

<table>
<thead>
<tr>
<th>Position/Institution:</th>
<th>Email/Phone:</th>
</tr>
</thead>
</table>

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?  
   a. If no, who will directly supervise and serve as the Designated Supervisor?  
   b. Experience/Training of the Designated Supervisor:

I attest that the student has conducted the work as indicated above and that any required review and approval by institutional regulatory board (IRB/IACUC/IBC) has been obtained. Copies are attached if applicable. I further acknowledge that the student will be presenting this work publicly in competition and I have communicated with the student research regarding any requirements for my review and/or restrictions of what is publicized.

<table>
<thead>
<tr>
<th>Supervising Adult’s Printed Name</th>
<th>Signature</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institution</td>
<td>Date Signed (must be after experimentation) (mm/dd/yy)</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td>Email/Phone</td>
<td></td>
</tr>
</tbody>
</table>

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

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

If yes, how many individuals were in the group and who were they (e.g. high school students, graduate students, faculty, professional researchers)?
Risk Assessment Form (3)
Must be completed before experimentation; recommended for all projects. May be required for projects involving 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.

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 documents provided to human participants. ☐ 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 Scientist Form 2.

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.)

☐ Approved with Full Committee Review (3 signatures required) and the following conditions: (All 6 must be answered)
1. Risk Level (check one): ☐ Minimal Risk ☐ More than Minimal Risk
2. Qualified Scientist (QS) Required (Form 2): ☐ Yes ☐ No
3. Risk Assessment Required (Form 3): ☐ Yes ☐ No
4. Written Minor Assent required for minor participants: ☐ Yes ☐ No ☐ Not applicable (No minors in this study)
5. Written Parental Permission required for minor participants: ☐ Yes ☐ No ☐ Not applicable (No minors in this study)
6. Written Informed Consent required for participants 18 years or older: ☐ 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 counselor, physician’s assistant, doctor of pharmacy, or registered nurse) with expertise related to this project.

Printed Name Degree/Professional License
Signature Date of Approval (Must be prior to experimentation.) (mm/dd/yyyy)

Educator

Printed Name Degree/Professional License
Signature Date of Approval (Must be prior to experimentation.) (mm/dd/yyyy)

School Administrator

Printed Name Degree/Professional License
Signature Date of Approval (Must be prior to experimentation.) (mm/dd/yyyy)
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: ________________________________
Printed Name Date of Approval (mm/dd/yy)

To be completed by Veterinarian:
- I have reviewed this research and animal husbandry with the student before the start of experimentation.
- I have approved the use and dosages of prescription drugs and/or nutritional supplements.
- I will provide veterinary medical and nursing care in case of illness or emergency. (Fees may apply.)

To be completed by Designated Supervisor or Qualified Scientist when applicable:
- I have reviewed this research and animal husbandry with the student before the start of experimentation and I accept primary responsibility for the care and handling of the animals in this project.
- I will directly supervise the experiment.

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 read the following information about the project. If you would like to participate, please sign in the appropriate area below.

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:

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: ________________________________

To be completed by: Adult Sponsor/QS/DS or Parent/Guardian.

To be completed by Adult Sponsor/QS/DS or Parent/Guardian,
Research Participant: ________________________________
Signature: ________________________________
Date of Approval (mm/dd/yy) ________________________________

To be completed by Adult Sponsor/QS/DS or Parent/Guardian,
Research Participant: ________________________________
Signature: ________________________________
If applicable, include additional pages with permission.

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 read the following information about the project. If you would like to participate, please sign in the appropriate area below.

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:

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: ________________________________

To be completed by: Adult Sponsor/QS/DS or Parent/Guardian.

To be completed by Adult Sponsor/QS/DS or Parent/Guardian,
Research Participant: ________________________________
Signature: ________________________________
Date of Approval (mm/dd/yy) ________________________________

To be completed by: Adult Sponsor/QS/DS or Parent/Guardian,
Research Participant: ________________________________
Signature: ________________________________
If applicable, include additional pages with permission.
**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).

**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).

**Vertebrate Animal Form (5B)**

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

**Student’s Name(s)______________________________**  
**Title of Project______________________________**  

**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.

**Qualified Scientist/Principal Investigator**

<table>
<thead>
<tr>
<th>Printed Name</th>
<th>Signature</th>
<th>Date (mm/dd/yy)</th>
</tr>
</thead>
</table>

**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 to be used in this study will be conducted at a Regulated Research Institution and was approved by the appropriate institutional board prior to experimentation; institutional approval forms are attached.

- Experimentation on the microorganisms/cell lines/tissues to be used in this study will be conducted at a Regulated Research Institution, which does not require pre-approval for this type of study. The SRC has seen and approved the research plan and supporting documentation and acknowledges the accuracy of the responses above.

**CERTIFICATION - To be SIGNED by the QUALIFIED SCIENTIST or DESIGNATED SUPERVISOR**

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

<table>
<thead>
<tr>
<th>QS/DS Printed Name</th>
<th>Signature</th>
<th>Date of review (mm/dd/yy)</th>
</tr>
</thead>
</table>

**SECTION 4: CERTIFICATION – To be completed by the LOCAL or AFFILIATED FAIR SRC**

The SRC has seen this project’s research plan and supporting documentation and acknowledges the accuracy of the information provided.

<table>
<thead>
<tr>
<th>SRC Printed Name</th>
<th>Signature</th>
<th>Date of review (mm/dd/yy)</th>
</tr>
</thead>
</table>
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.

<table>
<thead>
<tr>
<th>Components</th>
<th>Current Research Project</th>
<th>Previous Research Project: Year: ___</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Title</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Change in goal/purpose/objective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Changes in methodology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Variable studied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Additional changes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To be completed by Student Researcher: List all components of the current project that make it new and different from previous research. The information must be on the form; use an additional form for previous year and earlier projects.

Student’s Name(s) __________________________
Title of Project __________________________

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 supplied to him/her by myself or qualified personnel from the laboratory; and that if vertebrate animals were euthanized they were euthanized for a purpose other than the student’s research.

☐ I certify that the blood, blood products, tissues or body fluids in this project will be handled in accordance with the standards and guidance set forth in U.S. Occupational Safety and Health Act, 29CFR, Subpart Z, 1910.1030 - Blood Borne Pathogens.

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

Institution __________________________

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 __________________________

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.

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 supplied to him/her by myself or qualified personnel from the laboratory; and that if vertebrate animals were euthanized they were euthanized for a purpose other than the student’s research.

☐ I certify that the blood, blood products, tissues or body fluids in this project will be handled in accordance with the standards and guidance set forth in U.S. Occupational Safety and Health Act, 29CFR, Subpart Z, 1910.1030 - Blood Borne Pathogens.

Printed Name __________________________ Signature __________________________ Date of Approval (mm/dd/yy) __________________________
Title __________________________ Phone/Email __________________________
Institution __________________________
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