Intel International Science and Engineering Fair

International Rules and Guidelines 2017
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The International Rules and Guidelines for Science Fairs is available at student.societyforscience.org/intel-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).

- **International Rules and Guidelines** – The full text of the International Rules and forms in html and as a downloadable pdf.
- **The Intel ISEF Rules Wizard** – An interactive tool which asks questions about your intended project and provides a list of forms required.
- **Common SRC Problems** – Frequent problems that emerge during Scientific Review Committee review for qualification at the Intel ISEF. Read these to learn what NOT to do.

These Rules are applicable for:

- **The Intel International Science and Engineering Fair 2017**
  Los Angeles, CA, USA, May 14–19, 2017
  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
  - ensure adherence to federal regulations
  - ensure use of safe laboratory practices
  - protect the environment
  - determine eligibility for competition in the Intel ISEF
  
  For pre-review and approval of your project, find your fair at http://apps2.societyforscience.org/ssp-affiliate-fair/

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

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

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### Ethics Statement

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

### Eligibility/Limitations

1. Each Intel ISEF-affiliated fair may send the number of projects provided by their affiliation agreement.

2. A student must be selected by an Intel ISEF-affiliated fair, and:
   a. be in grades 9–12 or equivalent;
   b. not have reached age 20 on or before May 1 preceding the Intel ISEF.

3. English is the official language of the Intel 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 2016.

5. **Team projects must have no more than three members. Teams competing at Intel ISEF must be composed of members who all meet Intel ISEF eligibility.**

6. Students may compete in only one Intel ISEF affiliated fair, except when proceeding to a state/national fair affiliated with the Intel ISEF from an affiliated regional fair.

7. Projects that are demonstrations, 'library' research or informational projects, 'explanation' models or kit building are not appropriate for the Intel ISEF.

8. **All sciences (physical, life, social) are represented at the Intel ISEF. 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 its own portion of the complete study.

### Requirements

**General**

1. All domestic and international students competing in an Intel ISEF-affiliated fair must adhere to all rules as set forth in this document.

2. **All projects must adhere to the Ethics Statement above.**

3. It is the responsibility of the student and the Adult Sponsor to evaluate the study to determine if the research will require forms and/or review and approval prior to experimentation, especially projects that include human participants, vertebrate animals, or potentially hazardous biological agents.

4. Projects must adhere to local, state and U.S. Federal laws, regulations and permitting conditions. In addition, projects conducted outside the U.S. must also adhere to the laws of the country and jurisdiction in which the project was performed.

5. The use of non-animal research methods and alternatives to animal research are strongly encouraged and must be explored before conducting a vertebrate animal project.

6. Introduction or disposal of non-native and/or invasive species (e.g., insects, plants, invertebrates, vertebrates), pathogens, toxic chemicals or foreign substances into the environment is prohibited. It is recommended that students reference their local, state or national regulations and quarantine lists.

7. **Intel ISEF exhibits must adhere to Intel ISEF display and safety requirements.**

8. All projects must adhere to the requirements of the affiliated fair(s) in which it competes to qualify for participation in the Intel ISEF. Affiliated fairs may have additional restrictions or requirements. Knowledge of these requirements is the responsibility of the student and Adult Sponsor.

### Approval and Documentation

9. Before experimentation begins, a local or regional Institutional Review Board (IRB) or Scientific Review Committee (SRC) associated with the Intel ISEF-affiliated fair must review and approve most projects involving human participants, vertebrate animals, and potentially hazardous biological agents. **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.

10. 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).

11. A **Qualified Scientist** is required for all studies involving Biosafety Lab-2 (BSL-2) potentially hazardous biological agents and DEA-controlled substances and is also required for many human participant studies and many vertebrate animal studies.

12. 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/data collection resumes.

13. Projects which are continuations of a previous year's work and which require IRB/SRC approval must undergo the review process with the current year proposal prior to experimentation/data collection for the current year.

14. **Any continuing project must document that the additional research is new and different. (Continuation Projects Form (7)).**
Continuation/Research Progression of Projects

1. In the professional world, research projects may build on work performed previously. It is a sound scientific endeavor.

2. Project forms must be completed for the new year. All projects must be reviewed and approved each year and displayed, if properly labeled as such.

3. Study support or data may be at the booth, but not openly.

4. Study aspects of the project. The final work should reflect the experience of the student during the course of the project.

5. Each team member should be familiar with the project.

6. Team members must appear on the abstract and forms.

Contact the Science Education Programs or the Scientific Review Committee with questions.

Roles and Responsibilities of Students and Adults

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

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

The Adult Sponsor

An Adult Sponsor may be a teacher, parent, professor, and/or other professional scientist whose lab work is the student. This individual must have a solid background in science and should have close contact with the student during the course of the project.

The Adult Sponsor is responsible for working with the student to identify any possible risks involved in ensuring the health and safety of the student conducting the research and the humans and/or animals involved in the study. The Adult Sponsor must submit a written project Experiment Checklist (1A) and Research Plan/Project Summary to ensure that: experimentation is within local, state, and federal laws and Intel ISEF rules; forms are completed by other adults; and criteria for the Qualified Scientist adhere to those set forth below.

The Adult Sponsor must be familiar with the regulations that govern potentially dangerous research as they apply to a specific student project. These may include chemical and equipment usage, laboratory experiment techniques, research involving human and vertebrate animals, and cells, microorganisms, or animal tissues. Some experiments involve procedures or materials in excess of local, state, federal, or U.S. national laws. If not thoroughly familiar with the regulations, the Adult Sponsor should help the student enlist the aid of a Qualified Scientist.

The Adult Sponsor is responsible for ensuring the student’s research is eligible for entry in the Intel ISEF.

The Qualified Scientist

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

The Qualified Scientist and the Adult Sponsor may be the same person, if that person is qualified as described above. A student may not work with a Qualified Scientist in a city, state, or country that is not where the student resides. In this case, the student must work locally with a Designated Supervisor (see below) who has been trained in the techniques to be applied by the student.

The Designated Supervisor

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

If a student is experimenting with live vertebrates and the animals are in a situation where their behavior or habitat is influenced by humans, the Designated Supervisor must be knowledgeable about the humane care and handling of the animals.

Review Committees

The Institutional Review Board (IRB)

An Institutional Review Board (IRB), is a committee that, according to institutional regulations or requirements (see 4G), must evaluate the potential physical and/or psychological risk of research involving humans. All proposed human research must be reviewed and approved by an IRB before experimentation begins. This includes review of any surveys or questionnaires to be used in a project.

Federal regulations require local community involvement. Therefore, it is advisable that an IRB be established at the school level to evaluate human research projects. If necessary, the local or Intel 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 must have experience in clinical documentation, biomedical science, medical or mental health education, and may be a 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 physical and/or psychological risk involved in a given study.
An IRB is responsible for assessing risk and documenting the determination of risk level on Human Participant Form 4. However, in reviewing projects just prior to a fair, if the SRC is serving at that level of competition judges an IRB’s decision as inappropriate, thereby placing human participants in jeopardy, they may override the IRB’s decision and the project may fail to qualify for competition. It is advised that IRBs consult with the local or affiliated fair SRCS and/or with the Intel ISEF SRC in questionable cases.

The Affiliated Fair Scientific Review Committee

A Scientific Review Committee (SRC) is a group of qualified individuals that is responsible for evaluating 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 is at: https://apps2.societyforscience.org/ssp-affiliate-fair/.

Most proposed research projects involving vertebrate animals and/or potentially hazardous biological agents must be reviewed and approved before experimentation. Local or regional SRCS prior review is not required for human studies previously reviewed and approved by a properly constituted IRB.

Projects which were conducted at a Regulated Research Institution would be a comparable research institution or an industrial setting require review and approval by an IRB before experimentation and before competition in an Affiliated Fair. Projects which were conducted at a Regulated Research Institution (not home, high school or field) and which were reviewed and approved by the proper institutional board before experimentation, must also be approved by the Affiliated Fair SRC.

An SRC must consist of a minimum of three persons, including the following:
1. a biomedical scientist with an earned doctoral degree
2. an educator
3. at least one additional member

Additional expertise: Many project evaluations require additional expertise (e.g., on biosafety and/or of human risk groups). If the SRC needs an expert as one of its members and one is not in the immediate area, all documented contact with an external 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.

To avoid conflict of interest, no Adult Sponsor, parent or other relative of the student(s), the Qualified Scientist, or the Designated Supervisor who oversees the project may serve on the SRC reviewing that project. Additional members are recommended to diversify and to increase the expertise of the committee.

A Scientific Review Committee (SRC) examines projects for the following:
- evidence of literature search and appropriate attribution
- evidence of proper supervision
- use of accepted and appropriate research techniques
- completed forms, signatures and dates showing maximum of one year duration of research and appropriate preapproval of research (if required)
- evidence of search for alternatives to animal use
- humane treatment of animals
- they may override the IRB’s decision and the project may fail to qualify for competition. It is advised that IRBs consult with the local or affiliated fair SRCS and/or with the Intel ISEF SRC in questionable cases.

Sources of Information are available as a separate section at the end of the document.

Combined SRC/IRB Committee

A combined committee is allowed as long as the membership meets both the SRC and IRB requirements listed above.

Regulated Research Institutions/Industrial Settings Review Committees

Regulated Research Institution: A Regulated Research Institution within the U.S. is defined as a professional research/teaching institution that is regularly inspected by the USDA and is licensed to use animals covered by the Animal Welfare Act and may also be subject to U.S. Public Health Service Policy. Also included are all federal laboratories such as National Institutes of Health, Veteran’s Affairs Medical Centers and the Centers for Disease Control. In addition, pharmaceutical and biotechnology companies and research institutions that utilize research animals that are not covered by the Animal Welfare Act but have an operational Institutional Animal Care and Use Committee and are in compliance with U.S. federal laws are included in this definition. For project conducted outside of the United States, a Regulated Research Institution would be a comparable research institution that adheres to country laws governing the care and use of vertebrate animals.

Certain areas of research conducted in a regulated research institution or an industrial setting require review and approval by federally mandated committees that have been established at that institution. These committees include:
1. Institutional Animal Care and Use Committee (IACUC); Animal Care and Use Committee (ACUC); Animal Ethics Committee
2. Institutional Review Board (IRB); Human Subjects Participant Protection (HSPP)
3. Institutional Biosafety Committee (IBC)
4. Embryonic Stem Cell Research Oversight Committee (ESCORO)
5. Safety Review Committee

The ISEF Scientific Review Committee (Intel ISEF SRC)

All projects are reviewed by the Intel ISEF Scientific Review Committee prior to competition. The Intel ISEF SRC is the final arbiter of the qualification of students to participate in the Intel ISEF. Before the fair, committee members review research plans and all required forms to confirm that applicable Intel ISEF rules have been followed. The Intel ISEF SRC may request additional information from students prior to the Intel ISEF or may interview potential Intel ISEF participants at the fair to ensure that they qualify to compete.

The Intel ISEF SRC, like an Affiliated Fair SRC, is made up of adults knowledgeable about research regulations. In addition to the review of all projects at the Intel ISEF, committee members answer questions about the rules throughout the year from students and teachers. The ISEF SRC can be contacted at SRC@societyforscience.org.

Members of the Intel ISEF Scientific Review Committee 2017:

- Mrs. Christine Miller, Chair
- Ms. Susan Appel
- Mr. Henry Disston
- Dr. Jennifer Green
- Dr. Paula Johnson
- Dr. Timothy Martin
- Mrs. Evelyn Montalvo
- Dr. Jason Shuffitt
Human Participants Rules

Rules involving human participants

require IRB review and preapproval and may also require documentation of written informed consent/assent/parental permission. Examples of studies that are considered "human participant research" and require IRB approval and preapproval include:

a. Participants in physical activities (e.g., physical exertion, ingestion of any substance, any medical procedure)

b. Psychosocial, educational and opinion studies (e.g., surveys, questionnaires, tests)

c. Studies in which the researcher is the subject of the research (Expedited Review may be used, see page 9)

d. Testing of student designed invention, prototype or computer application by human participants other than student researcher (Expedited Review may be used, see page 9)

e. Testing of student designed invention or concept by human participants other than student researcher

f. Data/record review projects that include data that are not de-identified/anonymized (e.g., data set that includes name, birth date, phone number or other identifying variables).

Behavioral observations that

1. involve any interaction or observation of the individual(s) or where the researcher has modified the environment (e.g., post a sign, place an object),

2. occur in non-public or restricted access settings (e.g., day care setting, doctor's office)

3. involve the recording of personally identifiable information.

Students must complete all elements of the "Human Participants Pre-Research Plan Form" (see page 10 for the Risk Assessment Guide (https://student.societyforscience.org/human-participants#riskas) for additional guidance.

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

3. the researcher does not record any personally identifiable data.

Projects in which the student receives pre-existing/ retrospective data in a de-identified/anonymized format which complies with both of the following conditions:

a. the protocols and any human data certificates 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 project that the data were appropriately de-identified by review of the written documentation provided by the supervising adult(s).

1. The use of human participants in science projects is allowable under the conditions and rules described above. Based upon the Code of Federal Regulations (45 CFR 46), the definition of a human participant is a living individual about whom an investigator commits research (obtains 1) data or samples through intervention or interaction with individual(s), or (2) identifiable private information. These projects

require IRB review and preapproval and may also require documentation of written informed consent/assent/parental permission. Examples of studies that are considered "human participant research" and require IRB approval and preapproval include:

a. Participants in physical activities (e.g., physical exertion, ingestion of any substance, any medical procedure)

b. Psychosocial, educational and opinion studies (e.g., surveys, questionnaires, tests)

c. Studies in which the researcher is the subject of the research (Expedited Review may be used, see page 9)

d. Testing of student designed invention, prototype or computer application by human participants other than student researcher (Expedited Review may be used, see page 9)

e. Testing of student designed invention or concept by human participants other than student researcher

f. Data/record review projects that include data that are not de-identified/anonymized (e.g., data set that includes name, birth date, phone number or other identifying variables).

Behavioral observations that

1. involve any interaction or observation of the individual(s) or where the researcher has modified the environment (e.g., post a sign, place an object),

2. occur in non-public or restricted access settings (e.g., day care setting, doctor's office)

3. involve the recording of personally identifiable information.

Student researchers must complete all elements of the "Human Participants Pre-Research Plan Form" (see page 10 for the Research Plan/Project Summary, and Approval Form (1B), Human Participants Form (4) with applicable consents and surveys/ For additional guidance see section on IRB waivers for permission in his/her research plan if the project meets specific requirements. See section on IRB waivers for more information about situations in which written parental permission and/or written informed consent can be waived by the IRB.

6. Research participants must voluntarily give informed consent/assent (in some cases with parental permission) before they participate in the study. Adult human research participants may give their own consent. Research participants under 18 years of age and/or individuals not able to give consent (e.g., individuals with disabilities) given written consent with the parent/guardian providing the permission. The IRB will determine whether the consent/assent/parental permission may be verbally or in writing depending on the level of risk and the type of study, and will determine if a Qualified Scientist is required to oversee the project. Risk Assessment information on page 11 and the online Risk Assessment Guide (https://student.societyforscience.org/human-participants#riskas) 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 guardians to make an informed decision about whether or not to participate.

b. Participants must be informed that their participation is voluntary (i.e., they may participate or decline to participate) and that refusal to participate will not result in any adverse consequences (e.g., non-participation or abortion participation) and that they are free to stop participating at any time.

4. Informed consent does not involve coercion and is an on-going process, not a single event that ends with a signature.

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

6. 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 situations in which written parental permission and/or written informed consent can be waived by the IRB.

7. A student may observe and collect data for analysis of medical procedures and medication administration only under the direct supervision of a medical professional. This medical professional must be named in the research proposal. Students are prohibited from administering medication and/or performing invasive medical procedures on human participants. The IRB must also confirm that the research is not violating the medical practice of the state or country in which he/she is conducting the research.

8. 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)).

9. All published instruments that are not in the public domain must be administered, scored and interpreted by a Qualified Scientist as required by the instrument publisher. Any and all uses of rules in the following section must be in accordance with the publisher's requirements, including procurement of legal copies of the instrument.

10. Studies that involve the collection of data via use of the Internet (e.g., online, web-based surveys) are allowed, but researchers should be prepared to h the student researcher to include (a) collecting anonymous data, b) obtaining informed consent and c) ensuring that participants are of the appropriate age to give informed consent. See the Online Studies Section of the Risk Assessment Guide.

11. After experimentation and before Intel ISEF competition, the Intel ISEF SRC reviews and approves previously-approved projects to ensure that students followed the approved Research Plan/Project Summary and all of the Intel ISEF rules.

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

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

b. Human Participants Form (4) with applicable consents and surveys/s(6)

c. Regulated Research Institution Form (1C), when applicable

d. Qualified Scientist Form (2), when applicable

e. Risk Assessment (3) when applicable

IRB Waiver of Written Informed Consent/Parental Permission

The IRB may waive the requirement for documentation of written informed consent/parental permission if the research involves only minimal risk and anonymous data collection and if it is one of the following:

Research involving normal educational practices

Research involving behavioral or characteristics of individuals where the researcher does not manipulate the participants' behavior and the study does not involve more than minimal risk.

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.

Studies involving physical activity where the IRB determines that no more than minimal risk exists 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 during performance of routine physical activities.

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.

Expedited Review

An expedited review by only one member of the IRB may be conducted in the following circumstances described below.

The IRB member reviewing the project will determine whether appropriate safety precautions will be employed and whether the project must undergo full IRB review. If a project submitted for expedited review does not meet the criteria specified below, the project must undergo full IRB review. The IRB member reviewing the project must have the expertise necessary to make such a decision and/or receive advisement from an appropriately qualified expert.

Exempt Studies (Do Not Require IRB Preapproval or Human Participants Paperwork)

These projects do not require IRB review and approval as they 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. These projects

a. are observational/case studies that 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.

b. are surveys, questionnaires, or tests that 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.

c. are studies involving only minimal risk and anonymous data collection and if it is one of the following:

Research involving normal educational practices

Research involving behavioral or characteristics of individuals where the researcher does not manipulate the participants' behavior and the study does not involve more than minimal risk.

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.

Studies involving physical activity where the IRB determines that no more than minimal risk exists 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 during performance of routine physical activities.
Projects involving no more than minimal risk and those with more than minimal risk are allowed under the following guidelines.

No more than minimal risk exists when the probability and magnitude of harm or discomfort anticipated in the research are not greater (in and of themselves) than those ordinarily encountered in everyday life or during performance of routine physical or psychological examinations or tests.

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 video 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 (https://student.societyforscience.org/human-participants#riskass) and Online Survey Consent Procedures (https://member.societyforscience.org/document.doc?id=40) for more detailed information on risk assessment.
Vertebrate Animals Rules

Rules involving vertebrate animals

The following rules were developed to help pre-college student researchers adhere to regulations set forth by the federal government professional scientists and to protect the welfare of both animal subjects and the student researcher. Health and well-being is of high priority when students conduct research with animal subjects.

The Society strongly endorses the use of non-animal research methods and encourages students to use alternatives to animal research. If the use of vertebrate animals is necessary, students must develop additional alternatives to reduce and refine the use of animals.

All projects involving vertebrate animals must adhere to the rules below AND to either Section A or Section B rules, depending on the nature of the study and the research site. A project is considered a tissue study and not a vertebrate animal study if tissue is obtained from an animal that was euthanized for a purpose other than the student’s project. (Documentation is required of the IACUC approval for the original animal study from which tissues are obtained.) In tissue studies, a student may observe the vertebrate study, but may not manipulate or have any direct involvement in the vertebrate animal or experimental procedures.

Rules for ALL Vertebrate Animal Studies

1. The use of vertebrate animals in science projects is allowable under the conditions and rules in the following sections. Vertebrate animals, as covered by these rules, are defined as:
   a. Live, nonhuman vertebrate mammalian embryos or fetuses
   b. Tadpoles
   c. Bird and reptile eggs within three days (72 hours) prior to hatching
   d. All other nonhuman vertebrates (including fish) at hatching or birth.

   Exception: Because of their delayed cognitive neural development, zebrafish and other fish not considered vertebrate animals until 7 days (168 hours) post-fertilization.

2. Alternatives to the use of vertebrate animals for research must be explored and discussed in the research plan. The guiding principles for the use of animals in research include the following:
   a. Replace vertebrate animals with invertebrates, lower life forms, tissue/cell cultures and/or computer simulations where possible.
   b. Reduce the number of animals without compromising statistical validity.
   c. Refine the experimental protocol to minimize pain or distress to the animals.
   d. Respect animals and their contribution to research.

3. 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 oversight review and approval body for all animal studies at a Regulated Research Institution. The local OR affiliated fair SRC serves in this capacity for vertebrate animal studies performed in the home or the field. Any SRC serving in this capacity must include a veterinarian or an animal care provider with training and/or experience in the species being studied.

4. All vertebrate animal studies must have a research plan that includes:
   a. Justification why animals must be used, including the reasons for the choice of species, the source of animals and the number of animals to be used; description, explanation, or identification of alternatives to animal use that was considered, and the reasons these alternatives were unacceptable; explanation of the potential impact or contribution this research may have on the broad fields of biology or medicine.
   b. Description of how the animals will be used. Include methods and procedures, such as experimental design and data analysis; describe any of the procedures that will minimize the potential for discomfort, distress, pain and injury to the animals during the course of experimentation; idenitify other than that the student’s project, act, age, weight, sex and number of animals proposed for use.

5. Studies involving behavioral observations of animals are exempt from prior SRC review if all of the following apply:
   a. There is no interaction with the animals being observed.
   b. There is no manipulation of the animal environment in any way, and
   c. The study meets all federal and state agriculture, fish, game and wildlife laws and regulations.

6. Students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

7. Students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

8. All students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

9. Students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

10. Students are prohibited from designing or participating in an experiment associated with the following types of studies on vertebrates: any form of experiment involving:
   a. Induced toxicity studies with known toxic substances that could cause pain, distress or death, including but not limited to, drug toxicity, endotoxins, and pesticides.
   b. Behavioral experiments using conditioning with aversive stimuli, mother/infant separation or induced distress.
   c. Studies of pain.
   d. Predator/vertebrate prey experiments.

11. 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 IACUC and conducted at a Regulated Research Institution.

12. Vertebrate animal studies may be conducted at a home, school, field site or a Regulated Research Institution. If death is the result of the experimental procedure, the study must be terminated, and the study will not qualify for competition.

13. Vertebrate animals are permitted in any group or subgroup.

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

15. Any animal that is investigated by a veterinarian, the Qualified Scientist or the 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.

16. 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 oversight review and approval body for all animal studies at a Regulated Research Institution. The local OR affiliated fair SRC serves in this capacity for vertebrate animal studies performed in the home or the field. Any SRC serving in this capacity must include a veterinarian or an animal care provider with training and/or experience in the species being studied.

17. All vertebrate animal studies must have a research plan that includes:
   a. Justification why animals must be used, including the reasons for the choice of species, the source of animals and the number of animals to be used; description, explanation, or identification of alternatives to animal use that was considered, and the reasons these alternatives were unacceptable; explanation of the potential impact or contribution this research may have on the broad fields of biology or medicine.
   b. Description of how the animals will be used. Include methods and procedures, such as experimental design and data analysis; describe any of the procedures that will minimize the potential for discomfort, distress, pain and injury to the animals during the course of experimentation; idenitify other than that the student’s project, act, age, weight, sex and number of animals proposed for use.

18. Studies involving behavioral observations of animals are exempt from prior SRC review if all of the following apply:
   a. There is no interaction with the animals being observed.
   b. There is no manipulation of the animal environment in any way, and
   c. The study meets all federal and state agriculture, fish, game and wildlife laws and regulations.

19. Students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

20. All students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

21. Students are prohibited from designing or participating in an experiment associated with the following types of studies on vertebrates: any form of experiment involving:
   a. Induced toxicity studies with known toxic substances that could cause pain, distress or death, including but not limited to, drug toxicity, endotoxins, and pesticides.
   b. Behavioral experiments using conditioning with aversive stimuli, mother/infant separation or induced distress.
   c. Studies of pain.
   d. Predator/vertebrate prey experiments.

22. 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 IACUC and conducted at a Regulated Research Institution.

23. Vertebrate animal studies may be conducted at a home, school, field site or a Regulated Research Institution. If death is the result of the experimental procedure, the study must be terminated, and the study will not qualify for competition.

24. Vertebrate animals are permitted in any group or subgroup.

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

26. Any animal that is investigated by a veterinarian, the Qualified Scientist or the 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.

27. All vertebrate animal studies must have a research plan that includes:
   a. Justification why animals must be used, including the reasons for the choice of species, the source of animals and the number of animals to be used; description, explanation, or identification of alternatives to animal use that was considered, and the reasons these alternatives were unacceptable; explanation of the potential impact or contribution this research may have on the broad fields of biology or medicine.
   b. Description of how the animals will be used. Include methods and procedures, such as experimental design and data analysis; describe any of the procedures that will minimize the potential for discomfort, distress, pain and injury to the animals during the course of experimentation; idenitify other than that the student’s project, act, age, weight, sex and number of animals proposed for use.

28. Studies involving behavioral observations of animals are exempt from prior SRC review if all of the following apply:
   a. There is no interaction with the animals being observed.
   b. There is no manipulation of the animal environment in any way, and
   c. The study meets all federal and state agriculture, fish, game and wildlife laws and regulations.

29. Students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

30. All students performing vertebrate animal research must satisfy the US federal regulations governing the use of animals.

31. Students are prohibited from designing or participating in an experiment associated with the following types of studies on vertebrates: any form of experiment involving:
   a. Induced toxicity studies with known toxic substances that could cause pain, distress or death, including but not limited to, drug toxicity, endotoxins, and pesticides.
   b. Behavioral experiments using conditioning with aversive stimuli, mother/infant separation or induced distress.
   c. Studies of pain.
   d. Predator/vertebrate prey experiments.

32. 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 IACUC and conducted at a Regulated Research Institution.

33. Vertebrate animal studies may be conducted at a home, school, field site or a Regulated Research Institution. If death is the result of the experimental procedure, the study must be terminated, and the study will not qualify for competition.

34. Vertebrate animals are permitted in any group or subgroup.

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

36. Any animal that is investigated by a veterinarian, the Qualified Scientist or the 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.
are in compliance with U.S. federal laws are included in this
definition. For projects conducted outside of the United States, a
Regulated Research Institution would be a comparable research
institution that adheres to country laws governing the care and
use of vertebrate animals.

Some protocols permitted in a Regulated Research Institution are
not permitted for participation in the Intel ISEF; adherence to RRI
rules is necessary but may not be sufficient.

1. The Institutional Animal Care and Use Committee (IACUC) or
the comparable animal oversight committee must approve
all student research projects before experimentation
begins. Such research projects must be conducted under
the responsibility of a principal investigator. The local and
affiliated fair SRCs must also review the project to certify that
the research project complies with Intel ISEF Rules. This local
and regional SRC review should occur before experimentation
begins, if possible.

2. Student researchers are prohibited from performing
euthanasia. Euthanasia at the end of experimentation
for tissue removal and/or pathological analysis is permitted. All
methods of euthanasia must adhere to current American
Veterinarian Medical Association (AVMA) Guidelines.

3. Research projects that cause more than momentary or slight
pain or distress to vertebrate animals that is not mitigated
by approved anesthetics, analgesics and/or tranquilizers are
prohibited.

4. Research in nutritional deficiency or research involving
substances or drugs of unknown effect is permitted to the
point that any clinical sign of distress is noted. In the case
that distress is observed, the project must be suspended and
measures must be taken to correct the deficiency or drug
effect. A project can only be resumed if appropriate steps are
taken to correct the causal factors.

5. 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.

Sources of Information are available as a separate
section at the end of the document.

Research using microorganisms (including bacteria, viruses, viroids,
prions, rickettsia, fungi, and parasites), recombinant DNA (rDNA) technologies or human
or animal fresh/frozen tissues, blood, or body fluids may involve potentially hazardous
biological agents. Students are permitted to do some 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 Biosecurity 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 laboratory facilities, equipment, training,
and supervision required.

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. The following types of studies involve BSL-1 organisms and are exempt
from prior SRC review and require no additional forms:

a. Studies involving baker’s yeast and brewer’s yeast, except in rDNA studies.

b. Studies involving Lactobacillus, Bacillus thuringiensis,
nitrogen-fixing, oil-eating, and algae-eating bacteria
introduced into their natural environment. (Not exempt
if cultured in a petri dish environment.)

c. Studies involving water or soil not concentrated in media
dar conducting their microbial growth (please review all
rules below to ensure that there are not more specific
rules that may apply).

d. Studies of mold growth on food items if the experiment is
terminated at the first evidence of mold.

e. Studies of slime molds and edible mushrooms.

f. Studies involving E. coli k-12 which are done at school
and are not recombinant DNA studies.

2. The following types of studies are exempt from prior SRC
review, but require a Risk Assessment Form 3:

a. Studies involving protists, archaea and known non-
pathogenic microorganisms.

b. Research using manure for composting, fuel production,
or other non-culturing experiments.

c. Commercially-available color change coliform water test
kits. These kits must remain sealed and must be properly
disposed.

d. Studies involving decomposition of vertebrate organisms
(such as in forensic projects).

e. Studies with microbial fuel cells.

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

a. Laboratory studies with BSL-2 organisms require prior
SRC review, but require a Risk Assessment Form 3:

b. Experimentation involving the culturing of potentially hazardous
biological agents 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.

c. 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.

d. 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. The research
must be supervised by a Qualified Scientist. For a high
school BSL-2 laboratory, the SRC must review and
approve.

e. Students are prohibited from designing or participating in an experiment associated with the following types of
PHBA studies:

• BSL-3 or BSL-4 Research
• Culturing CRE (Carbenem Resistant Enterobacteriaceae)
• Insertion of antibiotic resistance markers for the
clonal selection of bioengineered organisms is permitted.

• Students may not genetically engineer organisms with
multiple drug resistance traits for the intended purpose
of investigation of the pathology or treatment of antibiotic-
resistant infections. 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 is
strictly prohibited.

g. Laboratory studies culturing known MRSA (Methicillin-
resistant Staphylococcus aureus), VRE (Vancomycin-
resistant enterococci) and KPC (Klebsiella pneumonia)
should have a written justification for usage and be
conducted at a Regulated Research Institution with
a minimum BSL-2 laboratory with documented IBC
Committee review and approval.

h. Extreme caution must be exercised when selecting and
sub-culturing antibiotic-resistant organisms. Studies
using such organisms require at least BSL-2 containment.

i. Naturally-occurring plant pathogens may be studied
(not cultured) at home, but may not be introduced into a
home/garden environment.
l. The culturing of human or animal waste, including sewage sludge, is considered a BSL-2 study.

k. All potentially hazardous biological agents must be properly disposed at the end of experimentation in accordance with their biosafety level. For BSL 1 or BSL 2, the BSL-1 laboratory must be conducted 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 S. subtilis host-vector systems.

2. Commercially available rDNA kits using BSL-1 organisms may be conducted under the supervision of a Qualified Scientist or Designated Supervisor and must be approved by the SRC prior to experimentation.

3. 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.

4. 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.

5. Propagation of recombinants containing DNA coding for human, plant or animal toxins (including viruses) is prohibited.

C. Additional Rules for Projects Involving Unknown Microorganisms

Studies involving unknown microorganisms present a challenge because the presence, 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, dust, water). Therefore, a proper risk assessment is 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.
   c. Fresh or frozen meat, meat by-products, pasteurized milk or eggs obtained from food stores, restaurants, or packing houses
   d. Hair, hooves, nails and feathers
   e. Teeth that have been sterilized to kill any blood-borne pathogen that may be present.
   f. Fossilized tissue or archeological specimens.
   g. Prepared fixed tissue

2. Research involving human and/or non-human primate established cell lines and tissue culture collections (e.g., obtained from the American Type Culture Collection) must be considered a BSL-1 study. The source and/or catalog number of the cultures must be identified in the Research Plan/Project Summary.

3. If tissues are obtained from an animal that was euthanized solely for the student's project, the study must be considered a vertebrate animal project. Use of tissues obtained from agricultural/animal study. Use of tissues obtained from agricultural/aquacultural studies require prior SRC approval.

4. If the animal was euthanized solely for the student's project, the study must be considered a vertebrate animal project and is subject to the vertebrate animal rules. (See vertebrate animal rules. (See vertebrate animal rules.)

5. The collection and examination of fresh/frozen tissue and/or body fluids (not including blood or blood products; see rule 8) from non-infectious source with little likelihood of microbial pathogens present must be considered Biosafety level 1 studies and must be conducted in a BSL-1 laboratory or higher level laboratory by a Qualified Scientist or trained Designated Supervisor.

6. The collection and examination of fresh/frozen tissues or body fluids or meat, meat by-products, pasteurized milk or eggs NOT obtained from food stores, restaurants, or packing houses may contain pathogenic microorganisms. Because of the increased risk from unknown potentially hazardous agents, these studies must be considered biosafety level 2 studies conducted in a BSL-2 laboratory under the supervision of a Qualified Scientist.

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

8. All studies involving human or wild animal blood or blood products should be conducted 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 containing blood-borne pathogens (e.g., blood, blood products, tissues that release blood when compressed, blood contaminated instruments) must be properly disposed after experimentation.

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

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

11. A project involving a student researcher using their own body fluids (if not cultured) a. can be considered a BSL-1 study b. may be conducted in a home setting c. must have IRB review if the body fluid is serving as a measure of an effect of an experimental procedure on the student researcher; (e.g., student manipulates 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.

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

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 for risk assessment involving:

1. Assignment of the biological agent to a risk group
2. Studies involving a known microbiorganism 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 expertise and expertise of the adult(s) supervising the student.

Classification of Biological Agents Risk Groups

Biological agents, plant or animal, are classified according to biosafety level risk groups. These classifications presume some knowledge of microbiological practices and the use of biological safety cabinets or hoods. Agents require Biosafety Level 1 containment. Examples of BSL-1 organisms are: Mycobacterium, Bacillus subtilis, and Bacillus subtilis var. niger. BSL-2 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 or plants. The agents require Biosafety Level 1 containment. Examples of BSL-1 organisms are: Acinetobacter baumannii, Burkholderia cepacia, and Clostridium perfringens. BSL-3 risk group contains biological agents that usually cause serious disease in humans, animals or plants. These agents require Biosafety Level 2 containment. Examples of BSL-2 organisms are: Escherichia coli, Salmonella choleraesuis, and Salmonella enterica serovar Typhi. BSL-4 risk group contains biological agents that are often untreatable. Projects in the BSL-4 group are prohibited.

Hazardous Biological Agents Risk Assessment

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, was approved by an 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 Intel ISEF rules.
3. Assignment of the expertise and expertise of the adult(s) supervising the student.

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 a culture room that is not designated as a BSL-2 laboratory. Other practices are those used in the laboratory, Decontamination can be achieved by using chemical 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 animals and plants or with biological agents that pose moderate risk to personnel and the environment. Access to the laboratory is restricted. Biological safety cabinets (Class 2, type A, BSC) must be available. An autoclave should be readily available for decontaminating waste materials. Lab coats and gloves are required; eye protection and face shields must also be worn. The laboratory work should be supervised by a scientist who understands the risk associated with working with the agents involved.

BSL-3 containment is required for 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.

Hazardous Chemicals, Activities or Devices Rules

Includes DEA-controlled substances, prescription drugs, alcohol & tobacco, firearms and explosives, radiation, lasers, etc.

1. DEA-Controlled Substances

   a. All studies using DEA-controlled substances must be supervised by a Qualified Scientist 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 be accompanied by a DEA Schedule 1 permit approved by DEA before research begins. Schedule 2, 3, and 4 substances do not require protocol approval by DEA.

2. Prescription Drugs

   Prescription drugs are regulated by federal or country laws to prevent against inappropriate or unsafe use. Special precautions must be taken for their use for a science project as follows:
   a. Students are prohibited from administering prescription drugs to human participants.
   b. A veterinarian must supervise student administration of any prescription drugs to vertebrate animals.

3. Alcohol and Tobacco

   The U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB) regulates the production, transport and distribution of alcohol and tobacco products. Many such products are restricted by age for purchase, possession and consumption. Inability to produce the necessary permits in minute quantities of ethyl alcohol are produced are permitted.
   b. The Designated Supervisor is responsible for the acquisition, usage and appropriate disposal of alcohol or tobacco used in the study.
   c. 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 alcoholic production of the wine or beer.
   d. 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 do so, the work must be conducted at school or at a Regulated Research Institution and follow all local and county laws. See Alcohol and Tobacco Tax and Trade Bureau (TTB) website for details.

4. Firearms and Explosives

   The U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) and state and local 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 defined as a substance that contains gunpowder, compound or mixtures of these, the primary purpose of which is to function by explosion. Explosives include, but are not limited to, dynamite, black powder, fuming nitric acid and igniters.
Environmental Responsibility

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 in the EPA website under the Sources of Information section. Whenever possible the following principles should be incorporated into the research plan:

- Waste less
- Use of the safest possible chemicals and products
- Design of the least possible hazardous synthetic routes
- Use renewable feeding material
- Use 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

5. 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 (www.faa.gov/airs/registration). "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:

- Toxicity – the tendency of a chemical to be hazardous to health when inhaled, swallowed, inhaled or in contact with the skin.
- Reactivity – the tendency of a chemical to undergo chemical change.
- Flammability – the tendency of a chemical to give off flammable vapors which readily ignite when used under normal working conditions.
- 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 must include proper disposal methods for the chemicals used in an experiment. The Flinn Catalog (www.amazon.com) contains detailed information on the proper disposal of chemicals. If applicable, the student researcher must incorporate in the research plan disposal procedure required by federal and state guidelines.

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

Risk assessment 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), and radiofrequency (RF) and extremely low frequency (ELF). Ionizing radiation has enough energy to remove tightly bound electrons from atoms, thus creating ions. Examples include high frequency UV, X-Rays, and gamma rays.

Lasers usually emit visible, ultraviolet or infrared radiation. Lasers are classified into four classes based upon their safety. Manufacturers are required to label Classes II – IV lasers.

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 on the level of radiation, it may be impossible to study radioactive materials from these sources can be a health hazard.

A risk assessment must take into account the time of exposure, distance and shielding involved in the study.

- A study of natural radiation that is no more than encountered in everyday life is exempt from the following requirements.
- 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.
- 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 SRC preapproval is not required.
- A study using 10-25 kvolts must have a risk assessment conducted and must be preapproved by the SRC to assess safety. Such a study must be conducted in a metal chamber using a camera only, not direct view through glass.
- 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.

Sources of Information for All Projects

1. United States Patent and Trade Office
   Customer Service: 1-800-786-9199 (toll-free);
   571-272-1000 (local);
   571-272-9950 (TTY)
   www.uspto.gov
   www.uspto.gov/patents/patents/index.jsp

2. European Patent Office
   www.epo.org
   www.epo.org/applying/basics.html

3. The Mad Scientist Network at Washington University School of Medicine:
   www.madsci.org

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

5. APHIS
   www.aphis.usda.gov
   Animal and Plant Health Inspection Service
   Invasive Species List

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

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

   ISBN: 978-0-86333-004-8

Human Participants

   http://ohrrd.od.nih.gov/guidelines/g4c46.html

   Customer Service: 1-800-224-44-19
   Can be purchased from: www.amazon.com

3. NIH tutorial, “Protecting Human Research Participants”
   http://nihpr.nihtraining.com/users/PFRP.pdf

4. Belmont Report, April 18, 1979
   www.nih.gov/ohrp/humansubjects/guidance/belmont.html

   Washington, DC: AERA, APA, NCFME.

6. American Psychological Association
   750 First Street, NE Washington, DC 20002-4242
   phone: 202-336-5500; 800-374-2721
   www.apa.org

   Information for students:
   www.apa.org/science/leadership/students/information.aspx

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

8. The Children’s Online Privacy Protection Act of 1998 (COPPA)
   www.ftc.gov/policy/coppafaq.shtm

Vertebrate Animals

Animal Care and Use

1. Laboratory Animals, Institute of Laboratory Animal Research (ILAR), Commission on Life Sciences, National Research
   http://delis.nas.edu ila

2. Guide for the Care and Use of Laboratory Animals, 8th Edition
   www.nas.edu/catalog.php?record_id=12910

3. Guidelines for the Care and Use of Mammals in Neuroscience and Behavioral Research (2003), Institute for Laboratory Animal
   www.nas.edu/report/guidelines-carey/10732

To order these ILAR publications contact:
   National Academy Press
   500 Fifth Street, NW
   Washington, DC 20055
   phone: 202-334-3313; fax: 202-334-2451
   www.nap.edu

4. Federal Animal Welfare Act (AWA)
   7 U.S.C. 2131-2157
   Subchapter A - Animal Welfare
   Parts I, II, III
   www.nal.usda.gov/avcr/advisoryboard/awreg.htm

   Above document is available from:
   USDA/APHIS/AC
   4700 River Road, Unit 84
   Riverside, MD 20737-1234
   email: ape@aphis.usda.gov
   phone: 301-734-7833; fax: 301-734-4978
   www.aphis.usda.gov

5. Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (Agri-Guide) Federation of Animal Science Societies (FASS) 1800 S. Oak Street, Suite 100 Champaign, IL 61820-6974 phone: 217-356-3182 email: fass@lassoqch.org www.fass.org


Alternative Research and Animal Welfare

1. The National Library of Medicine provides computer searches through MEDLINE.

   Animal Welfare Information Center National Agriculture Library 10301 Baltimore Avenue, Room 410 Beltsville, MD 20705-2351 phone: 301-504-6212, fax: 301-504-7125 email: awic@ars.usda.gov www.nal.usda.gov/awic

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: 202-334-2950; fax: 202-334-1687 email: ila@nas.edu http://dx.doi.org/10.1177/004590290274585

4. Quarterly bibliographies of Alternatives to the Use of Live Vertebrates in Biomedical Research and Testing may be obtained from:

5. Johns Hopkins Center for Alternatives to Animal Testing (CAAT) has worked with scientists since 1981 to find new methods to replace traditional laboratory animals in experiments, reduce the number of animals tested, and refine necessary tests to eliminate pain and distress. email: caat@jh.edu http://caat.jh.edu/

6. Quality Assurance Manuals (for appropriate species)
   Such as:

Potentially Hazardous Biological Agents


2. American Type Culture Collection (ATCC) www.atcc.org

3. Bergey’s Manual of Systematic Bacteriology website – follow the links for resources and microbial databases for a collection of international websites of microorganisms and cell cultures. www.bergeys.org/resources.html


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. www.hhmi.org/resources/

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

4. Safety and Data Sheets (SDS) www.finnsci.org/msds-search.aspx
   A directory of SDS sheets from Finn Scientific Inc. that includes a ranking of hazard level and disposal methods.
   www.lipi.org/msds/index.html - A listing of numerous sites that have free downloads of MSDS sheets.

5. Pesticides
   National Pesticide Information Center http://npic.orst.edu/ingred/products.html
   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://asap.epa.gov/apes/pesticides/#/?p=125-1
   A database of product labels. Enter the product name or company name to view the approved label information of pesticides which are registered with the agency.

6. DEA Controlled Substances
   Controlled Substance Schedules – a list of controlled substances: www.deadiversion.usdoj.gov/schedules/

   Bureau of Alcohol, Tobacco, Firearms and Explosives www.atf.gov

8. Radiation
   Radiation Studies Information (CDC) www.cdc.gov/nceh/radiation/default.htm


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

    Safety and Health Topics: www.osha.gov/SLTC/cshhonhealth/pdf.html
    www.osha.gov/SLTC/reactivechemicals/index.html
    www.osha.gov/SLTC/faserhazards/index.html
    www.osha.gov/SLTC/radiationionizing.html

11. U.S. Nuclear Regulatory Commission
Display and Safety Authority

The Intel ISEF Display and Safety Committee is the final authority on display and safety issues for projects approved by the SRC to compete in the Intel ISEF. Occasionally, the Intel ISEF Display and Safety Committee may require students to make revisions to conform to display and safety regulations. The Regulations that follow have been divided into two main categories to separate those that deal specifically with display regulations and those that pertain to safety regulations.

Display Regulations

The following regulations must be adhered to when a finalist exhibits a project at Intel ISEF.

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 allowing the posted work to be released to the public, must be returned to project and must fit within allowable dimensions.

1. All project materials and support mechanisms must fit within the project dimensions.
2. Fair provided tables will not exceed a height of 36 inches (91 centimeters).
3. If a table is used it becomes part of the project and must not exceed the allowed dimensions.
4. Nothing can be attached to the rear curtain for display.
5. All demonstrations must be done within the confines of the finalist booth. When not being demonstrated, the component must be returned to project and must fit within allowable dimensions.

Forms Required to be Visible and Vertically Displayed

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

Forms required at all projects:

- Original of official abstract and certification as approved and stamped/embossed by the Intel ISEF Scientific Review Committee.
- Completed Intel ISEF Project Set-up Approval Form SRC/DS2 (Receive on-site at the Fair)
- Forms required when applicable (indicated on Form SRC/DS2)
  1. Regulated Research Institutional/Industrial Setting Form (IC)
  2. Continuation Projects Form (7)
- Completed Informed Consent Forms Not to be Displayed

Forms Required at Project but not Displayed

Forms including, but not limited to, Checklist for Adult Sponsor (1), Student Checklist (1), Research Plan/Project Summary and Approval Form (18) which are required for the project or for Scientific Review Committee approval do not have to be displayed as part of the project but must be available in the booth in case asked for by a judge or other Intel ISEF official. 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. All other forms not specifically called for in the above sections are NOT required to be Displayed at the booth.

Photograph/Image Display Requirements

Display of photographs other than that of the finalist must have a photo release signed by the subject, and if under 18 years of age, also by the guardian of the subject. Sample consent text: “I consent to the use of visual images (photos, videos, etc.) involving my participation in this research.” (These forms must be available upon request by a Display & Safety Inspector, but shall not be displayed.)

Photographs taken of the finalist’s project, being displayed, are sufficient. Any photographs/visual depictions on the vertical display board (Exception: The project title displayed in the finalist’s booth may mention duration of the project). Any equipment or model of a project or finalist.

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

Prior year’s written material or visual depictions on the vertical display board may mention duration of the project. For example, Year 2 of an Ongoing Study. Please note continuation projects must vertically display the Continuation Project Form.

Any attachment of material that is returned removed items from the above list is a violation of the Ethics Agreement and will result in items being confiscated by the Display and Safety Committee and may result in the project failing to qualify for competition.

Handouts Allowed at Project

- Handouts to judges and to the public must be limited to UNALTERED photocopies of the official abstract and certification.
- The Intel ISEF Scientific Review Committee defines the “official abstract and certification” as an UNALTERED original abstract and certification as stamped/embossed by the Intel ISEF Scientific Review Committee. If the Scientific Review Committee requires a finalist to make changes to the abstract and certification submitted with registration papers, the revised version will be stamped/embossed, will replace the earlier version, and will become the finalist’s official abstract and certification.

1. The finalist will be provided with 20 copies of the Official Abstract and Certification.
2. The name of the project may NOT be used as a title or reference for any information on a finalist’s display or materials at the project except as part of displaying the official abstract.
3. An alternative photocopy of the official abstract and certification must be vertically displayed at the project.

Items/Materials Not Allowed at Project

The following is a list of what cannot be displayed at the project:

1. Any items that are acknowledgments, self-promotions or external endorsements (such as naming the research institution, mentor or patent pending statements) and/or are intended for distribution including:
   a. Any disks, CDs, business cards, printed materials, etc. (including unofficial abstracts) designed to be distributed to judges or the public
   b. Flash drives, brochures, booklets, endorsements, and additional give-away items including, but not limited to, pins, key chains, food etc.
   c. Any awards or medals, except for past or present Intel ISEF medals that may be worn by the finalist.
2. Postal addresses, World Wide Web, email and/or social media addresses, QR codes, telephone and/or fax numbers of a project or finalist.
3. Active Internet or email connections as part of displaying or operating the project at the Intel ISEF.
4. Prior year’s written material or visual depictions on the vertical display board (Exception: The project title displayed in the finalist’s booth may mention duration of the project). For example, Year 2 of an Ongoing Study. Please note continuation projects must vertically display the Continuation Project Form.

Any attachment of material that is removed from the above list is a violation of the Ethics Agreement and will result in the project failing to qualify for competition.

Other Display Regulations

1. No changes, modifications, or additions to projects may be made after approval by the Display and Safety Committee and the Scientific Review Committee. Finalists who do not adhere to the signed agreement on the SRC/DS2 Form regarding this regulation will fail to qualify for competition.
2. Any project that fails to qualify and is not removed by the finalist, Society for Science & the Public will remove the project in the safest manner possible but is not responsible for damage to the project.
3. It is highly recommended that your project number be placed on all notebooks or materials that will be left at your booth. A project data book and research paper are not required but are highly recommended.
4. Judges will preview projects without finalist’s present beginning at noon on Tuesday.
5. No Acknowledgements
Information on Required Abstract & Certification for ALL Projects at the Intel 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, one-page abstract. This is written on the Official Abstract and Certification Form as provided by Society for Science & the Public. 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 work may be included. An abstract must not include the following:

- acknowledgments (including naming the research institution and/or mentor with which you were working), self-promotions and external endorsements
- b. 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 Intel ISEF Scientific Research Committee will review and approve the abstract and answers to the questions.

Revisions or questions will be resolved via Intel ISEF SRC.

My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes
- no

NOTE: Your abstract must be on the Intel International Science and Engineering Fair Abstract & Certification form and embossed/stamped by the Intel ISEF Scientific Review Committee before it is displayed or handed out. No pasted or taped text will be permitted. No other format or version of your approved Abstract & Certification will be allowed for any purpose at the Intel ISEF.
Intel ISEF Categories and Subcategories

The categories have been established with the goal of better aligning judges and student projects for the judging at the Intel ISEF. Local, regional, state and country fairs 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 student.societyforscience.org/intel-isef-categories-and-subcategories for a full description and definition of the Intel ISEF categories:

**ANIMAL SCIENCES**
- Animal Behavior
- Cellular Studies
- Development
- Ecology
- Genetics
- Nutrition and Growth
- Physiology
- Systematics and Evolution
- Other

**BEHAVIORAL AND SOCIAL SCIENCES**
- Clinical and Developmental Psychology
- Cognitive Psychology
- Sociolgy and Social Psychology
- Other

**BIOCHEMISTRY**
- Analytical Biochemistry
- General Biochemistry
- Medicinal Biochemistry
- Structural Biochemistry
- Other

**BIOLOGICAL AND HEALTH SCIENCES**
- Disease Diagnosis
- Disease Treatment
- Drug Development and Testing
- Epidemiology
- Nutrition
- Physiology and Pathology
- Other

**BIOENGINEERING**
- Biomedical and Regenerative Medicine
- Biomechanics
- Biomedical Devices
- Biomedical Imaging
- Cell and Tissue Engineering
- Synthetic Biology
- Other

**CELLULAR AND MOLECULAR BIOLOGY**
- Cell Physiology
- Genetics
- Immunology
- Molecular Biology
- Neurobiology
- Other

**CHEMISTRY**
- Analytical Chemistry
- Computational Chemistry
- Environmental Chemistry
- Inorganic Chemistry
- Materials Chemistry
- Organic Chemistry
- Physical Chemistry
- Other

**COMPUTATIONAL BIOLOGY AND BIINFORMATICS**
- Biomedical Engineering
- Computational Pharmacology
- Computational Bioimaging
- Computational Evolutionary Biology
- Computational Neuroscience
- Other

**EARTH AND ENVIRONMENTAL SCIENCES**
- Atmospheric Science
- Climate Science
- Environmental Effects on Ecosystems
- Geosciences
- Water Science
- Other

**EMBEDDED SYSTEMS**
- Circuits
- Internet of Things
- Microcontrollers
- Networking and Data Communications
- Optics
- Sensors
- Signal Processing
- Other

**ENERGY: CHEMICAL**
- Alternative Fuels
- Computational Energy Science
- Fossil Fuel Energy
- Fuel Cells and Battery Development
- Microbial Fuel Cells
- Solar Materials
- Other

**ENERGY: PHYSICAL**
- Hydro Power
- Nuclear Power
- Solar
- Sustainable Design

**ENGINEERING MECHANICS**
- Aerospacae Aeronautical Engineering
- Civil Engineering
- Computational Mechanics
- Control Theory
- Ground Vehicle Systems
- Industrial Engineering-Processing
- Mechanical Engineering
- Naval Systems
- Other

**ENVIRONMENTAL ENGINEERING**
- Biomediation
- Land Reclamation
- Pollution Control
- Recycling and Waste Management
- Water Resources Management
- Other

**MATERIALS SCIENCE**
- Biomaterials
- Ceramic and Glasses
- Composite Materials
- Computation and Theory
- Electronic, Optical and Magnetic Materials
- Nanomaterials
- Polymers
- Other

**MATHEMATICS**
- Algebra
- Analysis
- Combinatorics
- Graph Theory
- Game Theory
- Geometry and Topology
- Number Theory
- Probability and Statistics
- Other

**MICROBIOLOGY**
- Antimicrobials and Antibiotics
- Applied Microbiology
- Bacteriology
- Environmental Microbiology
- Microbial Genetics
- Virology
- Other

**PHYSICS AND ASTRONOMY**
- Astronomy and Cosmology
- Atomic, Molecular, and Optical Physics
- Biological Physics
- Computational Physics
- Condensed Matter and Materials Instrumentation
- Electromagnetics and Plasmas
- Mechanics
- Nuclear and Particle Physics
- Optics, Lasers, Masers
- Quantum Computation
- Theoretical Physics
- Other

**PLANT SCIENCES**
- Agronomy
- Ecology
- Genetics/Breeding
- Growth and Development
- Pathology
- Physiology
- Systematics and Evolution
- Other

**ROBOTICS AND INTELLIGENT MACHINES**
- Biomechanics
- Cognitive Systems
- Control Theory
- Machine Learning
- Robot Kinematics
- Other

**SYSTEMS SOFTWARE**
- Algorithms
- Cybersecurity
- Databases
- Operating Systems
- Programming Languages
- Other

**TRANSLATIONAL MEDICAL SCIENCES**
- Disease Detection and Diagnosis
- Disease Prevention
- Disease Treatment and Therapies
- Drug Identification and Testing
- Pre-Clinical Studies
- Other

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**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 Intel ISEF Rules and Guidelines.

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, IRACUC or IBC:
   - Humans
   - Potentially Hazardous Biological Agents
   - Vertebrate Animals
   - Microorganisms
d. rDNA
t. Tissues

5. Items to be completed for ALL PROJECTS:
   - Adult Sponsor Checklist (1)
   - 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)

6. Additional forms required if the project involves the use of one or more of the following (check all that apply): Humans
   - Requires prior approval by an Institutional Review Board (IRB); see full text of the rules.
   - Testing student designed invention/prototype
   - 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) (Required for all vertebrate animal projects at a regulated research site or when applicable)
   - Potentially Hazardous Biological Agents (Requires prior approval by SRC, IACUC or Institutional Biosafety Committee (IBC), see full text of the rules.)
   - Potentially Hazardous Biological Agents Risk Assessment Form (6A)
   - Human and Vertebrate Animal Tissue Form (6B) - to be completed in addition to Form 6A when project involves the use of fresh or frozen tissue, primary cell cultures, blood, blood products and body fluids.
   - Qualified Scientist Form (2) (when applicable)
   - Hazardous Chemicals, Activities and Devices (No SRC prior approval required, see full text of the rules.)
   - Risk Assessment Form (3)
   - Qualified Scientist Form (2) (required for projects involving DEA-controlled substances or when applicable)

Note: The following are exempt from prior review but require a Risk Assessment Form 3: projects involving protists, archae and similar microorganisms, for projects using manure for composting, fuel production or other non-culturing experiments, for projects using color change coliform water test kits, microbial fuel cells, and for projects involving decomposing vertebrate organisms.

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Adult Sponsor's Printed Name:____

Signature:____

Date of Review:____

Phone:____

Email:____
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. 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)

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

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

8. List name and address of all non-school work site(s):
   Name: ____________________________ Address: __________________________________________
   Phone: ____________________________

9. List name and address of all non-school work site(s):
   Name: ____________________________ Address: __________________________________________
   Phone: ____________________________

10. List name and address of all non-school work site(s):
    Name: ____________________________ Address: __________________________________________
        Phone: ____________________________

11. An abstract is required for all projects after experimentation.

# Research Plan/Project Summary Instructions

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

1. All projects must have a Research Plan/Project Summary written prior to experimentation following the instructions below to detail the rationale, research question(s), methodology, and risk assessment of the proposed research.
   a. If changes are made during the research, such changes can be added to the original research plan as an addendum, recognizing that some changes may require returning to the IRB or SRC for appropriate review and approvals. If no additional approvals are required, this addendum serves as a project summary to explain research that was conducted.
   b. If no changes are made from the original research plan, no project summary is required.

2. Some studies, such as an engineering design or mathematics projects, will be less detailed in the initial project plan and will change through the course of research. If such changes occur, a project summary that explains what was done is required and can be appended to the original research plan.

3. The Research Plan/Project Summary should include the following:
   a. **RATIONALE**: Include a brief synopsis of the background that supports your research problem and explain why this research is important and if applicable, explain any societal impact of your research.
   b. **RESEARCH QUESTION(S), HYPOTHESIS(ES), ENGINEERING GOAL(S), EXPECTED OUTCOMES**: How is this based on the rationale described above?
   c. **Describe the following in detail**:
      - Procedures: Detail all procedures and experimental design including methods for data collection. Describe only your project. Do not include work done by mentor or others.
      - Risk and Safety: Identify any potential risks and safety precautions needed.
      - Data Analysis: Describe the procedures you will use to analyze the data/results.
   d. **BIBLIOGRAPHY**: List major references (e.g., science journal articles, books, internet sites) from your literature review. If you plan to use vertebrate animal research, you must accompany Student Checklist (1A).

Items 1–4 below are subject-specific guidelines for additional items to be included in your research plan/project summary as applicable.

1. **Human participants research**:
   a. **Participants**: Describe age range, gender, racial/ethnic composition of participants. Identify vulnerable populations (minors, pregnant women, prisoners, mentally disabled or economically disadvantaged).
   b. **Recruitment**: Where will you find your participants? How will they be invited to participate?
   c. **Methods**: What will participants be asked to do? Will you use any surveys, questionnaires or tests? What is the frequency and length of time involved for each subject?
   d. **Risk Assessment**: What are the risks or potential discomforts (physical, psychological, time involved, social, legal, etc.) to participants? How will you minimize risks? List any benefits to society or participants.
   e. **Protection of Privacy**: Will identifiable information (e.g., names, telephone numbers, birth dates, email addresses) be collected? Will data be confidential/anonymous? If anonymous, describe how the data will be collected. If not anonymous, what procedures are in place for safeguarding confidentiality? Where will data be stored? Who will have access to the data? What will you do with the data after the study?
   f. **Informed Consent Process**: Describe how you will inform participants about the purpose of the study, what they will be asked to do, that their participation is voluntary and they have the right to stop at any time.

2. **Vertebrate animal research**:
   a. **Discuss potential ALTERNATIVES to vertebrate animal use and present justification for use of vertebrates**.
   b. **Explain potential impact or contribution of this research**.
   c. **Detail all procedures to be used, including methods used to minimize potential discomfort, distress, pain and injury to the animals and detailed chemical concentrations and drug dosages**.
   d. **Detail animal numbers, species, strain, sex, age, source, etc., include justification of the numbers planned**.
   e. **Describe housing and oversight of daily care**.
   f. **Discuss disposition of the animals at the termination of the study**.

3. **Potentially hazardous biological agents research**:
   a. **Give source of the organisms and describe BSL assessment process and BSL determination**.
   b. **Discuss safety precautions and discuss methods of disposal**.

4. **Hazardous chemicals, activities & devices**:
   - Describe Risk Assessment process, supervision, safety precautions and methods of disposal.
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 Intel ISEF Rules and Guidelines and will adhere to all International Rules when conducting this research.
   - I have read and will abide by the following Ethics statement.

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 the Intel 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.

Student’s Printed Name ___________________________ Signature ___________________________ Date Acknowledged (mm/dd/yy) ___________________________

Parent/Guardian’s Printed Name ___________________________ Signature ___________________________ Date Acknowledged (mm/dd/yy) ___________________________

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

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

a. Required for projects that need prior SRC/IRB approval

BEFORE experimentation (humans, vertebrates or potentially hazardous biological agents).

The SRC/IRB has carefully studied this project’s Research Plan/Project Summary and all the required forms are included. My signature indicates approval of the Research Plan/Project Summary before the student begins experimentation.

SRC Chair’s Printed Name ___________________________ Signature ___________________________ Date of Approval (mm/dd/yy) ___________________________

b. Required for research conducted at all Regulated Research Institutions with no prior fair SRC/IRB approval.

This project was conducted at a regulated research institution (not home or high school, etc.), was reviewed and approved by the proper institutional board before experimentation and complies with the Intel ISEF Rules. Attach (1C) and any required institutional regulatory board (IRB/IACUC/IBC) has been obtained. Copies are attached if applicable.

SRC Chair’s Printed Name ___________________________ Signature ___________________________ Date of Approval (mm/dd/yy) ___________________________

3. Final Intel ISEF Affiliated Fair SRC Approval (Required for ALL Projects)

I certify that this project adheres to the approved Research Plan/Project Summary and complies with all Intel ISEF Rules.

Regional SRC Chair’s Printed Name ___________________________ Signature ___________________________ Date of Approval (mm/dd/yy) ___________________________

State/National SRC Chair’s Printed Name (where applicable) ___________________________ Signature ___________________________ Date of Approval (mm/dd/yy) ___________________________

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)?

6. 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)?

7. 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.

8. The student(s) conducted research at my work site:

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)?

9. Did you or your proxy (e.g. graduate student, postdoc, employee) mentor or provide substantial guidance to the student researcher?

Yes ☐ No ☐ If yes, 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).

10. To be completed by the Supervising Adult in the Setting (NOT the Student(s)) after experimentation:

(Responses must remain on the form as it is required to be displayed at student’s project booth.)

Student’s Name(s) ___________________________

Title of Project ___________________________

To be completed by the Supervising Adult in the Setting (NOT the Student(s)) after experimentation:

The student(s) conducted research 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 ☐ If so, 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).

2. Is the student’s research project a subset of your ongoing research or work?

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)?

3. Describe the independence and creativity with which the student:

a. developed the hypotheses or engineering goals for her/her research project

b. designed the methodology for his/her research project

c. analyzed and interpreted data

4. 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)?

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)?

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.

Supervising Adult’s Printed Name ___________________________ Signature ___________________________ Title ___________________________

Institution ___________________________ Date Signed (must be after experimentation) ___________________________

Address ___________________________ Email/Phone ___________________________
Qualified Scientist Form (2)

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

Student's Name(s) ____________________________________________
Title of Project ______________________________________________

To be completed by the Qualified Scientist:

Scientist Name: ____________________________________________
Educational Background: ____________________________________ Degree(s): __________________________
Experience/Training as relates to the student's area of research: _______ ____________

Position: __________________________ Institution: __________________________
Address: __________________________ Email/Phone: __________________________

1) Have you reviewed the Intel ISEF rules 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. DEA-controlled substances □ Yes □ No
3) Was this study 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: __________________________ ____________

To be completed by the Designated Supervisor when the Qualified Scientist cannot directly supervise.

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

Qualified Scientist's Printed Name __________________________
Signature __________________________ Date of Approval ____________

To be completed by the Designated Supervisor:

I certify that I have reviewed the Research Plan/Project Summary and have been trained in the techniques to be used by this student, and I will provide direct supervision.

Designated Supervisor's Printed Name __________________________
Signature __________________________ Date of Approval ____________

Phone __________________________ Email __________________________

Risk Assessment Form (3)

Required for projects using hazardous chemicals, activities or devices and microorganisms which are exempt from pre-approval. Must be completed before experimentation.

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) List all hazardous chemicals, activities, or devices that will be used; identify microorganisms exempt from pre-approval (see Potentially Hazardous Biological Agent rules).

2) Identify and assess the risks involved in this project.

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.

To be completed and signed by the Designated Supervisor (or Qualified Scientist, when applicable):

I agree with the risk assessment and safety precautions and procedures described above. I certify that I have reviewed the Research Plan/Project Summary and will provide direct supervision.

Designated Supervisor's Printed Name __________________________
Signature __________________________ Date of Review (mm/dd/yyyy) ____________
Position & Institution __________________________ Phone or email contact information __________________________
Experience/Training as relates to the student's area of research __________________________
### 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 experimentation.)**

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<tr>
<th>Student’s Name(s)</th>
<th>Title of Project</th>
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**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.
  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.)

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<tr>
<th>1. Risk Level (check one):</th>
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<tr>
<td>[ ] Minimal Risk</td>
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<tr>
<td>[ ] More than Minimal Risk</td>
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| 2. Qualified Scientist (QS) Required: |
| [ ] Yes |
| [ ] No |

| 3. Designated Supervisor (DS) Required: |
| [ ] Yes |
| [ ] No |

| 4. Written Minor Assent required for minor participants: |
| [ ] Yes |
| [ ] No |

| 5. Written Parental Permission required for minor participants: |
| [ ] Yes |
| [ ] No |

| 6. Written Informed Consent required for participants 18 years or older: |
| [ ] Yes |
| [ ] No |

- IRB SIGNATURES (All 3 signatures required unless expedited review checked above) 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.

**IRB SIGNATURES (All 3 signatures required unless expedited review checked above)** 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).

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

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<th>Printed Name</th>
<th>Degree/Professional License</th>
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<th>Signature</th>
<th>Date of Approval (Must be prior to experimentation.)</th>
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**Educator**

<table>
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<th>Printed Name</th>
<th>Degree</th>
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<th>Date of Approval (Must be prior to experimentation.)</th>
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**School Administrator**

<table>
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<tr>
<th>Printed Name</th>
<th>Degree/Professional License</th>
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<th>Date of Approval (Must be prior to experimentation.)</th>
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### 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.

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<tr>
<th>Student Researcher(s):</th>
<th>Title of Project:</th>
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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:

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<tr>
<th>Adult Sponsor/QS/DS:</th>
<th>Phone/email:</th>
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**Voluntary Participation:**

Participation in this study is completely voluntary. If you decide not to participate there will not be any 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.

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<tr>
<th>Adult Informed Consent or Minor Assent</th>
<th>Date Reviewed &amp; Signed:</th>
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<th>Research Participant Printed Name:</th>
<th>Signature:</th>
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<th>Parent/Guardian Permission (if applicable)</th>
<th>Date Reviewed &amp; Signed:</th>
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Page 37
Vertebrate Animal Form (5A)

**Required for all research involving vertebrate animals that is conducted in a school/home/field research site.**

(Student 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 Intel 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:**

- 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:**

**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.

**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.

**Vertebrate Animal Form (5B)**

**Required for all research involving vertebrate animals that is conducted in at a Regulated Research Institution.**

(IACUC approval required before experimentation. Form must be completed and signed after experimentation.)

**Student's Name(s)**

**Title of Project**

**Title and Protocol Number of IACUC Approved Project**

**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**

**Printed Name**

**Email/Phone**

**Signature**

**Date of Approval**

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**Page 39**
Student’s Name(s) _____________________________

Title of Project:

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

SECTION 1: PROJECT ASSESSMENT

1. Identify potentially hazardous biological agents to be used in this experiment. Include the source, quantity and the biosafety level risk group of each microorganism.

2. Describe the site of experimentation including the level of biological containment.

3. Describe the procedures that will be used to minimize risk (personal protective equipment, hood type, etc.).

4. What final biosafety level do you recommend for this project given the risk assessment you conducted?

5. Describe the method of disposal of all cultured materials and other potentially hazardous biological agents.

SECTION 2: TRAINING

1. What training will the student receive for this project?

2. Experience/training of Designated Supervisor as it relates to the student’s area of research (if applicable).

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

☐ Experimentation on the cell line/microorganism used in this study was not conducted at a Regulated Research Institution, but was conducted at a (check one) __ BSL-1 or __ BSL-2 laboratory. This study has been reviewed by the local SRC and the procedures have been approved prior to experimentation.

☐ Experimentation on the cell line/microorganism used in this study was conducted at a Regulated Research Institution, but was conducted at a (check one) __ BSL-1 or __ BSL-2 laboratory. This study has been reviewed by the local SRC and the procedures have been approved prior to experimentation.

☐ Experimentation on the cell line/microorganism used in this study was conducted at a Regulated Research Institution and was approved by the appropriate institutional board prior to experimentation; institutional approval forms are attached.

Origin of cell lines: __________________________ Date of IACUC/IBC approval (mm/dd/yy) __________________________

☐ Experimentation on the cell line/microorganism used in this study was conducted at a Regulated Research Institution, which does not require pre-approval for this type of study. The SRC has reviewed that the student received appropriate training and the project complies with Intel ISEF rules.

SECTION 4: 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 or ___BSL-2 study, and will be conducted in an appropriate laboratory.

Printed Name __________________________ Signature __________________________ Date of Approval (Must be prior to experimentation.)

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 Occupational Safety and Health Act, 29CFR, Subpart Z, 1910.1030 - Blood Borne Pathogens.

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 date of IACUC approval.

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 above.

Printed Name __________________________ Signature __________________________

Continuation/Research Progression Projects Form (7)
Required for projects that are a continuation/progression in the same field of study as a previous project.
This form must be accompanied by the previous year's abstract and Research Plan/Project Summary.

Student’s Name(s)
To be completed by Student Researcher:
List all components of the current project that make it new and different from previous research. The
information must be on the form; use an additional form for 2013–2014 and earlier projects.

<table>
<thead>
<tr>
<th>Components</th>
<th>Current Research Project</th>
<th>Previous Research Project</th>
</tr>
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</table>

Attached are:

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

Student’s Printed Name(s)  Signature  Date of Signature

The Intel International Science and Engineering Fair encourages students to tackle challenging scientific questions and develop the skills needed to solve the problems of tomorrow.

Society for Science & the Public
Society for Science & the Public (the Society) is one of the oldest nonprofit organizations in the U.S.
dedicated to public engagement in science and science education. Established in 1921, the Society is a
membership society and a leading advocate for the understanding and appreciation of science and the
vital role it plays in human advancement.

Through its acclaimed education competitions and its award-winning Science News Media Group, the
Society is committed to inform, educate, and inspire.
societyforscience.org

To learn more about the Intel International Science and Engineering Fair, visit:
student.societyforscience.org/intel-isef

Intel Corporation
The foundation of tomorrow’s innovation is education. That’s why making quality education available
to more students around the world—with the help of technology—has inspired Intel’s commitment to
education for 40 years. We do more than make contributions. Intel gets directly involved in developing
and helping to change policy, training teachers, offering free curricula, providing kids with a place
to explore technology, and encouraging young innovators. Intel believes that students at all levels
everywhere deserve to have the skills they need to become part of the next generation of innovators.

In the last decade, Intel has invested more than $1 billion, and Intel employees have donated more
than four million hours, toward improving education in more than 75 countries, regions, and territories.
We are actively involved in education programs, advocacy, and technology access to help tomorrow’s
innovators.
intel.com/education