

# Mercer Science and Engineering Fair Junior & Senior Division Instructions

<http://mercersec.org>

*All fair dates can be found on the MSEF website*

This packet is the starting point for Mercer Science and Engineering Fair (MSEF) projects by students in the Junior (grades 6-8) and Senior (grades 9-12) divisions. Elementary (grades 4-5) division students **do not use** these instructions or forms. They should check the MSEF website for registration details.

The packet includes the **Intel International Science and Engineering Fair (ISEF)** forms 1, 1A, and 1B that are required for all projects. All applications must include these forms plus a **detailed research plan** and abstract. These forms and the research plan must be completed and approved and signed by your sponsor **BEFORE** a project is started. The approval is found on Form 1. The abstract is to be completed **AFTER** the project is done.

You should run the ISEF Rules Wizard using a web browser to determine what additional forms are required, if any. You will need to complete only those forms required for a particular project. *Projects using humans, animals, tissue, microorganism or recombinant DNA definitely need additional forms.* This normally involves two additional forms. You can download special versions suitable for automatic posting to your online application from our website.

These PDF-based forms can be filled out and saved using the latest Adobe Acrobat Reader (version 8 or higher). You may also use digital signatures to sign these forms. See the online help for the Acrobat Reader for details on using digital signatures with PDF files. There is also information on the MSEF website regarding all aspects of the registration process. Below are some useful links.

ISEF Rules Wizard: <https://apps2.societyforscience.org/wizard/index.asp>

ISEF Documents: <https://student.societyforscience.org/forms>

Adobe Acrobat Reader: <http://get.adobe.com/reader/>

## **Precertification:** (Optional)

Those wishing to have their projects checked prior to starting their experiments can email a list of forms you will use along with a **detailed** research plan to [src@mercersec.org](mailto:src@mercersec.org). We will respond as soon as possible. We recommend precertification for any project that requires Form 2 through Form 6. Precertification requests must be made **BEFORE** experimentation starts.

## **Online Application Submission:**

You will need to complete an online application on the MSEF website using the information entered in the ISEF forms. You will have to transcribe the information from your forms to the online application. You will also need to upload a copy of your forms to the website as part of your online application. You can upload the form files if you use digital signatures otherwise you will have to upload an image instead. This can be done by scanning the printed forms or using a digital camera.

You will need an account on the website. You may reuse an online account from the previous year or create a new one. The account is used manage your online application. The online application will be complete when **ALL** necessary information has been posted including your project category, research plan and abstract. Once your online application is complete you will be able to print out the following:

- MSEF Application and release form
- Check-in letter
- Check-out letter
- MSEF Research Plan
- MSEF Abstract

These should be brought to the fair when you set up your project. You will leave the check-in letter, MSEF Research Plan and MSEF abstract with your project. The ISEF forms are uploaded as part of the online application process so you do not have to bring these to the fair.

# 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, IRB, IACUC or IBC:
  - Humans  Potentially Hazardous Biological Agents
  - Vertebrate Animals  Microorganisms  rDNA  Tissues
5.  Items to be completed for **ALL PROJECTS**
  - Adult Sponsor Checklist (1)  Research Plan/Project Summary
  - Student Checklist (1A)  Approval Form (1B)
  - Regulated Research Institutional/Industrial Setting Form (1C) (when applicable; after completed experiment)
  - Continuation/Research Progression Form (7) (when applicable)

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

- Humans**, including student designed inventions/prototypes. (Requires prior approval by an Institutional Review Board (IRB); see full text of the rules.)
  - Human Participants Form (4) or appropriate Institutional IRB documentation
  - Sample of Informed Consent Form (when applicable and/or required by the IRB)
  - Qualified Scientist Form (2) (when applicable and/or required by the IRB)
- Vertebrate Animals** (Requires prior approval, see full text of the rules.)
  - Vertebrate Animal Form (5A) - for projects conducted in a school/home/field research site (SRC prior approval required.)
  - Vertebrate Animal Form (5B) - for projects conducted at a Regulated Research Institution. (Institutional Animal Care and Use Committee (IACUC) approval required prior experimentation.)
  - Qualified Scientist Form (2) (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)
  - The following are exempt from prior review but require a Risk Assessment Form 3: projects involving protists, archae and similar microorganisms, for projects using manure for composting, fuel production or other non-culturing experiments, projects using color change coliform water test kits, microbial fuel cells, and projects involving decomposing vertebrate organisms.
- Hazardous Chemicals, Activities and Devices** (No SRC prior approval required, see full text of the rules.)
  - Risk Assessment Form (3) (have up with potentially hazardous biological agents.)
  - Qualified Scientist Form (2) (required for projects involving DEA-controlled substances or when applicable)

\_\_\_\_\_  
Adult Sponsor's Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date of Review

\_\_\_\_\_  
Phone

\_\_\_\_\_  
Email

# Student Checklist (1A)

This form is required for ALL projects.

1. a. Student/Team Leader: \_\_\_\_\_ Grade: \_\_\_\_\_  
Email: \_\_\_\_\_ Phone: \_\_\_\_\_  
b. Team Member: \_\_\_\_\_ c. Team Member: \_\_\_\_\_
2. Title of Project:  
\_\_\_\_\_
3. School: \_\_\_\_\_ School Phone: \_\_\_\_\_  
School Address: \_\_\_\_\_  
\_\_\_\_\_
4. Adult Sponsor: \_\_\_\_\_ Phone/Email: \_\_\_\_\_
5. Does this project need SRC/IRB/IACUC or other pre-approval?  Yes  No Tentative start date: \_\_\_\_\_
6. Is this a continuation/progression from a previous year?  Yes  No  
If Yes:
  - a. Attach the previous year's  Abstract **and**  Research Plan/Project Summary
  - b. Explain how this project is new and different from previous years on  Continuation/Research Progression Form (7)
7. This year's laboratory experiment/data collection:  
\_\_\_\_\_  
Actual Start Date: (mm/dd/yy) \_\_\_\_\_ End Date: (mm/dd/yy) \_\_\_\_\_
8. Where will you conduct your experimentation? (check all that apply)  
 Research Institution  School  Field  Home  Other: \_\_\_\_\_
9. List name and address of all non-home and non-school work site(s):  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_  
Phone/  
email \_\_\_\_\_
10. **Complete a Research Plan/Project Summary following the Research Plan/Project Summary instructions and attach to this form.**
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
  - a. Written prior to experimentation following the instructions below to detail the rationale, research question(s), methodology, and risk assessment of the proposed research.
  - b. If changes are made during the research, such changes can be added to the original research plan as an addendum, recognizing that some changes may require returning to the IRB or SRC for appropriate review and approvals. If no additional approvals are required, this addendum serves as a project summary to explain research that was conducted.
  - c. If no changes are made from the original research plan, no project summary is required.
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 animals, one of these references must be an animal care reference.

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 organism and describe BSL assessment process and BSL determination.
- b. Detail safety precautions and discuss methods of disposal.

## 4. Hazardous chemicals, activities & devices:

- Describe Risk Assessment process, supervision, safety precautions and methods of disposal.

# Approval Form (1B)

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

## 1. To Be Completed by Student and Parent

### a. Student Acknowledgment:

- I understand the risks and possible dangers to me of the proposed research plan.
- I have read the 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.**

\_\_\_\_\_  
Student's Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date Acknowledged (mm/dd/yy)  
(Must be prior to experimentation.)

**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.

\_\_\_\_\_  
Parent/Guardian's Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date Acknowledged (mm/dd/yy)  
(Must be prior to experimentation.)

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

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

**a. Required 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/IRB Chair's Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date of Approval (mm/dd/yy)  
(Must be prior to experimentation.)

OR

**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 approvals (e.g. IACUC, IRB).**

\_\_\_\_\_  
SRC Chair's Printed Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date of Approval (mm/dd/yy)

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

### SRC Approval After Experimentation and Before Competition at Regional/State/National Fair

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

\_\_\_\_\_  
State/National SRC Chair's Printed Name  
(where applicable)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date of Approval