64th Annual Maui County Regional Science and Engineering Fair

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Science Fair Committee

- Director:
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- Science Review Committee (SRC): Dr. Bert Akitake
 - <u>jakitake@hotmail.com</u>
- Institutional Review Board (IRB):
 - momi.kihata-ball@k12.hi.us

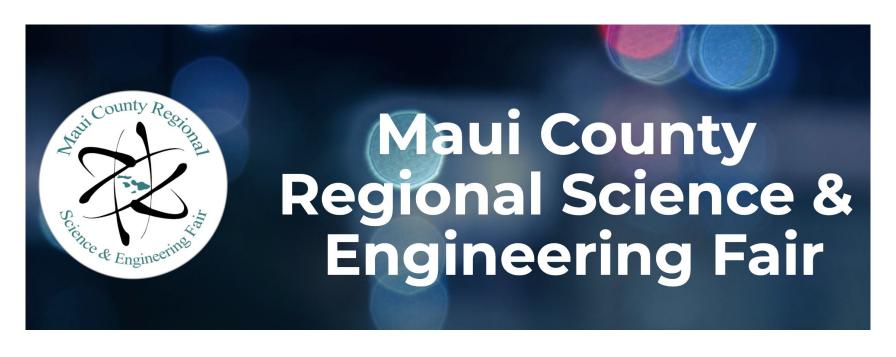
Presentation Link

https://bit.ly/22-23MCRSEF



MCRSEF Website

https://sites.google.com/k12.hi.us/mauisci enceandengineeringfair/home



Overview of School Fairs

1. School Level Fairs

- For schools with more than 40 projects, please email your fair dates.
 - All school level fairs must be completed by January 6, 2023.
- Number of projects eligible to advance to County from the school level will be determined by MCRSEF.
 - Please email the number of students and number of projects for your school.
- If your school does not have a school level fair, the student participant is eligible to register directly with the Maui County Regional Science and Engineering Fair (MCRSEF).

2. Home Schools

• Student participant(s) are eligible to register directly with the Maui County Regional Science and Engineering Fair.

Overview of County, State & International Fairs

- Maui County Regional Science and Engineering Fair at UH Maui College- Conference Room
 - February 8th
 - Project Registration and Display and Safety Review
 - February 9th
 - Round 1 and Round 2 Judging
 - Number of projects advancing to States will be determined by HSSEF and MCRSEF
 - 1 project advances to ISEF; Additional project awaiting appeal process
- Hawaii State Science and Engineering Fair
 - April 6, 2023: Blaisdell Exhibition Hall
 - Neighbor Island setup (optional) April 5, 2023
 - Virtual Award Ceremony TBD
- International Science and Engineering Fair
 - May 13-19, 2023
 - Dallas, TX

ISEF Rules

- The Maui County Regional Science and Engineering Fair is an ISEF sanctioned fair and follows the International Rules for Pre-college Science Research. The purpose of these rules is to:
 - protect the rights and welfare of the student researcher
 - protect the rights and welfare of the human participant
 - ensure adherence to federal regulations
 - ensure use of safe laboratory practices
 - protect the environment
 - determine eligibility for competition in the ISEF 2023
- To read a description of the <u>ISEF rules</u>, please navigate to: https://student.societyforscience.org/international-rules-pre-college-science-research
- For rules questions, please contact the Intel ISEF Scientific Review Committee at <u>SRC@societyforscience.org</u> and CC: the MCRSEF director at <u>janine.fisk@k12.hi.us</u> <u>alfred.perez@k12.hi.us</u> <u>katie.hearl@k12.hi.us</u> <u>cynthia.coleman@k12.hi.us</u>

21 Project Categories

- Animal Sciences
- Behavioral and Social Sciences / Psychology
- Biochemistry
- Biomedical and Health Sciences
- Biomedical Engineering
- Cellular and Molecular Biology
- Chemistry
- Computational Biology and Bioinformatics
- Earth and Environmental Sciences
- Embedded Systems

- Energy: Sustainable Materials and Design
- Engineering Mechanics
- Environmental Engineering
- Materials Science
- Mathematics
- Microbiology
- Physics and Astronomy
- Plant Sciences
- Robotics and Intelligent Machines
- Systems Software / Computer Science
- Translational Medical Science

To read a description of each category, please navigate to: https://www.societyforscience.org/isef/categories-and-subcategories/

ISEF RULES Wizard

Rules Wizard

The Rules Wizard has been designed as a first step to help you determine what forms and approvals are necessary before beginning a science fair project. Answer each of the 9 questions and a result page will provide a list of forms and information based on your answers; these forms and the accompanying rules should be reviewed closely with a teacher or mentor BEFORE experimentation begins.

This wizard is intended to be a helping tool, but cannot account for all specifics and situations of your individual project. Please be sure to review the International Rules. The Virtual Regeneron ISEF SRC (Scientific Review Committee) is available via e-mail (SRC@societyforscience.org) to answer any specific questions you may have.

You can move through the wizard screens by using the "Previous" and/or "Next" buttons or you can restart the wizard by using the "Clear & Restart" button at the top or bottom of each page.

Will your experiment include (check all that apply):

- □ Vertebrate Animals
 □ Human Participants
 □ Recombinant DNA
 □ Microorganisms
 □ Human or Animal Tissue
 □ Hazardous Chemicals, Activities, or Devices
- ☐ Student-Designed Invention,

App, or Prototype

☐ None of the Above

https://ruleswizard. societyforscience.org/

New Platform

Academy of Science Platform

Amy Weintraub from Academy of Science

Required Forms for ALL Projects

- Student Checklist, <u>Form 1A</u>
- Research Plan/Project Summary (<u>Template Link</u>)
- Checklist for Adult Sponsor, <u>Form 1</u>
- Parent Approval Form, <u>Form 1B</u>
- Risk Form, Form 3
- SRC Review Dates:
 - September 27, 2022- Projects involving Risk
 - November 15- Rest of projects due

ISEF Form 1A

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 (Tentative start date:)
	Is this a continuation/progression from a previous year? ☐ Yes ■ No
	If Yes:
	a. Attach the previous year's Abstract and Research Plan/Project Summary b. Explain how this project is new and different from previous years on
	Continuation/Research Progression Form (7)
7	This year's experimentation/data collection:
/.	This year's experimentation/data confection:
	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:
a	Source of Data:
٥.	☐ Collected self/mentor ☐ Other Describe/url:
40	
10.	. List the name and address of all non-home and non-school work site(s), whether you worked there virtually or on-site:
Na	me
	dress:
Ph	one/
em	nail

11. Complete a Research Plan/Project Summary following the Research Plan/Project Summary instructions must accompany this form.

International Rules: Guidelines for Science and Engineering Fairs 2022-2023, societyforscience.org/ISEF

12. 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).

- · All projects must have a Research Plan/Project Summary
- a. The Research Plan is to be written prior to experimentation following the instructions below to detail the rationale, research question(s), methodology, and risk assessment of the proposed research.
- b. If changes are made during the research, such changes can be added to the original research plan as an addendum, recognizing that some changes may require returning to the IRB or SRC for appropriate review and approvals. If no additional approvals are required, this addendum serves as a project summary to explain research that was conducted.
- c. If no changes are made from the original research plan, no project summary is required.
- d. Some studies, such as an engineering design or mathematics projects, will be less detailed in the initial project plan and will change through the course of research. If such changes occur, a project summary that explains what was done is required and can be appended to the original research plan.
- · The Research Plan/Project Summary should include the following:
- a. RATIONALE: Include a brief synopsis of the background that supports your research problem and explain why this research is important and if applicable, explain any societal impact of your research.
- RESEARCH QUESTION(S), HYPOTHESIS(ES), ENGINEERING GOAL(S), EXPECTED OUTCOMES: How is this based on the rationale described above?
- c. Describe the following in detail:
 - Procedures: Detail all procedures and experimental design including methods for data collection, and when applicable, the source of data used. Describe only your project. Do not include work done by mentor or others. If you will use published surveys, questionnaires or tests, describe how you obtained these, including required permission if applicable.
 - · 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? If yes and not your own, how did you obtain? Did it require permissions? If so, explain. 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
- 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 end of the study.

· 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:

- a. Describe Risk Assessment process, supervision, safety precautions and methods of disposal.
- b. Material Safety Data Sheets are not necessary to submit with paperwork.

Subject Specific Research Plan Guidelines

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:

- 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.
- 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
- 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.
- Detail safety precautions and discuss methods of disposal.

4. Hazardous chemicals, activities & devices:

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

Student Research Plan Template

ISEF Form 1, Adult Sponsor

Zoom in

Checklist for Adult Sponsor (1)

This completed form is required for ALL projects.

To be completed by the Adult Sponsor in collaboration with the student researcher(s):				
Student's Name(s):				
Project Title: 1. I have reviewed the ISEF Rules and Guidelines, including the science fair ethics statement.				
2. I have reviewed the student's completed Student Checklist (1A) and Research Plan/Project Summary.				
3.				
4. The project involves one or more of the following and requires prior approval by an SRC, IRB, IACUC or IBC: Humans Vertebrate Animals The project involves one or more of the following and requires prior approval by an SRC, IRB, IACUC or IBC: Potentially Hazardous Biological Agents Microorganisms TrDNA 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 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; projects using manure for composting, fuel production or other non-culturing experiments; projects using color change coliform water test kits, microbial fuel cells; and projects involving decomposing vertebrate organisms.				
Hazardous Chemicals, Activities and Devices (No SRC prior approval required, see full text of the rules.) Risk Assessment Form (3) Qualified Scientist Form (2) (required for projects involving DEA-controlled substances or when applicable)				
Other Risk Assessment Form (3)				
I attest to the information checked above and that I have read and agree to abide by the science fair ethics statement.				
Adult Sponsor's Printed Name Signature Date of Review (mm/dd/yy)				

ISEF Form 1B, Approval Form

Approval Form (1B)

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

me or high school, etc.), was reviewed and approved proper institutional board before experimentation and	
(Must be prior to experimentation.) risks and possible dangers involved in the icipating in this research. Date Acknowledged (mm/dd/yy) (Must be prior to experimentation.) In 2a or 2b as appropriate.) Quired for research conducted at all Regulated search Institutions with no prior fair SRC/IRB proval. ject was conducted at a regulated research institution or high school, etc.), was reviewed and approved proper institutional board before experimentation and	
Date Acknowledged (mm/dd/yy), (Must be prior to experimentation.) In 2a or 2b as appropriate.) Quired for research conducted at all Regulated search Institutions with no prior fair SRC/IRB proval. giet was conducted at a regulated research institution or high school, etc.), was reviewed and approved proper institutional board before experimentation and	
(Must be prior to experimentation.) quired for research conducted at all Regulated search Institutions with no prior fair SRC/IRB proval. giect was conducted at a regulated research institution or high school, etc.), was reviewed and approved proper institutional board before experimentation and	
quired for research conducted at all Regulated search Institutions with no prior fair SRC/IRB oroval. ject was conducted at a regulated research institution or high school, etc.), was reviewed and approved proper institutional board before experimentation and	
This project was conducted at a regulated research institu (not home or high school, etc.), was reviewed and approx by the proper institutional board before experimentation: complies with the ISEF Rules. Attach (1C) and any require institutional approvals (e.g. IACUC, IRB).	
air's Printed Name	
air's Printed Name	
e Date of Signature (mm/dd/yy) (May be after experimentation)	
tate/National Fair mary and complies with all ISEF Rules. Date of Approval (mm/dd/yy)	
bate of Approval (Hill/du/yy)	

Form 3 - Risk Assessment

Position/Institution

- If you are the teacher and/or the adult supervisor...
 - Discuss possible risks involved with project with student participant(s).
 - Provide feedback to student on his/her research plan to include safety precautions and procedures used to reduce any potential risks.
 - Ensure all ISEF rules and safety regulations are followed.
 - All signatures may be typed.

safety precautions and procedures.

Must be completed before experimentation. Required for projects involving hazardous chemicals, activities or devices and may be needed by other projects. Student's Name(s) Title of Project To be completed by the Student Researcher(s) in collaboration with Designated Supervisor/Qualified Scientist: (All guestions must be answered; additional page(s) may be attached.) 1. Identify and assess the risks and hazards involved in this project. 2. a) List all hazardous chemicals, activities or devices to be used; b) identify and list all microorganisms to be used that are exempt from pre-approval (see Potentially Hazardous Biological Agent rules). 3. Describe the safety precautions and procedures that will be used to reduce the risks. 4. Describe the disposal procedures that will be used (when applicable). 5. List the source(s) of safety information. To be completed and signed by the Designated Supervisor (or Qualified Scientist, when applicable): gree with the risk assessment and safety precautions and procedures described above. I certify that I have reviewed the Plan and the International Rules, including the science fair ethics statement and will provide direct supervision. The designated supervisor is the person that ensures the student(s) is following the 's Printed Name Signature Date of Review (mm/dd/yv)

Phone or email contact information

Risk Assessment Form (3)

Additional Forms Required

Recommendation to please review ISEF rules for projects involving Human Subjects, Vertebrate Animals, Potentially Hazardous Biological Agents and Hazardous Chemicals, Activities or Devices, DEA-controlled substances, and continuation projects.

 Please navigate to: <u>https://student.societyforscience.org/international-rules-p</u> <u>re-college-science-research</u>

SRC review and approval: Sept. 27 (projects involving risk), Oct. 28, & Nov. 15

MCRSEF Important Dates

2022-2023 Maui County Regional Science and Engineering Fair Dates and Deadlines

August 9, 2022	Science Fair Orientation Meeting #1
August 10, 2022	Registration Opens: Fill out Intent to Participate and Mentor/Teacher form on MCRSEF website
September 6, 2022	Science Fair Orientation Meeting #2 with Hawai'i Academy of Science
Before Start of ANY Projects	Create an IRB Panel, Students ID project topic and complete forms listed on MCRSEF website
September 27, 2022	SRC Pre-Approval Deadline for High Risk Projects SRC Pre-Approval Deadline- 1st
October 28, 2022	SRC Pre-Approval Deadline- 2nd
November 15, 2022	SRC Pre-Approval Deadline- 3rd & FINAL DEADLINE to submit Intent to Participate and Mentor/Teacher form on MCRSEF website
January 6, 2023	Last day to hold school science fairs.
January 9, 2023	District Fair Informational Meeting for Mentors/Teachers
January 11, 2023	DEADLINE to submit school promotion list of student projects and for changing categories
January 9, 2023 to January 13, 2023	Complete 2023 MCRSEF Student Registration on HSA platform + media release + Photo
January 20, 2023	DEADLINE to address infractions on projects for MCRSEF
February 8, 2023	Registration and Set Up at UH Maui College
February 9, 2023	Round I and II Judging at UH Maui College MCRSEF Awards Ceremony

Judging Criteria for Science Projects - TBD

Research Question (10 pts)	V. Presentation (35 pts)
clear and focused purpose	a. Poster 10 pts)
identifies contribution to field of study	logical organization of material
testable using scientific methods	clarity of graphics and legends
II. Design and Methodology (15 pts)	supporting documentation displayed
well designed plan and data collection methods	b. Interview (25 pts)
variables and controls defined, appropriate and complete	clear, concise, thoughtful responses to questions
III. Execution: Data Collection, Analysis and Interpretation (20 pts)	understanding of basic science relevant to project
systematic data collection and analysis	understanding interpretation and limitations of results and conclusions
reproducibility of results	degree of independence in conducting project
appropriate application of mathematical and statistical methods	recognition of potential impact in science, society and/or economics
appropriate application of mathematical and statistical methods	quality of ideas for further research
sufficient data collected to support interpretation and conclusions	for team projects, contributions to and understanding of project by all memebers
IV. Creativity (20 pts)	@soceity/science
	(A)SACAITVASCIANCA

project demonstrates significant creativity in one or more of

the above criteria

Judging Criteria for Engineering Projects - TBD

I. Research Problem (10 pts)	V. Presentation (35 pts)
description of a practical need or problem to be solved	a. Poster (10 pts)
definition of criteria for proposed solution	logical organization of material
explanation of constraints	clarity of graphics and legends
II. Design and Methodology (15 pts)	supporting documentation displayed
exploration of alternatives to answer need or problem	b. Interview (25 pts)
identification of a solution	clear, concise, thoughtful responses to questions
development of a prototype/model	understanding of basic science relevant to project
III. Execution: Construction and Testing(20 pts)	understanding interpretation and limitations of results and conclusions
prototype demonstrates intended design	degree of independence in conducting project
prototype has been tested in multiple conditions/trials prototype demonstrates engineering skill and completeness	recognition of potential impact in science, society and/or economics
IV. Creativity (20 pts)	quality of ideas for further research
project demonstrates significant creativity in one or more of the above criteria	for team projects, contributions to and understanding of project by all members

Additional Resources

Hawaii Academy of Science:

https://www.hawaiiacademyofscience.org/science-fair

International Science and Engineering Fair:

http://www.societyforscience.org/isef/

Science Buddies: http://www.sciencebuddies.org

Discovery Education Science Fair Central:

https://sciencefaircentral.com/

MCRSEF Office Hours

- Maui, Moloka'i, and Lāna'i Office Hours will be provided upon request.
 - Cynthia.Coleman@k12.hi.us
 For HLLM and private/charter
 - Alfred.Perez@k12.hi.us For BKKM Students/Teachers
 - Support teachers, students and families with project development and research plan
 - Support teachers, students and families with presentation requirements, rules, regulations and review
 - Consult a scientist / engineer
 - Other suggestions....

Additional Science Opportunities with the Hawaii Academy of Science

Virtual Office Hours - TBD

MAHALO

https://sites.google.com/k12.hi.us/mauisci enceandengineeringfair/home

