

HAWAII STATE SCIENCE & ENGINEERING FAIR

Handbook



HAWAI'I ACADEMY OF SCIENCE



A Program of the Hawaii Academy of Science

in cooperation with the

Hawaii State Department of Education and the College of Education at the University of Hawaii

Please keep this Handbook for future reference.

State Science Fair Office

Science Fair Office Website

<http://www.hawaii.edu/acadsci>

A copy of this handbook, as well as the Exhibit Entry Form, Abstract Form, Summary Form, Assistance Received Form, and the Display Certification Form can be downloaded from the Hawaii Academy of Science website. All other forms need to be obtained from the Science Service website (<http://www.societyforscience.org/isef/>).

Contacting Our Office

E-mail: acadsci@hawaii.edu

Phone (808) 956-7930

Fax (808) 956-5183

Sending Us Mail

Hawaii Academy of Science
Educational Programs Office
c/o College of Education—UA 4, Room 4
1776 University Avenue
Honolulu, Hawaii 96822

Table of Contents

Hawaii Academy of Science & Hawaii State Science Fair.....	4
Why Do a Science Fair Project?.....	4
Levels of Competition Among Science Fairs.....	5
Research/Display Projects & Project Divisions	5
How Do You Start a Science Fair Project?.....	6
Personal Schedule for Your Research Project	7
Category Description List	8
Judging Criteria	9
Required Forms for Research Projects	10
Required Forms for Display Projects.....	11
Project Safety Rules.....	12
Definition of Terms.....	13
Special Approvals: IRB/SRC	15
Rules Highlights.....	16
Building & Displaying Your Exhibit Board	17
Items Required at Your Exhibit.....	18
Liability & Safety Issues for Your Project.....	18
Contacting the State Science Fair Office.....	inside front cover
How to Get a Copy of the ISEF Rules Book.....	inside back cover

Attention Teachers and Students:

A copy of the ISEF Rules Book is absolutely essential!

The ISEF website contain more detailed information that we are not able to include in this handbook (see websites on back inside cover). This booklet is an overview of the process to attend the Hawaii State Science and Engineering Fair only; and not intended to be the official International Science Fair rulebook.

Hawaii Academy of Science & the Science Fair Program

Founded in 1925, and affiliated with the American Association for the Advancement of Science, the Hawaii Academy of Science (HAS) is a private, nonprofit, professional society whose mission is the promotion of scientific research and the diffusion of scientific knowledge, particularly as related to Hawaii and the Pacific.

A major focus of the Academy's activities is the support and improvement of secondary science education in Hawaii. Toward this end, the Academy has sponsored the Hawaii State Science & Engineering Fair (HSSEF) since 1957.

The HSSEF is the oldest and largest science education program in Hawaii. It is an enrichment program which stimulates interest in science and engineering and encourages entry into a science related career. Excellence of student achievement is recognized and rewarded. Students have the opportunity to interact personally with professional scientists and engineers in the program. The HAS enjoys the support of the scientific, business and education communities in Hawaii.

Why Do a Science Fair Project?

There are many benefits to doing a science fair project.

- You will learn important skills including how to:
 - Conduct a literature review
 - Design an experiment
 - Conduct statistical analysis and understand what the numbers mean
 - Write an organized, well thought-out scientific paper
 - Summarize and display your research on a display board
 - Communicate your findings to the judges and to your peers
- You will learn the power and limitations of science
- You may even win awards
- You can state that you participated in the science fair program on your college application or on your resume
- You will have the opportunity to continue and expand your work on your project and try to get your research published. You can do this in college, or with a mentor. The Hawaii Academy of Science sponsors another program for high school students, the Pacific Symposium for Science and Sustainability which accepts good science fair projects that are written up as scientific papers.

Levels of Competition Among Science Fairs

Any student in grades 6-12 in Hawaii is eligible to participate in the science fair program. Since science fair projects begin at the school level and advance to the district, state or international levels, rules and procedures for the international fair need to be followed by all the fairs. This avoids disqualifications at the higher levels.

School Science Fairs—if there is no district fair, then winners advance from their school fair directly to the state fair.

District Science Fairs—students from the district fair are recommended, or provisionally recommended, to the state fair. Top senior research projects at the district fair are eligible for the international fair if the district fair is affiliated with the International Science and Engineering Fair (ISEF).

Hawaii State Science & Engineering Fair (HSSEF)—the top two senior research projects at the state fair advance to the international fair. An outstanding team project may also be recommended.

International Science & Engineering Fair (ISEF)—the top senior research projects from ISEF-affiliated fairs compete at the international fair.

Research & Display Projects

A research project is an investigation, where you form a hypothesis (a question), design and conduct experiments, record data, and draw a conclusion from your data to answer your question. A research project can also be an engineering project involving the design, building and testing of something; or it can be a field study where data is gathered through observation.

A display project explains or demonstrates a scientific principle, apparatus, technique, design, or application. It usually does not pose a hypothesis or include experiments but is based on fact-finding through extensive library research and other sources.

Project Divisions at the State Science Fair

Senior Research, Junior Research, and Junior Display are the divisions at the science fair. Senior Research is for grades 9-12, Junior Research and Junior Display are for grades 6-8. Display projects from grades 9-12 are not accepted at the state science fair.

How Do You Start a Science Project?

1. Choose your topic.

You should choose something you're interested in. If you don't care about the growth cycle of the moth, then don't choose it! Once you've found a topic you get more specific with it. If you've chosen roaches, then choose some aspect of the roaches, like their physiology or habitat. Narrow down your topic even further by framing it in the form of a question. For example, "How can I get rid of roaches in the house without using poison?"

2. Research your topic.

This is the library part of the project. Librarians are really useful and knowledgeable, so don't be afraid to ask questions. You need to find out what information scientists already have about roach habitat and how to get rid of them. While you're reading, take good notes and, try to think of questions that haven't been answered. These questions can lead to your experimentation later on. When searching for information on the internet make notes of the URL address.

3. Brainstorm for your experiment.

Now that you know what there is to know about roach habitat or physiology, you can start thinking of things left unanswered. Since your goal is to find a way to get rid of all the roaches in your house, without using poison, write down all your questions and ideas, silly or otherwise—you never know when you'll hit the jackpot with a great idea.

4. Show your ideas to a science teacher.

Science teachers will help you refine your ideas into a science experiment. They also might be able to direct you to someone in the community who is also interested in roaches.

5. Find a scientist mentor.

Yes, it can be pretty intimidating to ask an expert for advice, but in the long run you'll be really glad you did. Ask your science teacher for guidance in finding a mentor, and be sure to check out our website for a list of potential mentors (see inside front cover for the HAS web address. You might need your teacher's help in deciphering

Personal Schedule for Your Research Project

Steps	What you should be working on	Target Date	Done ✓
1	<ul style="list-style-type: none"> • Make sure you understand what you need to do for the science fair project. Ask your teacher or call the HAS office if you are not certain about any aspect. • Use books, encyclopedias, scientific journals and magazines at the library. You can also do a search on the Internet on your topic of interest. Keep bibliographic notes on the books and articles where you get your ideas. • Visit university departments, science centers, hospitals, museums, zoos, etc. to get ideas. You can call the HAS office for a list of community resources for science fair students. 		
2	<ul style="list-style-type: none"> • With your project idea firmly in mind, write the purpose, question, hypothesis, materials needed, and procedures. • Show your written materials to your science teacher and discuss your project. 		
3	<ul style="list-style-type: none"> • Get your science teacher's approval for your project. Then gather your necessary equipment and start your project. 		
4	<ul style="list-style-type: none"> • Find a mentor, or seek advice and help from professionals to refine your project: doctors, nurses, researchers, librarians, veterinarians, etc. 		
5	<ul style="list-style-type: none"> • Conduct your experiment and collect data. • Keep careful, written records of your results in a databook. Record the day and time you make observations. Be as specific as you can about the amount, size, and type of materials, plants or animals you use. 		
6	<ul style="list-style-type: none"> • Analyze your data by drawing conclusions based on the data. Organize the results of your experiments in chart or graph form. 		
7	<ul style="list-style-type: none"> • Write your research paper. Include a title page, table of contents, abstract, purpose of your research or hypothesis, step-by-step explanation of your experiment, results, discussion, conclusion and bibliography. 		
8	<ul style="list-style-type: none"> • Design a mock-up of your display board. Ask a few friends and family members to critique your display board and adjust accordingly. • Construct your exhibit. Build a back-drop to mount graphs, charts, illustrations, photographs, signs and summary charts. 		
9	<ul style="list-style-type: none"> • Prepare for the judges' interview by asking your teacher or mentor to ask you questions about your research. 		
10	<ul style="list-style-type: none"> • Add finishing touches to your project. • Come to the science fair and present your research. Enjoy! Date of school/district fair: 		

Adapted from a National Science Teachers Association Journal.

Category Description List

Projects may be entered in one of the following categories from the ISEF Rules Book. For a full description and definition of the Intel ISEF categories visit their website: www.sciserv.org/isef/students/research_categories.asp

1) ANIMAL SCIENCES

Study of animals and animal life, including the study of the structure, physiology, development, and classification of animals. Animal ecology, physiology, animal husbandry, cytology, histology, entomology, ichthyology, ornithology, herpetology, etc. Areas include Development, Ecology, Animal Husbandry, Pathology, Physiology, Population Genetics, and Systematics.

2) BEHAVIORAL AND SOCIAL SCIENCES

The science or study of the thought processes and behavior of humans and other animals in their interactions with the environment studied through observational and experimental methods. Areas include Clinical & Developmental Psychology, Cognitive Psychology, Physiological Psychology, and Sociology.

3) BIOCHEMISTRY

The study of the chemical substances and vital processes occurring in living organisms, the processes by which these substances enter into, or are formed in, the organisms and react with each other and the environment. Area include General Biochemistry, Metabolism, and Structural Biochemistry.

4) CELLULAR AND MOLECULAR BIOLOGY

The study of the structure and formation of cells. Areas include Cellular Biology, Cellular and Molecular Genetics, Immunology, and Molecular Biology.

5) CHEMISTRY

The science of the composition, structure, properties, and reactions of matter, especially of atomic and molecular systems. Areas include Analytical Chemistry, General Chemistry, Inorganic Chemistry, Organic Chemistry and Physical Chemistry.

6) COMPUTER SCIENCE

The study of information processes, the structures and procedures that represent processes, and their implementation in information processing systems. It includes systems analysis and design, application and system software design, programming, and datacenter operations. Areas include Algorithms, Data Bases, Artificial Intelligence, Networking and Communications, Computational Science, Computer Graphics, Software Engineering, Programming Languages, Computer System, and Operating System.

7) EARTH AND PLANETARY SCIENCE

The study of sciences related to the planet Earth (Geology, mineralogy, physiography, oceanography, meteorology, climatology, speleology, seismology, geography, atmospheric sciences, etc.) Areas include Climatology, Weather, Geochemistry, Mineralogy, Historical Paleontology, Geophysics, Planetary Science, and Tectonics.

8) ENGINEERING

Electrical and Mechanical. The application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, processes, and systems. Areas include Electrical Engineering, Computer Engineering, Controls, Mechanical Engineering, Robotics, Thermodynamics, and Solar.

9) ENGINEERING

Materials and Bioengineering. The application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical machines and systems. Areas include Bioengineering, Civil Engineering, Construction Engineering, Chemical Engineering, Industrial Engineering, Processing and Material Science.

10) ENERGY & TRANSPORTATION

The study of renewable energy sources, energy efficiency, clean transport, and alternative fuels. Aerospace and Aeronautical Engineering, Aerodynamics. Areas include Alternative Fuels, Fossil Fuel Energy, Vehicle Development, and Renewable Energies.

11) ENVIRONMENTAL MANAGEMENT

The study of managing mans' interaction with the environment. Areas include Bioremediation, Ecosystems Management, Environmental Engineering, Land Resource Management, Forestry, Recycling, and Waste Management.

12) ENVIRONMENTAL SCIENCE

The analysis of existing conditions of the environment. Areas include Air Pollution and Air Quality, Soil Contamination and Soil Quality and Water Pollution and Water Quality.

continued on next page

Category Description List (cont.)

13) MATHEMATICAL SCIENCES

The study of the measurement, properties, and relationships of quantities and sets, using numbers and symbols. The deductive study of numbers, geometry, and various abstract constructs, or structures. Mathematics is very broadly divided into foundations, algebra, analysis, geometry, and applied mathematics, which includes theoretical computer science.

14) MEDICINE AND HEALTH SCIENCES

The science of diagnosing, treating, or preventing disease and other damage to the body or mind. Areas include Disease Diagnosis and Treatment, Epidemiology, Genetics, Molecular Biology of Diseases, Physiology and Pathophysiology.

15) MICROBIOLOGY

The study of micro-organisms, including bacteria, viruses, prokaryotes, and simple eukaryotes and of antibiotic substances. Areas include Antibiotics, Antimicrobials, Bacteriology, Microbial Genetics and Virology.

16) PHYSICS AND ASTRONOMY

Physics is the science of matter and energy and of interactions between the two. Astronomy is the study of anything in the universe beyond the Earth. Areas include Atoms, Molecules, Solids, Astronomy, Biological Physics, Instrumentation and Electronics, Magnetics and Electromagnetics, Nuclear and Particle Physics, Optics, Lasers, Masers, Theoretical Physics, Theoretical or Computational Astronomy.

17) PLANT SCIENCES

Study of plant life. Areas include Ecology, agronomy, horticulture, forestry, plant taxonomy, physiology, pathology, plant genetics, hydroponics, algae, etc. Agriculture, Development, Genetics, Photosynthesis, Plant Physiology (Molecular, Cellular, Organismal), Plant Systematics, and Evolution.

Judging Criteria

Overall, judges look for well thought-out projects. They look at how significant your project is in its field and how thorough you are. Judges want to see if you understand what you did, why you did it, and how you did it. Judges also would like to see if you understand how you got your statistics and conclusions. Ask your teacher or mentor to make sure you understand what your numbers mean, and how you got them. Judges applaud students who can speak easily and confidently about their projects; memorized speeches or information will not impress the judges.

RESEARCH PROJECTS

- 30% Creative Ability: originality in questions and hypotheses, as well as in methods, data analysis, and interpretation of data
- 30% Scientific Procedures: well-defined goals, hypotheses, variables, controls, methods, relevant and adequate data or testing
- 15% Thoroughness: completeness of data gathered, goals achieved, knowledge of literature on the topic
- 15% Competence/Skill: complexity, skill in design, lab techniques, computation, overall skill, assistance received, able to explain statistics
- 10% Communication: clearly described/explained, readable, good use of visuals

DISPLAY PROJECTS

- 20% Creative Ability: originality of approach, methods of explaining or demonstrating
- 20% Scientific & Technical Accuracy: scientific principles understood, purposes carried out, problem was studied thoroughly
- 15% Instructional Value: accuracy, presentation effectiveness, significance of topic
- 15% Dramatic Value: visual quality of exhibit (attractiveness, involves the viewer)
- 15% Communication: clearly described and explained, good use of language and graphics, easily readable presentation board
- 15% Craftsmanship: amount of assistance received, workmanship

BEFORE EXPERIMENTATION Fill out these forms before starting any experiments. The forms can be found in the ISEF Rules Book (inside back cover). Special Forms/Approvals may be required (dashed line box).



- _____ 1. Student completes Student Checklist (1A) and the Research Plan Attachment.
- _____ 2. Student reviews form 1A with Adult Sponsor.
- _____ 3. The Adult Sponsor completes the Checklist for Adult Sponsor (1) Form. This form determines if the student or team needs any special approvals or special forms before starting experimentation.
- _____ 4. Student gets signatures for Approval Form (1B). Each team member must complete an individual Approval form (1B).
- _____ 5. Get special approvals if needed. Fill out any special forms if needed. Refer to the ISEF Rules Book or the “Rules Wizard” available at Science Service Web Site.
- _____ 6. Make 3 copies of the above certification forms. Keep the original forms in your notebook, and give copies to your teacher and science fair officials if they ask for one. SRC and IRB must sign originals, so keep a copy when you send for their approval.
- _____ 7. Bring all original forms to the state science fair when you set up your project.

AFTER EXPERIMENTATION Forms to enter your project in the Science Fair are mailed to your science teacher or School’s Science Fair Coordinator each year in summer, or can be downloaded from our website (see back cover).



- _____ 1. Write a (maximum) 250 word, one-page abstract of your project. Teams jointly submit one abstract.
- _____ 2. Complete the Abstract Form. Either type directly on the form, or attach your abstract to the form.
- _____ 3. Complete the Assistance Received Form.
- _____ 4. Complete the Exhibit Entry Form. This form is used at all fair levels in Hawaii. You need to fill out a new form if you change any information on the form, including your project title. The Science Fair Office uses the information on this form for certificates, awards and the official program, so type or print clearly when you fill it out. This is the only form you need to send to the Hawaii Academy of Science/State Science Fair office by the entry deadline. Bring all other forms to the Blaisdell Exhibition Hall on exhibit set-up day.
- _____ 5. Make 3 copies of the Abstract Form (and abstract, if separate), the Assistance Received Form, and your Exhibit Entry Form. Keep your original forms and use the copies to give to teachers and science fair officials.
- _____ 6. Turn in a copy of the completed Abstract Form when you register at the State Science Fair.
- _____ 7. Tape your Assistance Received Form to the table top at the science fair.

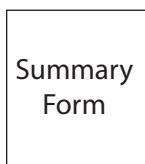
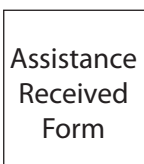
All display forms are mailed to school science fair coordinators in the summer. They can also be downloaded from our website - see back cover.

BEFORE STARTING ON YOUR PROJECT



- _____ 1. Make 3 copies of the Display Certification Form. Each team member needs to complete an individual certification form.
- _____ 2. Keep the original form in your notebook, and give a copy to your teacher and science fair officials if they ask for one.

AFTER PROJECT IS COMPLETED Forms to enter your project in the Science Fair



- _____ 1. Write a (maximum) 250 word, one-page summary of your project. Teams jointly submit one summary.
- _____ 2. Fill out the Summary Form. Either type directly on the form, or attach your summary to the form.
- _____ 3. Fill out the Assistance Received Form. Teams jointly fill out one form.
- _____ 4. Fill out the Exhibit Entry Form. This form is used for all fair levels in Hawaii. You need to fill out a new form if you change any information on the form, including your project title. The Science Fair Office uses the information on this form for certificates, awards and the official program, so type or print clearly when you fill it out. This is the only form you need to send to the Hawaii Academy of Science/State Science Fair office by the entry deadline. Bring all other forms to the Blaisdell Exhibition Hall on exhibit set-up day of the State Science Fair.
- _____ 5. Make 3 copies of the completed Summary Form, the Assistance Received Form, and your Exhibit Entry Form. Keep your original forms and use the copies to give away if someone asks for one.
- _____ 6. Bring all your original forms to the state science fair when you set up your project.
- _____ 7. Turn in a copy of the Summary Form when you register at the State Science Fair.
- _____ 8. Tape your Assistance Received Form to the table top at the science fair.

Project Safety Rules

Please note: All exhibits will be checked for safety.

Not Acceptable for Exhibit:

- Living organisms (i.e., plants, animals, microbes)
- Taxidermy specimens or parts
- Preserved vertebrate or invertebrate animals (including embryos)
- Human or animal food
- Human/animal parts or body fluids (e.g., blood, urine) (exceptions: teeth, hair, nails, dried animal bones, histological dry mount sections and completely sealed wet mount tissue slides)
- Plant materials (living, dead, or preserved)
- Laboratory/household chemicals
- Poisons, drugs, controlled substances or devices (i.e., firearms, weapons, ammunition, reloading devices) .
- Dry ice or other sublimating solids, i.e. solids which vaporize to a gas without passing through a liquid phase
- Sharp items (i.e., syringes, needles, pipettes, knives)
- Flames or highly flammable materials
- Batteries with open top cells
- Awards, medals, business cards, flags, etc.
- Photographs or other visual presentations depicting vertebrate animals in other-than-normal conditions (i.e., surgical techniques, dissection, necropsies or other lab techniques, improper handling methods, housing conditions, etc.)

Acceptable for Exhibit Only (do not operate):

- Class III and IV lasers
- Projects with unshielded belts, pulleys, chains and moving parts with tension or pinch points
- Any device requiring voltage over 125 volts

Acceptable for Exhibit & Operation (with Restrictions):

- Soil or waste samples if permanently encased in a slab of acrylic
- Large vacuum tubes or dangerous ray-generating devices must be shielded properly.
- Any apparatus producing temperatures that will cause physical burns must be adequately insulated.

Acceptable for Exhibit & Operation (with Restrictions) cont.:

- Class II lasers:
 - a) the output energy is < 1 mW and is operated only by the student exhibitor,
 - b) can be operated only during safety check and judging,
 - c) posted sign must read "Laser Radiation: Do not Stare into Beam",
 - d) must have protective housing that prevents access to beam,
 - e) must be disconnected when not operating.
- Photographs and/or visual depictions if:
 - a) They are not deemed offensive or inappropriate by the SRC or the Display and Safety committee. The decision by the committees is final.
 - b) Credit lines of their origins are attached. (If all images displayed were taken by the student or from the same source, one credit line prominently displayed is sufficient.)
 - c) They are from the Internet, magazines, newspapers, journals, etc. and credit lines are attached.
 - d) They are photographs of human subjects for which signed consent forms are at the project.
- Tanks that previously contained combustible liquids or gases, must be certified as having been purged with carbon dioxide.
- Pressurized tanks that contained noncombustibles may be allowable if secured.
- High-voltage equipment must be shielded with a grounded metal box or cage to prevent accidental contact.
- High-voltage wiring, switches and metal parts must have adequate insulation and overload safety factors and must be inaccessible to others.
- Electric circuits for 110-volt AC must have a nine foot (min.) cord; the cord must have sufficient load carrying capacity and be approved by Underwriters Laboratories.
- Electrical connections in 110-volt circuits must be soldered or made with approved connectors; connecting wires must be insulated.
- Bare wire and exposed knife switches may be used only in circuits of 12 volts or less; otherwise, standard enclosed switches are required.
- Personal photographs, accomplishments, acknowledgments, addresses, phone or fax numbers, and personal e-mail and Web addresses may be in the research paper or data book only.

Definition of Terms

Forms

Certification Forms Forms found in the ISEF Rules Book, including the Checklist for Adult Sponsor, Student Checklist (1A) and Research Plan Attachment, Approval Form (1B) and other special forms.

Display Certification Form A special form for Hawaii's display projects since ISEF forms are only for experimental research projects.

Entry Forms Forms for Hawaii science fairs, including the Exhibit Entry Form, Assistance Received Form, Abstract Form or Summary Form.

Adult Roles

In certain cases there could be multiple adults supervising a student's science fair project. The titles listed below are the roles adults play in a student's project. Adults listed below cannot serve on the SRC or the school IRB for their student's project.

Adult Sponsor An Adult Sponsor may be a teacher, parent, university professor, or scientist in whose lab the student is working. This individual must have a solid scientific background and should have close contact with the student during the course of the project. The Adult Sponsor is ultimately responsible not only for the health and safety of the student conducting the research, but also for the humans or animals used as subjects. The Adult Sponsor is responsible for ensuring the student's research is eligible for entry in the Intel ISEF.

Qualified Scientist The Qualified Scientist should have an earned doctoral/professional degree in the biological or medical sciences as it relates to the student's area of research. A master's degree with equivalent experience and/or expertise in the student's area of research is acceptable when approved by an SRC. The Qualified Scientist and the Adult Sponsor may be the same person if qualified as outlined above. A student may work with a Qualified Scientist in another city or state, but must work locally with a Designated Supervisor who has been trained in the techniques the student will use.

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 should be trained in the student's area of research. The Adult Sponsor may act as the 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.

Definition of Terms continued

Other Terms

Project Data Book This is where you keep accurate and detailed notes of your research. A project data book is required for research projects only.

IRB / Institutional Review Board A committee within each school that approves the safety of human subject projects. The IRB must include a teacher, a school administrator, someone qualified to evaluate the physical and/or psychological risk involved (doctor, P.A., R.N., psychiatrist, psychologist, or licensed social worker). Students need to get this board's approval before doing any experimentation (including surveys) on humans (see p. 15).

SRC / Scientific Review Committee A committee within a school's district that approves projects needing special approvals. In some cases, students need to get this board's approval before doing any experimentation (see p. 15).

If your research involves any of the items listed below or human subjects, you will need special forms and IRB or SRC approval. For these situations, you MUST refer to the ISEF Rules Book and follow the steps outlined there.

Controlled Substances DEA classed substances, prescription drugs, narcotics, alcohol and tobacco.

Hazardous Substances or Devices These include hazardous chemicals and equipment, firearms, radioactive substances and radiation.

Human and Animal Tissue These include all viable fresh tissue, organs, human or animal parts, including blood, blood products, teeth, primary cell cultures and body fluids (urine, saliva).

Nonhuman Vertebrate Animals Any animal with a vertebra (back bone). E.g., mice, rats, guinea pigs, rabbits, goldfish, guppies, etc.

Pathogenic Agents These are disease-causing or potentially disease-causing agents such as bacteria, viruses, fungi, molds and parasites.

Registered Research Institution/Industrial Setting An example of a registered research institution would be the University of Hawaii. An example of an industrial setting would be a Chevron lab.

rDNA/Recombinant DNA Molecules that are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell. Or, molecules that result from their replication.

Special Approvals

The Checklist for Adult Sponsor/Safety Assessment Form will tell you if you need any special approvals. Fill out the Checklist before experimentation has begun. The special forms are found in the ISEF Rules Book.

To obtain SRC / IRB approval, the special form(s) must be submitted along with Form1B.

If a project involves human subjects in any way, including survey or experimentation, then approval of your school Institutional Review Board (IRB) must be obtained before experimentation.

Any student working in a registered research institution or industrial setting needs to have their supervising scientist (scientist who supervises your work at the institution) complete the ISEF form (1C) after experimentation.

SRC / IRB members cannot be an Adult Sponsor, Qualified Scientist, Designated Supervisor, or any other adult whose student's project needs approval.

The Institutional Review Board (IRB)

Each participating school is required to have an IRB. The IRB's purpose is to evaluate the potential physical or psychological risk of research involving human subjects, including projects with surveys. Each school must have an IRB if there are projects involving human subjects, whether students are going to enter a school, district or state fair.

The committee needs to have at least 3 members:

1. A teacher
2. A school administrator, and
3. One of the following: a psychologist, a psychiatrist, a medical doctor, a physician's assistant, or registered nurse.

Suggestions for this committee and certification forms are in the ISEF Rules Book.

Scientific Review Committee (SRC)

An SRC member must be contacted for approval of projects involving non-human vertebrates, recombinant DNA, tissue culture, controlled substances and hazardous substances or devices.

Each District Fair should have its own SRC. Where there is no district fair, then students must contact the State Scientific Review Committee for approval. State SRC member contact information is listed on our web site (www.hawaii.edu/acadsci).

An SRC is composed of a minimum of three members, including at least one biomedical scientist (PhD, MD, DVM, DDS or DO) and one teacher. One member must be familiar with animal care procedures. A teacher whose student's project is being reviewed cannot be a member of the SRC. Refer to the ISEF Rules Book for guidelines on the work this committee performs.

Rules Highlights

Avoiding Mistakes at the Science Fair

- After the student completes Form (1A), the Adult Sponsor should fill out the Checklist for Adult (1) Sponsor to determine if special approvals and/or special forms are needed.
- To obtain IRB / SRC approval, Approval Form (1B) and the appropriate special forms need to be submitted for signature approval. If you are not sure where to send the form, contact the science fair office. When obtaining approval, submit your original, but be sure to keep copies.
- Projects involving non-human vertebrate animals, rDNA, pathogens, controlled substances, and human and animal tissue require SRC approval before experimentation begins.
- Projects involving humans must be approved by the school's IRB before experimentation begins. If more than minimal risk is involved (risk is determined by the school's IRB), then a copy of any test, survey or questionnaire must be provided for parental review and approval.
- Projects involving pathogenic agents may not be done in a home environment. Specimens may be collected at home, but the specimens must be cultured in a science laboratory and be disposed of following proper safety procedures.
- Projects with a death rate of 50% or more in any group or subgroup of nonhuman vertebrate animals will not qualify for competition.
- Try to replace nonhuman vertebrate animals with invertebrates (or other lower life forms) in projects. If you need suggestions, ask your science teacher.
- Nonhuman vertebrate animals should be taken care of properly. Every consideration should be given to their comfort and well-being. Experiments involving common lab animals (e.g., mice, guinea pigs, rats, rabbits) are only allowed in an institutional or school setting (if housing standards are maintained). Only non-invasive, behavioral studies involving pets (e.g., fish, livestock) may be done at home.
- Using alcohol, acid rain, herbicides, insecticides and heavy metals in toxicity or behavioral studies on live vertebrates is not allowed.
- For vertebrate animals, proper euthanasia at the end of experimentation for tissue removal and/or pathological analysis, should be done by the Animal Care Supervisor, Qualified Scientist or Designated Supervisor. Only in an emergency should the student perform euthanasia.

Building & Displaying Your Exhibit Board

Exhibit Size

Exhibit may be smaller, but should not exceed the guidelines below:

Height—72 inches if set on a table top, 108 inches when set on the floor

Width—48 inches (122 cm) maximum side to side, including add-ons

Depth—30 inches (76 cm) maximum front to back

Private school students with Junior Research or Display projects should note that the Hawaii Association of Independent Schools (HAIS) Fair requires the following dimensions: Maximum height is 72 inches; width 32 inches; depth 18 inches. No floor displays (project must sit on table).

Senior Research follows the State Fair dimensions.

Safety

All projects need to conform to the Safety Rules listed on page 12.

Backboard Construction

Exhibit backboard should be a free-standing, rigid material. Lightweight material is recommended for ease of transportation and shipping, but poster board is not advisable unless it is framed.

Lettering should be clearly readable at a distance of at least 6 feet. Your title is an important attention-grabber. A good title should accurately present your research while also making the casual observer want to know more.

During Exhibit Set-up, bring all necessary supplies to assemble your exhibit, e.g., scissors, string, tape, tools, glue, etc.

Visual Display

Your goal is to make it easy for the viewer to understand your project. You want to attract and inform. Your board is the visual summary of your work, so be concise—you don't need to include every single bit of information. Make it easy for people to look at your board and see what you did, and your results. If you want judges to get more details, you can tell them while they interview you and/or show your data book. Organization is important in arranging items on your board. Judges and the public should be able to take a quick glance at your board and locate the title, experiment or method, results, analysis and conclusions. Try to use "white space" so the items on your board will stand out. Photographs are good in moderation, as well as charts and graphs of data. Make sure all pictures and graphics are clear and correctly labeled with a descriptive title. Anyone should be able to understand the visuals without further explanation. For more advice, the ISEF Rules book has hints for displaying research in their Student Handbook section.

Items Required at Your Exhibit

In addition to your display board, the following forms and items should be kept at the exhibit during judging:

- Written report
- Required forms
 - Research projects: Checklist for Adult Sponsor (1)
Student Checklist (1A)
Research Plan Attachment
Approval Form (1B)
Special Forms (if any)
Abstract Form
Assistance Received Form (taped to the table)
 - Display projects: Display Certification Form
Summary Form
Assistance Received Form (taped to the table)
- Project data book (for research projects)

Liability & Safety Issues for Your Project

- The Hawaii Academy of Science cannot and will not assume liability for damage to or theft of exhibits (including all equipment, databooks, and anything else associated with your exhibit).
- Valuable equipment, such as computers, should be removed immediately after judging because valuables could be stolen or vandalized when the Fair is open to the public.
- Written reports and data books must also be removed immediately after judging has been completed.
- Exhibits left behind after take down time will not be saved.

How to Get a Copy of the ISEF Rules Book

ISEF Website

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

The ISEF Rules Book can be viewed and downloaded in pdf format from the ISEF web site. This includes all ISEF guidelines. ISEF forms can be obtained from your science teacher, or the Hawaii Academy of Science Educational Programs office. Forms are also available on The Academy's website: <http://www.hawaii.edu/acadsci>

Complete Rules Available online:

http://www.societyforscience.org/isef/primer/rules_regulations.asp

ISEF Handbook Downloadable at:

<http://www.societyforscience.org/isef/document/index.asp>

Questions Regarding Rules and Regulations?

http://www.societyforscience.org/isef/about/rules_regulations.asp

E-mail: src@societyforscience.org

Fax: (202) 785-1243

Call: (202) 785-2255

