SCVSEFA HANDBOOK
2014 Rules & Guidelines

The Santa Clara Valley
Science and Engineering Fair Association (SCVSEFA)

and

The Synopsys Silicon Valley Science and
Technology Outreach Foundation (SOF)

present the

Synopsys
Silicon Valley
Science and Technology
Championship

Tuesday and Wednesday
March 11 & 12, 2014
San Jose McEnery Convention Center, **SOUTH HALL**
San Jose, California

Submit applications to:
SCVSEFA
P.O. Box 307
Los Altos
CA 94023

Affiliated with the
Intel® International Science and Engineering Fair (ISEF)

Processing Fee: Attach a check to the Application payable to SCVSEFA. The fee is $15 per student or $30 per team and is non-refundable if the project fails to qualify for any reason. The processing fee must accompany the application form. We reserve the right to limit the number of entries based on teacher experience (see web site). Teachers: Mail forms to: SCVSEFA, P.O. Box 307, Los Altos, CA 94023.

IMPORTANT DATES

See www.science-fair.org for additional times and location details.

TEACHER WORKSHOPS and STUDENT CLINICS

Sept. 12 Thursday, at
Monta Vista High School.

Check our website homepage for updates on Workshop & Clinic dates, times, and room locations.

Future workshops are being planned at Martin Murphy Middle School, and at RAFT, Resource Area For Teaching in San Jose.

Contact us if you wish to host a workshop/clinic.

POSTMARK DEADLINES

Applications requiring SRC preapproval:

Grades 9 -12 projects

Oct 24, 2013 (Thursday)

Grades 6 -8 projects

January 9, 2014 (Thursday)

Applications NOT requiring SRC preapproval:

January 30, 2014 (Thursday)

SYNOPSYS CHAMPIONSHIP

CHECK-IN DAY

March 11, 2014 (Tuesday)

- **PROJECT CHECK-IN:** NOON—6:00 PM

PROJECTS MUST BE CHECKED IN ON MARCH 12

JUDGING DAY

March 12, 2014 (Wednesday)

- Judging: 2:00 PM—6:00 PM
- **Public viewing of projects: 5:00—6:00 PM**
- Project removal: 6:00 PM—6:30 PM

PROJECTS MAY NOT BE REMOVED PRIOR TO 6:00 PM

AWARDS CEREMONY

Please check our web site:
www.science-fair.org

Table of Contents

Where Can You Turn…

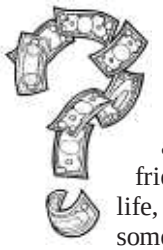
Start by visiting http://www.science-fair.org. Everything in this Handbook and MUCH MORE can be found on our web site . . . Select the Mentors Tab online to review our Mentors Program

STUDENTS

…for help getting started?	*Attend a student clinic (see www.science-fair.org for dates/locations)*
…if you can't find a teacher to sponsor your project	*E-mail: rvwcwl@yahoo.com*
…for help with SRC requirements or forms?	*E-mail: src@science-fair.org*
For Intel ISEF Rules and Guidelines see:	*www.societyforscience.org/isef/rulesandguidelines*

TEACHERS

… for general Championship related questions	*E-mail:fairmanager@science-fair.org*
…for help with SRC requirements or forms?	*E-mail: src@science-fair.org*
…for additional funding?	*Check out: www.outreach-foundation.org*
…for help with student fees?	*Contact: rvwcwl@yahoo.com*
…for mailing instructions?	*Teachers should mail applications to: SCVSEFA P.O. Box 307, Los Altos, CA 94023*



Why Should You Participate?

For the challenge and sense of accomplishment that comes from doing and presenting your own research project. To learn the scientific method and taste the science fair culture. To make new friends and establish contacts that will benefit your life, school, and career choices. To become an expert in something. To talk to others about your project. To stretch your talents and perhaps to win . . .

Prizes and Awards

- First, Second, and Honorable Mention ribbons (Place Awards) are awarded by SCVSEFA for scientific merit.
- Outstanding projects in the Senior Division (grades 9-12) win Grand Prize Awards and an all-expense-paid trip to the Intel International Science and Engineering Fair, May 11-16, 2014, in Los Angeles, CA.
- Outstanding projects in the Junior Division (grades 6-8) receive the Isabelle Stone Award (biological sciences) or the Castro Family Award (physical sciences) and an all-expense-paid trip to the California State Science Fair in Los Angeles, California. Date to be determined. See CSSF website for more information.
- Selected winners in the Junior Division are eligible to further compete in the Broadcom Masters Competition.
- Two projects in the Senior Division will be selected to participate in the 2014 I-SWEEEP Olympiad, April 30-May 5, 2014 in Houston, TX.
- Top students in the Junior and Senior Divisions will be selected to compete in the California State Science Fair.
- In addition, 60+ companies and organizations present Special Awards.

Who May Enter

- All students less than 20 years old who attend school in Santa Clara County in grades 6-12 are eligible to enter (if they have not competed in any other Intel ISEF-affiliated fair in the same school year). A student may participate in only one project. A fee of $15 per student is required or $30 per team.
- Individual entries—A student may enter one project.
- Team entries—A team of two or three students may enter one team project. SCVSEFA strongly recommends teams be limited to two students.
- All projects will be judged for scientific merit using the same criteria regardless of the number of individuals preparing the project.

Project Categories

BIOLOGICAL SCIENCES

- Botany
- Environmental Sciences
- Zoology
- Behavioral/Social Sciences
- Medicine/Health
- Biochemistry/Microbiology

PHYSICAL SCIENCES

- Chemistry
- Physics
- Earth/Space Sciences
- Engineering
- Computers/Mathematics
- Bioinformatics

General Rules

1. The Synopsys Championship is an Intel ISEF affiliated fair. We follow the Intel ISEF Rules and Guidelines and expect all students to read and abide by the following ethics statement: "Scientific fraud and misconduct are not condoned at any level of research or competition. Such practices include 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 or the ISEF."
2. The fair Application can be downloaded from our website, www.science-fair.org. We require the application be submitted by the student's teacher in its entirety as a single stapled document in page number order, with all extra forms stapled behind the completed 8-page Application, and the Detailed Research Plan.
3. Projects requiring SRC preapproval before beginning experimentation must be submitted by the appropriate deadlines. Our only deviation from the Intel ISEF Rules is that, for safety reasons, we request that projects involving hazardous chemicals, activities, devices or regulated substances also seek preapproval. See pages 4-5 for guidance.
4. Additional forms are required for some projects, and the checklist on Page 5 provides information. These forms may be downloaded from our web site www.science-fair.org.
5. Both our web site and the Intel ISEF web site: http://www.societyforscience.org/isef/ have significant amounts of additional and very useful information.
6. A copy of the project Minimum Quality Standards can be obtained from the Application & Handbook page of our website. ***Please adhere to these standards or your project will fail to qualify for competition***.
7. All additional forms should be submitted by the teacher along with the Application in a single document (in Application page number order). The Adult Sponsor Checklist (Form 1 on page 4 of the Application) should be used to ensure that the Application is complete.
8. Projects that are a continuation of a previous year's research will require SRC preapproval. They must involve significant new work and additional paperwork is required (see Form 1A of the Application form). Only the current year's research may be on the project board.
9. Projects must comply with all local, state and federal laws as well as SCVSEFA and Intel ISEF Rules. We reserve the right to fail to qualify the project of any student who does not follow these.

About Safety

Some science experiments and engineering projects are inherently dangerous. The SRC (Scientific Review Committee) process is designed to protect the students, their peers and families, and the environment. If any boxes listed under 4) or 6) are checked on the Adult Sponsor Checklist (Form 1), the project will need a **Designated Supervisor (DS).** This person must have training in the field and understand the complexities of the research plan so that he or she is able to complete the risk assessment on Form 3. The DS commits to provide direct supervision.

A Qualified Scientist (QS) is a PhD level scientist (or MS with 5 years of training in the field) with expertise in the area of study. The QS is required for all BSL-2 studies or studies using DEA-controlled chemicals and for other projects as specified by Intel ISEF Rules.

Do I Need SRC Preapproval Before I Can Begin My Project?

Some projects may be covered by the rules for more than one category

Is your project a continuation of last years project? **(Continuation Project)**

Yes →

No ↓

Does your project involve...asking your friends or other people questions? experiments on yourself? experiments with people in any way? **(Human Subjects)**

Yes →

No ↓

Does your project involve...your pet? any other animals that have bones(except people)? E-mail src@science-fair.org immediately for assistance with experimental design. **(Vertebrate Animals)**

Yes →

No ↓

Does your project involve...

- mold or other fungus? Bacteria? Viruses? Anything that might make you sick? Samples collected from the environment?
- DNA from one organism inserted into the DNA of another organism?
- Anything coming from a human or animal body? Cheek cells or other cells? Teeth? Bone? Fluids such as blood, saliva, or urine? **(Potentially Hazardous Biological Agents)**

Yes →

Does your project involve...

- any chemical such as household cleaning agents, solvents, metals or organic chemicals? **(Chemicals)**
- dangerous activities, such as being on a roof? or igniting objects? **(Hazardous Activities)**
- model rockets? lasers? UV light? radiation? guns or gunpowder? or anything else that might be considered dangerous or hazardous? **(Hazardous Devices)**
- prescription drugs? alcohol, wine, or beer? cigarettes or other tobacco? gunpowder? any product which the student may not legally purchase? **(Regulated substances)**.

Yes →

No ↓

You do not need SRC preapproval. Your teacher must submit your application by **January 30, 2014.**

You must have SRC preapproval.
See www.science-fair.org/src for more information. Your teacher must submit your application by
Oct 24, 2013 (Grades 9-12)
Jan. 9, 2014 (Grades 6 - 8)
Additional forms are required
See Handbook Page 5

Checklist for Required Championship Forms

Project Content →	Projects not Requiring SRC Preapproval	Human Participants (including surveys)	Vertebrate Animal Projects	Potentially Hazardous Biological Agents, (pathogens, rDNA or Human/Animal Tissues)	Hazardous Chemicals, Dangerous Activities, Devices or DEA Regulated Substances
Application Form	Yes	Yes - and a copy of ANY surveys, photographs	Yes	Yes	Yes
Registered Research Institutional / Industrial Setting Form (1C)	See note 1	See note 1	See note 1	See note 1	See note 1
Qualified Scientist Form (2)		See note 2	Yes See note 3	Yes See notes 4, 5	Yes - if using DNA controlled substances
Risk Assessment Form (3)			Yes See note 9		Yes See note 6
Human Participants Form (4)		Yes See note 8		Yes - for Human Tissue, see note 8	
Vertebrate Animals Form (5A or 5B)			Yes See note 3		
Potentially Hazardous Biological Agents Form (6A)				Yes See: http://www.societyforscience.org/page.aspx?pid=319	
Human and Vertebrate Animal Tissue Form (6B)				Yes - for Human and Animal Tissue only	
Continuation Project Form (7)	See note 7	See note 7	See note 7	See note 7	See note 7

Forms and expanded information and all Intel ISEF Rules and Regulations for each of these project types may be found at http://www.societyforscience.org/isef/document

Notes:

1) If work was conducted or equipment used at an institutional or industrial setting at any time, a Registered Research Institutional/Industrial Setting Form (1C) must be completed following the end of experimentation, shown at check-in, and displayed with the project.
2) An Institutional Review Board (IRB) must review all human subjects projects for risk assessment and approval BEFORE experimentation begins. If the IRB determines the project involves more than a minimal risk to the human subjects, then a Qualified Scientist will need to oversee the project and complete the Qualified Scientist Form (2).
3) Not required for observational studies involving animals in their natural environment or animals in zoological parks with no manipulation of their environment or interaction between the experimenter and the subject animal(s).
4) rDNA studies must be supervised by a Qualified Scientist or Designated Supervisor with relevant expertise.
5) Qualified Scientist Form (2) is required for studies handling BSL-2 organisms, human and animal tissues or rDNA. Special rules apply for unknown microorganisms isolated from the environment. See ISEF Rules & Guidelines.
6) These projects require a qualified Designated Supervisor and completed Form (3).
7) Continuation projects require Continuation Form (7) which must be displayed with the project.
8) Also requires a sample of the Informed Consent Form.
9) If project is a Vertebrate Animal Decomposition Study.

Completing the Championship Application Forms

The following procedures will help ensure that all applications are complete when submitted and can be reviewed by the SRC committee in a timely manner.

Teacher Involvement

- Championship applications can only be submitted by teachers. Deadlines are listed on the front cover of this Handbook. Please add the submission check made out to SCVSEFA with the student's name in the note line.
- If no teacher is available to submit your forms, please email: fairmanager@science-fair.org.

2014 Application Forms

- The 8-page Application Form MUST be completed in its entirety and submitted by the teacher as one document stapled together in page number order. All additional forms must be attached after the 8-page application.
- All fields must be completed unless otherwise indicated.
- Each team member must submit a separate, signed Form (1B).
- Additional Forms not included in the Application itself can be downloaded using the Forms link on the website home page.

STUDENT CHECKLIST (page 2) Student

ALL FIELDS SHOULD BE COMPLETED

Item 4. Your teacher is usually your adult sponsor.
Item 5. If you are continuing work on a project you entered last year, check the box and include a copy of your previous year's Abstract and complete Continuation Form (7). Only this year's work may be displayed on your project board.
Item 6. If your project requires SRC preapproval, write the words "upon approval" in the space for "start date" and leave a blank for "end date." If your project does not require SRC preapproval, you can designate your own start date. (Leave the actual start and end dates blank unless you have completed your project and can get those dates from your notebook.)
Item 7. Indicate where the experiment will be done. Include names, addresses, and phone numbers of all locations.

Research Plan Attachment (see Application page 3)
Complete all sections. Then, on a separate sheet(s) of paper, include the details of your experiment or engineering project and insert behind page 3 in your Application Form. Follow the minimum quality standards (see Application page 6). Incomplete forms cause delays in approval.

ADULT CHECKLIST (page 4) Teacher

First read page 4 of this Handbook to determine if SRC preapproval is needed. Then check the appropriate boxes on Form 1 (see Application page 4). If you check any boxes under 4) or 6), additional forms are required. To determine which ones are needed, consult the table on page 5 of the handbook. All forms must be signed and dated by the adult sponsor/teacher prior to experimentation.

- **Human Participant Projects**
  If the project will use people in any way (even if only answering questions), Form 4 is required. Students and teachers should fill out only the top one third of this form; students should also fill out the Informed Consent Form that they will use for their project. Attach a copy of the Human Consent Form, any questionnaire, photographs, tapes, etc. to the project application. After IRB approval, a copy of the signed form will be returned to the teacher for the student to use when recruiting Participants.
- **Vertebrate Animal Projects**
  If the project involves animals with bones, students should fill out either Form 5A or 5B. Contact src@science-fair.org and we will put you in contact with our veterinarian who will guide the student through the process.
- **Potentially Hazardous Biological Agents**
  Projects involving bacteria, fungi, viruses, tissues, biological fluids, organs, etc. may never be done at home. Fill out Form 6A, and Form 6B and Form 2 if required. This project area is complicated so refer to the ISEF Rules. Some items are exempt: Brewer's yeast, cut hair, pasteurized meat and eggs.
- **Hazardous Chemicals, Activities and Devices**
  This is a broad topic area involving chemicals, tobacco, alcohol, drugs, radiation, fire, rockets, motorized vehicles, etc. We request that you obtain preapproval as the most dangerous projects are often in this category. Fill out Form 3 and answer questions in detail.

STUDENT ACTION

CAUTION! You must obtain PRE-approval for all the types of projects listed above. To do this, all the appropriate additional forms should be filed with the 8-page Application form and detailed project proposal -see page 8. If you need help to fill out the forms, send a note to src@science-fair.org. Correctly filled out forms speed the approval process—avoid "failure to qualify".

Monitor the web site for the 'status' of your project (details on page 7). You may start the experimental part of your project as soon as your project is marked "Approved" on your web site. If we have questions we will communicate with your teacher (and you, if you give us a legible email address).

Research done at a Registered Institute or Industrial Research Setting

Preapproval needs to be given by the SRC. Preapproval must also be given by the Institute, but all required forms (or Institute's equivalent) must be filled out, signed and dated prior to start of experimentation. Students should have the PI or Senior Researcher in the Lab fill out Form 1C at the end of experimentation.

Minimum Quality Standards

The minimum quality standards for each of the acceptable project types can be found on page 6 of the Application Form. Remember that these are minimum standards and winning projects are likely to be more complex.

Championship Project Judging Criteria

Nearly 35% of all participating students receive an award of some type.

Category Place Awards.

All projects are judged for awards by scientific category. Projects are judged according to the criteria listed at the right, and First, Second and Honorable Mention place awards are given.

Special Awards

More than 60 companies and organizations select projects to receive Special Awards at the Championship. These awards may include cash, tours, and/or tangible items. Judging for Special Awards is based upon the objectives of the participating company or organization, and any project may be evaluated by a Special Awards judge or judges. The Special Awards judges only review projects whose titles fit their criteria of interest. Therefore, it behooves the student to entitle his/her project so the judges have a good idea what the project involves from the title information alone

Category Award Judging Criteria

Scientific Thought or Engineering Goals Did you follow the scientific method or engineering design process?	**30%**
Creative Ability Do you have a unique and original problem or solution, or have you used a novel approach?	**30%**
Thoroughness Did you find out what others have done on your subject? Did you look at different aspects of the problem? Are your interpretations and decisions supported with data?	**15%**
Skill Do you understand the subject? Did you use appropriate laboratory, computational, observational, research and design skills? Did you acknowledge the help you received?	**15%**
Clarity Are your abstract and presentation accurate and understandable? Did you present your data using appropriate statistics, graphs, drawings, etc?	**10%**
TOTALS	**100%**

Tracking The Status of Your Project

When you have submitted your project to SCVSEFA, it is then <u>your responsibility</u> to track its status on the SCVSEFA web site. Use the "Project Status" link on the home page to find your project and its assigned Project Number according to your school and teacher. Project status should be listed on the web site about 7-10 days following the deadline or an earlier mail submission. If you cannot find your project within 2 weeks of submission, please contact us (see page 2).

Once entered in the SCVSEFA database, your project will be listed as "project received – check back in 7 days". After review for quality and need for SRC pre-approval, your project status will change to one of the following:

- "project accepted" – everything is fine. Begin your research.
- "awaiting SRC review" – in queue for review, continue to monitor the web site.
- "project failed to qualify" – only given for major safety hazards or rules violations that cannot be corrected.
- "project incomplete – see your teacher". If you find this note, contact your teacher to find out what is wrong. An e-mail note will have been sent to the teacher with your project number in the subject line along with a a message.
- If the message is "quality issues", check your procedures against the Minimum Quality Standards listed on the application form and on the web site. Resubmit your improved procedures as an e-mail reply to the note sent by the Scientific Review Committee.
- If the message is "Forms Violation", the note will specify the missing/incomplete forms needed. Continue to monitor the status of your project after you have submitted the requested forms until the project status is listed as "Accepted" on the web site.

Note: Projects involving human subjects require IRB preapproval. This committee meets less frequently, but always on the Saturday of the week after the deadline. It is particularly important that a completed Form 4 with accompanying Consent Form and all required items (surveys, etc.) be included with the application.

Research Plan Instructions

A complete research plan is required and must accompany Checklist for Student (1A)

Provide a typed research plan and attach to Student Checklist (1A). Please include your name on each page.
The research plan for ALL projects is to include the following:

A. Question or Problem being addressed

B. Goals/Expected Outcomes/Hypotheses

C. Description in detail of method or procedures

The following are important and key items that should be included when formulating ANY AND ALL research plans:

- Procedures: Detail all procedures and experimental design to be used for data collection
- Data Analysis: Describe the procedures you will use to analyze the data that answer research question or hypothesis

D. Bibliography: List at least five (5) 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.

- Choose one style and use it consistently to reference the literature used in the research plan
- Guidelines can be found in the Student Handbook

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

1. Human participants research :
   - Participants. Describe who will participate in your study (age range, gender, racial/ethnic composition). Identify any vulnerable populations (minors, pregnant women, prisoners, mentally disabled or economically disadvantaged).
   - Recruitment. Where will you find your participants? How will they be invited to participate?
   - 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?
   - Risk Assessment.
     - Risks. What are the risks or potential discomforts (physical, psychological, time involved, social, legal,etc.) to participants? How will you minimize the risks?
     - Benefits. List any benefits to society or each participant.
   - Protection of Privacy. Will any identifiable information (e.g., names, telephone numbers, birthdates, email addresses) be collected? Will data be confidential or anonymous? If anonymous, describe how the data will be collected anonymously. If not anonymous, what procedures are in place for safeguarding confidentiality? Where will the data be stored? Who will have access to the data? What will you do with the data at the end of the study?
   - 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 :
   - Briefly discuss potential ALTERNATIVES to vertebrate animal use and present a detailed justification for use of vertebrate animals
   - Explain potential impact or contribution this research may have
   - Detail all procedures to be used
     - Include methods used to minimize potential discomfort, distress, pain and injury to the animals during the course of experimentation
     - Detailed chemical concentrations and drug dosages
   - Detail animal numbers, species, strain, sex, age, source, etc.
     - Include justification of the numbers planned for the research
   - Describe housing and oversight of daily care
   - Discuss disposition of the animals at the termination of the study
3. Potentially Hazardous Biological Agents :
   - Describe Biosafety Level Assessment process and resultant BSL determination
   - Give source of agent, source of specific cell line, etc.
   - Detail safety precautions
   - Discuss methods of disposal
4. Hazardous Chemicals, Activities & Devices :
   - Describe Risk Assessment process and results
   - Detail chemical concentrations and drug dosages
   - Describe safety precautions and procedures to minimize risk
   - Discuss methods of disposal

International Rules: Guidelines for Science and Engineering Fairs, www.societyforscience.org/isef

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