Participating in Fairs

Implementation Strategies

Participating in Fairs provides information on opportunities for students to share their hard work by showcasing their projects and competing in engineering competitions.



Intel ISEF

This section presents information on participating in the Intel International Science and Engineering Fair (Intel ISEF) and the Intel ISEF-affiliated science fairs where students qualify to participate in Intel ISEF.

Hosting a Fair

Hosting a Fair offers suggestions on how to host your own engineering fair. Hosting a fair is explained in detail in Session 17, *Fairly There*; and Session 18, *Dress Rehearsal*.

Other Fairs

A selection of engineering fair and competition opportunities for middle school age students is provided here. For middle school students who may not yet be eligible for an Intel ISEF-affiliated science fair, *Hosting a Fair* and *Other Fairs* are good practice for future participation in an Intel ISEF-affiliated science fair.



Intel ISEF

Participating in Fairs

The Intel International Science and Engineering Fair (Intel ISEF) (www.intel.com/education/isef/) is the world's largest pre-college science competition. It



provides an opportunity for the world's best young scientists and inventors to come together to share ideas, showcase cutting-edge science projects, and compete for more than \$3 million in awards and scholarships. Each year, 10 to 15 percent of finalists file for patents on their projects.

Overview

The Intel ISEF is the world's only international science fair representing all life sciences for students. Every year, more than one million students in grades 9-12 compete in regional science fairs and nearly 500 Intel ISEF-affiliated fairs held around the world. Then, at Intel ISEF, more than 1,200 students from 40-plus countries win the chance to compete for the scholarships and prizes in 14 scientific categories and a team project category.

The Intel ISEF has been coordinated for more than 50 years by Science Service, one of the most respected nonprofit organizations advancing the cause of science. As title sponsor, Intel Corporation has committed millions of dollars to developing and promoting this competition. In addition, each year a volunteer committee representing the host city raises funds to sponsor events throughout the fair.



Intel's Sponsorship

Intel became the first title sponsor for the Intel ISEF in 1997 as

a way to recognize and reward excellence in science from the world's best young scientists, and to encourage more young people to explore science and technology in their higher education and career choices.

Since assuming the sponsorship, Intel has focused on increasing international participation and adding new awards such as Young Scientists Scholarships, Achievement Awards, Best of Category, and awards to teachers and fair directors. Intel's sponsorship of the Intel ISEF is part of the Intel® Innovation in Education initiative to prepare today's teachers and students for tomorrow's demands.

Intel ISEF-Affiliated Science Fairs

An Intel ISEF-affiliated science fair is a science competition that is a member of the Intel ISEF network. These competitions exist in every state in the U.S. and 40 countries. All Intel ISEF-affiliated science fairs register with Science Service and must consist of five participating high schools or 50 students in the ninth through twelfth grades. Some fairs may have middle school divisions. Fairs are conducted at local, regional, state, and national levels.

Before participating in the Intel ISEF, a student must compete at an Intel ISEF-affiliated science fair. Each affiliated fair can send two individual project finalists and one team project to compete



Intel ISEF (continued)

in the Intel ISEF. Information for becoming an Intel ISEF-affiliated fair and finding an Intel ISEF-affiliated fair near you is available at www.sciserv.org/isef/aff fairs/*.

Below is general information about the fair. For more detailed information, go to Science Service, www.sciserv.org/isef/* and Intel ISEF www.intel.com/education/isef/.

How to Participate

- 1. Any student in grades 9-12 or equivalent is eligible to enter.
- 2. First, compete in a high school or local science fair. More information at www.sciserv.org/isef/*.
- 3. Winners at the high school or local level can then compete in a regional or state fair.
- 4. Winners of the regional or state level may be eligible to compete at the Intel ISEF. Each affiliated fair can send up to two individual finalists and one team consisting of up to three members to represent them at the Intel ISEF.

The Engineering Category

Engineering is one of the 14 Intel ISEF categories. According to the Intel ISEF student handbook, an engineering project should "state the engineering goals, the development process, and the evaluation of improvements." Engineering projects may include the following steps:

- 1. Define a need.
- 2. Develop design criteria.
- 3. Search literature to see what has already been done.
- 4. Prepare preliminary designs.
- 5. Build and test a prototype.
- 6. Retest and redesign as necessary.

This mirrors the design process in *Design and Discovery*. It is important that students keep accurate and consistent notes and sketches in their design notebooks for Intel ISEF. It is critical to thoroughly read the Intel ISEF rules since they are very specific.

If judges ask students what their hypothesis is, students could answer, "This project is an engineering project. I defined a need and then developed design criteria to meet that need. This procedure replaces the scientific method for my project."

Project Submissions

Project submission criteria are thoroughly explained on the Science Service Web site www.sciserv.org/isef/*. Most of the information is generalized for all the categories and needs adaptations for an engineering project. Successful project submissions include:

- 1. Project data book (the *Design and Discovery* design notebook)
- 2. Abstract: A 250-word, one-page document that includes the purpose of the project, procedures used, data, and conclusions
- 3. Research paper
- 4. Visual display (Be sure to read the display rules.)



Hosting a Fair

Participating in Fairs

Many schools or districts already have annual science fairs that *Design and Discovery* students may be able to participate in. Session 17, *Fairly There*, describes the suggested engineering fairs for *Design and Discovery*.



This culminating event is held to recognize students' hard work and celebrate their accomplishments; to share engineering expertise with others; to practice presenting projects to an audience; to get feedback on their projects: display boards, prototypes, and presentations. A brief description of each culminating event follows.

A Solutions Showcase

This culminating event is held for parents and community members and is an opportunity for students to share their work and get feedback. Each student explains his or her project with a display board that includes their design brief, sketches, their models, and prototypes. They can also create slide presentations. Invite a guest speaker to open the event. Don't forget to have snacks on hand as well as programs for the guests.

A Mini-Engineering Fair

This culminating event is held for younger students and peers. In this case, all of the students set up their project displays around the room and the guests visit each project for an explanation by students. These presentations are more informal than a Solutions Showcase. In addition to sharing their projects, *Design and Discovery* students also plan mini-engineering activities for younger students to give them a taste for engineering and what they've learned.

Organizing a School Science Fair

Many resources are available for organizing a more traditional school science fair. For example, see Science Fair Central, www.school.discovery.com/sciencefaircentral/*. The science fair organizer section provides information for teachers on how to organize a school science fair.



Other Fairs

Participating in Fairs

Many organizations hold science fairs that are geared to middle school. The following is a partial list of resources.



Science Fair Resources

eCybermission. eCybermission is a Web-based science, math, and technology competition for seventh- and eighth-grade teams of three or four students and a Team Advisor who have registered on the site. Teams select a problem related to one of four Mission Challenges: Arts and Entertainment; Environment; Health and Safety; and Sports and Recreation. www.ecybermission.com*

Craftsman/NSTA Young Inventors Awards Program. The Craftsman/NSTA Young Inventors Awards Program, begun in 1996, challenges students to use their imaginative and creative abilities, along with science, technology, and mechanical ability to invent or modify a tool. Students in grades 2-8 in the United States and the U.S. Territories are eligible to participate in the Young Inventor Awards Program. Students work independently to imagine and develop their tool inventions. With guidance from a teacher, advisor, parent, or other significant adult, the student designs and builds the tool. The tool must be useful, that is, it must mend, make life easier or safer in some way, entertain, or solve an everyday problem. Two national winners each receive a \$10,000 United States Series EE Savings Bond. Ten national finalists each receive a \$5,000 United States Series EE Savings Bond. The winning teachers and schools receive prizes. www.nsta.org/programs/craftsman*

Christopher Columbus Awards. The mission of the Christopher Columbus Awards program is to have middle school students (sixth, seventh, and eighth grade) combine science and technology with community problem-solving in a real-world setting. In teams of three or four, students identify a problem or issue they care about and use science and technology to develop an original solution. With the help of an adult coach, they work with experts, conduct research, and test out their ideas. Ten finalist teams and their coaches receive an all-expense-paid trip to the Walt Disney World Resort to attend National Championship Week and a \$200 grant to further develop their ideas. The first-place team wins a \$5,000 savings bond per team member; second place, a \$3,000 savings bond per team member; and third place, a \$1,000 saving bond per team member. One of the 10 finalist teams wins the \$25,000 Columbus Foundation Community Grant to develop its idea in the community.

www.nsf.gov/od/lpa/events/bayernsf/intro.htm*



Other Fairs (continued)

Invent America! Launched in 1987, Invent America! is a nonprofit K-8 education program that helps students develop problem solving and creative thinking skills through inventing. Teachers can enroll and become an Official Invent America! member. Members can enter their

students' inventions in the National Invent America! Student Invention Contest. Entries are judged on the basis of usefulness, creativity, illustration, communication of ideas, and research performed. First-, second-, and third-place winners receive U.S. Savings Bonds. Past winners have received congratulations from the President of the United States, traveled to Japan to receive awards, and had their inventions displayed at the Smithsonian Institution. www.inventamerica.org*

The Discovery Channel Young Scientists Challenge. The DCYSC is a creation of Discovery Communications, Inc. in partnership with Science Service. Every year, 6,000 out of 60,000 student competitors in grades five through eight are nominated to the DCYSC by fair directors of Science Service-affiliated fairs. Between June (entrance deadline) and early September, judges choose 400 semifinalists among the entries. Students' work is judged on its scientific merit as well as the students' ability to communicate the science of their project. In October, 40 finalists receive an all-expense-paid trip to Washington, D.C. for the competition finals, which consists of a series of team challenges and oral presentations. The finalists present their original science fair project to the judges and other finalists. The winners receive scholarships and semifinalists receive prizes. www.school.discovery.com/sciencefaircentral/dysc/*

Toshiba ExploraVision Awards Program. ExploraVision is a competition for students in grades K-12, divided into four categories: grades K-3; grades 4-6; grades 7-9; and grades 10-12. Participants must be U.S. or Canadian citizens or legal residents. The purpose of the competition is to encourage students to look at the tools and technologies we all use every day, identify a problem that a current technology does not solve, and then imagine possible solutions to the problem. Prizes for the student members of the four first-place teams will each receive a U.S. EE Savings Bond worth \$10,000 at maturity. Second-place winners will receive U.S. EE series bonds worth \$5,000 at maturity. Canadian winners receive Canada savings bonds purchased for the equivalent issue price in Canadian dollars. National finalist team members and their parents/guardians travel to Washington, D.C. for ExploraVision Awards Weekend where they are recognized for their outstanding achievement. www.toshiba.com/tai/exploravision/index.html*

The National Engineering Design Challenge (NEDC). The National Engineering Design Challenge (NEDC) is an annual engineering-based competition for grades 9-12 that challenges students to apply mathematics, science, and technology to a multidisciplinary problem. Teams of students design, build, and demonstrate a working model of a new product that is a proposed solution to the problem. Past design challenges have included designing and fabricating a temporary shelter that is portable, inexpensive, and easy to set up in a variety of



Other Fairs (continued)

environments; designing an easily transportable fitness system for people of all ages and physical abilities; and developing a solution to enable a person to open and/or close containers that are commonly found in the home or office. The National Engineering Design Challenge can be conducted over four, eight, or ten weeks, or as a one-semester program. www.jets.org/programs/nedcdesc.cfm*

The WWW Virtual Library: Science Fairs. This library is an attempt to provide a single comprehensive list of every science fair accessible on the Internet. These include national, international, state, and regional fairs. http://physics.usc.edu/~gould/ScienceFairs*

