GENERAL INFORMATION

A science and engineering fair is a competition in which students can exhibit, demonstrate and discuss their projects with members of the scientific community and the public. It serves three major purposes: it stimulates an active interest in science and engineering; it provides an educational experience to students through exposure to judges and to the public; and it provides a forum for talented students to receive public recognition for their work.

Science Fairs begin at the local level and can lead to competition at the international level. An estimated 1.5 million students participate each year throughout the United States and in more than 70 countries worldwide.

New Mexico Science and Engineering Fair (NMSEF) is a non-profit program hosted by New Mexico Tech, an equal opportunity institution. NMSEF is a member of the New Mexico Activities Association. Financial support for the State Science Fair comes from New Mexico Tech, the State of New Mexico, registration fees, donations from a number of foundations, and corporate and individual donors.

The personnel of the New Mexico Science and Engineering Fair are:

Fair Director is responsible for organizing and overseeing all aspects of the Science Fair as well as recruiting and assigning regular and special award judges and organizing the judging committees. Emergency Fair Assistant and volunteers provide assistance to the Fair Director. The Volunteer Awards Coordinator and assistants oversee the scoring and awards of this event. Contact Information: (575) 835-5678, sciencefair@admin.nmt.edu.

Committee Chairpersons are responsible for overseeing their judging committees. A committee is the group of judges responsible for judging exhibits in one category of one division (e.g., Senior Botany). The Committee is responsible for regular category awards and possibly any special awards which fall into that category.

CLASSIFICATION OF EXHIBITS

There are two divisions of exhibitors: Junior (grades 6 through 9) and Senior (grades 9 through 12). The divisions are further subdivided into categories:

- Behavioral and Social Sciences
- Botany (Plant Sciences)
- Cellular and Molecular Biology
- Chemistry
- Computer Science
- Earth & Planetary Sciences
- Energy & Transportation
- Engineering
- Environmental Sciences
- Mathematical Sciences
- Medicine and Health Sciences
- Microbiology
- Physics and Astronomy
- Zoology (Animal Sciences)

Team Projects are judged in regular categories.
JUDGES

There are two different categories of judges at the New Mexico Science and Engineering Fair:

**Category Awards** judges and **Special Awards** judges each use different methods of evaluation and therefore require separate guidelines.

**Category awards** judges interview the finalists in each of the disciplines to determine the winners for these awards. Category awards include the place winners and honorable mention exhibits in each of the above categories, as well as the overall grand award winners. The top four exhibits in the Senior Division are chosen to represent New Mexico at the Intel International Science and Engineering Fair.

**Special awards** are sponsored by governmental agencies, the Armed Forces, professional societies, and industrial organizations, and are based upon criteria established by the sponsor. Judges for special awards may also serve as category award judges.

**IMPORTANT POINTS FOR ALL JUDGES**

- Judges should keep in mind that NMSEF is not only a competition, but an educational and motivating experience for students. The high point of the Science Fair experience for the majority of students is their interviews with the judges. Please be positive and gentle with suggestions of improvements. Give encouragement and constructive criticism for the work accomplished. Remember the age and delicate self-esteem of the students with whom you are working.

- Judges may not ask student exhibitors for their name, their school name, or where they're from. All Student Exhibitors should only be referred to by Exhibit Number.

- Students may have worked on a research project for more than one year. However, for the purpose of judging, only research conducted within the current year is to be evaluated. Although previous work is important, it should not be considered as part of this year’s project.

- Examine the quality of the finalist’s work, and how well the finalist understands his or her project and area of study. The physical display is secondary to the student’s knowledge of the subject. As mentioned earlier, if the project is a multi-year effort, the Student Exhibitor is required to have a Continuation Form (Intel ISEF Form 7) visible at the project. Please be aware of the fact that the only work being judged should be that completed in the year prior to this Science Fair (2013).

- When research is conducted in an industrial or institutional setting, the student is required to have documentation (Intel ISEF Form 1C), that provides a forum for the mentor or supervisor to discuss the project. Judges should review this information in detail when evaluating research.

- Look for evidence of laboratory, field or theoretical work, not just library research or gadgeteering.

- Compare projects only with those in the same competition and not with projects seen elsewhere under other circumstances.

- As a general rule, judges represent professional authority to finalists. For this reason, judges should use an encouraging tone when asking questions, offering suggestions or giving constructive criticism. Judges should not criticize, treat lightly, or display boredom toward projects they personally consider unimportant. Always give credit to the finalist for completing a challenging task and/or for their success in previous competitions.

- Keep in mind that projects are middle-high and high-school level, not Ph.D. or professional levels. Sometimes judges tend to go to extremes, giving students either far more credit than they deserve or not enough because it is not in the Nobel Prize category.

- Please be discreet when discussing winners or making critical comments about judging, as students or adult escorts might overhear them. All results are confidential until announced at the awards ceremonies.

- Harassment refers to behavior that is personally offensive, impairs morale, or interferes with the ability of exhibitors to perform well. Any harassment of a Student Exhibitor will not be tolerated. This policy refers to harassment due to age, race, color, national origin, ancestry, religion, sex, physical or mental disability.
Harassment includes unsolicited remarks, gestures, or physical contact. Sexual harassment includes sexual advances, request for sexual favors, and other conduct which is sexual and offensive. We ask that you be aware of any conduct that might be interpreted as inappropriate.

- Please keep in mind that the only people allowed in the Exhibit Hall during judging will be judges. If you bring any additional guests, please remind them that they will not be allowed in the Exhibit Halls except during Public Viewing.

**JUDGING PROCEDURES—CATEGORY AWARDS**

Category awards are based on the recognition of excellence in the conception and realization of a science or engineering project. Senior division awards recognize student capabilities leading to careers in science or engineering, and they may include college scholarships. Junior division awards encourage the student to make further efforts in the study of science and engineering.

A list of all of the exhibits is provided in the judge's packet. Exhibits are grouped by division and category. Student exhibitors select the category in which they wish their exhibit to be judged. Only under very exceptional circumstances do NMSEF officials move an exhibit from one category to another.

The judging is based on a two-step evaluation process. Initially, the exhibits are judged in the absence of the exhibitors. After the committees caucus, interviews are conducted, followed by final evaluations by committees.

**Initial Briefing**

Judging Assignments and Caucus Rooms are listed in judging packets. Judges must report to their assigned caucus room for initial briefing by the committee chairperson before going to the Exhibit Hall.

**Initial Rating of Exhibits**

At each of their assigned exhibits judges rate the exhibit on the basis of the five criteria described below. Scores are recorded on the Judging Forms provided. Ratings should be done individually and judges should initially judge all the exhibits assigned to them. All of this ensures that initially each exhibit will receive three independent evaluations. After the initial rating of exhibits, if judges have time, they are urged to survey the other exhibits in their category so that they can enter into later committee discussions regarding projects in the category.

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<tr>
<th>Criteria</th>
<th>Exceptional</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Acceptable</th>
<th>Points</th>
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<td>Presentation:</td>
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<td>b. Interview</td>
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<td>16-20</td>
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<td>Creativity</td>
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<td>Execution</td>
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<td>Design &amp; Methodology</td>
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<td>Research Problem/Question</td>
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Evaluation criteria set by 2013 International Science & Engineering Fair Advisory Committee
New Mexico Science and Engineering Fair uses the same evaluation criteria used for judging at the Intel ISEF. As shown below, both criteria have five sections as well as suggested scoring for each section. Each section includes key items to consider for evaluation both before and after the interview. Students are encouraged to design their posters in a clear and informative manner to allow pre-interview evaluation and to enable the interview to become an in-depth discussion. Judges should examine the student notebook and, if present, any special forms such as Form 1C (Regulated Research Institution/Industrial Setting) and Form 2 (Qualified Scientist). Considerable emphasis is placed on two areas: Creativity and Presentation, especially the Interview section, and are discussed in more detail below.

Creativity: A creative project demonstrates imagination and inventiveness. Such projects often offer different perspectives that open up new possibilities or new alternatives. Judges should place emphasis on research outcomes in evaluating creativity.

Presentation/Interview: The interview provides the opportunity to interact with the finalists and evaluate their understanding of the project’s basic science, interpretation and limitations of the results and conclusions.

- If the project was done at a research or industrial facility, the judge should determine the degree of independence of the finalist in conducting the project, which is documented on Form 1C and Form 2.
- If the project was completed at home or in a school laboratory, the judge should determine if the finalist received any mentoring or professional guidance.
- If the project is a multi-year effort, the interview should focus ONLY on the current year’s work. Judges should review the project’s abstract and Form 7 (Intel ISEF Continuation Projects) to clarify what progress was completed this year.
- Please note that both team and individual projects are judged together, and projects should be judged only on the basis of their quality. However, all team members should demonstrate significant contributions to and an understanding of the project.

Judging Criteria for Science Projects

I. Research Question (10 pts)
   - clear and focused purpose
   - identifies contribution to field of study
   - testable using scientific methods

II. Design and Methodology (15 pts)
    - well designed plan and data collection methods
    - variables and controls defined, appropriate and complete

III. Execution: Data Collection, Analysis and Interpretation (20 pts)
    - systematic data collection and analysis
    - reproducibility of results
    - appropriate application of mathematical and statistical methods
    - sufficient data collected to support interpretation and conclusions

IV. Creativity (20 pts)
    - project demonstrates significant creativity in one or more of the above criteria

V. Presentation (35 pts)
   a. Poster 10 pts
      - logical organization of material
      - clarity of graphics and legends
      - supporting documentation displayed
b. Interview (25 pts)
   - clear, concise, thoughtful responses to questions
   - understanding of basic science relevant to project
   - understanding interpretation and limitations of results and conclusions
   - degree of independence in conducting project
   - recognition of potential impact in science, society and/or economics
   - quality of ideas for further research
   - for team projects, contributions to and understanding of project by all members

Judging Criteria for Engineering Projects

I. Research Problem (10 pts)
   - description of a practical need or problem to be solved
   - definition of criteria for proposed solution
   - explanation of constraints

II. Design and Methodology (15 pts)
   - exploration of alternatives to answer need or problem
   - identification of a solution
   - development of a prototype/model

III. Execution: Construction and Testing (20 pts)
   - prototype demonstrates intended design
   - prototype has been tested in multiple conditions/trials
   - prototype demonstrates engineering skill and completeness

IV. Creativity (20 pts)
   - project demonstrates significant creativity in one or more of the above criteria

V. Presentation (35 pts)
   a. Poster (10 pts)
      - logical organization of material
      - clarity of graphics and legends
      - supporting documentation displayed
   b. Interview (25 pts)
      - clear, concise, thoughtful responses to questions
      - understanding of basic science relevant to project
      - understanding interpretation and limitations of results and conclusions
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First Caucus: Preliminary Scoring

Judges within each group or category meet in caucus at 10:00 a.m. to discuss the merits of individual determine potentially outstanding exhibits and make interviewing assignments. Judges should freely discuss both the merits and shortcomings of the exhibits in their category.

Interviewing the Exhibitors

- The exhibitors will be at their exhibits from 10:30 a.m.-12:00 noon.

- Judges will interview the students whose exhibits they judged earlier in the morning. In addition, top contenders should be interviewed by as many judges as possible.

- The committee chairperson may want to make specific interviewing assignments.

The importance of this portion of the judge's function cannot be overemphasized. The interview is perhaps the most educational aspect of the Science Fair experience. The interview provides a means for the judge to evaluate the exhibit more accurately and should also serve to stimulate the student's thinking, to suggest means of improving the work and working habits, to point out errors, and to provide feedback for the student from the judge, who is most likely a specialist in a given field. Science education within the State can only benefit from this practice, so be encouraging and supportive to the student.

Special care must be taken, especially in the Junior Division, not to intimidate the exhibitors. For many students, the interview is an extremely traumatic experience. Judges should go out of their way to make the exhibitors feel comfortable. A positive experience with a judge during the interview may encourage the student to pursue further scientific investigation, possibly leading to a career in science or engineering, whereas, an unpleasant, frightening experience may turn the student away from these disciplines indefinitely. **Judges should not criticize, treat lightly, or display boredom toward projects they personally consider unimportant.** Always give credit to the finalist for completing a challenging task and/or for their success in previous competitions.

Second Caucus: Determining the Awards

Following the interviews with the exhibitors, a second caucus is held to determine final placing of the exhibitors within each category. The students' preliminary placing together with their performance during the interview should be taken into consideration for the final evaluation of their exhibits.

The total number of regular awards made in each category must be limited to six. There will be a first, a second, and a third place award, with up to three honorable mentions. Once final results have been determined, all judges except the committee chairpersons are free to leave.

All results are **CONFIDENTIAL** until announced at the Awards Ceremonies. Judges may not inform student exhibitors of final decisions made for any award. Please be discreet when discussing winners or making critical comments as students or adult sponsors might overhear.