Judging Guide
for the
23rd Annual
Blue Ridge Highlands Regional Science Fair

Sponsored by:
Radford University

Saturday, March 8, 2014
Preface

The success or failure of any science and engineering fair depends to a large extent upon the quality of the judging. Therefore, it is vitally important for each judge to thoroughly understand the duties and obligations of judging.

This guide is being sent to all the judges who will be participating in the 23rd Annual Blue Ridge Highlands Regional Science Fair prior to the opening of the fair.

Your first duty as a judge is to read this pamphlet so you will be prepared for the judging on Saturday, March 8, 2014.

Any questions you may wish to ask will be answered at the Briefing Session for judges prior to judging.

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co-Director
Blue Ridge Highlands Regional Science Fair

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Judging at the Blue Ridge Highlands Regional Science Fair

There are four basic requirements for judging at the Blue Ridge Highlands Regional Science Fair.

1. Every student should be interviewed by as many members of the judging team as possible. This is first of all to ensure thorough evaluation of the student's research project. The exhibit by itself is never adequate for this purpose, and only by extensive questioning can the judge obtain a good grasp of what the student has done and what he/she knows about the subject. It is also important because the Regional Science Fair is an educational experience as well as a contest, and the interviews with the judges are an important part of this experience. Students love to exchange "shop talk" with judges, so an interview should continue even if a judge decides almost immediately that a project will not qualify for an award.

2. Every interview should last from 5 to 10 minutes. There is no substitute for careful consideration of the student and his/her project, and this is something that cannot be hurried. In addition, even if a student is not in the running, he/she should be talked to for the educational experience involved, and ten minutes is a small amount of time for such an undertaking.

3. Judges are encouraged to talk to students as much as possible, but with one limitation -- it should not be at the expense of other judges. A judge should ask the questions necessary for the purpose of judging, but should not take up a student's time just talking if there are other judges who want to interview.

We estimate that the ratio of judges to students will be approximately 1 to 5. This number will permit careful consideration of all students and still provide enough persons so that the judging can be finished in the scheduled time.

However, even if they are not expert, they can still obtain other kinds of information useful to evaluation through personal questioning of the student.
General Information

Introduction

A science and engineering fair is a competition based on the quality of projects done by students, the results of which are presented through exhibits at the fair.

The purpose of fairs is threefold: to stimulate in young people an active interest in science and engineering; to provide an educational experience through being exposed to the judges and to the public; and to give public recognition to talented students for the work that they have done.

Fairs range in scope from the local level, which may involve one class, one school, or one district, to ones which may involve a large city, a country, a state, or even a nation. While there are no exact figures, Science Service estimates that over 15,000,000 student projects are undertaken each year in the United States and that there are fairs in some form in more than 30 other countries.

Science fairs operate on a step basis, with students who have won in small fairs participating in larger fairs as representatives of the fairs in which they have previously won. Thus, an individual might participate in a local fair, move on to a city fair, and then to a regional fair and there be chosen to represent that fair in the International Science and Engineering Fair (ISEF).

The International Fair takes place annually in May in a different city with each of the more than 400 affiliated fairs being allowed to send one or two representatives. Participants must be in the 9th, 10th, 11th, or 12th grades and cannot be over the age of 21 at the time of the ISEF.

Awards

The Junior division includes students from 6th through 8th grades, while the senior division includes students from 9th through 12th grades. Both junior and senior divisions are initially divided into 17 disciplinary categories. However, the science fair committee may combine categories to ensure competition.

Special Awards are given for work in a variety of disciplines by organizations ranging from the American Meteorological Society to the Yale Science and Engineering Association.

Special Awards categories are determined by the organizations giving the awards, and may consist of a single category, or of several categories. Awards may consist of cash, a certificate or plaque, medals, books, etc.

Each participating organization usually determines the students eligible for its awards, and from among the eligible students, the winners.

At the ISEF, more than 250 Grand Awards are given in 17 disciplinary categories. Awards will be a minimum of $5,000 for First Place, $3,500 for Second
Place, $2,000 for Third Place and $1,000 for Fourth Place. Two top finalists are chosen to attend the Nobel Prize Ceremonies and Stockholm International Youth Science Seminar. Two additional students are chosen to represent the U.S. as guest observers at the European Community Contest for Young Scientists. The school of each First Place Winner will receive a plaque and a $250 equipment/book purchase grant.

Judges

Judges for the Regional Science Fair include graduate students, university faculty, industrial scientists and engineers, representatives of federal agencies, and medical researchers.

The judges for the Special Awards are usually provided by the organizations involved, and vary in number depending upon the number of awards given. They are usually chosen by the organizations represented.

Layout

The exhibit area, in Peters Gym, will be laid out by categories so that all of the exhibits in any particular category will be together.

A judges’ discussion area will be available in Peters C142 and C143.

Exhibit Setup

About 150 exhibits are expected. Students and exhibits arrive on March 7. All exhibits must be set up by 8 a.m. on March 8.

As exhibits are set up, they are checked out by the Display and Safety Committee and the Scientific Review Committee. Final checks and clearances will be completed by 8:30 a.m. on March 8.

Display and safety rules to which exhibits must conform include the following: size of exhibit, regulations for plant and animal pest control (Department of Agriculture), regulations for safety, local codes concerning fire, electric power, hazardous chemicals, tanks with compressed gases, etc.

The Scientific Review Committee monitors conformance to rules involving vertebrate animals, humans, recombinant DNA, tissue and pathogenic agents/controlled substances.

Any project displaying a violation sign is not eligible for judging. All other projects have been approved and are eligible for judging.
Judging

Background

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

2. Judges should keep in mind that competing in a science fair is not only a competition, but an educational and motivating experience for the students. The high point of the Fair experience for most of the students is their judging interviews.

3. 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 unduly impact the judging of this year’s project.

4. 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.

5. Compare projects only with those competing at this Fair and not with projects seen in other competitions or scholastic events.

6. It is important in the evaluation of a project to determine how much guidance was provided to the student in the design and implementation of his or her research. When research is conducted in an industrial or institutional setting, the student should have documentation, most often the 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.

7. Please be discreet when discussing winners or making critical comments in elevators, restaurants, or elsewhere, as students or adult escorts might overhear. Results are confidential until announced at the awards ceremony.

Exhibits will be judged according to the Intel ISEF Judging Guidelines 2014.

The following evaluation criteria will be used for judging at the Intel ISEF 2014. It has been extensively reviewed and revised by the Intel ISEF Judge Advisory Committee, with additional input from science, engineering and educational experts. One of the most significant changes from the previous guidelines is the use of different criteria for science and engineering projects. 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 indepth 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’ 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 Non-Engineering 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
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

Judging Schedule and Procedures

Registration: Pick up your badge and packet of materials at the desk in C142 or C143.

Judges' Briefing Session: This will include a review of the Judging Guide, a presentation of the layout of exhibit and judges' area, and an opportunity to ask questions.

Judges will receive abstracts of all projects at registration. Please review these abstracts prior to surveying the projects. Judging forms and comment forms are also in the packet.

Survey of entire fair: (No students present at exhibits.) The purpose of this survey is to get an idea of what the general run of exhibits is like, and make some estimate of the overall quality in categories other than your own. There may be 150 exhibits, and you should plan your time so that you can sample a few in each category.

For Special Awards teams, it is necessary at this time to determine which exhibits are eligible for awards given by the organization to whose team the judges belong, and thus come up with a list of exhibits to be judged. All exhibits in the Fair should be checked if possible, since the category of an exhibit is not always a clear indication of the type of project which the student has done. Example: A project involving the reaction of an organism to high acceleration might be in Medicine and Health, or Earth and Space Sciences.

Survey of exhibits to be judged by team: (No students present at exhibits.) Here you should try to get a general estimate of the quality of the exhibits which your team will be judging so that you will have some frame of reference to decide what is good and what is not so good. Remember, you are judging on a relative and not an absolute basis. You are comparing projects with each other, and not with graduate students or with your peers. This time also provides an
opportunity to make notes on what kinds of questions you will want to ask.

You will be assisted by the fact that the exhibits are substantially self-explanatory, and there will be an abstract, and in some cases, a complete paper.

Since there are always cases of judges being assigned to exhibits which they do not feel are sufficiently close to their own area of competency, this period offers an opportunity to check on this. Judges who wish to drop an exhibit and be reassigned should notify the science fair co-directors.

Some exhibits may require interdisciplinary judging (a botany project which uses a lot of mathematics), and you may want to request assistance at this time.

Judging:
The judges need to utilize all of the interview time to talk to Finalists and make the final decision only after the interview time is over. Results are tabulated, and winners are determined.

All interviews with students must be individual, one judge per student or team. Individual interviews are a much better experience for the student. Every interview should last for 5 to 10 minutes. Judges are encouraged to talk to students as much as possible, but with one limitation—it should not be at the expense of other judges. A judge should ask the questions necessary for the purpose of judging, but should not take up a student’s time just talking if there are other judges who want to interview.

No student should be passed over regardless of what you think of his/her exhibit. Judging should be considered to be an educational process as well as a selection process, and so a student should be given as much time as possible. Students will appreciate your encouragement and suggestions on how to improve their research.

Remember, do not fill out your judging form in front of the students and all judging forms must be completed and turned in to the science fair committee prior to leaving.

The Judging Award List

The chairperson of each judging team will be given a Judging Award List at the Judges’ Briefing Session. This list will contain the number and type of winners to be selected (1st, 2nd, Honorable Mention, etc.). The number of
winners may vary from one or two to five or more depending upon the size of the group judged.

**Judges Conduct**

When interviewing, judges should remember that the Fair is not only a competition -- it is also an educational and a motivating experience.

Most students say that they enjoy talking to the judges, and that in many cases, it is the high point of their experience at the Fair.

As a general rule, the judge represents professional authority to the student being evaluated and, therefore, it is imperative that the judges conduct themselves in an appropriate manner. The way in which questions are asked, suggestions offered, and constructive criticism made should always be in a tone which will provide definite encouragement for continued effort.

The judge must never tear down, treat lightly, or display boredom towards projects which are personally considered unimportant. Always give credit to the individual for having expended the effort necessary to present and prepare a project which was sufficiently better than the others in the student's local fair to be chosen to come to the Regional Fair.

**Warning:**

Be careful about any comments in elevators, restaurants or elsewhere about judging. The students, as well as their adult escorts, are naturally very interested in the judging decisions, and we do not want word to get out ahead of time. We also do not want students to overhear any critical comments that judges might make to each other.

The same care should apply to written notes or comments that you might have. Don't leave them in the exhibit area or in any place where they might be found.
JUDGING SCHEDULE
Radford University
Saturday, March 8, 2014

7:30 - 8:00 am  Judges’ Breakfast (Peters C142 and C143)
8:00 - 8:15 am  Judges’ briefing (C142, C143, and Peters Gym)
8:15 - 9:00 am  Survey of exhibits and examination of assigned exhibits by judges only (Peters Gym)
9:00 - 12:00 noon Interviews with student exhibitors (Peters Gym) and judge discussions (Peters C142 and C143)
11:30 - 12:30 pm Judges’ Lunch (Peters C142 and C143). All chairs must submit their lists of winners no later than 11:45 am (Peters B160)
12:00 - 1:00 pm Final selection of Grand Award winners (Peters Gym and Peters B160)
1:30 - 3:00 pm Exhibits open to public (Peters Gym)
3:00 pm Awards ceremony (Bondurant Auditorium / Preston Hall)
5:00 - 6:00 pm Dismantling of exhibits (Peters Gym)

In case of emergency, please call Chris Hermann at 540-818-2431