Notes for the Teacher

About the Judging Guide

About 30 minutes before judging begins, meet with the judges and ask them to read through the following Science Fair Judging Guide. Make sure you are available to answer any questions they might have. Before handing this guide out to the judges, consider attaching the following:

- A fair schedule
- Important event information, including:
    - Who to contact with questions
    - Where to park
    - Where refreshments will be served
- Restroom locations
- List of awards
- Fair statistics; see example below

Science Fair Statistics Example

Grade Levels	Earth and Environmental Sciences	Life Sciences	Physical Sciences
Grade __			
Grade __			
Grade __			
Totals			

Another Important Point to Consider

To ensure fair and accurate judging, you should review your students' skill levels with the judges so they know what to expect and can take that into account as they read through the material and review the projects.

Judging Guide

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Judging Guide

Welcome

Thank you for taking time to participate in our science fair! The students have put in a lot of hard work and are really looking forward to sharing their projects, as well as receiving feedback and reviews. Sharing your expertise with us will help our teachers and students improve the quality of the fair each year.

Please review the following goals for this science fair.

- Make the experience positive for each student; every student should come away with a sense of accomplishment.
- Students should perform every step of the scientific method.
- Teach students to teach themselves.
- Give students the opportunity to communicate what they have learned to others.
- Encourage student accomplishment by offering public recognition and rewards.
- Support students in applying what they've learned in other classes.
- Other? _____

We appreciate your willingness to do the difficult job of determining winners for our science fair. Below is a list of key responsibilities, a list of FAQs, and advice on judging effectively.

Key Responsibilities

1. Get your clipboard, judging scorecards, and other supplies from the fair organizer.

2. Know who the event volunteers are—they are available to direct you to the right projects.

3. Completely fill out the judging scorecard for every project. If a project does not have something that is listed on the scorecard, be sure to circle "0."

4. If the scorecard does not already have student name and project information filled out, enter those details yourself.

5. Please tally the score at the end of each scorecard.

6. The comments section on the scorecard is helpful for two reasons:
    a. Jot down notes or things that stood out to you, because by the time you get to the last project, you might have forgotten your reasoning for doing something the way you did on the first project.
    b. **Important Note:** You should write your comments with the students in mind, as the judging scorecard will be made available to them. Think of it as writing comments on a paper they've submitted for grading. If you write your comments as possible improvements, then you will probably have the proper tone for constructive feedback and also remind students of what they found lacking in the project.

We acknowledge there will be projects that you might want to linger at, but please try to spend the same amount of time on each project. We've provided basic guidelines, based on grade level, in the FAQs on the next page. You should allocate your time wisely or you will not finish on time or have to rush through projects. We want to make sure each student's project is judged fairly.

FAQs

Which projects should I judge?
On your clipboard you will have either pre-filled out judging scorecards for each project or a list of projects to judge. If you see any conflicts of interest, such as being asked to judge your own child's class or grade, or asked to judge a child from a family that you know, please ask for a different assignment.

Each project will be evaluated by two different judges to help minimize inconsistencies in scoring.

How long should I spend per project?
Aim to spend an average of 10 minutes judging a project. For grades K-3, you might need only 5 minutes. For an advanced project from grades 6-8, you might need 15 minutes.

How should I ensure confidentiality?
Don't discuss any of the projects unless you are in the judges' room. You never know which other volunteers or visitors are parents.

What was the students' Science Fair Project process?
Students spent ten weeks working on their projects, primarily at home, but with assistance and grading in class. Teachers guided the process and gave structured assignments for each step of the scientific method. Teachers distributed a guide to parents to ensure that they supported their children's work without actually doing any of the steps.

How do I judge projects outside my field of expertise?
Do not hesitate to judge projects outside your field of expertise. It would be impossible for us to find judges skilled in every specific area represented by all of our science projects. At the core, you will be judging the students' use of the scientific method, a fundamental skill that crosses all specific areas of science.

Judging Effectively
The next two sections focus on important tips for successful judging. The key considerations are two-fold. First, you should be keenly aware of the abilities the students have at their grade level. Second, it is exceptionally important that the students are judged fairly and for you to understand what warrants low/high scores.

On the next page is a table that explains the level of work you should expect from the students' projects you will be judging.

Expectations for the Students' Projects

Project Step	Expectations for Elementary School Students	Expectations for Middle School Students
Ask a question.	The student should have chosen a question that he or she can answer through performing a simple experiment.	The experiment should be simple. The student should display complete mastery of the underlying theory and their project materials should thoroughly explain why the experiment turned out the way it did. This is preferable to a more sophisticated project that the student understands poorly.
Do background research.	The student should have referred to the following sources during the research phase: • Books targeted at an elementary school audience • Appropriate Web resources • Encyclopedias: for third-grade students and above	The student should have referred to the following sources during the research phase: • Encyclopedias • Books targeted at a middle school audience • Appropriate Web resources Middle school students should not be expected to refer to or be familiar with academic research publications.
Construct a hypothesis. Test the hypothesis by doing an experiment.	• In grades K-2, the student should be able to follow basic steps to do an experiment. The student's investigation might be based just on what he or she can observe. • In grades 3-5, the student should be able to take measurements and collect accurate data. The student may be able to design his or her own simple experiment or add innovations to a known experiment. • An advanced fourth- or fifth-grader may understand the concept of a fair test, changing only one factor at a time.	The methodology and experimental design should be appropriate for the student's grade and discipline. • Less sophisticated students should understand a fair test, changing only one variable at a time, but may not have understanding of independent, dependent, and control variables and the relationship between them. • Advanced students should be able to use data to explain what is happening in their experiments. They should understand variables, but they may have difficulty controlling more than one at a time. Students should present experimental procedures, reflecting his or her considerations of the issues above, in a clear step-by-step format.
Analyze the data and draw a conclusion.	In all grades, the student should have collected data in a table or written down observations. In all grades, the student should use data and observations as evidence to answer a scientific question. For third grade and above, the student should be able to provide a simple graph and do straightforward calculations, such as finding the average.	The student should be able to organize data in tabular or graphical form to display a clear answer to his or her scientific question. He or she should also be able to provide a qualitative description of the relationships between independent and dependent variables.
Communicate the results.	• In grades K-2, a typical student is able to write only basic information about the project. In the youngest grades, expect drawings to take the place of some or all of the text. • In grades 3-5, the student should provide written information describing each step of the scientific method that he or she performed.	The student is capable of writing clear text for all steps of the scientific method. If requested by the teacher, he or she should have written a concise abstract to summarize the project. The student should be able to design a display that organizes information in a logical sequence.

Scoring Guidelines

You should rely on the judging scorecard to provide a framework for consistent scoring. Also, please make sure you've carefully evaluated the expectations chart above so you are able to base your scoring on what is age-appropriate.

General Scoring:

- The project should demonstrate the use and understanding of the scientific method. While the neatness and organization of the display is important and scored separately, using the scientific method is most important.
- The project should focus on experimentation, not just library research or gadgetry.
- The quality of the student's work is what matters, not the amount of work.
- Do not count it against the student if he or she ended up disproving the objective or hypothesis. Though it might technically be a negative result, the project and process the student went through could still be considered a success.
- State-of-the-art lab equipment does not guarantee the students' understanding of the experiment.

High Scores Should Go to the Following:

- A project that demonstrates the student's full understanding. A simple project that the student understands should receive a higher score than a more sophisticated project that the student does not understand.
- Scientific advances
- Innovative experimental procedures and/or lab equipment that go above and beyond the original experiment and what is expected for the grade level
- An understanding of concepts above and beyond what their resources might typically have allowed them to discover
- Correctly interpreted data
- Repeated trials to verify results
- Analytical techniques to predict and/or reduce the number of trials required, based on the prediction
- The student's display of the entire experiment and the results

Low Scores Should Go to the Following:

- Apparent lack of research; many resources were readily available to the students throughout the project
- Superfluous lab equipment or displays that do not relate to the experiment or were not aids in collecting data
- Poor understanding of terminology and equipment
- A failure to collect data that relates to the scientific question posed
- Results that are derived from another source (such as literature) and not from student experimentation

(Scoring Guidelines adapted from the University of Southern California's California State Science Fair website: http://www.usc.edu/CSSF/Judges/GoodJudge.html. Accessed: February 8, 2008.)