

**How to be a Good Judge (Virtual Fairs)**

The role of a science fair judge is a rewarding and worthwhile effort where you are given the unique opportunity to impact the lives of some young people. You provide students an opportunity to share their work with someone who is engaged in a science or engineering job for a living. You are an ambassador for your profession. You may very well influence their career choices.

Meeting the Student

Please meet the student in a friendly, professional manner. Your time with them is limited (25 minutes) so encourage them to get started right away.

As a judge, it is most important to show the students that you are fair and knowledgeable. You should show them that you are engaged and focused on their presentation. Listen carefully and ask questions to find out more about the project has done. Your questions and interactions should help build students confidence and help them see themselves in a STEM pathway.

Asking Questions

The best tool in judging is your ability to ask questions. You should ask questions that the student can answer, and keep a conversation going for 10-15 minutes. The student should do most of the talking.

Some questions/variations all students should be able to answer:

* How did you come up with the idea for this project?
* What did you learn from your background search?
* How long did it take you to build the apparatus?
* How did you build the apparatus?
* How much time (many days) did it take to run the experiments (grow the plants)(collect each data point)?
* How many times did you run the experiment with each configuration?
* How many experiment runs are represented by each data point on the chart?
* Did you take all data (run the experiment) under the same conditions, e.g., at the same temperature (time of day) (lighting conditions)?
* How does your apparatus (equipment) (instrument) work?
* What do you mean by (terminology or jargon used by the student)?
* Do you think there is an application in industry for this knowledge (technique)?
* Were there any books that helped you do your analysis (build your apparatus)
* What is the next experiment to do in continuing this study?
* Are there any areas that we not have covered which you feel are important?
* When did you start this project? or, How much of the work did you do this year? (Be alert to the fact that some students may bring the prior year's winning project back with minimal enhancements. You should only be scoring based on this year’s enhancements) *A CONTINUATION PROJECT stating differences for each year of the project and must be submitted and displayed with the project at the fairs. Judging will involve only research completed since the last MSEF so the new project design and research plan must show evidence substantial expansion of experimentation. Any continuing project must document new and different research (e.g. testing a new variable or new line of investigation, etc.). Repetitions of previous experiments or increasing sample size are examples of unacceptable continuations.*

Guiding the Discussion

Sometimes we come across projects in technical areas with which we are intimately familiar, and the student just didn't get it -- they made some incorrect assumptions, missed a key indicator in the data, produced a false conclusion, or didn't understand some common principles. It can be tempting to share your knowledge about the topic, to help the student appreciate what happened (or should have happened) in the experiment. Some judges have been observed to enthusiastically pontificate while a student stood idly listening. However, this may influence the student's interaction with the next judge when the student revises their presentation with the knowledge you imparted.

You can try with your questions to lead the student toward the right answers, but you should not provide the answers. If you really feel compelled to make explanations, save them until near the end of the judging time. Alternatively, you may provide the student with comments in the feedback area of the form.

Remember to be sure that your discussion meets the following Science Fair objectives to ensure it is student-driven discovery:

* The student should do most of the talking
* Coax and/or coach the student into realizing and describing the correct conclusions
* Remember, it is the student's project, not yours

Improving Communication

Since you are a judge, most students instinctively think of you as an intimidating figure. The more you can dispel this image, the more likely you are to help the student be less nervous, and engage in a better discussion. Again, simple things can make a difference:

* Make eye contact with the student. If possible, use a video chat window that aligns with your webcam sight lines.
* Tip your head to the side a little to indicate interest (this is a universal nonverbal form of communication; even dogs do it);
* Positively reinforce students who show a good idea, clear displays, a clever way to get expensive results with inexpensive equipment, or other positive points that help that student stand out.
* Use a tone of voice that indicates interest or inquisitiveness, not skepticism or contempt.

To assure your judging time is used well, you also need to make sure you both hear their ‘pitch’ and have a chance to interact and ask questions. If students run longer than the 5-7 minutes of presentation, remind them to wrap up so that you can ask questions. You may politely interrupt with a question, usually in the form of "I'm sorry, I didn't quite catch the relationship between that adjustment and this result," or some of the questions above like "How many times did you run the experiment with each configuration?" The idea is not to stop the student from talking, but to get the student to break the pattern of one-sided presentation.

If a project is outside your experience, you are still knowledgeable around problem solving and the scientific method. Concentrate on these aspects rather than the details of a particular project.

Never assume the student knows what the technical terms mean or what a piece of equipment does, how it works, or why it was used. Ask for clarification on vocabulary or jargon to gauge understanding.  At the same time, an advanced vocabulary is not a sign of deeper understanding of the concepts and content. Be aware of the potential bias of scientific language and speech.

Scoring the Projects

When you begin to deliberate on the projects, you can use a few simple criteria for your decisions:

* The quality of the student's/students’ work is what matters, not the amount of work.
* Team projects and individual projects are judged the same -- it is the quality of the work that matters.
* A continuation project should only be judged on the work completed that year.
* A less sophisticated project that the student understands gets higher marks than a more sophisticated project that is not understood.
* Access to sophisticated lab equipment and endorsements from professionals do not guarantee a high-quality project.
* It is acceptable if the student ended up disproving the objective or hypothesis of the experiment.

High marks go to:

* Correctly interpreting data
* A clever experimental apparatus
* Repetitions to verify experimental results
* Predicting and/or reducing experimental results with analytical techniques
* In engineering categories, experiments applicable to the "real world"
* Ability to clearly portray and explain the project and its results
* Genuine scientific breakthroughs
* Discovering knowledge not readily available to the student

Low marks go to:

* Ignoring readily available information (e.g. not doing basic library research)
* An apparatus (e.g. model) not useful for experimentation and data collection
* Improperly using jargon, not understanding terminology, and/or not knowing how equipment or instrumentation works.
* Presenting results that were not derived from experimentation (e.g. literature search)

Closing Remark:

Although the most obvious reason for being a judge at the Science Fair is to assist in assessment of the entered projects, a good judge knows that this is an important experience in the life of every participant. Please do your best to make sure that all of the participants remember the Science Fair as a positive experience in their lives.

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