

## DVSF Workshop

1. **Inside Science Fair Judging** (1-2 PM) - The judging of science fair projects at Delaware Valley Science Fairs involves judges of three different types, each working to identify the best projects within specific criteria. The bulk of this presentation will focus on the judging process, the criteria that judges use in making selections, and what the students can do to improve the judges' impressions and evaluations of their project.

Presented by Bob Hranek, MS Computer Science, 5 years USAF Computer Programming, 30 years Senior Systems Engineer, DVSF Judge every year since 1995, ISEF Judge every year since 1999.

Workshop Outline: "In the next hour I'll discuss DVSF from the judges, students, and your POV, and then answer your questions."

1) **JUDGES Information:** (Morning Display Review, Afternoon Student Interviews, then Making Awards Decisions)

- a. There are 3 Different Types of DVSF Judges. (all have **Blue-ribbon** badges at DVSF)
  - i. **Category Judges** – Blue-ribbon badges with specific grades & categories written on it.
    1. Category judges select the 1<sup>st</sup>, 2<sup>nd</sup>, & 3<sup>rd</sup> place winners for a given grade & category.
      - a. They can optionally award "Honorable Mentions" to up to 10% of the category.
    2. These judges usually have specialized knowledge of the category, based on availability.
  - ii. **Special Awards Judges** – Blue-ribbon badges and are representing an organization seeking to award students based on criteria that may span several categories.
    1. Special awards span everything from certificates to full multi-year college scholarships!
    2. The scoring criteria for special awards are uniquely set by that sponsoring organization.
  - iii. **Medals Judges** – Blue-ribbon badges but they only interview the 1<sup>st</sup> place category winners.
    1. Medals judges select the Gold, Silver, & Bronze winners in each grade to send to ISEF.
    2. Our selection is made based on relative merit and ability to answer in-depth questions.
- b. Category Awards Judging Suggested Criteria.
  - i. **Research, 10%**, explain the project's merit, what was learned, and how it relates to the project.
  - ii. **Design & Methodology, 20%**, well designed plan, detailed procedures, & appropriate controls.
  - iii. **Execution, 20%**, includes **Data Collection, Analysis, & Interpretation**, without hiding any data.
    1. For **Engineering Projects** this is listed as **Construction & Testing**, but is much the same.
  - iv. **Creativity, 15%**, in some aspect of the above 3 criteria.
  - v. **Display, 10%**, should make it easy for the judge to see what was done, why, & the conclusions.
  - vi. **Interview, 25%**, the ability for the student(s) to clearly communicate what they learned.
    1. For Team Projects, the judge is looking for equal work/knowledge from each teammate.
  - vii. The above 6 criteria are only guidelines to give judges (especially new ones) an idea of relative importance. The main thing all judges should be looking for are **what the student(s) learned**.
    1. Judges are impressed when students show enthusiasm for their project, do not hide 'bad' data and can explain what caused it, and how they overcame any obstacles.
    2. For Multi-year Projects: Be aware that if the student(s) did not learn significantly more in the last year, then I advise my judges to grade them lower, especially at ISEF.

2) Notes for the STUDENT:

- a. Your 1st impression to the judges will be your Display without you there, so make it neat, complete, & easy for the judges to determine what your project is about, how you did it, & what you discovered.
  - i. Make sure all the elements (Abstract, Question, Hypothesis, Background Research, Materials, Procedure, Results, Conclusion, Future Directions, & Bibliography) are clearly visible, in that order.
    1. Some judges want to see your log book, others do not, but if you do use and provide a log book, then ensure it is the original, with date/times, and daily details of your work.
  - ii. Do not make statements and conclusions that are not supported by your data and analysis.
    1. Know the difference between accuracy & precision, and don't display inaccurate digits.
    2. Be aware of the limitations of your data. E.G., if you test something at just 0°C & 100°C, then you can't claim to 'know' the performance of that thing at all temps in between.
    3. If at all possible perform as many experimental trials as possible and average the results.

- a. Performing 10 experiments at 10 different temperatures is NOT 10 trials. Having 10 trials in this case would mean 100 tests, 10 tests at each of the temps.
    - b. Only by repeating the exact same starting conditions multiple times can give you confidence that your results are consistent, reliable, and repeatable by others.
  - 4. Try to eliminate uncontrolled variables as much as possible. For instance, testing throwing distance outside during a severe storm is going to adversely affect your results.
- b. Please be at your project during the interview period.
  - i. For highly structured events like ISEF there will be a formal schedule of 15-minute time slots for when students can expect a Category Awards Judge to interview them, but Special Awards judges can show up at any time during the overall interview period.
  - ii. DVSF is not so rigidly structured; Category Awards judges will use the available time to interview every student in their categories ASAP, and cannot afford to wait or look for missing students.
- c. The Interview.
  - i. Greeting anyone with a smile and showing genuine interest always helps, so stand up, show your enthusiasm for your project, & the opportunity to show it to professionals in the category!
    - 1. Hand-shakes are nice, but not mandatory. Some people prefer not to shake hands, and some may choose not to if they're ill, just be aware and respect everyone's boundaries.
  - ii. Professional dress is preferred, speak clearly, and put away all distractions, like smartphones.
  - iii. Have a prepared presentation for your project, but don't expect to deliver all of it.
    - 1. This is meant to be an interview, with the judge(s) asking you questions, and you answering those questions as concisely, completely, and accurately as possible.
    - 2. Be prepared for a variety of questions. Some judges may know little about your project and need to be walked through the basics, whereas others may have PhDs in your topic.
  - iv. Category Awards judges usually are pressed for time to cover their entire category, sometimes splitting up into teams to cover a subset of the projects and combining their results to save time.
    - 1. In order to be fair (splitting time evenly among all projects) this means that typically there will only be 10 minutes (or even as little as 5 minutes 😊) per project.
    - 2. This is why it is so critical to answer judge's questions as concisely as you can, because there will rarely be enough time to tell the long version of what you did and why.
    - 3. You may have a dozen more things you 'must' tell the judges before they go, but be prepared for them to end the interview before you're 'done'. They are not being rude, and it does not mean you've performed poorly, it's just a reality of their limited time.
  - v. **RELAX!** I know all of this seems very intimidating, but you have already done the work and earned your right to be a finalist, this is an opportunity to explain your efforts to adults that can really appreciate what you've accomplished, so enjoy the moment. 😊

### 3) Notes for PARENTS, TEACHERS, & MENTORS:

- a. Help the student(s) do their work, but do not do the project for them.
  - i. Tutoring sessions walking them from question to hypothesis to planned procedures can be very effective, but if the student(s) are not actually thinking these things out for themselves, then they won't be able to explain what they did (& more importantly, why they did it) to the judges.
  - ii. It's important to ensure student(s) are working without harming anyone, but once the safety procedures are in place, have the student(s) perform as much of the procedure as possible.
  - iii. The same goes for the analysis, conclusions, and future ideas. You can review their work to prevent them from making scientifically invalid statements, but they will not be able to explain it to the judges unless the results come from their own minds.
- b. Make them document ALL of their work, even procedures and data that will not be on the display.
  - i. The judges should not give them credit for 'hidden' work, even if they can describe it verbally.
  - ii. Some of the 'best' knowledge gained (in projects and professionally) comes from 'failures', investigating what went wrong, and then overcoming those obstacles.