

DELAWARE VALLEY SCIENCE FAIRS, INC.

JUDGING CRITERIA

What are we Judging?

You are judging the quality of the work done on a student research project. The project must involve experimentation, laboratory, field, or theoretical work, and not only library research. The project should be compared with the other projects in the same category and Fair; not to an outside standard. There are different criteria when judging science experiments versus engineering, mathematics, computer science, or theoretical physics. As shown below, both criteria have six sections as well as suggested scoring for each section. Each section includes key items to consider for evaluation both before and after the interview. Judges should examine the student notebook, and, if present, any special forms such as Form 1C (Regulated Research Institution/Industrial Setting) and/or Form 7 (Continuation Project).

The interview provides the opportunity to interact with the student and evaluate their understanding of the project's basic science, interpretation and limitations of the results, and conclusions. It's often regarded as the most rewarding part of the day, by students and judges! It is very important to determine who did the work and how much the student was involved. However, do not fall into the trap that a sophisticated project could not be the work of the student. Some of these students are quite capable and brilliant. That is why they are here!

- For projects done at a research or industrial facility, you should determine the degree of independence of the student in conducting the project. Start with their **Form 1C**.
- For multi-year projects, the interview should focus **ONLY** on the current year's work. You should review their **Form 7** (Continuation Project) to clarify what progress was completed this year.
- For Team Projects, **all** team members should demonstrate significant contributions to and an understanding of the project.

CRITERIA

Priority is given to the Research Question, Design and Methodology, Execution, Creativity, and Presentation. The following weights are given as a guide, but **your decisions will be made by consensus of your panel of judges**.

Judging Criteria for "Science" Projects

Research Question (10%):

- Clear and focused purpose
- Was the question sufficiently limited to allow plausible attack?
- Testable using scientific methods
- Student use of scientific literature or popular literature
- Is the student aware of other approaches or theories concerning the project?

Design and Methodology (20%):

- Well-designed plan and data collection methods
- Variables and controls defined, appropriate, and complete

Execution (20%): Data Collection, Analysis, and Interpretation

- Systematic data collection and analysis
- Were there adequate data to support the conclusions?
- Reproducibility of results
- Appropriate application of mathematical and statistical methods
- Sufficient data collected to support interpretation and conclusions

Creativity (15%):

- In the question asked
- In the use of instruments
- Project demonstrates significant creativity in one or more of the above criteria

Poster Clarity (10%):

- Does it attract attention?
- Logical organization of materials
- Clarity of graphics and legends
- Supporting documentation displayed
- What parts of the display were created by the student? Were others involved?

Interview (& Teamwork) (25%):

- Clear, concise, and thoughtful responses to questions
- Understanding of basic science relevant to project
- Understanding interpretation and limitations of results and conclusions
- Does the student have the required laboratory, computational, observational, and

design skills to obtain supporting data?

- Degree of independence in conducting project
- Recognition of potential impact in science, society, and/or economics
- Quality of ideas for further research
- What were their lessons-learned from overcoming project obstacles?
- For Team Projects: contributions to and understanding of project by all members

Judging Criteria for “Engineering” Projects (any “practical application” or invention project)

Research Question (10%):

- Description of a practical need or problem to be solved
- Definition of criteria for proposed solution
- Explanation of constraints

Design and Methodology (15%):

- Exploration of alternatives to answer need or problem
- Identification of a solution
- Is the solution workable?
- Is the solution economically feasible?
- Development of a prototype/model

Execution (20%): Construction and Testing

- Prototype demonstrates intended design
- Prototype has been tested in multiple conditions/trials
- Prototype demonstrates engineering skill and completeness

Creativity (20%):

- In the use of instruments
- In the design or construction of new instruments
- Project demonstrates significant creativity in one or more of the above criteria

Poster Clarity (10%):

- Does it attract attention?
- Logical organization of materials
- Clarity of graphics and legends

- Supporting documentation displayed
- What parts of the display were created by the student? Were others involved?

Interview (& Teamwork) (25%):

- Clear, concise, and thoughtful responses to questions
- Understanding of basic science relevant to project
- Understanding interpretation and limitations of results and conclusions
- Does the student have the required laboratory, computational, observational, and design skills to perform the engineering in the project?
- Degree of independence in conducting project
- Recognition of potential impact in science, society, and/or economics
- Quality of ideas for further development
- What were their lessons-learned from overcoming engineering obstacles?
- For Team Projects: contributions to and understanding of project by all members