Standards for Judging Science Projects

Established by the International Science and Engineering Fair

CREATIVENESS

Originality of the problem, uniqueness of approach and the handling and interpretation of data should be commensurate with the grade level of the students. Ingenious use of equipment and materials is considered without regard to the cost of the items involved.

SCIENTIFIC THOUGHT / ENGINEERING GOALS

Scientific Thought:

> The project shows evidence of depth of study and effort in employing scientific procedures in the solution of a clearly defined problem including study of background, organized procedures, appropriate sampling, orderly recording and analysis of data and the formulation of logical conclusions.

or

Engineering Goals:

> The project has a clear objective relevant to the needs of the potential user. The product or process has been tested and is workable and feasible economically and ecologically.

THOROUGHNESS

The study is complete within the scope of the problem. Scientific literature has been searched, experiments have been repeated and careful records have been kept.

SKILL

Credit is given for special skills needed for the construction or use of equipment and for mathematical, computational, observational, and design skills.

CLARITY

The purpose, procedures and conclusions are clearly explained orally and through the display. The project notebook is well organized, neat and accurate. Sources of ideas, data and assistance are clearly identified.

Interviewing Students

The Science & Engineering Fair is both a competition and a valuable opportunity to nurture future scientists by giving them your undivided attention, asking incisive questions and providing positive feedback. As judges you will interview the students (this is most important!) AND have the opportunity to study their projects before and after the judging session. A good start, after introducing yourself, is to ask students to summarize their projects. Their explanations serve as verbal abstracts, providing a general overview of the projects. The students should:

- specify the source of their ideas
- clarify both the problem addressed and the bases for their hypotheses
- define the controlled and variable factors involved
- explain the procedures used to answer their questions
- detail how their data were collected and analyzed
- summarize their findings and explain their relevance

Notes:

If a student has worked on a project for more than one year, he/she should summarize the previous work before concentrating on the current year's research.

If a student uses unfamiliar jargon without clarifying it, ask for a "translation."

After this initial presentation, you may request additional information on:

- background research
- materials and mentoring provided
- information on the backboard (e.g., a request to clarify a graph or table)
- projected continuation of the project

Personal questions, e.g., about the students' backgrounds, home life or school attended, should be avoided.

Please remember that some students may be shy or speak English as a second language. While skill in making oral presentation is part of what you are evaluating, you final score should be based primarily on creativity, scientific or engineering goals, thoroughness and skill and clarity as demonstrated in the finished paper and on the backboard.

Of Special Importance – Remember to compliment students on work done and encourage them to expand their research interests.

20 Questions You Might Ask

1. How did you get this idea?
2. What was the most interesting background reading you did?
3. Which are your control factors? What are your variables? What is/are the difference(s) between your control & experimental groups(s)?
4. Where did you get your test subjects (humans, animals, etc.)?
5. What skills did you acquire to do this project?
6. What help did you receive from others (students, adults, teachers, family, etc.)?
7. How many times did you repeat this experiment and what changes, if any, did you make?
8. Why did you choose the statistical test used and what do your results mean?
9. Explain this graph to me.
10. What is the most important thing you found out in doing this experiment?
11. What changes would you make if you continue this project next year?
12. What application does this project have to your/my life?
13. Is this a continuation of an earlier year's project? Has a full year's work been added to that done previously?
14. How does this experiment illustrate the scientific method?
15. What experimental errors are in your project and how did you correct for them?
16. How did you determine the sample size to be used?
17. Explain your procedure to me.
18. How does your project differ from others you researched?
19. Where was your project done?
20. What does this (some project detail) mean?

GUIDELINES SUMMARY (adapted from a variety of sources)

Judges should look for sound evidence of:

- knowledge gained
- scientific method
- creativity
- primary experimental research
- individual work
- thoroughness
- validity of conclusions
- quality of written presentation
- quality of visual presentation