

## SKILL (15 points)

- 1) Does the student have the skills required to do all the work necessary to obtain the data that supports their project? Laboratory skills? Computation skills? Observation skills?
- 2) Where was the project completed—home? School laboratory? University laboratory? What assistance was received from parents, teachers, or scientists?
- 3) Was the project carried out under the supervision of a teacher, parent, or scientist? Or did the student work largely on their own?
- 4) Where did the equipment used come from? Did the student build it themselves? Was it obtained on loan? Was it part of a scientific laboratory in which they worked?

## CLARITY (10 points)

- 1) How clearly is the student able to discuss their project? Are they able to explain its purpose, procedure, and conclusions in a clear and concise manner? Please allow courtesy for nervousness, as this may be a result of talking to someone of an authority. Watch out for memorized speeches with little understanding of principles!!
  - a. Please note, only high school seniors make oral presentations
- 2) Has the student expressed themselves well in written material? Remember that such materials could have been prepared with the assistance of another person.
- 3) Are the important phases of the project presented in an orderly manner?
- 4) How clearly are the data presented?
- 5) How clearly are the results presented?
- 6) How well does the project explain itself?

## JUDGING CRITERIA

### We are judging based on the following:

- The quality of work done on a project in environmental science-related categories presented by high school upper-class students, and how well they understand their project and the area in which they are working. Secondary to this is evaluation of their physical display.
- A project which involves laboratory, field, or theoretical investigation, and not merely library research or the construction of equipment unless the construction involves a creative approach and/or original idea.
- Work done on the appropriate age/grade level, and NOT that of a Ph.D. candidate or a science professional. Sometimes judges tend to overreact to students, either giving them far more credit than they deserve, or acting as though the work done by the student was worthless because was not of an extremely high caliber.
- A project as compared with the other projects in the same category within the same fair, and not with projects seen elsewhere under other circumstances.

### CRITERIA

### Exhibits are judged on the following basis:

Creative Ability	30 points
Scientific Thought	30 points
Thoroughness	15 points
Skill	15 points
Clarity	10 points

## CREATIVE ABILITY (30 points)

- 1) Does the project show creative ability and originality in:
  - a. The question asked?
  - b. The approach to solving the problem?
  - c. The analysis of the data?
  - d. The interpretation of the data?
  - e. The use of the equipment?
  - f. The construction or design of new equipment?

No project would be creative and original in every aspect; one must keep in mind that these are high school students. Therefore, the questions asked must be in terms of science, or for that level student, thus making it important to ascertain what assistance the student received in doing their project.

**Students should NOT be penalized for seeking help from others**, as everyone—including scientists—receive help to some degree. However, credit for this category should be regarding what the student contributed, and NOT what others did for them. For example, did they get their project idea from a textbook suggestion, or did they develop the idea on their own? The latter would be considered to be more creative.

WARNING: there have been projects that contained elements scientists thought were original, but actually came from newly developed curricula in which scientists were unfamiliar. Please keep such a possibility in mind whilst judging.

- 2) Collections cannot be considered to be creative unless they are used to support an investigation and aid in answering a question in some original way. Construction of equipment, which involves the assembly of a kit, cannot be considered to be creative unless some unusual approach or design is being used.

## SCIENTIFIC THOUGHT (30 points)

- 1) Is the problem stated clearly and unambiguously?
- 2) Is the problem sufficiently limited so that it was possible to address it? One of the characteristics of good scientists is the ability to identify important problems that were capable of solutions. Simply working on a difficult problem without getting anywhere does not make much of a contribution—however, neither does solving a very simple problem.
- 3) Was there a procedural plan for obtaining a solution?
- 4) Are the variables clearly recognized and defined?
- 5) If controls were necessary, was their recognition of their necessity and were they correctly used?
- 6) Is there adequate data to support the data recognized? Are the limitations to the data also recognized?
- 7) Does the student understand how their project ties in with related research? Do they have an idea of what further research is indicated?
- 8) Did the student cite scientific literature, or did they cite only popular sources (newspaper, magazines, etc.)?

## THOROUGHNESS (15 points)

- 1) Does the project carry out its purpose to completion within the scope of its original intention? How completely has the problem been covered by the project?
- 2) Are the conclusions based on a single experiment, or on replication?
- 3) If notes are appropriate for the project, how complete are they?
- 4) Is the student familiar with literature in the field they were working? Are they aware of other approaches or theories regarding their project?
- 5) How much time was spent on the project?