

## Science Presentations Judging Criteria

**SCIENTIFIC THOUGHT** - *Selection and statement of the problem, experimental validity and value, scope of design.*

The ultimate aim of science research is to promote new knowledge and understanding of the world in which we live. From reading and observation one comes up with a basic concept. This idea permits formulation of a meaningful question or hypothesis to which an answer may be found through a suitably designed experiment.

Thus judging the "scientific thought" criterion involves consideration of such questions as:

- a) Does the student exhibit sufficient background understanding of the principles and concepts involved in the topic?
- b) Is there a significant basic thought in the project? Is it clearly stated?
- c) Does it admit formulation of an age-appropriate meaningful question?
- d) Is the scope of the problem sufficiently limited to permit a meaningful experiment?
- e) Is there a single, formal hypothesis?

**EXPERIMENTAL METHODS**- *Choosing/developing techniques for valid analysis. Use of original materials or using old materials in an original way. Proper controls and sample size.*

This criterion refers to the details of a **well-designed experimental procedure** intended to answer the question posed. The project may require designing, building and using material hardware. **The presenter must design and carry out his/her own experiment.**

- a) Is the project well designed for the problem at hand?
- b) Is the experiment basically sound, with sufficient sample size and control of variables? Did the experiment have both a control group and experimental group(s)?
- c) Does the procedure follow a logical sequence?
- d) Have any original or ingenious materials or methods been used?
- e) Were results measurable/quantifiable and done in metric?

**ANALYTICAL APPROACH** - *Ability to draw valid conclusions. Full use of data and findings. Interpretations of weakness of design. Suggestions for further research.*

Book reports and research theories unsupported by practical data cannot achieve success in PJAS competitions because of this criterion. The student must have personally accumulated some actual data to analyze, even if the trend is negative or neutral to his hypothesis. The critical thing for a student to exhibit to judges is that he knows what the data MEANS.

- a) Is the body of data sufficient to draw valid conclusions?

- b) Do the conclusions refer back to the original question or hypothesis?
- c) Is the student grouping the data properly to enable comparisons between groups?  
Is the data fully used to draw conclusions?
- d) Is he evaluating the significance of his own data properly?
- e) Has the student thought about how his experiment could be improved if it were to be repeated? Is he aware of sources of error?
- f) Is the student able to make suggestions for further researches related to his topic or perhaps see a practical application of his findings to the real world?

**PRESENTATION** - *Ability to convey the information gained to others. To demonstrate new and improved ways of expressing and communicating scientific ideas.*

The presentation should, preferably, be in the form of a free talk employing good oral communication skills. The time restrictions in the rules necessitate planning and rehearsal. The critical question is "When the student is finished do you understand exactly what he did and why?"

- a) Does the talk cover all the essentials of the project - the basic premises, the hypothesis or problem, the experimental methods, the data, and the conclusions?
- b) Is the talk well-organized and flowing in a logical pattern?
- c) Do the audiovisual aids enhance the audience's understanding?
- d) Does the student demonstrate through the presentation and his responses during the questioning period a firm understanding of the basic scientific principles involved?

**JUDGE'S OPINION** - *Consider the age level and project correlation when necessary. Also, your overall feeling of the problem and the quality of the student's work.*

This criterion covers simply the judge's overall reaction to the nature of the project and its handling by the student.