PJAS STATE JUDGING - THE SHORT COURSE

General Nature of PJAS Competition

Students wishing to present their researches for PJAS competition are grouped into units with other students of similar grade and category of research and evaluated by a small team of judges. Students give timed oral presentations about their projects after which judges may ask questions for a timed period. Judges score the student on their individual worksheets after each presentation. The student is rated numerically by his success in each of 5 independently-evaluated criteria. Later when all students in the unit are finished the judging team returns to Judging Headquarters to obtain the official tally sheet. On that paper they will compile their individual scores into a composite average score for each student.

General Procedures for Judges

1. Judges, who are selected by the Judging Committee, will show knowledge of the field he or she is judging as demonstrated by academic degrees or experience in the field.
2. Each new judge will submit a registration form to the Judging Committee.
3. Judges will regularly attend orientations conducted by the Judging Committee.
4. Judges are responsible for identifying all persons in the room before the presentations begin. The only persons permitted in a presentation unit are assigned presenters, assigned judges, assigned technicians, and PJAS approved Information Technology personnel helping with digital presentations. Exceptions must have written permission from a member of the judging committee. This written permission must be given to the judges in the unit. Judges should turn the permission slip back in with their judging papers.
5. Students will give presentations in the order listed in the program book. The judging committee will issue a note to the judges if an exception is needed.
6. Judges may not add a student to their unit without official written notice from a member of the judging committee.
7. Judges are responsible for making sure that proper conditions are established in the competition room. These include:
   a. Checking that presentation projection equipment is functioning properly
   b. All present (students, judges, and technicians) give each presentation the attention deserved. No talking. No cell phones. No disruptive or distracting behavior.
   c. The door to the presentation room should be closed.
   d. A student should not be interrupted during his/her presentation.
8. It is important that all judges in the team return to the judging headquarters when the individual worksheets are completed to record their scores on the official tally sheets. All worksheets and the tally sheet must be personally signed when they are submitted. Judges may be called upon to fill out individual comment sheets on the students or make recommendations about special awards for which they may be eligible.
9. Awards will be solely based on the mathematical averages of the scores. Individual judge’s scores for each of the criteria are entered into the computer scoring program.
10. Room Technicians. The judging team will be assisted in the presentation rooms by a technician. His/her duties are:
   a. Act as a timekeeper, using flash cards to aid the participant and judges, recording the times on the official log sheet.
   b. Have required supplies which are:
      Pen or pencil
      Provided timing sheet and flash cards
      Cell phone timer, stop watch, or a watch that shows seconds
   c. Helping with the setup of equipment, aiding its use during presentations, and shutting down or returning equipment at the end of the session.
11. If a technician is not available, judges should follow the instructions given during the orientation session.
12. Remember these PJAS participants are CHILDREN who are just beginning to work and think as scientists; they are not Ph.D. candidates.
13. Judges should know that PJAS adheres very closely to the rules and procedures of the International Science and Engineering Fair regarding living vertebrate and human subjects, recombinant DNA, tissue acquisition, the use of lasers, and the use of controlled substances. Judges should bring all questions regarding infractions and/or questionable research to a member of the Judging Committee in the tally room. Members of the State Judging Committee, the Regional Director, and the State Director will take the matter under discussion then act accordingly.

**PJAS Presentation and Scoring Rules**

The participants’ research and presentation must conform to the following rules.

1. Students are not in competition with each other for some single top award; rather they are evaluated on how well they succeed in fulfilling the 5 PJAS State Criteria. Therefore, there is no limit to the number of each award that may be awarded in a given Presentation Unit.
2. Eligibility. The student doing the presentation must be the one who conducted the research.
3. No student may present a research topic from a previous year without conducting significant additional research on the topic during the current year.
4. Each judge’s evaluation of the presentation shall be made independently from other members of the judging team. However, after all the presentations have been heard, judges are encouraged to consult with one another in determination of the final awards.
5. Presentation specifics:
   a) A student shall not be interrupted during his/her presentation.
   b) No three-dimensional objects may be used in the presentations.
   c) The student may use his/her notes in the presentation but reading the report to the judges is considered bad form.
   d) Presentations must be saved in PDF Format.
   e) Slides may contain text and graphics only. Animations, music, and sound effects are not permitted.
   f) Slides must be clearly visible to all in the presentation room.
   g) The actual experiment may not be used in the presentation. No materials may be passed to the judges during the presentation.
   h) Only a PJAS technician or person authorized by the Judging Committee may assist with the use of the projection equipment.
   i) When students upload their presentations, they are given the opportunity to run through their slides, confirming that all slides uploaded. Therefore, judges may choose to penalize presentations with missing slides.
   j) Measurements must be in metric except where highly specialized equipment is calibrated in other units. Presentations in which the measurements were not done in metric will not receive a first place award. Judges should adjust their scores to reflect this.
   k) The presentation will not exceed a maximum time limit of 10 minutes and will be given proper notice by a timekeeper. No reduction in score will be given for a presentation of less than 10 minutes. Presentations exceeding 10 minutes will not receive a first place award, regardless of score. There will be a grace period before this penalty is applied. Judges should not apply this penalty; it will be taken care of in the judging room when time sheets are checked.
6. Scoring specifics. Each category of the Judging Criteria shall be scored on a 5 point integer system:
   (Excellent) 5 - 4 - 3 - 2 - 1 (Unacceptable)
7. The student shall receive award based on the average score per judge, calculated by the following formula:
   \[
   \text{Average Score} = \frac{\text{Total Score of All Judges}}{5 \times (\text{Total Number of Judges})}
   \]
8. The standards for awards at the State Meeting are:
   1st award - average score 4.0 or higher
   2nd Award - average score 3.0 or higher
   3rd Award - average score below 3.0
9. Upon completion of the presentation the student may be questioned by the judges for a time period of not more than 5 minutes. Judges may ask questions to seek clarification of a student’s methods, conclusions, and/or understanding. It is inappropriate for judges to criticize or comment on a student’s project.
10. A parent waiting for his/her child may not disrupt the presentation unit in any way. This includes maintaining a sufficient distance from the door of the unit so that there is no visual contact and conversation is not audible in the presentation room. PJAS reserves the right to disqualify a student if his/her parent interrupts the presentation unit. If a unit is having problems with a parent, the best solution is to call the judging room or information desk.

PJAS Judging Criteria

Science Presentations

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.

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 -
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) Is the talk well organized and flowing in a logical pattern
b) Do the visuals enhance the audience’s understanding?
c) Did the presenter speak clearly and refer to notecards rather than read from them?
d) Did the student demonstrate a clear grasp of the topic?
e) Is the student’s competency with the principles such that he can answer questions with clarity, and elaborate where necessary to make a point?

JUDGE’S OPINION - This criterion is an overall subjective evaluation of the student’s work considering age level, depth, complexity of the subject matter, as well as the student’s success in achieving his purpose or objective.

Mathematics Presentations

Mathematics presentations are expository in nature, not experimental.

Appropriate projects should either be of a level beyond what the student is currently studying or on an enrichment topic.

FULFILLMENT OF PURPOSE -

a) Did the presentation have focus?
b) Considering the topic and time allowed, was the scope of the presentation suitable?
c) Did the student use appropriate mathematical vocabulary?
d) Did the student show depth of understanding of mathematical concepts and principles?

CONTENT

a) Did the presentation have specific and illustrative content?
b) Was the presentation free from mathematical errors?
c) Is there a practical application or any correlation or interaction with other disciplines?
d) Did the student use correct mathematical notation?

DEVELOPMENT

a) Was there unity, coherence and inherent logic in the sequence of ideas?
b) Does the student show insight?
c) Does the student show sufficient examples or counter-examples?
d) Can the student make suggestions as to related topics needing further investigation?

PRESENTATION

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.

a) Is the talk well organized and flowing in a logical pattern?
b) Do the visuals enhance the audience’s understanding?
c) Did the present speak clearly and refer to notecards rather than read from them?
d) Did the student demonstrate a clear grasp of the topic?
e) Is the student’s competency with the principles such that he can answer questions with clarity, and elaborate where necessary to make a point?

JUDGE’S OPINION
This criterion is an overall subjective evaluation of the student’s work considering age level, depth, complexity of the subject matter, as well as the student’s success in achieving his purpose or objective.

**Computer Science Presentations**

Computer Science Projects are usually expository in nature of its presentations and seldom involve the controlled experiments required of science projects. Projects that have data accumulated in a controlled experiment where the computer’s role is merely to serve as a tool to analyze the data, draw graphs, and do statistical calculations do **not** belong in the computer science category.

Note: The PJAS State Judging Committee feels that a small modification of a pre-existing program is not a suitable project to present in our competition. Pre-existing programs may be used, however, if they are a small part of the student’s own work.

**STATEMENT OF THE PROBLEM**

a) Is the objective of the project clearly stated?

b) Does the problem chosen have relevance or practical application in today’s world?

c) Did the student use appropriate computer vocabulary?

d) Did the student show depth of understanding of relevant programming concepts and principles?

e) Does the project entail creative thinking in approach techniques?

**METHODS**

a) Was there unity, coherence and inherent logic in the sequence of the presentation?

b) Does the student follow accepted procedures, using either structured programming or object-oriented programming? Is the underlying logic sound?

c) Did the student explain the project design using a high level diagram?

d) Did the student include an explanation of difficult, unique, and/or significant section(s) of the program?

**FULFILLMENT OF PURPOSE**

a) Did the student show the results of his work? Was the objective obtained?

b) Does the student have a quality product?

c) Did the project include exceptional features and/or coding?

d) Does the presenter know of areas for further expansion or improvement of the project?

**PRESENTATION**

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.

a) Is the talk well organized and flowing in a logical pattern?

b) Do the visuals enhance the audience’s understanding?

c) Did the presenter speak clearly and refer to notecards rather than read from them?

d) Did the student demonstrate a clear grasp of the topic?

e) Is the student’s competency with the principles such that he can answer questions with clarity, and elaborate where necessary to make a point?

*It is acceptable for a student to show key parts of code line by line. However, the presentation should not consist of a student explaining his/her program line by line. A high-level method should be used instead.*

**JUDGE’S OPINION**

This criterion is an overall subjective evaluation of the student’s work considering age level, depth, complexity of the subject matter, as well as the student’s success in achieving his purpose or objective.
Engineering Presentations

Note: The engineering method is different and more flexible than the scientific method.

PROBLEM/PURPOSE
  a) Did the presentation demonstrate a practical problem or need?
  b) Was significant research presented leading to a proposed solution?
  c) Were limitations and controls explained?

METHODOLOGY
  a) Is the proposed solution practical and viable?
  b) Is the solution economically feasible?
  c) Do the experimental methods follow a logical sequence?
  d) Was a testable model developed?
  e) Is there evidence of significant repetition to support results and conclusions?

FULLFILLMENT OF PURPOSE
  a) Did the model demonstrate engineering skill?
  b) Did the model demonstrate creativity in design and construction?
  c) Does the student have a quality product?
  d) Did the presenter address areas of improvement and/or further development?

PRESENTATION
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.
  a) Is the talk well organized and flowing in a logical pattern?
  b) Do the visuals enhance the audience’s understanding?
  c) Did the presenter speak clearly and refer to notecards rather than read from them?
  d) Did the student demonstrate a clear grasp of the topic?
  e) Is the student’s competency with the principles such that he can answer questions with clarity, and elaborate where necessary to make a point?

JUDGE’S OPINION
This criterion is an overall subjective evaluation of the student’s work considering age level, depth, complexity of the subject matter, as well as the student’s success in achieving his purpose or objective.

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