

JUDGING GUIDE

Introduction:

The Board of the Nebraska Junior Academy of Sciences strongly believes that Science as Inquiry is an integral part of science education and that students doing experimental research exemplifies what is intended by both the State and National Science Standards. The Nebraska Junior Academy of Sciences provides support for students to problem solve, plan and conduct research investigations, and use appropriate tools to gather and analyze data. The Regional Science Fairs of the Junior Academy provide a general audience of peers, interested adults, and working scientists for the students to communicate the results of their investigations. In addition, the Academy offers opportunities for students to present their research findings at the State and National levels.

Role of Judges:

Judges evaluate and focus on 1) how well a student followed the scientific methodologies; 2) the detail and accuracy of research as documented in the data book; and 3) whether experimental procedures were used in the best possible way.

Judges look for well thought-out research. They look at how significant the project is in its field as well as how thorough it was. Did the student leave something out?

Judges applaud those students who can speak freely and confidently about their work. They are not interested in memorized speeches - they simply want to TALK with the student about their research to see if they have a good grasp of the project from start to finish.

Judging Tips:

- Examine the quality of the student's work, and how well the student understands his or her project and area of study. The physical display is secondary to the student's knowledge of the subject.
- Review the student's research plan and other forms necessary for the project.
- Look for evidence of laboratory, field or theoretical work, not just library research or gadgeteering.
- Compare projects only with those competing in the NJAS and not with projects seen in other competitions or scholastic events.
- Keep in mind that NJAS is not only a competition, but also an educational and motivating experience for students. The high points of the fair experience for many students are their judging interviews and the opportunity to discuss their findings with established members of the scientific community.
- Use an encouraging tone when asking questions, offering suggestions or giving constructive criticism. As a general rule, judges represent professional authority to students. Judges should not criticize, treat lightly, or display boredom toward projects they personally consider unimportant. Always give credit to the student for completing a challenging task. Always be positive!
- Be discreet when discussing winners or making critical comments in elevators, hallways, or elsewhere, as students or adult escorts might overhear. Results are confidential until announced at the awards session.

Judging Criteria:

Following is a list of questions for each criteria that can assist you in interviewing the students and aid in your evaluation of the student project.

I A. Scientific Method (If an Engineering Project, the more appropriate questions are those found in Engineering Goals in section I B.)

- 1) Is the problem stated clearly and unambiguously?
- 2) Was the problem sufficiently limited to allow plausible attack?
- 3) Is the hypothesis clearly defined?
- 4) Did the procedure that was followed apply to the problem?
- 5) Are the variables clearly recognized and defined?
- 6) If controls were necessary, did the student recognize their need and were they correctly used?
- 7) Is there evidence that demonstrates proper data were collected?
- 8) Is there evidence the data were analyzed (i.e., percentages, statistics, graphs, tables, or other appropriate illustrations) ?
- 9) Are there adequate data to support the conclusions?
- 10) Does the student recognize the data's limitations?
- 11) Does the student have the required laboratory, computation, observational and design skills to obtain supporting data?
- 12) Where did the equipment come from? Was it built independently by the student? Was it obtained on loan? Was it part of a laboratory where the student worked?
- 13) Is the conclusion logical and related to the original purpose?
- 14) Is the research that was done relevant and significant?
- 15) Does the student understand the project's ties to the related research?
- 16) Does the student have an idea of what further research is warranted?
- 17) Is there evidence that library research was done and, if so, were the resources documented?
- 18) Did the student cite scientific literature, or only popular literature (i.e., local newspapers, Reader's Digest)?

I B. Engineering Goals

- 1) Does the project have a clear objective?
- 2) Is the objective relevant to the potential user's need?
- 3) Is the solution workable? Acceptable to the potential user? Economically feasible?
- 4) Could the solution be utilized successfully in design or construction of an end product?
- 5) Is the solution a significant improvement over previous alternatives?
- 6) Has the solution been tested for performance under the conditions of use?

II Communication Skills

Oral Presentation and Visual Display:

- 1) How clearly does the student discuss his/her project and explain the purpose, procedure, and conclusions? Watch out for memorized speeches that reflect little understanding or principles.
- 2) How clearly are the data presented?
- 3) How clearly are the results presented?
- 4) Are the important phases of the project presented in an orderly manner?
- 5) Was the oral presentation well organized and concise?
- 6) Was the presentation done in a forthright manner, without tricks or gadgets?
- 7) Were the responses clear and accurate to questions that were asked?
- 8) How well does the project display explain the project?
- 9) Are visual aids clear, neat, organized and complete?

Written Research Paper:

- 1) Was the research paper organized and complete?
- 2) Does the written material reflect the student's understanding of the research?

III Personal Growth

- 1) Does the project show creativity ability and originality in the questions asked? -the approach

to solving the problem? - the analysis of the data? - the interpretation of the data? - the construction or design of new equipment? Creative research should support an investigation and help answer a question in an original way. When evaluating projects, it is important to distinguish between gadgeteering and ingenuity.

- 2) Was the purpose carried out to completion within the scope of the original intent?
- 3) How completely was the problem covered?
- 4) Is the conclusion based on a single experiment or replication?
- 5) How complete are the project notes/logbook?
- 6) Is the student familiar with scientific literature in the studied field?
- 7) How much time and effort did the student spend on the project?