

## Judging Guidelines for the Brevard County Regional Science and Engineering Fairs

Thank you for volunteering to judge at a Brevard Regional Science Fair. Your judging team is responsible for interviewing each student in the category you are judging. You are to identify the top ranked 6 projects in your category for awards. In addition, you have the opportunity to offer **constructive** criticism to each student you interview. Remember, these are Junior and Senior High School students, not doctoral candidates. Your expertise and interest can encourage them to continue to investigate and explore the world around them. Please also keep all comments to your fellow judges positive as well, since there is a chance those comments can make their way back to the students and teachers. If you notice behavior unbecoming of a judge, such as excessive negativity or harshness, please let one of the Fair Directors know so that we can address the situation. We want this to be a positive experience for everyone.

### Judging Procedure:

- A. A judging Captain will have been identified or should be selected from your team. This person is responsible for returning the completed ranking card to the FairDirectors.
- B. Interview each student yourself. Place a dot on the project number card on the top left corner of the board. Make notes and tentatively rank each project.
- C. Meet with the other judges for your category and discuss your recommendations for the top 6 of the projects in your category.
- D. If necessary, interview students again.

### Professional Conduct:

#### Students:

- A. Students are asked to dress professionally and to demonstrate good manners at all times.
- B. Students are to be at their project during judging except for short bathroom breaks. They are instructed to leave written notice if they must leave their display.

#### Judges:

- A. Judges should remember that Science Fair is not only a competition but an educational and motivational experience for students when they are interviewing the students.
- B. Judges represent professional authority to the student being evaluated. The way in which questions are asked, suggestions offered, or constructive criticism made should always be in a tone which will provide definite encouragement for continued effort.

### Judging Card

The judging card is a checklist that allows you to compare each student's work in specific areas. You will rank students but are not required to develop numerical scores. You may write comments on the card to help students improve their project. These cards will be returned to the students, so please make sure the comments are positive and constructive. The following skills and documents are to be ranked:

**Scientific Thinking:** A student should demonstrate knowledge of the inquiry cycle. They should have a testable question, review published materials, develop a hypothesis, design an experiment, collect, analyze and interpret data, and draw a conclusion as part of their presentation.

**Subject Knowledge:** The student should have gained knowledge about the subject under investigation. They should be familiar with the literature they have collected and be able to completely explain what their experimentation and underlying science.

**Data/Data Presentation:** The data collected during experimentation can be either qualitative or quantitative, **and should be the work of the student for this year only**. The data can be presented in tables, chart, and/or graphs. Care should be given if a single trial was used to generate an unusually large amount of unnecessary charts and graphs. Why was only one trial completed?

**Use of statistics:** The data should be organized and summarized and statistical analysis should be performed. The student should understand the tests and what the numbers indicate about their results. **It is not enough to have used a statistical package on the computer if they don't understand their application.**

**Original Lab Data:** This involves notes taken during experimentation and field observation. It should be in their log book but may also be in a separate log.

**Log Book:** This is a stitched notebook containing a record of all work done by the student for the duration of the project. It should include early research, experimental design, data collection, experimental results and details of the procedure followed. It may also contain websites, e-mails from mentors, etc. There should not be large gaps of time with no entries. **This should be used to help make a final decision on Place awards.**

**Conclusion:** This summarizes the results based on the data analysis that was conducted. **It is not necessary for a project to prove the hypothesis to win.** Can the student explain the results and why the hypothesis was not proven? We often learn more from a hypothesis that was not supported than a supported one.

**Reprint file:** This contains copies of journal articles used in developing the project. It should give evidence of research specific to the topic studied as well as disciplines that provide background and support for the study. Articles should be highlighted and students should demonstrate knowledge of the articles.

**Display:** This refers to the materials on the table. **It must include a Log Book, a Research Paper, and Reprint File.**

The backboard should provide an overview of the project. It is required to have a title and an Abstract (lower left side). It **may** also include a problem, hypothesis, procedure, data results, conclusion, future studies, and bibliography.

**Final Paper:** Each student must have a scientific paper that summarizes the entire project. It should include an abstract, discussion, materials and methods, data analysis, conclusion, and bibliography.

**Interview:** Students should demonstrate their subject knowledge on their project and underlying concepts. They should demonstrate good use and understanding of the scientific method.

**Other:** how do you, as a judge, feel about the project? Was there exceptional or creative work conducted? How excited is the student about their project?

These items should be considered as you rank the top 6:

**A. Creative ability**

1. There was an original questions asked
2. The approach to answering the question was creative.
3. There was original equipment developed and used.

**B. Scientific Thought**

1. The scope of the study was within the student's ability
2. The study was well designed
3. Scientific literature was examined.
4. A logical hypothesis was developed.
5. The experimentation tested the stated hypothesis.

**C. Thoroughness**

1. The sample sizes and population were carefully chosen
2. Multiple trials were conducted where possible.
3. The data analysis was appropriate and thorough.
4. The conclusion is based on the statistical analysis of the results.

**D. Skills**

1. Data measurements were done precisely.
2. Technical problems were overcome and not merely avoided or ignored.
3. The log book is thorough.

**E. Clarity**

1. The student is able to explain the experimentation and underlying concepts.
2. The student is able to explain the results, statistical analysis, and conclusion.
3. The student has identified and understands applications for the research.

**F. Display**

1. Are all three required components present?
2. Does the Display board represent the findings of the study?

If there are questions or concerns, please ask one of the Fair Directors. Protocol and other paperwork for each project are available, if needed.

**Ranking Card**

List the project numbers and titles for the top 6 projects in rank order on the Ranking Card. The First Place projects will be going on to the State Science Fair and, possibly, the International Science Fair. We want the First Place projects to be able to represent Brevard well at these highly competitive events. The ranking cards need to be signed in **blue** ink by each of the judges and returned to the **Fair Directors** only.

## **Judging Criteria for Engineering Projects**

### **I. Research Problem**

- *description of a practical need or problem to be solved*
- *definition of criteria for proposed solution*
- *explanation of constraints*

### **II. Design and Methodology**

- *exploration of alternatives to answer need or problem*
- *identification of a solution*
- *development of a prototype/model*

### **III. Execution: Construction and Testing**

- *prototype demonstrates intended design*
- *prototype has been tested in multiple conditions/trial*
- *prototype demonstrates engineering skill and completeness*

### **IV. Creativity**

- *project demonstrates significant creativity in one or more of the above criteria*

### **V. Presentation**

#### **a. Display**

- *logical organization of material*
- *clarity of graphics and legends*
- *supporting documentation displayed*

#### **b. Interview**

- *clear, concise, thoughtful responses to questions*
- *understanding of basic science relevant to project*
- *understanding interpretation and limitations of results and conclusions*
- *degree of independence in conducting project*
- *recognition of potential impact in science, society and/or economics*
- *quality of ideas for further research*
- *for team projects, contributions to and understanding of project by all members*

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# ***Brevard Regional Fairs*** ***SECTIONS and CATEGORIES***

## ***SECTIONS***

*SR – Senior Section – Grades 9 -12*

*JR – Junior Section – Grades 6-8*

## ***CATEGORIES***

*ANIM (100)-Animal Sciences*

*BEHA (200) -Behavioral and Social Sciences*

*BMED (300) - Biomedical & Health Sciences*

*CMBI (400) -Cellular/Molecular Biology & Biochemistry*

*CHEM (500) -Chemistry*

*EAEV (600) -Earth and Environmental Sciences*

*ENMS (700) -Engineering*

*ENEV (800) -Environmental Engineering*

*IMRS (900) -Intelligent Machines, Robotics and Systems Software*

*MACO (1000)-Mathematics & Computational Sciences*

*MICR (1100) - Microbiology*

*PHYS (1200)- Physics & Astronomy*

*PLNT (1300)- Plant Sciences*