GEORGE WASHINGTON
CARVER SCIENCE FAIR

Providing opportunities for students to gain enriched learning experiences through scientific inquiry & discovery

JUDGING HANDBOOK

Introduction

Thank you for serving as a judge at the George Washington Carver Science Fair.

The Carver Science Fair encourages urban youth to pursue academic achievement, careers in science, civic involvement, and character development. Jointly sponsored by The School District and The Archdiocese of Philadelphia, Temple University, and the Academy of Natural Sciences, the Fair is open to all Philadelphia public, charter, parochial, and private school students in grades four through twelve. Since its inception in 1979, over 32,000 students have participated in the Carver Science Fair and have, in many cases, moved on to compete in the Delaware Valley Science Fair.

The George Washington Carver Science Fair is named in honor of the late Dr. George Washington Carver: scientist, inventor, artist, musician, and great humanitarian. Founded by a group of educators and business people in 1979, The George Washington Carver Science Fair encourages urban youth to pursue academic achievement and careers in science. The Carver Fair is jointly sponsored by Temple University, The Academy of Natural Sciences, The School District of Philadelphia, and The Archdiocese of Philadelphia. It is open to all students in grades four through twelve who attend Philadelphia County public, charter, parochial, and private schools, as well as to home schooled students residing in the county. Since its inception, over 34,000 students have participated in the Carver Science Fair and have, in many cases, moved on to compete in the Delaware Valley Regional and Intel International Science Fairs.

As in previous years, the judging day includes a continental breakfast, a brief introduction to the fair, project evaluations, a buffet lunch, the opportunity to network with colleagues, and individual student interviews. Judges also receive free parking at the designated lot or garage.

When You Arrive

1. Check-in at the Judges' Table. Pick up a Judging Folder, which contains the forms and worksheets you will need for the day.

2. Choose a project category, grade level, and team letter (A, B, or C) with less than three judges. Write your name on the sign-up sheet. Be sure to only sign up for one judging team.

3. Write down the projects numbers assigned to your judging team.

4. Locate your fellow judges at the continental breakfast or morning orientation.

Descriptions of Elementary School Project Categories

Consumer Science

Study or comparison of products, systems, or materials used by consumers in homes, workplaces, schools, recreation, etc.

Earth Science

Study of the processes that are carried out on our planet. Earth Science covers soil, air, and water.

Life Science

Study of how organisms operate, from bacteria to dinosaurs.

Physical Science

Study of energy and non-living matter.

Team Projects

Study conducted by two or three students together, in any discipline.

Descriptions of Secondary School Project Categories

Behavioral and Social Sciences

Human and animal behavior, social and community relationships--psychology, sociology, anthropology, archaeology, ethology, ethnology, linguistics, learning, perception, urban problems, reading problems, public opinion surveys, educational testing, etc.

Biochemistry

Chemistry of life processes--molecular biology, molecular genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry, hormones, etc.

Botany

Study of plant life--agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, algae, etc.

Chemistry

Study of nature and composition of matter and laws governing it--physical chemistry, organic chemistry (other than biochemistry), inorganic chemistry, materials, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.

Computer Science

Study and development of computer hardware, software engineering, internet networking and communications, graphics (including human interface), simulations/virtual reality or computational science (including data structures, encryption, coding and information theory).

Consumer Science
Study or comparison of products, systems, or materials used by consumers in homes, workplaces, schools, recreation, etc.

Earth and Space Sciences
Geology, mineralogy, physiography, oceanography, meteorology, climatology, astronomy, speleology, seismology, geography,

Engineering
Technology; projects that directly apply scientific principles to manufacturing and practical uses--civil, mechanical, aeronautical, chemical, electrical, photographic, sound, automotive, marine, heating and refrigerating, transportation, environmental engineering, etc.

Environmental Science
Study of pollution (air, water, and land) sources and their control; ecology

Mathematics
Development of formal logical systems or various numerical and algebraic computations, and the application of these principles--calculus, geometry, abstract algebra, number theory, statistics, complex analysis, probability.

Medicine and Health
Study of diseases and health of humans and animals--dentistry, pharmacology, pathology, ophthalmology, nutrition, sanitation, pediatrics, dermatology, allergies, speech, hearing, etc.

Microbiology
Biology of microorganisms--bacteriology, virology, protozoology, fungi, bacterial genetics, yeast, etc.

Physics
Theories, principles, and laws governing energy and effect of energy on matter -- solid state, particle, nuclear, atomic, plasma, superconductivity, fluid and gas dynamics, quantum mechanics, thermodynamics, optics, acoustics, semiconductors, magnetism, biophysics, etc.

Zoology
Study of animals--animal genetics, ornithology, ichthyology, herpetology, entomology, animal ecology, paleontology, cell physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, etc.

Team Projects
Study conducted by two or three students together, in any discipline.

Elements of a Successful Project

1) Project Log Book

All students must keep a log book throughout their research project. The log book must be displayed with the project board at the fair. Accurate and detailed notes make a logical and winning project. Make sure each entry is dated. Data tables are also helpful; they may be a little 'messy' but be sure the quantitative data recorded is accurate and that units are included in the data tables.

2) Abstract

Students must complete a 250-word, one-page abstract. This document should be displayed on or with the project board. An abstract should include the a) purpose of the experiment, b) procedures used, c) data, and conclusions. It also may include any possible research applications. Only minimal reference to previous work may be included. The abstract must focus on work done in the current year and should not include a) acknowledgments, or b) work or procedures done by the mentor.

3) Visual Display

Displays must clearly list all components of their project, including: Title, Question, Hypothesis, Procedure, Materials, Results/Data, and Conclusion. The display should be easy for viewers to assess the study and the results obtained, and convince them that the research is of sufficient quality to deserve scrutiny. Students should make the most of space using clear and concise displays.

a) Current Year. Make sure the board reflects the current year's work only. Prior year's data books are permitted at the project.

b) Good Title. A good title should simply and accurately present the research and depict the nature of the project. The title should make the casual observer want to know more.

c) Photographs. Many projects involve elements that may not be safely exhibited at the Fair, but are an important part of the project; photographs of important parts/phases of the experiment should be used in the display. Credit must be given for all photographs.

d) Well-Organized. Make sure the display follows a sequence and is logically presented and easy to read. A glance should permit anyone (particularly the judges) to locate quickly the title, abstract, experiments, results, and conclusions. Graphs should show the relationships of the variables tested.

e) Eye-Catching. The display should be neat and exhibit colorful headings, charts, and graphs. Pay special attention to the labeling of graphs, charts, diagrams, photographs, and tables to ensure that each has a title and appropriate label describing what is being demonstrated. Anyone should be able to understand the visuals without further explanation.

f) Correctly Presented and Well-Constructed. Please Note: You are judging the research, not the display. So, don't spend an excessive amount of time on the board. Judge on the science, not the show!

How To Conduct Good Interviews

Being a judge for the George Washington Carver Science Fair is challenging, but it's worth the effort. You are making a memorable impact on the lives of talented young people. For some students, you are the first professional they have ever met who does science, technology, engineering, or mathematics for a living. Part of your job at the Science Fair is to be an ambassador for your profession. Students' perceptions of you could influence their career choices. It is a good idea when you approach a student to introduce yourself and describe your background.

General Guidelines

Every student must be interviewed.
This ensures that each project is seen by a sufficient number of judges to ascertain its potential for winning. This is also the student's opportunity to meet with professional scientists and engineers. The interview should be an educational experience for the students.

The judging process must be as fair as possible and must appear as fair.
Students are to give only their first name. Please don't ask for their last name or the name of the school they attend. These have also been left off the boards on purpose, to ensure fairness.

Your fairness is indicated by a few *simple actions*:

- You spend about the same amount of time with each student (no more than 10 minutes!)
- You listen to the student's explanation of the project
- The questions you ask are intended to find out more about the project and how it was done—*not* to embarrass or intimidate the student

Every student should be treated with respect.
Students and their projects should be treated with due consideration, even if the science is flawed. The goal is to have students leaving the Carver Fair knowing more than when they arrived and feeling good about themselves and their project, so that they will continue to pursue science and engineering. Please do your best to make sure that all of the participants remember the Carver Fair as a positive experience.

Every student should receive a student evaluation feedback form.
Students value your feedback. Since judges are unable to spend a large amount of time with students, we ask that after you have decided the winners of your category, your judging team provides each student with at least one completed Student Evaluation form (ideally, one form from each judge if time permits). Please keep in mind that these are meant to encourage students to continue their participation in future fairs, but it is also important not to give all high or excellent marks to students who

were not chosen as winners. Give them tips on ways they might improve to create a winning project in the future.

Interviewing

The most important aspect of this fair is that *all students* come away with a *positive experience*.

- Students may give their name—don't ask which school they attend. We have asked them not to include this information so we can eliminate bias.
- Try to put students at ease; they are all nervous.
- Remember the age level of the students you are interviewing—some are as young as nine years old.
- Listen carefully to what the students have to say.
- Encourage students rather than criticize them.
- Reward students through your comments for all their effort, etc.
- Explain what could be done differently next time to improve the project.
- Interview students as a team, with only one person asking questions. Other team members may ask questions at the end. Special Awards judges are permitted to attend the questioning by the category judges, but must wait until the category judges are finish before asking their own questions
- At the end of the interview, ask the student if there is anything that they wish to add.
- Please don't discuss the project's merit in front of the student.
- Begin the interview by asking what the project is all about and how they became interested in this topic.
- Try to get a clear answer from the student on what they learned from the project - what was their conclusion.
- Ask who helped them—remember, we encourage parental participation—but the student must be able to explain their experiment and demonstrate understanding.
- Ask how could they change, extend, or improve the project?
- Remember, you are meeting very motivated students, many who have been working on their project for 3 or 4 years. This is an asset.

Every interview should last about 10 minutes.

An interview of less than 5 minutes cannot satisfactorily determine the extent of a student's knowledge of his/her project, while interviews of longer than 15 minutes will slow the judging process and may result in other students not having enough time with judges.

Every interview should have educational value.

The interview should provide some educational benefit to the student, particularly those who are not serious contenders for a prize. Your approach and the nature of your questions will educate the student as to how a scientist thinks, and about the questions they should be asking themselves about their project. Your interview could set the student on the track to a better project for next year.

However, the student should be doing most of the talking during an interview. Some judges have been observed to pontificate enthusiastically while a student stood idly listening. The interview is not a good opportunity for this, no matter how much it might benefit a student to listen to you.

Try to put students at ease.
Be aware that the students are all very nervous. As a judge, you will need to *reduce the intimidating image* that you will have to most students. The more you can do so, the more likely you are to reduce student nervousness, and to have a better interview discussion.

Simple actions by a Judge can make a difference:

- Make eye contact with the student.
- If the student is short and you are tall, stoop, bend, or squat down to lower your eye level.
- Tip your head to the side a little to indicate interest (this is a universal nonverbal form of communication; even your dog does it).
- If you wear glasses, look at the student through them, not over the top of the frames.
- Whenever a student shows a good idea, a clever way to get extensive results with inexpensive equipment, or anything you can compliment, be sure to use a compliment.
- Use a tone of voice that indicates interest or inquisitiveness, not skepticism or contempt.

Asking Good Questions in the Interview

Your best tool in judging is your ability to ask questions. Be sensitive to what the student knows. Remember, too, the age level of the students you are interviewing.

You can always ask questions that the student can answer, and keep a conversation going. There are *some questions all students should be able to answer*, including variations on:

- How did you come up with the idea for this project?
- What did you learn from your background search?
- How long did it take you to build the apparatus? How did you build the apparatus?
- How much time (many days) did it take to run the experiments (grow the plants) (collect each data point)?
- How many times did you run the experiment with each configuration?
- How many experiment runs does each data point on the chart represent?
- Did you take all data (run the experiment) under the same conditions, *e.g.*, at the same temperature (time of day) (lighting conditions)?
- How does your apparatus (equipment) (instrument) work?
- What do you mean by (terminology or jargon used by the student)?
- Do you think there is an application in industry for this knowledge (technique)?
- Were there any books that helped you do your analysis (build your apparatus)?
- When did you start this project? How much of the work did you do this year? (Some students bring last year's winning project back, with only a few enhancements.)

- What is the next experiment to do in continuing this study?
- Are there any areas that were not have covered which you feel are important?
- Do you have any questions for me?
- (At the conclusion of the interview) Is there anything you would like to add?

(Note: these are only suggestions to keep the dialogue going. You may find other questions to be more useful in specific interviews.)

Things to Avoid in the Interview

One *type of question to avoid* is "Why didn't you do …?" A solution to or extension of the work presented may be obvious to you, with all of your years of experience, but the student may not understand why you're asking such a question. If you ask a question of this type, be sure to imply the correct intent, as in "Could you have done …?" or "What do you think would have happened if you had done …?" When phrased this way the question is an invitation for the student to think about the experiment in a different way and can turn the question into a positive experience.

Please *avoid lecture-style teaching* during interviews. You may come across a project in a technical area with which you are intimately familiar, but where the student just didn't get it. The student may have made some incorrect assumptions, come up with a false conclusion, or the like. It can be tempting to share your knowledge about the topic, but this is not the opportunity to expound at length on the subject.

You may try with your questions to lead the student toward the right answers, but *please don't give the answers*. If you really feel compelled to make explanations, save them until near the end of the judging time. Alternatively, you may give the student your card and invite future discussion about the project.

Special Situations

A student may monopolize your time with a well-rehearsed pitch that prevents real interaction between you. The best way to interrupt is with a polite inquiry: "I'm sorry, I didn't quite catch the relationship between that adjustment and this result" or "How many experimental runs are represented by each data point?" This will stop his/her tape recording and get the student to think about what is being communicated to you.

When facing an incredibly impressive display and a bright or supremely confident student you may feel that the student's research is beyond your knowledge. However, even if a project is truly outside your experience, you are still knowledgeable in the area of problem solving and the process of science. Concentrate on these aspects rather than on the details of a particular project.

If you are unclear about a project, focus your questions on those aspects most familiar to you and continue to familiarize yourself with the project's process, procedures, intent, and outcomes. Remember, too, that you are not the only judge who will talk to the student. If something is not completely clear, bring it up later in the judging meeting. Judges who are familiar with the applicable science will have sorted it all out.

At the other extreme, a few projects are "snow jobs." *However, do not underestimate the student.* Students may have worked in conjunction with personnel in a university or industrial laboratory. Form 1C must be displayed and if not, ask to see it. (Also, see section entitled, Comparing Projects That Aren't Comparable.) If you think the student did not produce the project, it will become apparent if you ask for explanations of words that the student uses. Don't just assume a student knows what a technical term means. They may also not know what a piece of equipment does, how it works, or why it was used. Students should be able to explain the components of their project to your satisfaction. Chances are if it doesn't make sense to you, it doesn't make sense. Of course, as with all questions or concerns that arise, discuss these projects during the judging meeting. There will probably be others on your panel of Judges with similar reservations.

Special Note: Items may have been removed from the display that for safety reasons were disallowed.

Evaluation Criteria

Judging is conducted using a 100-point scale with points assigned to creative ability, scientific thought or engineering goals (II a and b respectively), thoroughness, skill, and clarity. Team projects have a slightly different balance of points that include points for teamwork.

A chart of the point values is located at the end of these criteria. Following is a list of questions for each criterion that can assist you in interviewing the students and aid in your evaluation of the student project.

I. Creative Ability (Individual - 30, Team - 25)

1. Does the project *show creative ability* and originality in
    a. the questions asked?
    b. the approach to solving the problem?
    c. the analysis of the data?
    d. the interpretation of the data?
    e. the construction or design of new equipment?

2. *Creative research* should support an investigation and help answer in an original way.
3. A creative contribution promotes *an efficient and reliable method for solving a problem*. When evaluating projects, it is important to distinguish between gadgeteering and ingenuity.

II a. Scientific Thought (Individual - 30, Team - 25)

(If an engineering project, the more appropriate questions are those found in II b. Engineering Goals.)

1. Is the *problem stated clearly* and unambiguously?

2. Was the *problem sufficiently limited* to allow plausible attack? Good scientists can identify important problems capable of solutions.
3. Was there *a procedural plan* for obtaining a solution?
4. Are the *variables* clearly recognized and *defined*?
5. If *controls* were necessary, did the student recognize their need and were they correctly used?
6. Are there *adequate data* to support the conclusions?
7. Does the student or team recognize *the data's limitations*?
8. Does the student/team understand the project's ties to *related research and applications*?
9. Does the student/team have an idea of what *further research* is warranted?
10. Did the student/team cite *scientific literature, or only popular literature* (i.e., local newspapers, Reader's Digest)?

II b. Engineering Goals (Individual - 30, Team - 25)

1. Does the project have a clear objective?
2. Is the objective relevant to the potential user's needs?
3. Is the solution workable? …acceptable to the potential user? …economically feasible?
4. Could the solution be utilized successfully in design or construction of a product?
5. Is the solution a significant improvement over previous alternatives?
6. Has the solution been tested for performance under the conditions of use?

III. Thoroughness (Individual - 15, Team - 12)

1. Was the purpose *carried out to completion* within the scope of the original intent?
2. How complete are the project notes?
3. Are the conclusions based on a single experiment or *replication*?
4. Is the student/team *aware of other approaches or possible explanations*?
5. Is the student/team *familiar with* scientific literature in *the studied field*?

IV. Skill (Individual - 15, Team - 12)

1. Does the student/team have the required laboratory, computational, observational and design *skills to obtain supporting data*?
2. Where was the project performed (*i.e.*, home, school laboratory, university laboratory)?
3. Did the student or team *receive assistance* from parents, teachers, scientists, or engineers?
4. Where *did the equipment come from?* Did the student or team build it independently? Was it obtained on loan? Was it part of a laboratory where the student or team worked?

V. Clarity (Individual - 10, Team – 10)

1. How clearly does the student discuss his/her project and *explain the purpose, procedure, and conclusions*?
2. Does the *written material reflect* the student or team's *understanding of the research*?

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 *display* explain the project?

VI. Teamwork (Team Projects only - 16)

1. Are the tasks and contributions of each team member clearly outlined?
2. Was each team member fully involved with the project, and is each member familiar with all aspects?
3. Does the final work reflect the coordinated efforts of all team members?

Criteria	Individual Projects	Team Projects
Creative Ability	30 points	25 points
Scientific Thought/Engineering Goals	30 points	25 points
Thoroughness	15 points	12 points
Skill	15 points	12 points
Clarity	10 points	10 points
Teamwork	----------	16 points
TOTAL POSSIBLE SCORE	**100 points**	**100 points**

Selecting Winners

Although each Judge will score each student project individually, all members of the judging team will select the winners in a category together. In categories with a large number of entries, there will be at least two teams of judges who are evaluating a different set of projects. The two panels must confer and share their judgments to arrive at the final awards for the category.

Basic Guidelines

Each category must have a single first place winner.

Since you are judging projects in comparison to each other, rather than to an outside standard, there will be one project that is the best. This will be the first place winner. There will also be *one* winner for second and third places.

Please limit honorable mentions.

Although students need recognition, it is important that the awards are meaningful. As a guideline, there should be no more than one or two honorable mentions per 10 projects. This number is entirely at the discretion of the judging panels, however. There may be more exemplary projects, or fewer, in your category than usual. Some categories also have more projects than others do, which will affect the number of honorable mentions.

Some simple guidelines for judging

The process of deciding on final winners can be a difficult one. Judges of different backgrounds and experience will naturally have different scores for each project. In the final discussion, it is important for judges to listen to one other in an open-minded manner and to be clear about the reasons for their own viewpoint and scoring. It helps if everyone uses the same guidelines in judging and the same evaluation criteria. However, the point system is a guide only. The final awards come from consensus. If judges are "deadlocked," the majority must rule. A filibuster by one person or group, or a random coin toss are not professional methods to use here.

- The quality of the student's work is what matters, not the amount of work.
- If the project is one you have seen done before, remember that it is new to the student. How the student approached and carried out the project is the basis for judging it.
- Do not assume that a young student could not do a highly sophisticated or ambitious project. Some students are very capable. Some have been conducting science projects for many years. The interview process will allow you to assess how independently the student worked and how much the project is his/her own.
- With projects that have been continued over a number of years, judge this year's work only. Do not penalize continuous work. Many students continue a project because of suggestions and guidance from Science Fair Judges or other mentors.
- A less sophisticated project that the student understands gets higher marks than a more sophisticated project that is not understood.
- Access to sophisticated lab equipment and endorsements from professionals do not guarantee a high quality project (Did the student really understand what was going on?)
- Conversely, do not penalize work that has been done in an outside lab or institution. Most students who work at this level have worked quite independently.
- It's okay if the student ended up disproving the objective or hypothesis of the experiment.

High marks should go to:

- Genuine scientific breakthroughs
- Discovering knowledge not readily available to the student
- Correctly interpreting data
- A clever experimental apparatus
- Repetitions to verify experimental results
- Predicting and/or reducing experimental results with analytical techniques
- In engineering categories, experiments applicable to the "real world"
- Ability to clearly portray and explain the project and its results

Low marks go to:

- Ignoring readily available information (*e.g.*, not doing basic library research)
- An apparatus (*e.g.*, model) not useful for experimentation and data collection
- Improperly using jargon, not understanding terminology, and/or not knowing how equipment or instrumentation works
- Presenting results that were not derived from experimentation or data (*e.g.*, literature search)

Comparing Projects That Aren't Comparable

Projects with different levels of sophistication

One of the most difficult judging tasks is comparing projects carried out in university or industrial laboratories under professional guidance with projects done at home with no professional help. Judges should not be in the position of arguing that a particular student would have done much better (or poorer) had only they had access (or no access) to state of the art equipment.

Among students with access to professional laboratories, every year there are those for whom the facilities are the enabling mechanism for their efforts, and there are those for whom the facilities are a mask for little effort. Both types of students should be judged on their personal scientific accomplishment and their <u>use</u> of these resources.

Students who work on their own may appear to be at a disadvantage but the interview is where the playing field is leveled. It is vital to identify how the student made a difference in the direction of the project.

Regardless of where the science project is conducted, good scientific principles and engineering practices must be evident. The student's level of scientific understanding should be consistent with the project's level of technical sophistication and complexity. Judges should apply this standard in evaluating the student's project.

Team Projects vs. Individual Projects

Judging the Science

It is important that judges keep in mind that all projects, regardless of the number of participants, are to be evaluated primarily on the quality of the personal contribution(s) of the student(s) to the science in evidence. In order for the judge to be able to evaluate the level of science of a team project, it is essential that all students in the team participate in the interview (unless otherwise acknowledged).

All students on the team should have general and specific knowledge of the project such as how the question was conceived and subsequently answered. The judge has the freedom to ask a question of anyone in the group. However, the judge should be aware that the group has the equivalent freedom to choose a spokesperson and may refer a particular question to a specialist.

Judging the Effort
In judging a team project versus one done by an individual, it is fair to have a higher expectation of the team projects regarding the overall level of effort involved in the project. In other words, team projects have greater resources (the number of minds working together) and therefore a greater capacity for more research and data collection, more time, effort, and thought spent on the project, and more analysis than someone acting alone.

There also must be evidence of team collaboration and synergy among team members (which should become evident during the interview process). In particular, the judge should try to ascertain how fully the resources of the group have been exploited. Remember that one of the primary goals of team projects is to encourage students to work as a team (mimicking the way science is done in the real world), and to encourage project management. Each team member should have made a significant contribution to the overall project.

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Judging Cheat Sheet (If You Are Too Busy To Read the Whole Guide)

- *You are looking for good research and the use of scientific methods.* However, engineering, computer science, mathematics, and some theoretical physics do not follow the traditional scientific methods and use different criteria. You should judge on merit and effort.

- Judge the project compared to other projects on the floor and *not* to an outside standard. Therefore, each category must have a single first place winner. There has to be a single project better than the rest! Please avoid ties!

- If you see a project that's "been done before," remember: not for them.

- "That project is too sophisticated or too ambitious; a student couldn't possibly do that." *Don't be so sure!* Some of these students are very capable and will surprise you.

- With projects that have been continued over a number of years, *judge this year's work only*. Do not penalize continuous work. Many of them are continuing because of your suggestions from the year before. On-going research is OK!

- Do not penalize work that has been done in an outside lab or institution. These kids are using resources that are available to them. This should not be viewed as an unfair advantage. *The interview is a good time to discover how much the student did and how much the mentor did.* You will find that most kids who reach this level have worked independently.

- Please keep your interviews short—no more than 10 minutes. Please keep your interview time the same for each student. *In order to be fair, we must be consistent. Don't spend more time with one and less with others.* And remember, this is an interview, not a presentation.

- Board size and "The Rules" are not your concern. Judge only the research!

- If you feel that the project is in the wrong category, don't rate it as high. The students and teachers pick the category.

- For team projects, each member should have a key role in the research and be familiar with the work of the others.

- The point system is to be used *as a guide only*. The consensus method is the best way to arrive at a decision. If you are "deadlocked," majority wins. Filibuster or coin toss is not appropriate or professional.

- Most importantly—Our goal is to have the students leaving here knowing more than they arrived. *We want them to feel good about themselves and their project so that they will continue to pursue science and engineering.* This should be a positive experience for them. Bear this in mind when offering constructive criticism. Please take the time to complete, as a group, the Student Feedback form for each student. Be certain that no one is missed. Please feel free to include additional comments on the back of the Student Feedback form.