



## Guide for Judges

### **SASEF Judges**

- Come from all segments of government, military, academia, industry, and private life.
- Realize the value of programs that nurture middle and high school students' interest in math, science, and engineering.
- Commit an afternoon of their time to support such a program.
- Interact with students in a manner that rewards and stimulates their interest.
- Determine which students have performed work that is worthy of special recognition.
- Enjoy an opportunity to meet and work with peers from the region in a setting that is relaxed and removed from routine job responsibilities.

SASEF's mission is to promote inquiry, "scientific reasoning and methodology" as well as "sound engineering practices" in middle and high schools of the 23-county region of East Tennessee. SASEF is actually two independent science fairs. Our "Junior Division" event is for students in grades 6-8. The "Senior Division" competition is for students in grades 9-12 and is conducted in accordance with the rules for the Regeneron International Science & Engineering Fair (ISEF). Students with the top two projects (team or individual) in our Senior Division contest will be eligible for ISEF, along with 1,400 finalists from other regional-level fairs. ISEF is held in a different city each year in May.

Most projects which make it to our regional fair have placed highly in their local (city or county) fairs. Schools in city or county systems that do not sponsor fairs can send a small number of projects directly to SASEF.

SASEF is operated by a board of directors, a President, a Vice President, a Fair Coordinator, and a Fair Director. SASEF depends on two important groups of people in addition to these dedicated officers: financial sponsors, individuals and organizations who have pledged financial resources; and judges, who dedicate their time and energy.



## Types of Judges

- 1) Category Judges** work in teams of 2 to evaluate the projects (or a subset of the projects) in a particular category (see the next section). Each team determines which of their projects are worthy of Honorable Mention certificates and which should be considered for higher recognition. They share their evaluations of their top projects with other judges in their category so that the group can reach a fair consensus as to which projects should be considered for division-level awards.
- 2) Team Judges** select top junior and senior team projects from those that have received Certificates of Excellence in their category.
- 3) Special Award Judges** work alone or in teams to determine which projects should receive awards in a particular subject area (not necessarily the same as one of our categories). Some special awards are restricted by grade level, gender, etc. The criteria for these awards can be very specific or very broad, depending on the sponsors' guidance. Special Award Judges can, at their own choosing, also serve as Category Judges. Special Award sponsors sometimes provide their own judges.
- 4) Lead Judges** are Category Judges that have agreed to take on the additional responsibility of advocating the top projects in their categories to other Lead Judges during the process of ranking projects for the various division-level awards. They remain after the other Category Judges have departed and select, usually through some sort of discuss-and-vote procedure, which projects should be named Grand Champion, Reserve Champion, Third Place, etc. Several lead judges will be assigned to Team Projects.

## Project Categories

Each project in each division is assigned to one of the following categories:

Animal Science	Engineering: Materials & Bioengineering
Behavioral & Social Sciences	Energy & Transportation
Biochemistry	Environmental Management
Cellular & Molecular Biology	Environmental Science
Chemistry	Mathematical Science
Computer Science	Medicine and Health Science
Earth Science	Microbiology
Engineering: Electrical and Mechanical	Physics & Astronomy
	Plant Sciences



Team Projects (located and judged in the discipline of the project, no special team category for regular judging)

Students and their teacher/sponsors usually determine which category a project belongs in. Sometimes (but rarely) we will overrule their decisions, but sometimes projects wind up in a category that is not the most appropriate. If you are assigned a project that is obviously not in the best category, please contact the Fair Director or the President.

## Types of Projects

- 1) Experiments** – the classic hypothesize-plan-experiment-analyze-conclude scientific approach.
- 2) Technology Demonstration** – many engineering projects fall into this bracket. Building a robot, designing a fiber-optic data transmission system, or inventing a new type of incubator are examples.
- 3) Study** – the collection and analysis of pre-existing data. For example, a student could review hospital records for the previous year to see if a disproportionate percentage of babies are born within three days of a full moon.

All three types of projects are equally valid, although judging criteria obviously must be adapted accordingly.

## Awards

**Participation** ribbons are presented to every student who brings a project to SASEF.

**Honorable Mention** ribbons are given to every project that, in the opinion of the category judges assigned to that project, meets or exceeds all basic criteria for a good science project.

**Excellence** ribbons are presented to all strong projects that are recommended for consideration for division-wide ranked awards. Smaller categories (ten or fewer entries) will usually award one Excellence Ribbon (assuming that there is at least one strong project). Larger categories might award two excellence ribbons. The largest categories (25 or more entries) might even award three if there are that many truly worthy projects. All judges in a category work together to select the excellence recipients. In the Junior Division, an excellence ribbon also qualifies the student (including team members) for the Broadcom MASTERS national STEM competition. *Because all Lead Judges in a division will have to review all excellence projects, awarding excellence to marginal projects will serve only to prolong the Lead Judges' ranking process.*



## Overall Awards

**Overall Awards** are presented to the top 11 projects in the junior division, and the top 8 projects in the Senior Division. The rankings are determined by consensus of the Lead Judges in that division.

Awards	Junior Division		Senior Division	
	# given	prize awarded	# given	prize awarded
<b>Fifth Place</b>	4	\$50	3	\$75
<b>Fourth Place</b>	3	\$75	2	\$150
<b>Third Place</b>	2	\$100	1	\$300
<b>Reserve Champion</b>	1	\$250	1	\$1,000 scholarship + ISEF trip*
<b>Grand Champion</b>	1	\$500	1	\$1,200 scholarship + ISEF trip*

\*ISEF trip includes ISEF registration fee, \$300 spending money, airfare, and hotel; each student, regardless of individual or team, wins a trip to ISEF. Representing teacher's travel is also covered.

**Special Awards** are provided by sponsors who wish to reward and encourage research in particular subject areas. Prizes can include cash, bonds, certificates, books, plaques, medals, invitations to participate in other competitions and events, and many other forms of recognition.

Note: If the Lead Judges for Team decide that the team project qualifies for ISEF, the team members (up to 3) will also qualify for the ISEF trip. Otherwise, the team members win \$300 each.

## Evaluating Projects

We suggest the following weighting factors to aid in your evaluation of projects.

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

1. Does the project show creative ability and originality in the questions asked? I.e., the approach to solving the problem, the analysis of the data, the interpretation of the data, the use of equipment, the construction or design of new equipment
2. Creative research should support an investigation and help answer a question 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 IIb. Engineering Goals.*

1. Is the problem stated clearly and unambiguously?
2. Was the problem sufficiently limited to allow plausible approach? 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 finalist or team recognize the data's limitations?
8. Does the finalist/team understand the project's ties to related research?
9. Does the finalist/team have an idea of what further research is warranted?
10. Did the finalist/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 an end product?
5. Is the solution a significant improvement over previous alternative?
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 completely was the problem covered?
3. Are the conclusions based on a single experiment or replication?
4. How complete are the project notes?
5. Is the finalist/team aware of other approaches or theories?
6. How much time did the finalist or team spend on the project?
7. Is the finalist/team familiar with scientific literature in the studied field?



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

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

#### **V. Clarity (Individual - 10, Team - 10)**

1. How clearly does the finalist discuss his/her project and explain the purpose, procedure, and conclusions? Watch out for memorized speeches that reflect little understanding of principles.
2. Does the written material reflect the finalist's or team's understanding of the research?
3. Are the important phases of the project presented in an orderly manner?
4. How clearly is the data presented?
5. How clearly are the results presented?
6. How well does the project display explain the project?
7. Was the presentation done in a forthright manner, without tricks or gadgets?
8. Did the finalist/team perform all the project work, or did someone help?

#### **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?



## Student Interviews

Please remember that the Science Fair is not only a competition; it is also an educational and motivating experience. Many students are anxious to talk to the judges, and for some it is the high point of their experience at the Fair.

### Interviewing Tips:

- Try to put the student at ease. Start off by introducing yourself, asking a friendly question, and making a favorable comment. Then let the student talk before bombarding him/her with more questions.
- Questions should be asked, suggestions should be offered, and critiques should be given in tones that encourage open communication and stimulate further interest.
- Please never act bored or distracted—not always easy on weak projects! Focus on the student and his/her work.
- Show appreciation for effort put forth by a student in preparing and presenting a project at SASEF. Close with an encouraging word.
- Every student should be interviewed by at least one team of judges. Because the fair is intended to be an educational experience as well as a competition, interviews with judges can be an important part of the student's experience.
- If you are not familiar enough with a particular field of study to ask probing questions or to know if you are receiving reasonable answers, seek help from another judge.
- Each interview should last seven to ten minutes even if it is clear that the project will not be considered for one of the higher awards. Hopefully, no judge will have so many assignments that he/she cannot do justice to each one.
- Keep in mind that a successful and valuable experience with science at this level could reap considerable rewards for the student. Share with the students your own enthusiasm about science and technology.



## Judging Process Overview

Step #	Start Time	End Time	Activity
1	12:30	1:00	Check in and receive your assignments
2	1:00	1:15	Welcome, announcements, last-minute instructions, questions
3	1:15		Meet and greet fellow category judges at first exhibit
4	1:15	3:00	With your teammate(s), review each assigned exhibit. If you have special award responsibilities, you should have time to check out exhibits that might relate to your special award subject area.
5	3:00	5:00	Students arrive and wait by their exhibits. In teams, visit each project on your list and discuss it with the student. Special awards judges should have time to visit the exhibits that they identified earlier and scout for more.
6	5:00	5:10	Students leave. Confer with your teammate(s) and 1) choose honorable mention projects and 2) select one or two of your best projects to promote to the other judges in your category. Turn in your team's Honorable Mention list to desk. Meet briefly with other judges in your category. Lead judge decides when to reconvene.
7	5:10	5:45	Food will be available until 6:30. If all judges in your category agree, you can perform step #8 now and eat afterwards.
8	5:45	6:30	Meet at the first exhibit in your category; begin visiting the "selected" projects. Each team in turn describes the strengths and weaknesses of its selected projects.
9	6:30	7:00	Judges in each category decide on one or two (if your category is large) projects to nominate for Excellence Ribbons. Judges (except Lead Judges) are free to leave at this time, or you are welcome to stay. Please turn in your special award selection(s) before you go. Lead Judges turn in Excellence list to the desk at this time.
10	7:00	8:00	Lead judges in each division gather at the first exhibit for the division. They review all Excellence projects as a group, with each lead judge serving as an advocate for the project(s) in





			his/her category.
11	8:00	until	Judges in each division gather to rank projects. When finished, facilitator turns in rankings to desk. Lead judges are free to leave. Please turn in your special award selection(s) before you go.
12			SASEF staff distributes Ribbons.



## **Administrative Matters**

Please arrive by 12:30 p.m. on the day judging occurs so that you can check in and be ready for the orientation briefing when it begins promptly at 1:00. If you require a parking pass (as indicated on your registration form), we will be sure to relay information on how to obtain the pass.

At a table inside the northwest entrance to the concourse area of the Thompson Boling Arena, a registration packet will be waiting for you with your badge, judging assignments, criteria for any special awards you might be judging, and other information that might be helpful.

If you are able to arrive early, we recommend that you take a few minutes to survey the entire fair or, at least, your assigned division. Signs at the ends of the tables list the division and category. Familiarity with the quality range between the weaker exhibits and the really good exhibits can help you determine which of your assigned exhibits might be contenders for the division-wide awards.

Put on your badge when you receive it and please leave it on until you leave. Please challenge (respectfully) anyone that you see without a badge. Students' parents, teachers, friends, etc., are not allowed on the concourse at any time during the judging process.

If you have questions not addressed adequately by the information in this guide, feel free to ask a fair official either before the orientation session or during Q&A period in the orientation session.

If you are a Category Judge who is not also a Special Awards Judge, you might find that you have some extra time, especially during the student interview period. Please spend this time browsing other categories and interacting with the students. We would like to minimize the number of students that get visited by judges only once.

Our judging decisions will have very real impacts on the lives of some contestants. You are providing a very valuable service, and your time, effort, concern, and skills are very much appreciated.