Judge’s Guide

Hosted by:
The University of Texas at San Antonio
ExxonMobil Texas Science and Engineering Fair

Welcome

Thank you for volunteering your time and expertise at this year’s ExxonMobil Texas Science and Engineering Fair (EMTSEF). The EMTSEF is a major event in the academic and scientific lives of the students of Texas. The level of scientific thought and competition at the state level is high. In order to ensure the best students continue through the fair process, we are committed to providing the highest level of competency in judging at the EMTSEF.

This is your guide to judging at the EMTSEF. It contains information about all aspects of the process including some of the forms you will see on fair day. Please review the information carefully because your evaluations will determine who wins an award, who represents the State EMTSEF at the Intel International Science and Engineering Fair (ISEF), and who will be invited to attend the Governor’s Science and Technology Champions Academy (GSTCA).

Do not hesitate to contact a fair organizer if you have any questions or are unsure of anything. We look forward to welcoming you at another successful fair and we hope the event is as exciting and fulfilling for you as it will be for our student participants.

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**General Information**

Two divisions:
- Junior Division (middle school students)
- Senior Division (high school students)

Two project types:
- Individual (completed by a single student)
- Team Projects (completed by a team of two or three students)

Two category types:
- Life Science
- Physical science

17 categories (in alphabetic order):

1. Animal Science
2. Behavioral & Social Sciences
3. Biochemistry
4. Cellular & Molecular Biology
5. Chemistry
6. Computer Science
7. Earth Science
8. Energy & Transportation
9. Engineering: Electrical & Mechanical
10. Engineering: Materials & Bioengineering
11. Environmental Management
12. Environmental Science
13. Mathematical Science
14. Medicine & Health
15. Microbiology
16. Physics & Astronomy
17. Plant Science
Types of Judges

*Fair Judges*

The Fair Judge will select first place, second place, etc. from one of 17 categories. Each judge will be assigned a category on site during registration based upon your online preregistration preferences. Fair Award judges evaluate projects to receive awards from the State Fair.

*Blue Team Judges*

The task of Blue Team judges is to identify the best entries in the fair. There are four Blue Teams:

1) Life Science, Junior  2) Life Science, Senior
3) Physical Science, Junior  4) Physical Science, Senior

As a Blue Team Judge you will select Grand Prize and Best of Show winners from amongst the winners of the individual fair categories. Specifically, you will rank them sequentially with the best project ranked number one and descending through the list. The fair organizers will use this list to award grand prizes and identify (in the senior division) students qualifying to represent the State EMTSEF at the International Science and Engineering Fair.

*Special Award Judges*

Special Award Judges represent a professional society, company, industry, or the military and have been specifically asked by the organization they represent to evaluate projects eligible to receive scholarships and awards from external organizations. Judges review specific projects in relation to their organization's scholarship or award guidelines.
Judges’ Conduct

The EMTSEF is both a competition and an educational and motivating experience for students. Students enjoy conversations with judges, both to showcase their projects and to learn from judges.

As a judge you are a professional authority whose comments can motivate or discourage students from continued engagement with scientific and engineering work. Because of this, it is important that feedback is offered in a friendly, supportive, and positive manner.

Never harshly criticize or dismiss any of the projects assigned to you. It is equally destructive to a budding scientist or engineer to feel ignored as it is to feel chastised. Also, don’t forget to give credit to the students for their effort to prepare and present their projects. Please try to find something positive to say for each project you judge and offer supportive suggestions.

NOTE:
1. **DO NOT** evaluate a student whom you know.
2. If you must excuse yourself from judging a particular project or category, please report to the organizers of the fair for reassignment.
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Judging Guidelines

1. Interviews
   a. Conduct a one-on-one interview with each student in your assigned category. For teams, interview the entire team together making sure each member contributes.
   b. Ask questions and listen to the student’s explanations.
   c. Feel free to engage in a bit of “shop talk” with the students.
   d. Please remember to place a Judge label on each project you judge. (see page 8)
   e. Do not exceed 10 minutes per project. You will hear a tone at 7 minutes reminding you to begin completing the interview process by asking questions; a second tone 3 minutes later will remind you to move to your next project.

2. Evaluations
   a. Does the student understand the work?
   b. Is there evidence of lab, field, or theoretical work?
   c. Is the display complete? (NOTE: Student understanding outweighs the look of the physical display.)
   d. Was the work completed in the current year?
   e. How much guidance and active help was given by third parties? (NOTE: including parents)

3. Interactions
   a. Encourage students to continue scientific work.
   b. Provide constructive criticism in a conversational tone.
   c. Find something positive to say to each student.
   d. Do not discuss rankings in the presence of students. Results are confidential until announced.
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Judging Process

Fair Judges (and only Fair Judges) will receive a sheet of Judge Labels. Once a project has been judged, place a Judge Label on the Project’s Table Card (see sample below). This procedure verifies how much times each project has been judged.

Once each Fair Judge has completed judging their assigned projects, all scantron sheets (pg.12) are to be turned in to the Judging Station immediately.

Write your Judge ID on each sticker and place it on each Project Table Card judged.
Judging Criteria

Entries are judged on a number of criteria that are weighted differently.

Creative Ability

1. Does the project show creative ability and originality in:
   a. the question(s) asked?
   b. the problem-solving approach?
   c. data analysis/interpretation?
   d. equipment used?
   e. design and/or construction of new equipment?

2. Creative research should support an investigation and help answer a question in an original way. Construction of equipment which involves the assembly of a kit cannot be considered to be creative unless some unusual approach or design was used.
Scientific Thought

1. Is the problem stated clearly and unambiguously?
2. Are clear objectives stated?
3. Was there a procedural plan for obtaining a solution?
4. Are all variables clearly recognized and defined?
5. If controls were necessary, did the student recognize their need and use them correctly?
6. Are there adequate data to support stated conclusions?
7. Are limitations recognized?
8. Is related research cited and understood?
9. Is further research warranted?
10. Does the solution present a significant improvement over previous alternatives?
11. Is the solution workable and/or economically feasible?
12. Was the solution tested under proposed conditions of use? (This may be difficult, but should be considered).

Thoroughness

1. Was the scope of the original intent met?
2. Are conclusions based on a single experiment or on replication?
3. Are project notes complete?
4. Is there a familiarity with and understanding of the scientific literature in the field?
5. Is there an awareness of other approaches?
6. How much time was spent on the project?
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Fair Judging Criteria contd.

Technical Skills

1. Does the student/team have the required skills (laboratory, computational, and/or design skills) to complete all of the work presented?
2. Where was the project completed? (Home, school, university, research facility?)
3. What assistance was given and by whom?

Neatness & Display

1. Are data clearly presented? Results? Presentations?
2. Are important project phases presented in an orderly manner?

Teamwork (Team Projects only)

1. Was each team member fully involved with the project?
2. Does the final work reflect the coordinated efforts of all members?
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Scoring Sheet

Please score as follows:

<table>
<thead>
<tr>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
<th>Superior</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

**CREATIVE ABILITY** (Individual 50%, Team 25%)
Consider novelty of theory and originality

**SCIENTIFIC THOUGHT** (Individual 30%, Team 25%)
Consider interpretation and analysis of data

**THOROUGHNESS** (Individual 15%, Team 12%)
Consider problem overview and content emptiness of project

**TECHNICAL SKILL** (Individual 15%, Team 12%)
Consider neatness, accuracy, and understanding of the subject matter

**NEATNESS AND DISPLAY** (Individual 10%, Team 10%)
Consider neatness, correct working, expression, and eye appeal

**TEAM EXHIBITS ONLY**
TEAM (Team projects only 16%)
Consider if the project was reasonably effort by each team member

Comments
Judge Process

Fair Judge Process

Score each project on its unique Project Scoring Sheet using the scale from 1 to 10: 1 = Lowest, 10 = Highest.

When all projects have been scored, turn in scoring sheets to be scanned and receive a summary report of your scoring.

There will be 3 judges in a group to judge the same 12-15 projects.

Each category will have 3 or 4 groups of judges (9 or 12 judges per category).

Each group of judges will need to arrive at consensus for their top 4 projects.

Each group will identify a representative to caucus within the category to arrive at consensus of the Top 6 projects in the category. For example, if there are 9 judges in a category (3 groups of 3 judges each), then 1 judge from each group will represent that group in the consensus-forming process.

Example:

If Senior Division – Animal Sciences has 30 Projects with 9 Category Judges assigned to them...

Round 1: 3 Judges per group = Total 3 groups of judges judging 10 projects each

  - Group 1 will judge projects 2001-2010
  - Group 2 will judge projects 2011-2020
  - Group 3 will judge projects 2021-2030

- Each group will arrive at consensus for their Top 3 projects & identify 1 representative to caucus with the representatives from the other groups
- Round 2: The representatives from each group will arrive at consensus for the category's Top 6 projects by re-visiting the projects selected
- Turn in the Top 6 projects
Fair Judges will determine 1st through 6th place of each category.

Blue Team Judges will receive a list of all 1st Place projects in their division and arrive at consensus to identify the 1st & 2nd Grand Awards in the Life Sciences and 1st & 2nd Grand Awards in the Physical Sciences divisions; then select the Best of Show Award from the 1st Grand Life Science & 1st Grand Physical Science. Senior division Blue Team Judges will also rank ALL their projects from best downwards (1 to 9 in Life Sciences and 1 to 8 in Physical Sciences).

Note: The project of the category that is awarded a grand prize, will move 2nd place up to 1st, 3rd up to 2nd, 4th up to 3rd, 5th up to 4th, and 6th up to 5th of that category.
Fair Awards

“Best of Show” Senior Division

1st Place Grand - Senior Division - Life Sciences
2nd Place Grand - Senior Division - Life Sciences

1st Place Grand - Senior Division - Physical Sciences
2nd Place Grand - Senior Division - Physical Sciences

“Best of Show” Junior Division

1st Place Grand - Junior Division - Life Sciences
2nd Place Grand - Junior Division - Life Sciences

1st Place Grand - Junior Division - Physical Sciences
2nd Place Grand - Junior Division - Physical Sciences

Senior & Junior Division Category Winners
1st Place
2nd Place
3rd Place
4th Place
Honorable Mention
Thank you to our title sponsor:
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The ExxonMobil Science and Engineering Fair
Hosted by The University of Texas at San Antonio

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