61st Annual Colorado Science and Engineering Fair (CSEF)

2016 Grand Awards Judging Guide

Lory Student Center, Fort Collins
Colorado State University
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CSEF Grand Awards Judging Guide (Rev 12/01/15)
CSEF Divisions: Projects may be from any field of science, engineering, mathematics, and computer science. The projects must represent the work of a single or a team of two-three students. For competition, projects will be grouped into the following Divisions by scholastic grade level:

- **Junior Division** (Grades 6-8), and
- **Senior Division** (Grades 9-12).

Only the Senior Division is eligible to participate in the International Science and Engineering Fair (ISEF).

DRAFT CSEF Categories: Finalists from the 13 Colorado Regional Science Fairs are offered 12 categories to compete in at the CSEF. These categories are offered in the Junior Division (6th-8th grade students) and Senior Division (9th-12th grade students). The categories are currently being updated to better coincide with the ISEF Category Descriptions. The CSEF does not have the same number of categories as the ISEF (20), but the CSEF has drafted the following updates which when finalized (minor tweaks) will be available on the Grand Awards Judging info page in January. Please read carefully.

The category in which an exhibit is entered is primarily the choice of the student or team at the direction of his/her sponsor or Regional Fair Director. Prior to the fair, the CSEF Scientific Review Committee (SRC) and/or the Grand Awards Judging Captains may re-categorize a project per the procedure outlined in the CSEF Policy Regarding Category Changes (see page 4). Individual students and teams may enter a project into any one of the following twelve (12) Content Categories:

**Animal Sciences:** Studies related to all aspects of non-human animals (including insects), animal life, animal life-cycles, animal health and medicine, animal behavior, and animal interactions with one another or their environment (i.e., structure, physiology, development and classification of animals; animal ecology; animal husbandry; nutrition and growth, genetics; systematics and evolution; entomology; ichthyology; ornithology; herpetology; cytology; histology; cellular physiology; etc.).

**Behavioral and Social Sciences:** Studies related to the thought processes and behavior of humans in their interactions with the environment as studied through observational and experimental methods (i.e., clinical and developmental psychology; cognitive psychology; physiological psychology; sociology; social psychology; etc.).

**Chemistry and Biochemistry:** Studies related to the chemical basis of processes occurring in living organisms, including the processes by which those substances enter into, or are formed in the organisms and react with each other and the environment (i.e., analytical biochemistry; general biochemistry; medicinal biochemistry; structural biochemistry; etc.) Studies related to the composition, structure, properties, and reactions of matter (i.e., analytical chemistry, computational chemistry; environmental chemistry; inorganic chemistry; materials chemistry; organic chemistry, physical chemistry; etc.).

**Earth and Space Sciences:** Studies related to the Earth systems and their evolution (i.e., atmospheric; climate science; geosciences; petrology; mineralogy; paleontology, etc.). Studies related to anything in the universe beyond the Earth (i.e., astronomy and cosmology; theoretical and computational astrophysics; etc.).

**Energy:** Studies related to biological and chemical processes of renewable energy sources, clean transport, and alternative fuels (i.e., alternative fuels; computational energy science; fossil fuel energy; fuel cells; and battery development; microbial fuel cells; solar materials; etc.). Studies related to renewable energy structures and processes including energy production and efficiency (i.e., hydro power; nuclear power; sustainable design; thermal power; wind; etc.).

**Engineering:** Studies related to electrical systems in which information is conveyed via signals and wave forms for purposes of enhancing communications, control and/or sensing (i.e., circuits; internet of things; microcontrollers; networking and data communication; optics; sensors; signal processing; etc.). Studies related to science and engineering that involves movement or structure. The movement can be by the apparatus or the movement can affect the apparatus (i.e., aerospace and aeronautical engineering; civil engineering; computational mechanics; control theory; ground vehicle systems; industrial engineering processing; mechanical engineering; naval systems; etc.). Studies related to the characteristics and uses of various materials with improvements to their design which may add to their advanced engineering
performance (i.e., biomaterials; ceramic and glass; composite materials; computation and theory; electronic, optical, and magnetic materials; nano materials; polymers; etc.). Studies related to the use of machine intelligence to reduce the reliance on human intervention (i.e., biomechanics; cognitive systems; robot kinematics; etc.). Studies related to the application of engineering principles and design concepts to medicine and biology for healthcare purposes including diagnosis, monitoring, and therapy (i.e., biomaterials and regenerative medicine; biomechanics; biomedical devices; biomedical imaging; synthetic biology; etc.).

**Environmental Sciences:** Studies related to the environment and its effect on organisms/systems, including investigations of biological processes such as growth and life span (i.e., bioremediation; land reclamation; pollution control; recycling and waste management; water resources management; etc.). Studies related to the engineering or development of processes or infrastructure to solve environmental problems in the supply of water, the disposal of waste, or the control of pollution (i.e., environmental effects on ecosystems; water science; ecology; air pollution and quality; soil contamination and quality; bioremediation; land reclamation; pollution control; recycling and waste management; water resources management; etc.).

**Mathematics and Computer Sciences:** Studies related to the measurement, properties, and relationships of quantities and sets, using numbers and symbols (i.e., algebra; analysis; combinatorics, graph theory and game theory; geometry and topology; number theory; probability and statistics; etc.). Studies related to the discipline and techniques of computer science as they relate to biological systems (i.e., computational biomodeling; computational evolutionary biology; computational neuroscience; computational pharmacology; etc.). Studies related to the development of software, information processes or methodologies to demonstrate, analyze, or control a process/solution (i.e., algorithms; cybersecurity; databases; programming languages; operating systems; control theory; machine learning; etc.).

**Medical and Health:** Studies related to the issues of human health and disease (i.e., disease detection and diagnosis; disease prevention; disease treatment and therapies; drug identification and testing; pre-clinical studies; etc.)

**Microbiology and Molecular Biology:** Studies related to microorganisms (i.e., antimicrobials and antibiotics; applied microbiology; bacteriology; environmental microbiology; microbial genetics; virology; etc.). Studies related to the structure, function, intracellular pathways, and formation of cells. Studies involve understanding life and cellular processes at the molecular level (i.e., cell physiology; genetics; immunology; molecular biology; neurobiology; etc.).

**Physics:** Studies related to the science of matter and energy and of the interactions between the two (i.e., atomic, molecular and optical physics; biological physics; computational physics; condensed matter and materials; instrumentation; magnetics, electromagnetics and plasmas; mechanics; nuclear and particle physics; optics, lasers and masers; quantum computation; theoretical; physics; etc.).

**Plant Sciences:** Studies related to plants and how they live, including structure, physiology, development, and classification (i.e., agronomy; growth and development; ecology; genetics/breeding; pathology; physiology; systematics and evolution; etc.).

**Team Projects:** Studies conducted by two or three students in any discipline.

**CSEF Policy on Category Changes:** The purpose of this policy is to facilitate proper categorization of projects entered into the CSEF and to allow for a process to move projects between categories, if required.

1. The Category descriptions used by the International Science and Engineering Fair (ISEF) will be used by the CSEF. If CSEF-designated categories do not coincide with those of ISEF, the appropriate combined descriptions will apply.

2. The CSEF Director will review the ISEF descriptions annually when the new *International Rules for Precollege Science Research: Guidelines for Science and Engineering Fairs* is available to ensure the descriptions used by the CSEF are appropriate. The Category/Division Policy will be updated as necessary to incorporate any changes made by the Society for Science and the Public to their categories.
3. The CSEF Director will communicate to Regional Fair Directors any changes to the CSEF categories. This information will also be communicated to the Judging Team Captains/Assistant Captains via the Grand Awards Judging Coordinator.

4. The Scientific Review Committee (SRC), as part of the normal project review process, will examine all projects for proper categorization. Projects that are not properly categorized will be recommended for re-categorized. The CSEF Director will communicate the re-categorization to the appropriate Regional Fair Director, the adult sponsor of the project, the student researcher, and the Grand Awards Judging Coordinator for approval.

5. After SRC review, the majority of project abstracts will be posted on the CSEF website at http://www.csef.colostate.edu/Judges.htm. Scroll down to the “yellow box” and click on the Abstract Database to view the students’ abstracts (no password required). All project abstracts will be posted on the website by March 11th, however, abstracts will be posted before this date so review can begin well before this date. Should the Category of a project come into question upon review of the abstract by a Judging Team Captain or by referral from the CSEF personnel, the appropriate Judging Captains (current Category Captain and proposed Category Captain) will review the projects by March 16th. March 16th is the final day for project moves. Only the Judging Team Captains may affect movement of a project to another category after the SRC review. Captains and Assistant Captains discuss possible moves between each other. Discipline scientists may be consulted with, if deemed necessary, by the Judging Team Captains. All such changes in categorization will be communicated to the Grand Awards Judging Coordinator and CSEF Director by the Abstract Gatekeeper or designee.

6. Once a Team Captain has identified project/projects for a possible move, you must contact the Captain of the “move to” category by email. All correspondence related to project moves must have a cc to Gwyneth Glissmann (Abstract Gatekeeper) at csef.gatekeeper@gmail.com, Nancy Glissmann (Grand Awards Judging Coordinator) at GrandAwardsCSEF@gmail.com, and Courtney Butler (Director) at Courtney.Butler@colostate.edu to ensure all proposed project moves are coordinated effectively.

7. The CSEF Director will communicate the re-categorization to the appropriate Regional Fair Director, adult sponsor of the project, and the student researcher for approval.

8. All category change recommendations must be approved by the student researcher and he/she has the right to decline the recommended move. In these cases, the project will stay in the original category.

9. Category placement is considered final on April 1st.

**CSEF Student Project Rules**

**Pre-Judging Activities:** Each project in the CSEF must conform to the CSEF Rules, which includes all the rules of the International Rules for Precollege Science Research: Guidelines for Science and Engineering Fairs with a few modifications. The most significant in terms of judging is that the CSEF does not offer as many Categories as the ISEF, and more grades are eligible to participate. The CSEF accepts entries from participants in grades 6-12. All student finalists at CSEF are top award winners from the 13 affiliated Regional Science Fairs in Colorado (http://www.csef.colostate.edu/Regional_Science_Fairs.htm).

There are very stringent ISEF rules, documentation, and adult/scientific supervision requirements for all projects, but particularly those using human subjects, non-human vertebrate animals, pathogenic agents and controlled substances, recombinant DNA, human and animal tissue, and hazardous substances or devices.

As a CSEF Grand Awards Judge, it is NOT your responsibility to ensure that the students have met all the ISEF/CSEF rules and requirements. This is the role of the two CSEF Committees that review project registration documents prior to the fair and review the exhibits/displays once they have arrived onsite at the CSEF.

The information provided below is to give you a basic understanding of the roles of the Scientific Review Committee and the Display and Safety Committee:

CSEF Grand Awards Judging Guide (Rev 12/01/15)
• **Scientific Review Committee (SRC):** The SRC at the Regional Fair or the local fair reviews the research plan of every project at the time of the local/regional fairs and some projects prior to experimentation. The CSEF SRC reviews the research plans of each exhibit prior to the CSEF. Any projects without the required signatures and forms will not be approved for exhibit in the CSEF.

• **Display and Safety Committee:** At the CSEF, the Display and Safety Committee and the CSEF SRC will check and verify each exhibit for compliance with rules and safety. During the set-up time, participants must stay at their project until the SRC and Display Committees sign-off is completed.

Exhibits not conforming must be corrected or removed before judging begins. Decisions of these committees and the CSEF Board of Directors are final. However, if during judging you have any concerns or questions regarding a particular project’s conformance to the ISEF/CSEF rules, please notify the Grand Awards Judging Coordinator immediately.

**Student’s Research Notebook and Required ISEF/CSEF Forms:** Each project must display, for judging, a Research Notebook. The ISEF/CSEF forms that you will see in the project notebook may include any or all of the following forms, depending on the type of project:

- CSEF Abstract (250 words maximum-one page),
- Checklist for Adult Sponsor (Form 1),
- Intel ISEF Student Checklist (Form 1A),
- Research Plan,
- Intel ISEF Approval Form (Form 1B),
- Regulated Research Institutional/Industrial Setting (Form 1C),
- Qualified Scientist (Form 2),
- Risk Assessment (Form 3),
- Designated Supervisor Form,
- Human Subjects (Form 4),
- Informed Consent Form(s),
- Nonhuman Vertebrate Animal (Form 5A/5B),
- Potentially Hazardous Animal Tissue (Form 6B), and
- Continuation Projects (Form 7).

To view all these forms, please go to [http://www.csef.colostate.edu/GAJudges/ISEF_Forms.pdf](http://www.csef.colostate.edu/GAJudges/ISEF_Forms.pdf). Because of the time constraints on the day of judging, taking the time to view these forms beforehand will assist in the judging process of the projects in your category. Judges shall **NOT** write in or remove, for any reason, a student’s research notebook or Project Display.

**CSEF Animal Research Guidelines:** The legitimate use of animals in science fair research projects presupposes two postulates: first, the use of animals for learning is morally acceptable; and second, that humans have a responsibility to grant the animals used with every humane consideration for their comfort and well-being. The proper care and use of animals is a prime concern that cannot be ignored.

The use of Protista and other invertebrates is to be encouraged for most research involving animals. Their wide variety and the feasibility of using larger numbers than is usually possible with vertebrates make them especially suitable. This is not to say that the use of vertebrate animals should be prohibited. Certain forms of investigation can only be done with vertebrates. Under proper supervision, students should be permitted to use vertebrates in research.

Research must be conducted with a respect for life and an appreciation of humane considerations that must be afforded all animals. Surgical procedures in vertebrate animals will only be done within academic, hospital, clinical, or research facilities to ensure proper equipment and supervision. This is intended specifically, to prohibit such procedures at home.
To provide humane treatment of animals, an animal care supervisor who is knowledgeable in the proper care and handling of laboratory animals must assume primary responsibility for the conditions under which the animals are maintained. Vertebrate Animal Forms must accompany the CSEF registration verifying that these procedures have been followed.

Parents and Adult Sponsors: Parents and adult sponsors are coaches and supervisors for the duration of the student’s project. They are to teach the “how-to”, but the student must do the work. The ISEF/CSEF forms in the project notebook provide information on mentors or adult sponsors a student finalist may have been working with. Not all students use mentors or adult sponsors for their projects. They may consult with a professional, but that person does not provide ongoing mentorship.

CSEF Rules and Student Handbook
If you are interested in more detailed information about the student rules, you may review or download copies of the student “Forms, Rules, and Guidelines” at the CSEF website: http://www.csef.colostate.edu/ISEF_Paperwork_Guidelines.htm

Grand Awards Judges’ Conflict of Interest Policy
As a Grand Awards Judge, when you submit your registration either online or by mail, you agree to the following policy:

I hereby acknowledge that by submitting this registration, I agree to serve as a Grand Awards Judge for the 2016 Colorado Science and Engineering Fair (CSEF). I agree to act in a positive and ethical manner in which each student encountered is treated fairly and respectfully. I agree to disclose all conflicts, potential conflicts and perceived conflicts of interest resulting from direct competitive, collaborative or any other relationships with any of the students and to recuse myself from judging in such circumstances. Some examples of a conflict of interest are (but not limited to):

- mentoring a student and then judging the student’s project,
- judging a project at one of the Colorado Regional Science Fairs (http://www.csef.colostate.edu/Regional_Science_Fairs.htm) and judging the same project at the CSEF,
- being a captain/judge in the same category and division you were in at a regional fair, or
- being a sponsor, teacher, or relative to a student that you would be judging.

I agree to notify CSEF’s Grand Awards Judging Coordinator immediately if I become aware of any circumstance that would potentially compromise my ability to attend the event or evaluate finalists’ projects. (If you have any questions regarding this Conflict of Interest Policy, please contact Nancy Gliessmann at GrandAwardsCSEF@gmail.com.)

Grand Awards Judging Guidelines/Criteria
The following evaluation criteria will be used for Grand Awards Judging at the 2016 CSEF. These guidelines and criteria align with the Intel International Science and Engineering Fair (ISEF). These guidelines/criteria use different criteria for science and engineering, math, and computer science. As shown below, both criteria have five sections as well as scoring for each section. Each section includes key items to consider for evaluation both before and after the interview. Students are encouraged to design their posters in a clear and informative manner to allow pre-interview evaluation and to enable the interview to become an in-depth discussion. Judges should examine the student notebook and, if present, any special forms such as Form 1C (Regulated Research Institution/Industrial Setting) and Form 2 (Qualified Scientist). Considerable emphasis is placed on two areas: Creativity and Presentation, especially the Interview section, and are discussed below:
Creativity: A creative project demonstrates imagination and inventiveness. Such projects often offer different perspective that opens up new possibilities or new alternatives. Judges should place emphasis on research outcomes in evaluating creativity.

Presentation and Interview: The interview provides the opportunity to interact with the finalists and evaluate their understanding of the project’s basic science, interpretation, and limitations of the results and conclusions.

- If the project was done at a research or industrial facility, the judge should determine the degree of independence of the finalist in conducting the project, which is documented on Form 1C and Form 2.
- If the project was completed at home or in a school laboratory, the judge should determine if the finalists received any mentoring or professional guidance.
- If the project is a multi-year effort, the interview should focus ONLY on the current year’s work. Judges should review the project’s abstract and Form 7 (Intel ISEF Continuation Projects) to clarify what progress was completed for this year’s science fair.
- Please note that both team and individual projects are judged together, and projects should be judged only on the basis of their quality. However, all team members should demonstrate significant contributions to the project and an understanding of the project.

Judging Criteria for Science Projects

1. Research Question (10 points): clear and focused purpose, identifies contribution to field study, and testable using scientific methods.
2. Design and Methodology (15 points): well-designed plan and data collection methods, and variables and controls defined, appropriate, and complete.
3. Execution: Data Collection, Analysis, and Interpretation (20 points): systematic data collection and analysis, reproducibility of results, appropriate application of mathematical and statistical methods, sufficient data collected to support interpretation and conclusions.
4. Creativity (20 points): project demonstrates significant creativity in one or more of the above criteria.
5. Presentation (35 total points): a. Poster (10 points): logical organization of material, clarity of graphics and legends, and supporting documentation displayed; and b. Interview (25 points): 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, and for team projects, contributions to the project and understanding of project by all members.

Judging Criteria for Engineering, Math, & Computer Science Projects

1. Research Problem (10 points): description of practical need or problem to be solved, definition of criteria for proposed solution, explanation of constraints.
2. Design and Methodology (15 points): exploration of alternatives to answer need or problem, identification of a solution, development of a prototype/model.
3. Execution: Construction and Testing (20 points): prototype demonstrates intended design, prototype has been tested in multiple conditions/trials, and prototype demonstrates skill and completeness.
4. Creativity (20 points): project demonstrates significant creativity in one or more of the above criteria.
5. Presentation (35 total points): a. Poster (10 points): logical organization of material, clarity of graphics and legends, and supporting documentation displayed; and b. Interview (25 points): 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, and for team projects, contributions to the project and understanding of project by all members.

The above-mentioned criteria highlighted in blue shows the differences between the judging criteria for science projects and the engineering, math, and computer science projects.
Rating Card: Two-sided blank rating cards for each project will be provided for each judge. The same rating card will be used for individual and team projects and will have the correct weighting for each criteria pre-printed on the card. A sample rating card is on page 14 of this guidebook.

The “Judge’s Comment Card - STUDENT COPY” portion is reserved for Judge’s comments to the students. This portion of the form will provide judges with the additional mechanism beyond the interview to get their comments to the students. Each judge needs to take the time to give feedback to every project.

When you provide comments on the Judge’s Comment Card, please use the pre-printed project name labels provided, or complete the student’s name, division, and exhibit number with your comments. Remember to keep your comments constructive and encouraging and do not give the students any information on the points or ratings you awarded. Also, please DO NOT give the comment cards directly to the students or leave them at the students’ displays. They will be distributed after judging has taken place. Please return ALL comment cards to the Judging Coordinator. The Judging Coordinator will separate and shred the rating cards from the comment cards and distribute them to the appropriate students and their projects.

Judging Recommendations and Protocol

- Students may have worked on a project for more than a year. However, for the purpose of judging, only research that has been conducted since the last CSEF is to be evaluated. Although previous work is important, it is not to be considered as part of this year’s CSEF project. (Form 7 confirms and is used for continuation projects.)
- The detail and accuracy of their data and whether their procedures were used in the best possible manner is critical in applicable judging of the project. Be careful not to include irrelevant and inappropriate criteria such as school size, access to well-equipped laboratories, student gender, race, physical disabilities, access to well-known mentors, etc. in your evaluation of the project. The project and individual or team’s knowledge of the project must stand on its own merit.
- When research is conducted in an industrial or institutional setting, the student is required to include ISEF Form 1C with the project documentation. Judges should review in detail supervisor’s comments on Form 1C when evaluating research conducted in an industrial or institutional setting.
- Look for evidence of laboratory, field, or theoretical work, and not just library research.
- Compare projects ONLY with those competing in the CSEF and not with projects seen in other competitions or scholastic events.
- Judges should keep in mind that the CSEF is not only a competition, but an educational and motivating experience for students. The high point for the CSEF experience for many of the students is the judging interviews. For this reason, judges should be encouraging when asking questions, offering suggestions, or giving constructive criticism. It is important for judges to consider all projects at the CSEF as important. Off-hand negative remarks or opinions about projects around the students at the CSEF may negatively affect students, so please keep all negative comments to the privacy of the judging room. All students competing at the CSEF have made it to this level through their Regional Science Fair competition and deserve encouragement for the effort they have made and the time they have spent on their projects.

Confidentiality of the Judging Process: DO NOT discuss the projects in hallways, restrooms, restaurants, CSU lobbies, or elsewhere as students or adult chaperons may overhear your comments. Please understand that all notes that are taken and discussions you have with fellow judges are considered confidential. All results of the judging process are considered confidential until they are announced at Friday night’s Awards Ceremony. If you have an opportunity to speak with any of the students you have judged after the judging has been completed, the conversations and notes of your team must still be considered confidential and not to be discussed with the students. However, it is totally acceptable for you to give your own personal encouragement and constructive feedback to a student or team, but not information that was discussed with your category judging team discussions.
**Student Notebooks and Display Articles:** No part of a student or team’s display or notebooks may be removed by a judge from their project exhibit. In addition, judges are **NOT** to write on any display or in their notebooks.

**Schedule:** Even though the judging schedule is hectic, please make every effort to not rush a student or team through your interview.

**CSEF Awards**

The Special Awards Program and the CSEF Grand Awards Program operate very differently.

**Special Awards and Scholarships:** In this program, over 50 professional, scientific, engineering, and federal organizations send their own judges and use their own criteria to select special award winners. The awards range from college scholarships, cash awards, internships, equipment, plaques, books, medals, and trophies to subscriptions and certificates. Some companies also give awards and recognition to the winner’s teachers and schools.

The Special Awards judging occurs simultaneously with the Grand Awards judging. The Special Awards judges will be asked to defer access to the projects and the students for interviews to the Grand Awards Judges. However, all judges are asked to cooperate with one another to ensure that all judging is accomplished in the allotted time.

**Grand Awards Judging:** Individual and team projects will compete against each other in one of the 12 categories for the following awards. Cash awards are given per project (team winners will split the award) and all non-cash awards are given per student (each team member will receive a medal, certificate, plaque or ribbon). A category judging team may decide not to award all 4 places or any honorable mentions in a category, but they must not skip over any award places (i.e.: if they want to give a 2nd place award, they must also award a 1st place; if they want to award any honorable mentions, they must award a 4th place; etc.).

They are as follows:
- **1st Place Junior and Senior Division Category Award** winners will receive $200, a blue ribbon medal, certificate, and be eligible for the Best-of-Fair (All Fair) Project Award.
- **2nd Place Junior and Senior Division Category Award** winners will receive $100, a red ribbon medal, and certificate.
- **3rd Place Junior and Senior Division Category Award** winners will receive $50, a white ribbon medal, and certificate.
- **4th Place Junior and Senior Division Category Award** winners will receive $25 and a certificate.
- **Honorable Mention Awards** may be awarded to 20% of the number of entrants (individual and team projects) in each category. The number of honorable mention awards is left to the discretion of the grand awards judging teams. Honorable Mention Award winners will receive an Honorable Mention ribbon and certificate.
- **1st Place Junior Division All-Fair CSEF Project Award** is $200 and a plaque.
- **2nd Place Junior Division All-Fair CSEF Project Award** is $100 and a plaque.
- **3rd Place Junior Division All-Fair CSEF Project Awards** is $50 and a plaque.
- **First Place Senior Division All-Fair CSEF Project Award** is an expense paid trip to compete at the Intel International Science and Engineering Fair and a plaque. (Expenses covered are: airfare, hotel, ground transportation as needed, meal costs of $150, registration, and trading pins).
- **Second Place Senior Division All-Fair CSEF Project Award** is an expense paid trip to compete at the Intel International Science and Engineering Fair and a plaque. (Expenses covered are: airfare, hotel, ground transportation as needed, meal costs of $150, registration, and trading pins).
• Third Place Senior Division All-Fair CSEF Project Award is an expense paid trip to compete at the Intel International Science and Engineering Fair and a plaque. (Expenses covered are: airfare, hotel, ground transportation as needed, meal costs of $150, registration, and trading pins).

Honorable Mention awards may be awarded for up to approximately 20% of the number of entrants (individual and team projects) in each category. The number of Honorable Mention awards is left to the discretion of the Grand Awards Judging Teams. Honorable mention awards for individual or team projects can only be given if 1st, 2nd, and 3rd, and 4th place have all been awarded in a category.

No ties are allowed for the 1st, 2nd, or 3rd, or 4th place awards. If there are any questions on awards to be given, please see the Judging Coordinator for resolution.

**Best-of-Fair (All Fair) Grand Awards:** The Best-of-Fair (All-Fair) Grand Awards are selected from 1st place Grand Awards from each category and for both junior and senior divisions. Overall Best-of-Fair 1st, 2nd, and 3rd place projects are chosen for junior division and an additional 4th place (at the discretion of the Board) is selected for the senior division. The awards are as follows:

**CSEF Grand Awards Judging Process**

As a Grand Awards Judge, you are expected to use the Judging Evaluation Guidelines/Criteria, specified herein in the selection process of awards. A Preliminary Judging Team assignment list will be provided prior to the actual CSEF. You are assigned to a team based on the Judge’s Information form you have submitted either online at the CSEF website or mailed to the Judging Coordinator. As more information is received regarding the numbers of projects in each category and division, and as judge cancellations, additions, and/or substitutions occur, a Final Judging Team assignment list will be available at the Judge’s Check-In.

Please make sure you have read and are familiar with all the materials on judging that are supplied to you. This process is suggested as it is not possible to set up specific, finite criteria for judging. The judging of exhibits is basically the process of determining the merits of each exhibit as compared with other competitive exhibits in the respective category, or in the case of All-Fair comparing all 1st place projects in their respective divisions. Judging is done on a relative and not an absolute basis. In establishing a “frame of reference” for evaluating exhibits, bear in mind that these are middle school and high school students and not Ph.D. candidates, professional scientists, or working as a professional. Consider the level of study such as math, science, or other relevant subjects of the individual or team that you are judging. Judges should not be concerned with minor errors in a project if the basic objectives and intent are clearly evident. While judging, the various elements and relative weights of the elements as shown on the rating card should be kept in mind. The Judging Evaluation Guidelines/Criteria are weights that have been adopted from the International Science and Engineering Fair (ISEF).

**Judging Procedure:** The following procedure is a guide to assist you in judging. Each judge should make his/her judging appraisal first, however, to establish the composite judgment of multiple judging teams in a category, some give and take of initial individual and team assessments must be expected. In discussing differences in selection, the basic merits of each exhibit must be the primary consideration.

The Category Team Captain is responsible for coordinating times for the team members to meet back for discussion, facilitating productive discussion and assuring that **ALL** judging team members’ comments are considered equally in the decisionmaking process, ensuring that **ALL** judges understand the necessity for complete confidentiality of team discussions regarding all finalists’ projects both during and after the fair, making sure that **ALL** students’ projects (individual or team) have been interviewed and evaluated at least three times, and finalists’ awards are provided to the Grand Awards Judging Coordinator by 5:30 p.m. If any unresolvable issues occur, please notify the Judging Coordinator immediately to assist with resolution.

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Judging Schedule:
1. Each judging team will be assigned a table for the Judges’ Briefing, luncheon, and judging process which will afford opportunities to meet and establish and discuss general strategy and schedule for the team prior to entering the exhibit area. The LSC Theater is to be used for the judging teams to hold conferences throughout the day. To maintain confidentiality, do not use any other area in the LSC to discuss judging, including with fair officials located in public areas.
2. After instructions from the Category Team Captain, you will place the pre-printed project ID labels provided for your assigned projects with the Student Name(s), Exhibit No., and Exhibit Title on the Judges’ Personal Rating Cards. A supply of cards will be available at Check-In in the LSC Theater.
3. At 11:30 a.m., the students will exit the exhibit area and judges will be allowed to enter and view the projects without the students present. To form some basis for judging, it is important that each judge take this opportunity to evaluate the exhibits to form a general “frame-of-reference” for their assigned exhibits. This is also the only opportunity you will have to look at the project research reports and displays in some detail without the students present.
4. The students will re-enter the exhibit area at 1:30 p.m. and will be at their exhibits for interviews. Interviews should be conducted by each judge individually, whenever possible.
5. **ALL** individuals and teams **must** be interviewed by at least three Grand Awards Judges (or all judges on the team if there are less than three total projects), and as many members of the Judging Team as possible should interview each individual and team project. Please give all projects equal time (10 minutes is recommended) and, in particular, do not abbreviate interviews for projects that seem less competitive. Personal contact between students and judges is important both for an objective and complete evaluation of the student or team’s knowledge of the project and the student or teams’ learning experience. This is an educational process as well as a competition. For each project, judges put a blue dot sticker (provided by the Coordinator) on each project number located in front of the project for each interview.
6. The Judges’ Rating Cards and method of rating are the personal and confidential information for each individual judge (see page 14 for an example of the Judge’s Rating Card).
7. The Judges’ Comment Card - STUDENT’S COPY (right-side of Judges’ Rating Card) is used to pass on constructive comments to the students, but **must** be returned to the Judging Coordinator (and not given directly to the student) for distribution to the students. For the students, feedback from the Judges is a **very important** part of the process of the CSEF competition. **ALL** Grand Awards Judges are responsible for making sure that each interview you have with a finalist receives comments from you. Your comments may provide a possible future direction of a project or areas of study that might be very helpful to students.
8. As soon as individual judge’s ratings are completed, exchange information within the team so that the order of placement of the exhibits can be established. The Team Captain is responsible for setting the judging and discussion schedule for the team members to meet the deadline of 5:30 for the selection of the 1st, 2nd, 3rd, and 4th place and Honorable Mention awards for each Category and Division.
   a. In the case of where multiple sub-teams (Teams A and B) exist for a Category, the Team Captain and Assistant Captain need to coordinate the team’s procedure and schedule to facilitate selection of the Category winners. Assistant Captains are required to come early, but are not required to judge All-Fair. As soon as the top three or four exhibits are selected by multiple sub-teams, the information should be exchanged with the other sub-team in the Category so that further comparison and interviews may be completed. The sub-teams should then meet for the final award selection. From these actions, the three project winners for 1st, 2nd, 3rd, 4th place and Honorable Mention awards for each content Category and each Division are selected.
   b. If **additional** interviews are required to facilitate team discussions, care shall be used to **avoid** making obvious which exhibits are being considered for the awards while students are in the exhibit area. Please be aware that students will only be available for interviews until 5:00 p.m.
9. The Judging Coordinator will provide the Awards Results Form to each Team Captain only. The Captain of each Category team is **required to sign off** on the Award Results Form before turning it in to the Judging Coordinator. Each Team Captain will submit the Award Results Form to the Judging Coordinator in the LSC Theater by 5:30 p.m. Remember that no ties are allowed for 1st, 2nd, 3rd, and 4th place and Honorable Mention Awards may only be given if 1st, 2nd, 3rd, and 4th place Awards have been given.

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a. After submitting the Category award results, the Team Captain or designated All-Fair Judging Team Representative for each Category and each Division will assemble in the Grand Ballroom and await additional instructions from the Senior or Junior Division All-Fair Captain (depending on which division you are judging in). The 1st place project winners from all 12 Content Categories from each Division will then be submitted for the All-Fair judging which starts at 5:45 p.m.

10. The All-Fair judging teams will determine the 1st, 2nd, and 3rd place Best-of-Fair projects for the Junior and Senior Divisions per the All-Fair Judging Instructions. A Senior Division All-Fair 4th Place may be awarded at the discretion of the Board of Directors.

**All-Fair Judging Instructions:**

1. In determining All-Fair winners, only the 1st place project Category winners are eligible. All of the Categories are to be given equal consideration for the All-Fair Award.

2. Each Category Team Captain shall be required to make a presentation to the rest of the All-Fair Judging Team members on the 1st place winner of each of their respective Category and answer questions from the rest of the All-Fair Judging Team (Animal Sciences, Behavioral and Social Sciences, Chemistry, Earth and Space Sciences, Energy and Transportation, Engineering, Environmental Sciences, Mathematics and Computer Sciences, Medicine and Health, Microbiology, Physics, and Plant Sciences).

3. The All-Fair judging teams shall then examine the exhibits as a group in the exhibit area. Students should be out of the exhibit area after 5:00 p.m., but if they are not please notify one of the CSEF officials so that we can ensure the student(s) departure from the exhibit area. The selection of the All-Fair winners shall be completed by 8:30 p.m. The All-Fair winners shall be recorded on a Winner’s List form and this, plus the Category winner’s lists shall be turned in by the All-Fair Team Captains to the Judging Coordinator in the Cherokee Park Room. The Captain of each All-Fair Judging Team is **required to sign off** on the Award Results Sheet before submittal to the Judging Coordinator.

**Awards Ceremony and Confidentiality**

No judge shall disclose the name of any winner to anyone except persons authorized to receive such information. This restriction is made so that the winners’ names will not be known until announced at the CSEF Friday's Awards Ceremony. All judges are encouraged to attend the Awards Ceremony. For more information on location and time, please see the CSEF 3-Day Schedule.
Exhibit No.: ____________________________________________

Exhibit Title: ____________________________________________

100 Maximum Total Possible Points

1. Research Question/Research Problem* (10 Points):

2. Design & Methodology/Engineering, Math, and Computer Science* (15 Points):

3. Execution: Data Collection, Analysis, & Interpretation/Execution: Construction & Testing* (20 points):

4. Creativity (20 points)*:

5. Presentation (35 total points) Poster (10 pts) Interview (25 pts)*:

*See Judging Guidelines/Criteria

Possible Contender: Total Points:

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