2022 SARSEF Regional Fair Judging Guidebook

SARSEF

Every child. Thinking critically. Solving problems.

Virtualfair.sarsef.org
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Welcome and Thank You

Dear 2022 Judges,

Despite everything happening - and not happening – in the past two years, the students you are about to meet worked hard to do science or engineering projects.

Now, you get to be the one to make them feel like the scientists and engineers they are. You get to tell them that their work is important and that they have potential. That they are smart and creative enough to pursue science and engineering. What an incredible job you have.

At the SARSEF Fair, you’ll see some projects that need some work, and some that are outstanding. Either way and in between, there are students behind those projects that deserve encouragement, and many deserve the awards you will help us give out through the fair.

Some students will walk away with the first award they’ve ever received. Others will receive scholarships that will increase their chances of attending college.

And none of this could happen without you.

As we kick off our first hybrid Regional Science and Engineering Fair, please remember that we are all at the mercy of technology. We are all trying our best to do good for students. Have patience with others and have patience with yourself. Your stress level can impact a student’s stress level, so try to relax and enjoy hearing about the projects. The students may need to hear that too.

Remember to be kind and to encourage every student. It means the world to them.

Join us for Happy Hour to show our appreciation on the following dates:

Tuesday, March 1 | 4:30p-6:30p | Culinary Dropout | 2543 E Grant Rd, Tucson, AZ 85716

Wednesday, March 2 | 4:00p-6:00p | Zinburger | 1865 E River Rd, Tucson, AZ 85718

Thursday, March 3 | 4:30p-6:30p | Borderlands Brewing Company Patio | 119 E Toole Ave, Tucson, AZ 85701

Also, continue to support and cheer our students on by attending the Community STEM Expo in conjunction with the Awards Ceremonies on March 5th at the Georges DeMeester Outdoor Performance Center in Reid Park from 9a-3p.

Sincerely,

Liz Bowman, Judging Chair, SARSEF
About SARSEF

Our Past
SARSEF is a 501(c)(3) organization with a rich history in Arizona. Our mission is creating the next generation of critical thinkers and problem solvers through science and engineering research. SARSEF encourages ALL citizens to make decisions based on data and form conclusions based on evidence.

Formed in 1955 to encourage the next generation of scientists and engineers, SARSEF has grown from a modest event with 100 research projects to directly impacting 90,887 students through our programming in a single year. SARSEF's year-round programs culminate with the top research projects advancing for further consideration by YOU, the Judges!

Our Future
According to the U.S. Bureau of Labor Statistics, STEM-related occupations will grow to more than 11.9 million jobs over the 2020-30 decade. In addition to the strong technical skills necessary for STEM fields, employers acknowledge the advantages of coupling those skills with the ability to make logical decisions through problem solving and critical thinking. SARSEF knows, students who learn to consider problems in different ways and explain a solution will be well-prepared for educational and later career success. And YOU are making that happen by generously contributing your time and expertise. For example, 83% of female students stated that participating in SARSEF made them consider a STEM career. The need for STEM professionals is skyrocketing. And since entering a STEM-related field eventually also means a higher-than-average salary, this increased interest is not only good for each child, but long-term for our community. Together, we will help shape our future workforce and community leaders!

Our Present
SARSEF has focused on reaching more broadly into Title 1 (low income) and rural schools to ensure all students are exposed to higher level critical thinking, problem solving and STEM learning. This past year, SARSEF staff engaged students both in-person and virtually across Arizona to teach and meet the needs of teachers, parents and students. A total of 1,099 projects were entered, representing the work of 2,853 students in the 2021 Fair. 70% of the students who participated came from a Title 1 school, 55% of participants were female, 1.7% identify as non-binary, and 71% qualify for free & reduced meals.

At last year’s fair, 463 grand awards and 458 sponsored awards were given out. In total, 900+ checks were given out to students of all ages for a total of $117,809 in scholarships and award money with over 3,105 views on our live Awards stream.

But we couldn’t do all of this alone. Last fiscal year, 303 judge roles were filled and approximately 80 non-judge volunteers engaged in the fair. With your help, we can help students think critically and solve problems through science and engineering and build a brighter future.
SARSEF Programs

- The SARSEF in-school and out-of-school Programs directly teach critical thinking and problem solving through research, impacting 53,990 students last year as well as teachers.

- S.T.A.R. Outreach Lab is a partnership between SARSEF and the University of Arizona, giving high school students the resources and mentorship they need to conduct their research.

- ACES (Applied Career Exploration in Science) Camp is a 4-day summer camp for 50 middle school girls designed to expose them to a wide variety of careers, provide a path to potential success, and spark their interest in high education in the STEM fields. ACES stresses teamwork, use of technology, and hands-on learning, while giving our students a feel for the college experience at a critical time in their lives.

- Arizona STEM Adventure is an annual event, giving over a thousand 4th-8th grade students a glimpse into the world of STEM research. STEM professionals from the community share their world to motivate children to complete a research project of their own. Professional Development provides 50 teachers with best practices in guiding their students through the research process, over $100 in materials. This year, STEM Adventure was virtual, providing kits with supplies for 12 different science activities and a day of exploring science in their community LIVE via Zoom to 1,549 students.

- Racing the Sun is a year-long program that challenges high school teams to design, build, and race solar-powered go-karts. Students must solve real-world problems, applying physics, engineering, and energy along the way. They are challenged to develop leadership skills as the ability to collaborate. The entire project culminates in Race Day in April, where all Arizona teams come together to race their karts.

- SARSEF Science and Engineering Fair enters its 68th year with PreK-12 students completing projects, conducting research requiring critical thinking and problem solving. The top students advance to this weeklong celebration of their achievements, competing for over $100,000 in prizes and an opportunity to compete at the International Science and Engineering Fair.
Your Role as a Judge

The role of a science fair judge is challenging, but it is a very rewarding and worthwhile effort. As a judge, you are given the unique opportunity to impact the lives of some very talented young people. Consider this: For many of these students, you may be the first professional they have ever met who is engaged in a science or engineering job for a living. You are an ambassador for your profession. You may very well influence their career choices.

- **Inspire**: Take care in what you say and do, as you are an example of the professionals that are involved in science, engineering and technology in our community! You are seen as someone with expertise and as a leader in the community. Show them you are someone to emulate. Be a role model.

- **Encourage**: The goal is to motivate and encourage students of all grade levels to continue in the science, engineering and technology fields. Positive and constructive comments are essential. At no time should a judge criticize a project or a student — however, suggestions are helpful and encouraged when kindly offered.

- **Evaluate**: Score the areas of the project per the judging criteria (see page 12), and based upon the grade level. The areas involved include:
  
  - Grades K-5: Curious investigation, statement of the problem and question, appropriate procedures, organization, as well as learning experience.
  
  - Grades 6-8: Creative ability, scientific thought/engineering goals, thoroughness, skill level (tools/techniques), and clarity (can the process be followed?)
  
  - Grades 9-12: Creativity/ingenuity, scientific thought, thoroughness, skill, clarity. High school students should be conducting a thorough literature review, and an appropriate statistical analysis of data, or describing a sound engineering goal.

Ethics

- Ideally, judges will not sign up for a category of grade level where a student or a project may already be known — however, it may come as a surprise. If you become aware of a conflict of interest please let Liz Bowman (eabowman88@gmail.com; 520-343-8651) know right away. Any judge who knows a student personally — and has any indication that this knowledge may affect a decision (either positively or negatively) — should recuse him or herself from scoring or interviewing that student.

- At no time should personal agendas or competing organization’s agendas be a factor in any judge’s decision.

- All decisions should be fairly made without discrimination of any kind for race, gender, class, creed or affiliation.
Schedule at a Glance

Online:

- **Saturday, February 26:** Virtual exhibit hall goes live at Noon
- **Monday, February 28:** Elementary School judging and interviews
  - Judging 11:00a-4:00p
- **Tuesday, March 1:** Middle School judging and interviews
  - Judging 8:00a-1:00p
- **Wednesday, March 2:** High School judging and interviews
  - 8:00a-12:00p Animal Science, Biochemical Science and Bioengineering, Cellular and Molecular Biology
  - 10:00a-3:00p Behavioral and Social Science, Earth and Environmental Science
  - 12:00p-4:00p Chemical and Material Science, Electrical and Mechanical Engineering
- **Thursday, March 3:** High School judging and interviews
  - 8:00a-12:00p Energy and Environmental Engineering, Microbiology
  - 10:00a-3:00p Health and Biomedical Science, Plant Science
  - 12:00p-4:00p Physics, Astronomy, and Mathematics, Robotics and Computer Science

In-person at Reid Park’s Georges DeMeester Outdoor Performance Center:

- **Saturday, March 5:** Awards Ceremonies and Community STEM Expo
  - STEM Expo 9:00a-3:00p
  - Elementary School Grand Awards 10:00a
  - Sponsored Awards 12:00p
  - Middle and High School Grand Awards, Top Awards 3:00p
Procedure for Judging

Judge Trainings

We will hold online training sessions for judges regarding the virtual judging process. We hope that the session will give you the information you need to be comfortable and confident during Fair Week.

Pick one:
- Tuesday, February 22nd 5:00pm
- Wednesday, February 23rd 8:00am
- Thursday, February 24th 5:00pm

Judging begins Saturday, February 26th

The virtual SARSEF Science and Engineering Fair project floor goes live at Noon on Saturday, February 26 at virtualfair.sarsef.org! At that time, you will be able to begin reviewing projects at your leisure until your assigned judging date.

When the project floor opens, you will receive an email announcement that includes the following information:
- The list of projects you will be judging
- The name and contact information of your Team Leader who can assist you with any questions you might have as you review projects
- A judging rubric for your reference
- A Zoom link for your day of judging

From 1:00 – 3:00pm that day, SARSEF staff will hold office hours on Zoom in case you have any general questions.
ELEMENTARY SCHOOL JUDGING
Monday, February 28, 2022, 11:00am – 4:00pm

Project Review before Caucus
Review and score your assigned projects before caucus on your own time once the Project Floor opens on Saturday, February 27 before caucus. If you have time, review other projects not assigned to you in your category to get to know all projects in your category.

Caucus
At 11:00am. on Monday, 2/28, click on the link above that corresponds to your judging team to enter the appropriate Zoom Meeting. When prompted to name yourself, please put “Judge [team name] [first name]” to help the Host identify your role.

If you enter the meeting without being prompted to name yourself, you can always change your name as soon as you enter the room, by clicking on “Participants,” hover over your name, click on “more,” then click on “Rename.”

How to rename yourself on Zoom
Step 1:

Step 2:

When you enter Zoom, rename yourself as “Judge [team name] [first name].”

The Host will assign you to your Team’s breakout room. Click “enter” on the popup to go to that room. You may also enter the room yourself by clicking “Breakout Rooms” at the bottom and “Join” next to the room with your corresponding team name. From 11:00-12:30, you will caucus and decide winners for the Grand Awards in your grade/category.

Once your team has finalized awards decisions, the team lead will notify the SARSEF staff by clicking the “Ask for Help” button. A recorder will come in to assist your team in entering scores/awards. You should make your decisions by 12:30 so that decisions can be entered and you can have a break before interviews begin.
Please keep in mind to click “Leave Breakout Room” at the end of each interview, not “Leave Meeting”.

**Interviews**
Student interviews will run from 1:00-4:00p. Hosts will place each student/project in an interview breakout room and then send you to a specific room to interview a student. When you receive an invitation to join another room, select “Enter” and begin interviewing the student once you arrive. When you are not interviewing students, you should remain in your team’s breakout room.

Students may share their screen so that you both are looking at their project, but if you need to look the project up on your computer, the student’s screen name will be their project number. If they are unable to share their screen or encounter any other technology issues, have patience. Remind them that it isn’t their fault and just ask them about their project without the screen share.

Interview them for 5 min, congratulate them, let them know another judge will be coming, and return to the main session to let the host know that project is ready for another judge. Then, you will return to your team’s breakout room to wait for another interview. Remind them that if this is their third interview, then they can just leave the meeting. Congratulate them again for their amazing work!

If during the 3 hours of interviews you need to take a break, please return to the main session, notify the Host, mute yourself, and turn off your camera. After a short break, please return and notify the Host that you are ready to interview more students! Hosts will pull judges from the team breakout rooms to interview projects.

**Tips:**
- Have snacks and water handy!
- Choose a quiet place in your house that will be a plain solid background, minimizing visual distractions. If desired, use our official SARSEF Fair virtual Zoom background!
- If you or the student encounter any technology issues, have patience. In this virtual setting, these situations are bound to happen, and the most important thing is that we stay calm and assure the student that it isn’t their fault.

**Team Leads:**
Watch the participants to ensure that those present are on your judging team. When your team has finalized their Grand Awards decisions (hopefully by 12:30), click the “ask for help” button. A SARSEF staff member will enter and record your results.
MIDDLE SCHOOL JUDGING
Tuesday, March 1, 2021, 8:00am – 1:00pm

Project Review

Review and score your assigned projects before caucus on your own time once the Project Floor opens on Saturday, February 26 before caucus. If you have time, review other projects not assigned to you in your category to get to know all projects in your category.

Caucus

On Tuesday, March 1, by **8:00am**, click on the link above that corresponds to your judging team to enter the appropriate Zoom Meeting. When prompted to name yourself, please put “Judge [team name] [first name]” before your name to help the Host identify your role.

If you enter the meeting without being prompted to name yourself, you can always change your name as soon as you enter the room, by clicking on “Participants,” hover over your name, click on “more,” then click on “Rename.”

*How to rename yourself on Zoom*

**Step 1:**

[Image of Zoom interface showing the Participants button]

**Step 2:**

[Image of Zoom interface showing the Rename button]

When you enter Zoom, rename yourself as “Judge [team name] [first name].”

The Host will assign you to your Team’s breakout room. Click “enter” on the popup to go to that room. You may also enter the room yourself by clicking “Breakout Rooms” at the bottom and “Join” next to the room with your corresponding team name. From **8:00-9:30**, you will caucus and decide winners for the Grand Awards in your grade/category.

Once your team has finalized awards decisions, the team lead will notify the SARSEF staff by clicking the “Ask for Help” button, and a recorder will come in to assist your team in entering scores/awards. You should aim to make your decisions by **9:30** so that decisions can be entered and you can have a break before interviews begin.
Please keep in mind to click “Leave Breakout Room” at the end of each interview, not “Leave Meeting”.

Student interviews will run from 10:00a-1:00p. Hosts will place each student/project in an interview breakout room and then send a judge to a specific breakout room to interview that student. When the Host sends you an invitation to move to a different breakout room, select “Enter” and begin interviewing the student once you arrive.

- Each interview must have 2 adults present, so there may be 2 judges in the interview breakout room. Both you and the other judge can take turns asking questions and interviewing the student.

Students may share their screen so that you both are looking at their project, but if you need to look the project up on your computer, the student’s screen name will be their project number. If they are unable to share their screen or encounter any other technology issues, have patience. Remind them that it isn’t their fault and just ask them about their project without the screen share.

Interview them for 5-10 min, congratulate them, let them know another judge will be coming, and return to the main session. Then, you will return to your team’s breakout room to wait for another interview. Remind them that if this is their third interview, then they can just leave the meeting. Congratulate them again for their amazing work!

If during the 3 hours of interviews you need to take a break, please return to the main session, notify the Host, then mute and turn off your camera. After a short break, please return and notify the Host that you are ready to interview more students! Hosts will pull judges from the team breakout rooms to interview projects.

Tips:
- Have snacks and water handy!
- Choose a quiet place in your house that will be a plain solid background, minimizing visual distractions. If desired, use our official SARSEF Fair virtual Zoom background!
- If you or the student encounter any technology issues, have patience. In this virtual setting, these situations are bound to happen, and the most important thing is that we stay calm and assure the student that it isn’t their fault.

Team Leads:
Watch the participants to ensure that those present are on your judging team. When your team has finalized their Grand Awards decisions (hopefully by 9:30), click the “ask for help” button. A SARSEF staff member will enter and record your results.
HIGH SCHOOL JUDGING

Wednesday, 3/2

Animal Science  
Biochemical Science and Bioengineering  
Cellular and Molecular Biology  
- 8:00a-9:00a Pre-caucus  
- 9:00a-11:00a Interviews  
- 11:00a-12:00p Final Caucus

Behavioral and Social Science  
Earth and Environmental Science  
- 10:00a-11:00a Pre-caucus  
- 11:00a-2:00p Interviews  
- 2:00p-3:00p Final Caucus

Chemical and Material Science  
Electrical and Mechanical Engineering  
- 12:00p-1:00p Pre-caucus  
- 1:00p-3:00p Interviews  
- 3:00p-4:00p Final Caucus

Thursday, 3/3

Energy and Environmental Engineering  
Microbiology  
- 8:00a-9:00a Pre-caucus  
- 9:00a-11:00a Interviews  
- 11:00a-12:00p Final Caucus

Health and Biomedical Science  
Plant Science  
- 10:00a-11:00a Pre-caucus  
- 11:00a-2:00p Interviews  
- 2:00p-3:00p Final Caucus

Physics, Astronomy, and Mathematics  
Robotics and Computer Science  
- 12:00p-1:00p Pre-caucus  
- 1:00p-3:00p Interviews  
- 3:00p-4:00p Final Caucus
Project Review

Review and initially score your assigned projects before caucus on your own time once the Project Floor opens on Saturday, February 26. If you have time, review other projects not assigned to you in your category to get to know all projects in your category.

Pre-Caucus Judges Meeting

The day before your judging day, you will receive an email with your judging interview schedule. On your judging day, please arrive at your pre-caucus judges meeting early (times listed above by category). Click on the Zoom link corresponding with your judging team to enter the appropriate Zoom Meeting. When prompted to name yourself, please put “Judge [first name]” to help the Host identify your role.

If you enter the meeting without being prompted to name yourself, you can always change your name as soon as you enter the room, by clicking on “Participants,” hover over your name, click on “more,” then click on “Rename.”

How to rename yourself on Zoom

Step 1:

Step 2:

When you enter Zoom, rename yourself as “Judge [first name].”

The Host in the Zoom room will invite you to enter a breakout room called “Judges Lounge.” A notice will pop up when you’re assigned to the breakout room. Click “enter,” to enter the room. You may also enter the room yourself by clicking “Breakout Rooms” at the bottom and “Join” next to the room entitled “Judges Lounge.” Here you will discuss projects for 50 minutes. Then you will have a short break to prepare for the interviews to begin.
Interviews

- Interviews are 10 minutes long and will begin every 15 minutes (allowing 5 minutes to get switched to the next interview).
  - To begin, the Host will assign you to your first project room. Click “enter” on the popup to enter the room.
  - You may also enter your assigned project room yourself by clicking “Breakout Rooms” at the bottom and “Join” next to the room with your corresponding project number for the interview slot.
  - You may begin the interview once you are in the room corresponding to the project you are to be interviewing at that time.
  - The Host will send a message after 10 minutes warning of 60 seconds left.
  - Please wrap up your interview and move to the breakout room of your next interview (or to the Judges Lounge if you have a break).
  - If you have not moved yourself by the time the interview period is over, the host will move you manually. You may have a pop-up where you need to “accept” this action.
  - If you finish your interview early, you may return to the “Judges Lounge” on your own and wait for the next interview period. You do not need to return to the main session in this case.
- If you have a 15-minute slot without an interview scheduled, please wait in the Judges Lounge breakout room. There, you can check in with your Team Lead and also have the opportunity to take a break.
  - If you take a break, be sure to turn off your camera and mute yourself. Please return 5 minutes before your next interview at the latest.
  - If you are not in need of a break, please interview a student who is not currently with a judge.

Please keep in mind to click “Leave Breakout Room” at the end of interviewing, not “Leave Meeting”

Notes:
- One student and one judge may not be in the breakout room together alone, so each interview will have an observer in the interview breakout room. The observer will be muted and will have their camera off. They will merely be observing the interview.
  ***If an observer is not present when you arrive in the breakout room, please do not let that stop you from beginning the interview on time.*** We want to ensure you have a full 10 minutes to talk to the student. An observer will arrive as soon as possible as we get people switched and filtered through Zoom.
- Students may share their screen so that you both are looking at their project, but if you need to look the project up on your computer, the students screen name will be their project number.
- If they are unable to share their screen or encounter any other technology issues, have patience. Remind them that it isn’t their fault and just ask them about their project without the screen share.
Final Caucus

Once the interview period is complete, your team will go back into the Judges Lounge to make the final determinations for the 1st, 2nd, and 3rd place projects for your category.

Team Leads:
Watch the participants to ensure that those present are on your judging team. When your team has finalized their Grand Awards decisions, click the “ask for help” button. A SARSEF staff member will enter and record your results.

Tips:
- Have snacks and water handy!
- We recommend choosing a place in your house that is quiet and will provide a plain, solid background, minimizing visual distractions. If you desire, you may use our official SARSEF Fair virtual Zoom background!
- If you or the student encounter any technology issues, have patience. In this virtual setting, these situations are bound to happen, and the most important thing is that we stay calm and assure the student that it isn’t their fault.
Criteria, Scoring and Awards

ALL categories are judged using the same criteria. You may choose to evaluate any project using either the science or engineering rubric. Please select the rubric that you feel will be most advantageous to the project. These criteria are provided at the end of this guidebook.

Please judge the projects in their current category. We will not move or reassign projects. Since we use the same rubrics between categories, the best science and engineering will rise to the top! Please just score the project like the others in your category, and do not punish a student for making an inappropriate selection (often it is an honest mistake made by the wonderful teacher who entered the project in).

Group/Class Projects

Students in groups of more than four are doing Group/Class Projects. These are distinguished by the letter "C" in their locator number and are judged separately from all other projects. If you have more than one Group/Class Project in your category, judge them against each other and give out first, second, and third place awards as you see fit - these awards are separate from the grand award number at the top of your project sheet. If you only have one Group/Class Project in your category, you have an additional placement (first, second or third) that you can award to the project as you see fit.

Scoring and Awards

Score sheets are available at the end of this document that you may use to help you identify your top projects. During Caucus, each judge will read their top three to five projects for each category or grade level while the team leader takes notes. This helps initially rank the projects, as those that appear multiple times are clearly a good place to start your discussion. Please do not base your caucus on scores alone, some judges may consistently score higher, or lower, than others, which is why we ask you to convert these scores to rankings. You may choose to view your top contenders as a team to help inform your decision determining awards.

You will be provided with a suggested number of awards per category at the top of your assigned projects sheet. These numbers are calculated as a percentage of each category. The number of each award is flexible! If you have two projects that are equally deserving of first- give it to them! But then don’t award one of your seconds or thirds. And, if you have a tie of two equally deserving projects, we can always add an additional award.

Sponsored Awards

We are very fortunate to have Organizations that donate Special Awards to the students. We all know just how much it means to a student to be recognized for using their brain, and each of these organizations provides an additional opportunity for them to be recognized. Some of the organizations provide judges, while others would rather have YOU choose the winners! So, we are hoping you and your team are willing to help!
Important Reminders while Judging

- Please do not judge on pdf quality or access to resources. Great scientific or engineering research does not depend on access to a lab, computer, or printer. Many of the best projects are done at home. As for the project pdf, please judge based on the logical organization and content of the board, not the appearance or spelling errors.

- Please assume that ALL work is Student Work!
  - The teachers and schools have already judged projects and have determined what is student work and what isn’t- and they know best!
  - We encourage mentorship and parent involvement (for example, we tell parents it is OK if they transcribe for their students, but they should use their child’s language and stop typing the moment their child is quiet.) But handwriting is OK too if what’s in your pdf is pictures or a scanned paper!
  - You will be amazed by what students can do. Keep in mind you are judging projects done by natives to technology- kindergarteners really can use Microsoft Excel!

- Please do not reward an “Out of the Book” project unless there was a very unique twist added that made it “their own.” There are some projects we see every year that are straight from the internet. We tell students, teachers, and parents during outreach NOT to do the old standbys while training them how to come up with an original idea. It is OK to use these as a basis for a new or exciting idea, but it's not okay to copy the project. If the student doesn’t care- why should we?

  The use of a non-novel idea should be accounted for in the “creativity” score.

Here are a few examples of projects to watch out for:
  - Playing music to plants
  - Comparing paper towels, laundry detergent, batteries, nail polish, etc
  - Mentos and Diet Pepsi
  - Flipping water bottles

- The Research Process is Changing! There are many trends in research and education that come and go. You may notice that the project pdfs are organized differently than what was the standard scientific method- that is OK! Hypotheses are not taught as much now as “Questions” so please do not mark a project down for something like not having a stated hypothesis or using the metric system, we are looking at the process as a whole.

- All projects have been cleared by the Scientific Review Committee (SRC) and Display and Safety. You do not need to worry about whether a student has followed proper safety procedures. Either a school, or SARSEF level SRC has cleared the projects.
Helpful Hints While Judging

Although you will be using the judging criteria to score projects, here are a few helpful general thoughts about what makes a winning project.

- When you deliberate on the projects, use a few simple criteria for your decisions. Then use the more-detailed criteria for those that you have narrowed down.
- The quality of the student’s (or group of students’) work is what matters.
- Team projects and individual projects are judged the same. It is the quality of the work that matters.
- A less-sophisticated project that the student understands gets higher marks than a more sophisticated project that is not understood (this can be determined through interviews at the High School Level).
- Access to sophisticated lab equipment and endorsements from professionals do not guarantee a high-quality project. (Ask yourself: Did the student really understand what was going on?)
- It is acceptable if the student ended up disproving the objective or hypothesis of the experiment.

In general, high marks go to:

- “Early starters” who took a longer period of time to collect data
- Genuine scientific breakthroughs
- Discovering knowledge not readily available to the student
- Correctly interpreting and analyzing data
- Repetitions to verify experimental results — and enough subjects to adequately test
- Predicting and/or reducing experimental results with analytical techniques
- Experiments applicable to the “real world” (for engineering projects)
- Ability to clearly portray and explain the project and its results

In general, 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

Please do your best to make sure that all of the participants remember the science fair as a positive experience in their lives.
Tips for Interviewing

Meeting the Student
When you first join a student in a breakout room, please do so with a friendly, professional manner. Be sure to introduce yourself, explain your affiliation and offer a brief description of your background.

Conveying Fairness
As a judge, it is most important to show the students that you are fair and knowledgeable.

Your fairness is indicated by a few simple actions:
● Spend about the same amount of time with each student, and the same goes for group projects. Make sure you’re spending about the same amount of time talking with each student in the group.
● Listen carefully to the student’s explanation of the project.
● Find out more about the project and how it was done.

The questions you pose should not embarrass or intimidate the student. This sounds obvious, but oftentimes can be challenging to implement.

Asking Questions

The best tool in judging is your ability to ask questions. Be sensitive to what the student knows. You can always ask questions that the student can answer, and keep a conversation going for at least 5 minutes.

Some questions/variations all students should be able to answer:
● How did you come up with the idea for this project?
● What did you learn from your background research?
● How much time (or how many days) did it take to run the experiments — such as growing the plants, or collecting data points?
● How many times did you run the experiment with each configuration?
● How many experiment runs are represented by each data point on the chart?
● Did you take all data (run the experiment) under the same conditions (in other words, at the same temperature, time of day or lighting conditions)?
● How does your apparatus (equipment or instrument) work?
● What do you mean by [terminology or jargon used by the student]?
● When did you start this project, or how much of the work did you do this year? (NOTE: Some students may bring the prior year’s winning project back, with minimal enhancements.)
● What is the next experiment to do in continuing this study?
● What would you do differently if you had to do this again?
● What are the real-world applications of your findings?
● Are there any areas that we not have covered which you feel are important?
● Do you have any questions for me?

PLEASE NOTE: These are only suggestions to keep the conversation going.
Guiding the Discussion

Sometimes we come across projects in technical areas with which we are intimately familiar, but the student just didn’t get it. They made some incorrect assumptions, missed a key indicator in the data, came up with a false conclusion, or didn’t look at or understand some common principles.

It can be tempting to share your knowledge about the topic, to help the student appreciate what happened (or should have happened) in the experiment. Some judges have been observed to enthusiastically pontificate while a student stood idly listening. Before you do this, please consider that these students are smart, and the next judge may hear the student parroting back the knowledge you imparted.

You may try with your questions to lead the student toward the right answers, but you should not provide the answers. If you really feel compelled to make explanations, save them until near the end of the judging time when your knowledge will not be relayed to judges following you. Alternatively, you may give the student your card and invite future discussion about the project.

Be sure that your discussion meets the following science fair objectives to involve the student in discovery:

- Your conversation should resemble a discussion with an esteemed colleague who is having difficulty with some research. Together, you talk through the situation to mutually arrive at improved answers.
- The student should do most of the talking.
- Coax and/or coach the student into realizing and describing the correct conclusions. (Remember, it’s the student’s project, not yours!)
- Encourage the student to conduct more experimentation in order to verify the new conclusions.
Improving Communication

Since you are a judge, most students instinctively think of you as an intimidating figure. The more you can dispel this image, the more likely you are to help the student be less nervous, and engage in a better discussion.

Again, simple things can make a difference:
- Look at your computer camera as though you were making eye contact.
- Tip your head to the side to indicate interest. (This is a universal nonverbal form of communication.)
- Whenever a student shows a good idea, be sure to use a compliment.
- Use a tone of voice that indicates interest or inquisitiveness — not skepticism or contempt.
- If a student gets flustered about a technological glitch, reassure them that you know that it isn’t their fault and that it won’t be held against them.
- If you are unable to hear the student or be heard, we encourage you to use the chat feature in Zoom to ensure you are able to communicate.

To assure the perception of fairness, you also need to make sure that one student doesn’t monopolize your time. Some have a well-rehearsed pitch that may prevent you from having a chance to interact with the student. You have to find some way to break the pattern — and again, your tool is questioning. Politely interrupt with a question, usually in the form of “I’m sorry, I didn’t quite catch the relationship between that adjustment and this result” — or even some of the “any student can answer” questions, like “How many times did you run the experiment with each configuration?”

The idea is not to stop the student from talking, but to get the student to interrupt the “tape recording” and think about what is being communicated to you.

Many of these students are exceptionally bright. It is easy to think, when facing an incredibly impressive display and a supremely confident student that this student’s research is beyond your knowledge. If a project is really and truly completely outside your experience, you are
still knowledgeable in the area of problem solving and the Scientific Method. Concentrate on these aspects rather than the details of a particular project.

If a student continues to use jargon, or refer to processes you are not familiar with, feel confident in stopping them and asking them to explain what it means. Not only is it important for them to be able to communicate their project with the public, asking basic questions is a great test of their understanding and many students see it as a “test” rather than a lack of understanding. Never assume the student knows what the technical terms mean or what a piece of equipment does, how it works, or why it was used.

Personal Tip: Sometimes I walk up to a student and am lost in the first 15 seconds. In these cases, I politely interrupt them and say that communicating science to the masses is important. I then ask them to explain their project to me like I was a five-year-old, in four sentences or less. It is one of the hardest questions you can ask a student because it challenges them to think differently about their language, meanwhile you create common dialogue!
Caucus Tips

These help keep the decision making process faster, and less controversial, but are very formal. Smaller judging groups might not need these, while larger ones might find them handy.

Work from the Top, Down (start with first place, and work down to third)

- There is a reason that more than one person liked a project—so start the discussion there
- Then ask, are there other projects we should consider for first place?

Focus on one project at a time

- Start with the project with the most votes, and ask for a volunteer to briefly describe why they gave it a high mark.
- Then ask if anyone has anything to add about THAT project that has not yet been mentioned (in the positive or negative) in one minute.
- Establish that each judge may speak once about a project for no more than one minute, and may not speak about the project again until everyone else has had a chance to comment.
- Once everyone has contributed something NEW to say, ask for a vote for that project to be considered for first place (this is NOT decided to award it first, just establishing that it is in the "pool" of contenders).
- Then ask if another project should be considered for first place, and repeat this process above.
- Pro Tip: Do not let this process get out of hand, if you have two first-place awards available, you should not have more than four contenders in your "pool."
- Once you have established a "pool" of first place projects, you will vote on each one individually. Ask "Who thinks this project (title and locator number) deserves a first place?" and count the number of votes. Repeat for each project in the "pool". Those with the highest number of votes, get the award spots.
- This is where you might want to rearrange the number of places. If you only have one first place, and the group feels two are worthy (and there votes show it), open up another spot at first place. But keep in mind you will either need to take a 2nd or 3rd away, or ask Julie Euber for another spot. Note, this is important because if you have two projects that are of ISEF quality you want to be sure they each get a first place.

Once a decision is made, it is Final! If this process is run well, there should be no reason to look back. You might need to remind a judge about the group's vote.
Your Time Makes a Difference!

From 4th Grade Winner to Forbes 30 Under 30

Jeremiah Pate, who participated in the SARSEF Fair throughout his entire childhood, was recently named on the Forbes 30 Under 30 – Manufacturing & Industry 2020 List at the age of 21 and credits SARSEF for his success.

The research Jeremiah conducted for SARSEF as a high school student-led him to compete on the international level at ISEF and eventually found his own company, Lunasonde.

“SARSEF is really the only thing that added an experiential component – that allowed me to develop and to be an innovator. I can’t overstate this: SARSEF is an incredible organization and it’s had a huge impact on my life. I might have been a scientist or engineer before but wanting to change the world I owe to SARSEF,” Pate shared.

The Fair provides opportunity for students to be recognized for their intelligence and encourages them to explore questions that are important to them.

Thank You for Creating the Next Generation of Critical Thinkers and Problem Solvers!
Appendix: Judging Criteria

The following evaluation criteria will be provided to you and used for judging at SARSEF. Judging is conducted using these guidelines, with approximate values assigned to the research question, design and methodology, execution, creativity, and presentation. Each section includes key items to consider for evaluation. Judges should take into consideration the grade level when scoring. Examine the student notebook, if present.

For Group/Class Projects, look for evidence that every child in the class had some responsibility or did part of the project.
SARSEF SCIENCE
Judging Guidelines for Pre K - Kindergarten

The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

I. Research Question (15 pts.)
___ question is something that this child or group of children genuinely might want to know
___ gives a reason for why this child (or children) wants to do the project
___ is authentic to this age level
___ question is asked clearly and is something that might be possible for a child to answer with assistance
___ question is narrowed down in scope (specific, not too broad or too many other parts)

II. Design and Methodology (25 pts.)
___ evidence that the child/children thought of what needs to happen in sequence/order ("First, I will..." “Then I will...")
___ plan for how the child can collect data – i.e. place to make tally marks, drawing pictures along the way
___ appropriate # of subjects i.e. plans to watch more than one anthill, measure speed of 2-3 toy cars
___ plans adequate # of trials i.e. sends each car down ramp several times, watches ants in morning and afternoon
___ cares about safety of others, nature, self

III. Execution: Data Collection, Analysis and Interpretation (25 pts.) NOTE: adult help is allowed but somewhere in the project there should be evidence that it some or most of it was done by or with the child.
___ followed same idea each time - not too much variation i.e. does not change mind each time
___ uses basic touch counting strategies up to ten “1, 2, 3...”
___ makes a comparison, conclusion – using words like “More” or “Less” and “Bigger” or “Smaller”
___ evidence that each child had their “hands-on” most parts of the project
___ says what the answer to their question was (more points if based on their collected data)
___ recognizes the meaning of what was found - mentions why they did the project in the first place
___ when asked, can say what they wish they could do next time or if there were no limits (i.e. money, time)

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been frequently listed in Science Fair idea books or web.
___ project demonstrates particular creativity for a young child in one or more Criteria I, II, III or V
___ idea appears novel - at least to this child
___ idea appears to be what student genuinely cares about as evidenced by reason given for doing project
___ there is passion the project: reason, discussion of the plan, or end results

V. Poster Board (15 pts.)
___ evidence the child experienced a science-related concept or skill and enjoyed the process
___ evidence that a child did part of this project on their own
___ evidence of the basic scientific process (question, test, results, conclusion)
___ colorful, creative and logical organization of display (drawings only are fine, expected)
___ hand drawn illustration of some part of the process, graph made out of Legos, M&M's, etc.
SARSEF ENGINEERING Design
Judging Guidelines Pre K – Kindergarten

The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

I. Research Problem (15 pts.)
   ___ problem is something that this child or group of children genuinely might want to solve
   ___ gives a reason for why this child (or children) wants to solve this problem
   ___ problem is authentic to this age level
   ___ problem is actually something that might be possible for a child at this level to solve with assistance
   ___ problem is narrowed down in scope (specific, not too broad or too many other parts)

II. Design and Methodology (25 pts.)
   ___ identifies a possible solution after observing/studying the problem
   ___ comes up with an idea (drawing or note about their plan)
   ___ develops a prototype/model that is different from what exists already
   ___ evidence that the child thought of what needs to happen in sequence (“First, I will…” “Then I will…”)
   ___ plans at least one model variation, retrial
   ___ plans for how to collect data – i.e. chart for tally marks, simple journal for drawings
   ___ appropriate # of subjects i.e. plans to measure if 2-3 different tire sizes changes speed of toy car
   ___ plans adequate # of trials i.e. tries different tire sizes several times

III. Execution: Construction and Testing (25 pts.)
   ___ prototype/model follows plan each time without too much variation, tried to “stick to the plan”
   ___ evidence that each child had their “hands-on” most parts of the project, follows safety rules
   ___ uses basic touch counting strategies up to ten “1, 2, 3…”
   ___ makes a comparison, conclusion – using words like “More” or “Less” and “Bigger” or “Smaller”
   ___ shows changes made based on results
   ___ says what the best solution to their problem was (more points for if based on their collected data)
   ___ recognizes the meaning of what was found - mentions why they did the project in the first place
   ___ when asked, can say what they wish they could do next time

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been frequently listed in Science Fair idea books or web.
   ___ project demonstrates particular creativity for a young child in one or more Criteria I, II, III or V
   ___ idea appears novel - at least to this child
   ___ idea appears to be what student genuinely cares about as evidenced by reason given for doing project
   ___ there is passion about the project: reason, discussion of the plan, or end results

V. Poster Board (15 pts.)
   ___ evidence the child experienced an engineering-related concept or skill and enjoyed the process
   ___ evidence that a child did part of this project on their own
   ___ evidence of the basic engineering design process was followed (research, design, execution)
   ___ colorful, creative and logical organization of display (drawings only are fine, expected)
   ___ hand drawn illustration of some part of the solution, graph made out of Legos, M&M’s, etc.
SARSEF SCIENCE
Judging Guidelines for Gr.1-2

The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

I. Research Question (15 pts.)
___ question is something that this child or group of children genuinely might want to know
___ gives a reason for why this child wants to do the project
___ is authentic to this age level
___ question is asked clearly and is something that might be possible for a child to answer at this level
___ question is narrowed down in scope, specific (can include other parts but not too many)

II. Design and Methodology (25 pts.)
___ evidence that the child thought of what needs to happen in order, numbered step by step plan (“1., 2., 3….”) 
___ plan for collecting data – i.e. place to record time or number observed, or illustrations
___ appropriate # of subjects i.e. plans to watch more than one girl and boy race, measure several ages’ reactions
___ plans adequate # of trials i.e. rolls different balls several times, watches birds in trees for several days
___ cares about safety of others, nature, self

III. Execution: Data Collection, Analysis and Interpretation (25 pts.)
___ followed the plan without too much variation i.e. does not switch ways of doing things each time
___ evidence of counting up to 100, basic math such as adding to find totals and subtracting to find differences
___ compares using words like “Greater than” and “Less than” or “More” and “Fewer” or “Larger” and “Smaller”
___ evidence that each child had their “hands-on” most parts of the project, were actively present, involved
___ says what the answer to their question was, forms conclusion (more points if based on their collected data)
___ recognizes the meaning of what was found - mentions why they did the project in the first place
___ when asked, can say what they wish they could do next time or if there were no limits (i.e. money, time)

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been frequently listed in Science Fair idea books or web.
___ project demonstrates particular creativity in one or more Criteria I, II, III or V
___ idea appears novel - at least to this child
___ idea appears to be what student genuinely cares about as evidenced by reason given for doing project
___ there is passion about the project: reason, discussion of the plan, or end results

V. Poster Board (15 pts.)
___ evidence the child experienced a science-related concept or skill
___ evidence that a child did some parts of this project on their own or was actively engaged in all parts
___ evidence of the basic scientific process (question, test, results, conclusion)
___ colorful, creative and logical organization of display (handwritten is fine, expected)
___ student-made illustration of some part of the process, graphs can be made out of Legos, M&M’s, etc.
The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

I. Research Question (15 pts.)
___ problem is something that this child or group of children genuinely might want to solve
___ gives a reason for why this child wants to solve this problem
___ problem is authentic to this age level
___ problem is actually something that might be possible for a child at this level to solve with assistance
___ problem is narrowed down in scope, specific (can include other parts but not too many)

II. Design and Methodology (25 pts.)
___ identifies a possible solution after observing/studying the problem
___ comes up with an idea (drawing or notes about their plan)
___ develops a prototype/model that is different from what exists already
___ evidence that the child thought of what needs to happen in order, numbered step by step plan (“1., 2., 3…..”)
___ plans at least one model variation, retrial
___ plan for collecting data – i.e. place to record times or numbers observed, or illustrated changes to prototype
___ appropriate # of subjects i.e. plans to measure how angle of ramps changes distance of several different balls
___ plans adequate # of trials i.e. tries different angle of ramp, each several times, several trials for each ball

III. Execution: Construction and Testing (25 pts.)
___ prototype/model follows plan each time without too much variation, tried to “stick to the plan”
___ evidence that each child had their “hands-on” most parts of the project, observes safety checks
___ evidence of counting up to 100, basic math such as adding to find totals and subtracting to find differences
___ compares using words like “Greater than” and “Less than” or “More” and “Fewer” or “Larger” and “Smaller”
___ shows changes to prototype made, based on results
___ says what the best solution to their problem was (more points for if based on their collected data)
___ recognizes the meaning of what was found - mentions why they did the project in the first place
___ when asked, can say what they wish they could do next time, what hope to find/do some day

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been frequently listed in Science Fair idea books or web.
___ project demonstrates particular creativity in one or more Criteria I, II, III or V
___ idea appears novel - at least to this child
___ idea appears to be what student genuinely cares about as evidenced by reason given for doing project
___ there is passion about the project: reason, discussion of the plan, or end results

V. Poster Board (15 pts.)
___ evidence the child experienced a science-related concept or skill
___ evidence that a child did some parts of this project on their own or was actively engaged in all parts
___ evidence of the basic scientific process (question, test, results, conclusion)
___ colorful, creative and logical organization of display (handwritten is fine, expected)
___ student-made illustration of some part of the process, graphs can be made out of Legos, M&M’s, etc.
The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

I. Research Question (15 pts.)
___ clear and focused purpose
___ states what is the question/problem that needs solving in their life, community, world?
___ follows rules, gets permission, question is testable using scientific process
___ the answer is not already obvious or out there if a simple search is conducted
___ is reasonable, follows safety rules, asks for and receives appropriate permission

II. Design and Methodology (25 pts.)
___ has a step by step plan and data collection methods that are consistent
___ has a test group and a control group (if appropriate), or multiple groups for testing
___ identification of variables that cannot be controlled but could affect the results
___ clearly written, numbered step by step plan to follow so other could do the same test
___ considered the appropriate # of subjects, adequate # of trials are planned

III. Execution: Data Collection, Analysis and Interpretation (25 pts.)
___ followed same planned method/process each time - not too much variation
___ enough data collected to reasonably answer question, allow for analysis of data
___ appropriate application of mathematical methods for comparison – use of fractions, averaging
___ forms a conclusions based on the data and evidence, refers to data
___ recognition of potential impact of what was done
___ refers back to the original question or problem, ideas for further research
___ include what challenges were presented, can say what they wish they could do next time

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been done hundreds of times before or frequently listed in Science Fair idea books or web.
___ project demonstrates particular creativity in one or more Criteria I, II, III or V
___ idea appears novel – at least to the student (not almost the same or seen repeatedly)
___ idea appears to be something that student genuinely cares about, passion or enthusiasm is communicated

V. Poster Board (15 pts.)
___ understanding of basic science relevant to project, evidence of process that was followed
___ colorful, creative and logical organization of display (handwritten is still acceptable)
___ graphics (photo or drawing) including a basic graph of some kind
___ extra points for mentioning references, supporting documentation listed on board or notebook
SARSEF ENGINEERING
Judging Guidelines Gr. 3-5

The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Each section includes key items to consider.

I. Research Problem (15 pts.)
___ project has a clear and focused purpose
___ states what is the question/problem that needs solving in their life, community, world?
___ the answer is not already obvious or out there if a simple search is conducted
___ is reasonable, follows rules, asks for and receives appropriate safety precautions
___ definition of criteria for proposed solution, limitations

II. Design and Methodology (25 pts.)
___ exploration of several alternatives to answer an actual need/problem
___ identification of a possible solution that is practical, reasonable, doable
___ realistic plan for development of an actual prototype/model for testing
___ step by step plan and consistent data collection methods
___ recognition that there are variables that may NOT have been anticipated but could affect the results
___ plans appropriate # of models, adequate # of planned trials and retrials

III. Execution: Construction and Testing (25 pts.)
___ prototype actually demonstrates the intended design or variation
___ prototype was tested in more than one condition, and in multiple trials
___ followed the plan for testing, not too much variation in conditions, tried to do the same thing each time
___ documents changes made based on results
___ forms final conclusions based on the data
___ can say what they wish they could do next time, may include what challenges were presented

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been done hundreds of times before or frequently listed in Science Fair idea books or web.
___ project demonstrates significant creativity in one or more Criteria I, II, III or V
___ idea appears novel – at least to the student (not almost the same or seen repeatedly)
___ idea appears to be something that student cares about, passion and enthusiasm is communicated

V. Poster Board (15 pts.)
___ clear communication of basic engineering design relevant to overall project
___ colorful, creative and logical organization of display (handwritten is still acceptable)
___ graphics (photo or drawing) including a basic graph or chart of some kind
___ extra points for references mentioned, listed on board or in notebook
The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Students are encouraged to design their posters in a clear and informative manner to allow thorough evaluation. Examine the student notebook.

I. Research Question (15 pts.)
___ project has a clear and focused purpose
___ idea is a question/problem that needs solving in student’s life, school, community, world
___ idea is testable using a scientific process, can be retested
___ the answer is not already obvious or out there if a simple search is conducted
___ is reasonable, follows safety rules, asks for and receives appropriate permission

II. Design and Methodology (25 pts.)
___ well-designed plan and data collection methods that will ensure consistent recording or results
___ control group and variables are identified
___ identification of variables that cannot be controlled but might affect the results
___ reproducibility of results, i.e. clearly written, step by step plan to implement
___ considered what would be the appropriate # of subjects, adequate # of planned trials and retrials

III. Execution: Data Collection, Analysis and Interpretation (25 pts.)
___ systematic data collection and analysis - same procedure each time, little variation conditions of testing
___ sufficient data collected to support interpretation and conclusions - several trials, many subjects in the study
___ appropriate application of mathematical methods for comparison - averaging, percentages, etc.
___ understanding limitations of results and conclusions, constraints
___ makes conclusions based on the data and evidence, refers to data
___ implications for larger community are thought about, ideas for further research, links to other studies
___ states whether question was answered, or if not, what challenges faced

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been done hundreds of times before or frequently listed in Science Fair idea books or web. Creative projects offer different perspectives that open up new possibilities or new alternatives.
___ project demonstrates significant creativity in one or more Criteria I, II, III or V
___ idea appears novel – at least to the student (not copied or seen repeatedly)
___ idea appears to be something that student genuinely cares about, passion or enthusiasm is communicated

V. Poster Board (15 pts.)
___ clear communication and evidence of understanding basic science concepts relevant to project
___ colorful, creative and logical organization of display facilitate communication of project
___ clarity of graphs, legends & graphics – at this level more than one graph or chart is expected
___ supporting documentation displayed – multiple references listed on board or in notebook
The following evaluation criteria will be used for judging at SARSEF. This may assist you in evaluating each of these categories, however, the points are provided as guidelines only. Students are encouraged to design their posters in a clear and informative manner to allow thorough evaluation. Examine the student notebook.

I. Research Problem (15 pts.)
- project has a clear and focused purpose
- problem is one that needs solving in student’s life, school, community, world
- the answer is not already obvious or out there if a simple search is conducted
- is reasonable, follows rules, asks for and receives appropriate safety precautions
- definition of criteria for proposed solution
- explanation of constraints

II. Design and Methodology (25 pts.)
- exploration of several alternatives to answer an actual need/problem
- identification of a possible solution that is practical, reasonable, doable
- well-designed plan and data collection methods that are as consistently implemented
- realistic plan for development of an actual prototype/model
- recognition that there are variables that may NOT have been anticipated but could affect the results
- reproducibility of results i.e. clearly written step by step plan to construct or implement
- plans appropriate # of models, adequate # of planned trials and retrials

III. Execution: Construction and Testing (25 pts.)
- prototype actually demonstrates the proposed design
- prototype was tested in multiple conditions, and in multiple trials
- prototype demonstrates an engineering skill
- systematic data collection and analysis - same procedure each time, little variation in conditions of testing
- appropriate application of mathematical methods for comparison – averaging, ideally percentages
- understanding limitations of results - mentions constraints
- forms conclusions based on the data, refers to results
- implications for broader community are thought about, ideas for further research explored
- answers what problem was solved, or if not, what challenges faced

IV. Creativity (20 pts.)
A creative project demonstrates imagination and inventiveness. Such projects are ones that the student personally cares about, have not been done hundreds of times before or frequently listed in Science Fair idea books or web. Creative projects offer different perspectives that open up new possibilities or new alternatives.
- project demonstrates significant creativity in one or more Criteria I, II, III or V
- idea appears novel – at least to the student (not copied or seen repeatedly)
- idea appears to be something that student cares about, passion or enthusiasm is communicated

V. Poster Board (15 pts.)
- clear communication and evidence of understanding basic engineering relevant to project
- colorful, creative and logical organization of display facilitate communication of project
- clarity of graphs, legends & graphics – at this level more than one graph or chart is expected
- supporting documentation displayed – multiple references listed on board or in notebook
SARSEF Judging Guidelines  
High School - Science Research Project

The following evaluation criteria will be used for judging at the Intel ISEF and SARSEF. Awards judging is conducted using a 100-point scale with points assigned to the research question, design and methodology, execution, creativity, and presentation. Following please find information that will assist you in evaluating and scoring in each of these categories.

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.

I. Research Question (10 pts.)
___ clear and focused purpose  
___ identifies contribution to field of study  
___ testable using scientific methods

II. Design and Methodology (15 pts.)
___ well-designed plan and data collection methods  
___ variables and controls defined, appropriate and complete

III. Execution: Data Collection, Analysis and Interpretation (20 pts.)
___ systematic data collection and analysis  
___ reproducibility of results  
___ appropriate application of mathematical and statistical methods  
___ sufficient data collected to support interpretation and conclusions

IV. Creativity (20 pts.)
(A creative project demonstrates imagination and inventiveness. Such projects often offer different perspectives that open up new possibilities or new alternatives. Judges should place emphasis on research outcomes in evaluating creativity.)  
___ project demonstrates significant creativity in one or more of the above criteria

V. Presentation (35 pts.)
(Presentation/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 finalist 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 this year.
· 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 and an understanding of the project.)

a. Poster (10 pts.)
   ___ logical organization of material
   ___ clarity of graphics and legends
   ___ supporting documentation displayed

b. Interview (25 pts.)
   ___ clear, concise, thoughtful responses to questions
   ___ understanding of basic science relevant to project
   ___ understanding interpretation and limitations of results and conclusions
   ___ degree of independence in conducting project
   ___ recognition of potential impact in science, society and/or economics
   ___ quality of ideas for further research
   ___ for team projects, contributions to and understanding of project by all members
SARSEF Fair Judging Guidelines
High School - Engineering Design Project
(See Reverse for Science)

The following evaluation criteria will be used for judging at the Intel ISEF and SARSEF. Awards’ judging is conducted using a **100-point scale** with points assigned to the research question, design and methodology, execution, creativity, and presentation. Following please find information that will assist you in evaluating and scoring in each of these categories.

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.

I. Research Problem (10 pts.)
___ description of a practical need or problem to be solved
___ definition of criteria for proposed solution
___ explanation of constraints

II. Design and Methodology (15 pts.)
___ exploration of alternatives to answer need or problem
___ identification of a solution
___ development of a prototype/model

III. Execution: Construction and Testing (20 pts.)
___ prototype demonstrates intended design
___ prototype has been tested in multiple conditions/trials
___ prototype demonstrates engineering skill and completeness

IV. Creativity (20 pts.)
(A creative project demonstrates imagination and inventiveness. Such projects often offer different perspectives that open up new possibilities or new alternatives. Judges should place emphasis on research outcomes in evaluating creativity.)
___ project demonstrates significant creativity in one or more of the above criteria

V. Presentation (35 pts.)
(Presentation/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.

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<th>Creativity</th>
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Thank You for Judging!
Criteria for 9-12th Grades is based on ISEF Criteria

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Rubric for both Science and Engineering

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Thank You for Judging!