CoorsTek

DMRSEF DENVER METRO REGIONAL SCIENCE AND ENGINEERING FAIR

2024 JUDGE GUIDE

COORSTEK DENVER METRO REGIONAL SCIENCE AND ENGINEERING FAIR

FEBRUARY 23, 2024

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WELCOME

...to the CoorsTek Denver Metro Regional Science and Engineering Fair!
On behalf of the entire DMRSEF team, **THANK YOU** for volunteering your time, enthusiasm and expertise to support and encourage our students on their STEM journey! This regional fair is open to students in grades 6-12 from public, private, parochial, charter and home schools in 7 metro Denver counties (Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Jefferson, and Summit counties). The primary purpose of the regional fair is to recognize student achievement and to qualify students to go to the state level fair. We want our best projects to be competitive at the state level, so we strictly follow the ISEF (International Science & Engineering Fair) rules for pre-college science research. **Please remember every student here is interested in science and has tried their best.** Whether their project is outstanding or not, their effort deserves attention at the fair. All projects should receive equal time at this level of competition. Students will be at many different skill levels, from first time participants to returning state participants, so there will be a large range of project quality. This is completely normal for this age group especially in the Junior Division. Do not expect professional-level posters. Please be respectful of their time and encourage their learning.

FAIR TIMELINE

Friday, February 23rd, 2024- In-person fair and judging

Location: University of Colorado Denver

8:00am - **Community Breakfast (Optional)** - Student Wellness Center Gym
9:00am - **Judge Orientation** - Student Commons Building 1600
10:00am- **Judging Round One** - Student Wellness Center Gym
12:00pm - **Lunch break** - Student Commons Building 1600
1:00pm - **Judging Round Two** - Student Wellness Center Gym
2:00pm - **Judge Deliberation** - Student Commons Building 1600
3:00pm - **Finalist Judging** - Student Wellness Center Gym
4:15pm - **Final Judge Deliberation** - Student Commons Building 1600
5:00pm - **Adjourn**

Sunday, February 25th, 2024, 5-8 pm Awards Ceremony (optional)

Location: Tivoli Turnhalle

JUDGING LOGISTICS

Prior to the fair, judges will receive an email with a map, parking directions, a free parking code, and other pertinent information on the day of the fair.

All judges are invited to join our students ahead of judging for our (optional) Community Breakfast starting at 8am. Judges need to **arrive at Student Commons Building Room 1600 by 9am**. Our judge meeting will start promptly at 9am. From 10am - 4:15pm, judges will be interviewing students, meeting with their category teams, and completing the student feedback forms.

Coffee, lunch, and refreshments will be provided for all judges throughout the fair day.

PROJECT REVIEWS

MONDAY, FEBRUARY 19TH - THURSDAY, FEBRUARY 22RD:

Projects will be displayed in our virtual showcase at: https://symposium.foragerone.com/2024-dmrsef

During this week, judges are expected to review all projects in their category. Each student is required to upload a poster presentation (up to 12 page pdf) and a short (maximum 3 minute) introductory video. You can view the student project requirements here on the How to Science Fair tab of our website.

Please carefully review all materials, as well as any supplemental materials, that were uploaded for your assigned projects. It is also helpful to prepare interview questions for your assigned projects during this time, as the time spent with each student is limited.

You will receive your category and team assignments prior to the fair. Please keep your judging assignments confidential.

Best-in-fair judges should also use this week to review projects and be familiar with the possible candidates, prior to meeting with Category Captains on Friday afternoon.

STUDENT INTERVIEWS

FRIDAY, FEBRUARY 23RD

Student interviews with judging teams will take place between **10:00 am and 4:15 pm**. This year, you will be interviewing students as a judging team. There will be 3-4 judges on each team and you will be assigned to a Division and a Category. For larger categories, we will have multiple judging teams. Most teams will judge between 3-6 projects. While you are interviewing as a team, each judge will submit a completed judging rubric for each student project they are assigned.

We will conduct the interviews in person at the Student Wellness Center at CU Denver.

10:00am- **Judging Round One** - Student Wellness Center Gym
1:00pm - **Judging Round Two** - Student Wellness Center Gym
3:00pm - **Finalist Judging** - Student Wellness Center Gym

During the two judging rounds, you will have students in your category to interview. You must ensure that at least one team of judges interviews each student in your category.

Each student interview will last for approximately 15 minutes. You and your judge teammates will use this time to listen to the students' presentations, ask questions, and view their poster display (which may be different than the online poster display).
You will be provided with a paper rubric for taking notes during judging. We encourage you to speak to as many students in your category as possible, while still ensuring that every student receives a detailed interview.

When you have a break in your interview schedule, or when all interviews have concluded, you will turn in your judge feedback forms electronically. We will provide you with a link to an online rubric, where you can enter your notes, scores, and student feedback. **PLEASE BRING A LAPTOP, TABLET, OR SMART PHONE** for completing these electronic forms.

STUDENT INTERVIEWS CONTINUED

You are using the student interviews to help formally evaluate your assigned projects but also to provide these students with the opportunity to share their science with professionals. **This is the high point of the fair for the students!** Treat this interaction like a job interview, remember to be professional, refrain from asking questions about race, ethnicity, religion, or personal topics, and avoid being overly familiar with students. If at any point during the student interviews you have questions or need advice/support from DMRSEF staff in the Wellness Center. You may also call or text the Judge Coordinator, Samantha Sands, at 248-760-6077 for support.

At the end of the scheduled interviews, teams will meet back in the judge meeting room (Student Commons Building 1600) to discuss projects and decide on awards. The team captain will lead the team meeting, moderate the discussion, ensure that each judge has submitted a rubric for each student they interviewed, and submit award decisions to the judging coordinator. Category judges are dismissed for the day once the team meeting is over and all rubrics are submitted.

CATEGORY CAPTAINS AND BEST-IN-FAIR TEAMS

At **2:30 pm on Friday**, **Category Captains** will meet with the **Best-in-Fair teams** in the judge meeting room (**Student Commons Building 1600**) to recommend the top projects at the fair. Senior Division Category Captains will meet with the Senior Best-in-Fair team and Junior Division Category Captains will meet with the Junior Best-in-Fair team. During this meeting, each captain will give a brief overview of the top project(s) in their category and if they feel it is a high-quality project, recommend the project for a BIF candidate. It is important to note that some categories may be stronger than others and we do not expect that the winner of each category is a contender for a best-in-fair award. However, a project must win in its category to be considered for BIF. In rare cases, first and second place projects from one category may be considered for BIF, but the 1st place project would need to place in BIF in order for the 2nd place project to place. At the conclusion of the Captains and BIF team meetings, the BIF team will have a shortlist of projects to consider for BIF. The Best-in-Fair teams will then go view the student projects in the Wellness Center and have the opportunity to interview students from 3:00 pm - 4:15 pm.

At 4:15 pm, the Best-in-Fair teams will meet back in the judge meeting room (SCB 1600) to determine the winning projects. The Senior Best-in-Fair team will be selecting a 1st, 2nd and 3rd place project that will advance to the International Science & Engineering Fair. They will also select a 1st and 2nd runner-up. The Junior Best-in-Fair team will be selecting a 1st, 2nd and 3rd place and an honorable mention.

STUDENT INTERVIEWS: SPECIAL AWARDS

FRIDAY, FEBRUARY 23RD

Special Awards: This year, organizations who are sponsoring Special Awards have the opportunity to select their winning projects in one of two ways.
Option 1: They can view the projects asynchronously on the virtual fair website and choose their winning projects based on the digital materials (poster, video, supplementary documents, etc.).
Option 2: Organizations may view the projects ahead of the fair on the virtual fair website and then select students to interview at the fair on Friday, February 23rd. Special awards judges may interview as many students as they would like during the 10a and 1p judging rounds (during the same time as category judging). They may also conduct interviews when students are at their posters between 3:15 - 4:15 pm. All special award winners must be selected and turned in to the Special Awards judging coordinator by 5 pm on Friday, February 23rd.

AWARDS CEREMONY

SUNDAY, FEBRUARY 25TH, 5 - 8 PM
TIVOLI TURNHALLE

If you are available, please consider joining us for our awards ceremony and celebration of our science fair students! We will be announcing the category awards, Best-in-Fair awards and special awards. Register to attend the awards ceremony here: https://ucdenver.co1.qualtrics.com/jfe/form/SV_bfwBSHbyLiyCKcC

AWARDS

DMRSEF enters the top 10% of our middle school winners in the Thermo Fisher Scientific Junior Innovators Challenge competition for middle school students. 300 Innovators are identified from nationwide entrants and then 30 finalists are selected to attend the final competition. Our Best in Fair high school winners receive monetary awards and trips to the Regeneron International Science and Engineering Fair (ISEF) to compete with students from around the world. Our best in fair and category winners at the middle and high school levels receive monetary awards and are eligible to compete at the Colorado State Science and Engineering Fair (CSEF). Top winners at the state fair will also be nominated for Junior Innovators Challenger and the Regeneron ISEF. Numerous special awards of certificates, money, or prizes are given by associations, schools, and other community groups to DMRSEF students. Please let the fair coordinators know if you, your employer, or an organization you are a member of would like to sponsor a special award.

EVALUATION GUIDELINES

The guidelines used to evaluate students at the DMRSEF, included below, comply with International and State-level standards and are meant to set students up for success as they move on to higher levels of competition. Please review these before the fair so you are familiar with our assessment criteria and scoring.

Students may have worked on a research project for more than one year. However, for the purpose of judging, ONLY evaluate research conducted within the current year. Compare projects only with those competing at this Fair and not with projects in other competitions or scholastic events. Try to determine how much guidance was provided to the student in the design and implementation of his or her research. Please do not share your opinion with the student about their performance in relation to the other students. Do offer praise!

Please be discreet when discussing winners or making critical comments. Results are confidential until the awards ceremony. Judges represent professional authority to the students and should use an encouraging tone when asking questions or offering suggestions. Judges should not criticize, treat lightly, or display boredom toward projects they consider unimportant. Consistency and respect are key to positive judge-student interactions.

If you think that a project has violated Science Fair rules or other regulations (local, state, or federal), do not bring up the matter with the student(s). Please discuss the matter with the Science Fair Director or Judging Coordinator. All projects are screened by a Scientific Review Committee, so you should assume that projects comply with all relevant rules and regulations. Any allegations of rules violations should not be part of the judging process and should not be discussed when deciding awards.

This year, you will be using an online form to submit your scores. We will send you a link to the judging forms prior to the start of the fair on February 24th. We have included a sample of the evaluation form in this document. We will provide you with a printed copy for taking notes while you review projects, and during the student interviews. However, all final forms must be submitted online. We appreciate your taking the time to write comments for every project you judge. Comments for improvement will be important for students moving on to the state competition or returning to our fair next year.

EVALUATION GUIDELINES CONTINUED

We have also included details about the criteria you will use to evaluate students' projects. These criteria are based on the criteria used to judge the International Science & Engineering Fair.

Each criteria will be evaluated on a 10 point scale, with 1 being the lowest and 10 being the highest.

Point Scale:

1-4 Developing
5-6 Average
7-8 Good
9-10 Exemplary

A few things to keep in mind when judging projects:

- 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.
- 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.
- 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.

EVALUATION CRITERIA

RESEARCH QUESTION

- Question/problem is clearly stated
- Question was sufficiently limited to allow a solution to be found
- Question is testable using the scientific research process
- Originality in questions asked
- Research addresses a meaningful problem

DESIGN & METHODOLOGY

- A procedural plan was in place for obtaining a solution/answer
- Project demonstrates a well-designed plan and method of data collection
- Variables were clearly recognized and defined
- If controls were necessary, the student(s) recognized their need correctly utilized them
- Student(s) had the required laboratory, computation, observational and design skills to obtain supporting data
- The purpose was carried out to completion within the scope of the original intent

EXECUTION

- There was adequate data to support the conclusions
- There was adequate assistance from parents, teachers, scientists, etc.
- The time spent on the project was appropriate
- Project contains sufficient data collected to provide evidence to support interpretation.
- Student(s) made recommendations for further research

CREATIVITY

- The project shows creative ability and originality in the questions asked, the approach to solving the problem, the analysis of data, or the interpretation of that data
- The student's(/s') findings helps to answer their question in an original way
- The student's(/s') findings promote an efficient and reliable method for solving a problem

POSTER/SLIDES

- Student(s) demonstrated an understanding of the project which is reflected in their written materials
- Important phases of the project are presented in a logical and orderly manner
- Data is clearly and correctly presented
- Results are conclusions are clearly presented
- Poster possesses clarity of graphics, legends and supporting documentation

INTRODUCTORY VIDEO

- Video is clear and audible
- Student(s) demonstrated preparation and thoughtfulness in content of video
- Student(s) clearly introduced themselves and their project
- Student(s) provided a well-rounded overview of their purpose, procedures, and conclusions

INTERVIEW

- Student)s) exhibited clear, concise, thoughtful responses to questions
- Student(s) demonstrated an understanding of the interpretation and limitations of results and conclusions

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NAME(S)

PROJECT #

PLEASE EVALUATE THE PROJECT ON THE FOLLOWING ELEMENTS:

Criteria:	Score:	Notes:
Research Question	/10	
Design & Methodology	/10	
Execution	/10	
Creativity	/10	
Poster (slides)	/10	
Introductory Video	/10	
Interview	/10	

ANY CONSTRUCTIVE COMMENTS FOR THE STUDENT(S):

ADDITIONAL COMMENTS FOR DMRSEF TEAM:

HOW TO BE A GOOD SCIENCE FAIR JUDGE

ADAPTED FROM: HTTP://CSEF.USC.EDU/JUDGES/GOODJUDGE.HTML

INTERVIEWING THE STUDENT

A genuine interest in each student's work, coupled with the determination to make judging a positive learning experience, is a good formula to use here. The interview a) allows students to present their work in their own way, b) permits the judges to, by **asking specific questions,** review the work done and determine the student's understanding of the field, and c) encourages verbal communication between exhibitors and judges. Ideally, students will be well organized, familiar with their field of study, relatively composed, courteous and eager to learn. Please remember, however, that for many young students this is their first experience in this type of high-pressure situation. The importance of a **positive approach** cannot be over-emphasized. Your own maturity will prove a valuable tool in drawing out theirs.

ASKING QUESTIONS

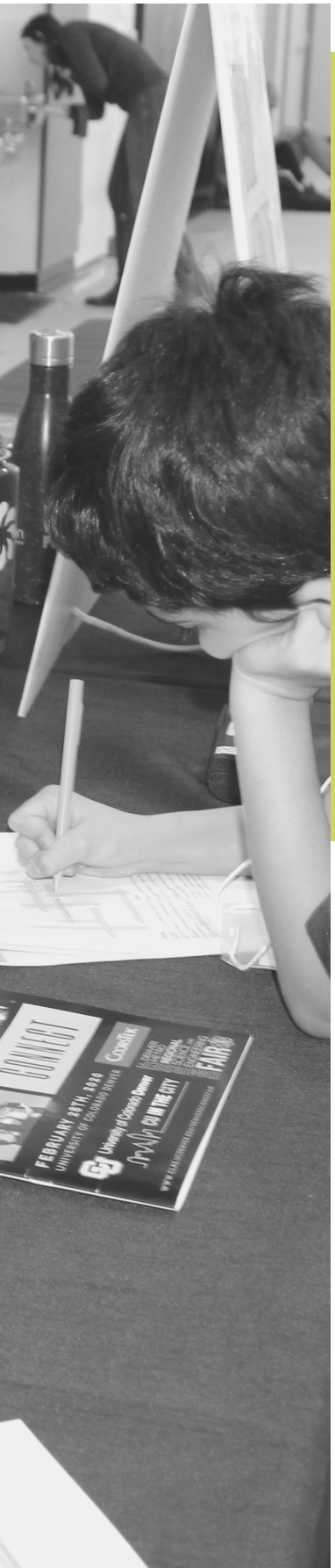
Sometimes we come across projects in technical areas, with which we are intimately familiar, and the student just didn't get it -- they made some incorrect assumptions, missed a key indicator in the data, came up with a false conclusion, or didn't look at or understand some common principles. It can 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 please don't give them the answers. If you really feel compelled to make explanations, please share these comments with the students on your judging forms.

Be sure that your discussion meets the following Science Fair objectives to involve the student in discovery:

1. 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
2. The student should be doing most of the talking
3. Encourage the student to conduct more experimentation in order to verify the new conclusions

GUIDING THE DISCUSSION

Your 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 ten minutes. There are some questions all students should be able to answer, including variations on:



- ***How did you come up with the idea for this project?***
- *What did you learn from your background search?*
- *How long did it take you to build/design your experiment?*
- *How many times did you run the experiment with each configuration?*
- *What are the variables in your experiment?*
- *Did you take all data (run the experiment) under the same conditions, e.g., at the same temperature (time of day) (lighting conditions)?*
- *How does your experiment (equipment) (instrument) work?*
- ***What do you mean by (terminology or jargon used by the student)?***
- *How can your experiment be applied to everyday life or industry?*
- *When did you start this project? or, How much of the work did you do this year? (some students bring last year's winning project back, with only a few enhancements)*
- ***What is the next experiment to do in continuing this study?***
- ***If you could do this project again, what would you do differently?***
- *Are there any areas that we not have covered which you feel are important?*
- ***What is something you learned during this project?***
- ***Why is your project/experiment important?***

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

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

PROVIDING FEEDBACK

ADAPTED FROM: MONTEREY COUNTY SCIENCE AND ENGINEERING FAIR JUDGES' GUIDE

Thus far we have focused on your role as a judge: to accurately and fairly rate projects. But your other - and actually much more important role – is as inspiration. Remember students have invested multiple months in their projects and now they get to meet actual scientists who study the same thing. What you say and do can have a life-long impact. If you're excited to meet students, smile, ask encouraging questions, and give constructive feedback, then you might be helping a budding scientist grow! In contrast, if you're sarcastic, look bored, or show contempt, you might squash a career path they'd consider. While your ratings should always be honest and accurate, your interactions should always err on the side of being gentle.

Any time you can share something positive with a student, please do! You can compliment their effort, a beautiful poster board, or how well they explain a scientific concept. Make generous comparisons (e.g., wow, I didn't learn that until my first year of college). Whenever possible, turn what could be negative feedback into an opportunity. For example, looking at a student's results, you could say, "you should have done … ." But notice a statement like this emphasizes where the student fell short. Instead you could say, "I like how you figured out …, and if you'd like to take your project to the next level next year, try … ." Notice how now you're inspiring them to keep pursuing excellence.

THANK YOU…for volunteering your time, expertise and enthusiasm to support and encourage the next generation of STEM professionals!

You are instrumental in the success of the science fair and helping to inspire these students to continue their science journeys.

If you have any questions, please to not hesitate to contact our Judging Coordinator, Samantha Sands, at samantha.sands@ucdenver.edu.