Metropolitan SCIENCE & ENGINEERING FAIR

Founded 1980 | Omaha, NE

WHY SHOULD I ENTER THE FAIR?

There are many reasons for doing a science fair project. You'll have a chance to increase your knowledge, confidence, and self-esteem and find out what science is really all about by doing a project of your choosing from start to finish. Not only will you increase your own awareness and understanding of some aspects of science or engineering, but you will also be able to inform others about your findings and possibly win awards and prizes. With increasingly limited enrollments and scholarships available at select schools, science fair participation will help your chances for acceptance and awards. Also, good science students will get a great start in preparing themselves for potential jobs in the high-demand, high-salaried science and engineering career fields. The reasons are numerous and the possibilities almost unlimited.

The Metropolitan Science and Engineering Fair serves as the regional qualifier for the Nebraska Junior Academy of Sciences. MSEF/NJAS is open to students in grades 6-12 attending school in Douglas, Sarpy and Washington Counties or home schooled within these counties. Projects will be judged in February with final judging on Thursday morning, March 4, 2021 at Omaha's Henry Doorly Zoo and Aquarium with an awards program on Saturday, March 20, at Lauritzen Gardens. The MSEF/NJAS Fair will give students a chance to display and describe their project to area instructors and practicing professionals in the project's field. The overall top six projects from the MSEF/NJAS Junior Division and the overall top six projects from the MSEF/NJAS Senior Division will compete in the Nebraska Junior Academy of Sciences in April 2021. Senior Division awardees selected at NJAS are invited to present their research as the American Junior Academy of Sciences in February 2022.

MSEF consists entirely of volunteers from area schools and colleges, businesses, and government agencies. MSEF/NJAS Rules and Regulations, Registration, Research Plan, and Approval Forms and Abstract Forms, and are available at our web site: http://www.msefomaha.com

SCIENCE AND ENGINEERING FAIR PROJECT PREPARATION

I. GETTING STARTED ON YOUR PROJECT.

Doing a project means designing an investigation and performing it yourself, gaining recognition for having done it, and possibly preparing you for a scientific career. The first step is coming up with an idea. Some suggestions:

Look at what interests you and what you are curious about. Find a broad subject in science, mathematics, or engineering, then start asking yourself questions. Since questions that start with "why" are often broad and difficult to test, narrow your questions to a limited area of study that may be thoroughly investigated. Try out some ideas as preliminary investigations to determine what other aspects you notice and wonder about, taking notes as you do so.

Go to your science teacher and to the library and look through some of the many books, websites and pamphlets on science fair projects. Consider the lab skills that you have already learned, as well as equipment available for you to use. In addition, consider safety and ethical issues that may require your study to receive approval from a review committee. Other good sources include lists of previously done science fair projects, scientific papers or

newspapers, science books and magazines, scientists or summer institutes, science or mathematics/computer science teachers, or your own curiosity.

Employ scientific or engineering practices. Using your observation and questioning skills, identify an area of inquiry. Then begin to plan your project and refine your tentative hypothesis to reflect the area that you want to study. Projects need only be a simple investigation of a scientific statement, idea or process. In addition to experimentation, projects may also represent analysis of large data sets, theoretical explanations or engineering designs.

Find out as much as you can about your subject and related subjects. Search the literature in your school, public, and college libraries. Remember to keep an accurate list of your sources. For books, include author, title, edition, publication place, publisher, date, and pages used. Magazine/journal article references should list author, article title, magazine name and volume number, date, and pages.

For publications found on the Internet, include the web address, author, page title, and date accessed. Writing style guides will help you format your paper. Feel free to use any writing style guide, but use it consistently throughout your paper. Don't forget to ask others for information or assistance. Classmates, teachers, professional scientists, engineers, and technicians may be helpful. Before asking professionals if they have time to answer your questions, be sure you are familiar with background research, have a set of prepared questions to ask. Credit all sources that you use, including drawings and ideas used.

II. WORKING ON YOUR PROJECT.

Science projects may be displays or models, but the best projects are generally laboratory or field projects. Some comments on these:

1. Make sure that the experiment is designed to obtain information to help answer the inquiry. Consider how to identify and isolate variables, which may influence your work, select appropriate equipment, and keep time requirements in mind.
2. Start collecting data. Keep an accurate record of your experiment's purpose, all research done, data, problems, measurements and other results in a bound project notebook. Include charts, photographs, notes on materials, apparatus, and experimental factors and conditions, graphs, preliminary conclusions reached, and data generalizations.
3. Continue your library research and discussions with others as you encounter unexpected results, new questions, or data that supports your tentative hypothesis. Experiment and research as completely as you can, but remember to isolate variables and stick to the inquiry you are researching. Use controls, which have the same conditions as the experimental except for the factor being investigated, and repeat the experiment to confirm that your results are valid. Record all results in your project notebook.

SCIENCE PROJECT RESOURCE WEBSITES:

- http://www.gnsef.org/resources/
- www.super-science-fair-projects.com
- https://www.sciencenews.org/snhs
- www.ipl.org/div/projectguide
- www.all-science-fair-projects.com/
- www.sciencepage.org/scifair.htm
- www.sciencebuddies.org/science-fair-projects/project-ideas
- www.education.com/science-fair/
- www.sciencefaircentral.com/
- cssf.usc.edu/Resources/Good_Project.html
- https://www.dowlingmagnets.com/blog/2020/going-virtual-experiments-tips-for-virtual-science-fairs/

IMPORTANT DATES

Tuesday, January 26, 2021:
Due: MSEF Digital Registration Form, Form 1, Research Plan (Form 1A + attachment) and Approval Form (Form 1B)

Friday, February 5, 2021:
Due: Digital submission of links to pre-recorded video presentation of project, written report, and copy of display (either photo of project board or a slide of a poster from a template)

Wednesday, February 24, 2021:
Invitations to MSEF Final Round judging sent to sponsors and finalists

Wednesday, March 3, 2021:
MSEF Finalists Project Set Up at Henry Doorly Zoo and Aquarium. A member of the Rules Committee will verify that your display meets the size and safety requirements. Allow up to 30 minutes to complete check-in, set up, and obtain Rules Committee approval for your display. 4:00 – 6:30 PM (Senior and Junior Division)

Thursday, March 4, 2021:
MSEF Check-in at Henry Doorly Zoo and Aquarium
7:15 – 7:45 AM (Senior Division)
7:45 – 8:25 AM (Junior Division)
Final Round MSEF Project Judging (Live)
8:00 AM – 11:30 PM at OHDZA Daugherty Education Center (Senior Division)
8:30 AM – 11:30 PM at OHDZA Education Conference Center (adjacent to Scott Aquarium) (Junior Division)
11:45 – 12:00 PM Departure to return to participants' schools
NOTE: MSEF is prepared to pivot to an entirely remote, live final round of judging on March 4 should Douglas, Sarpy and Washington County Health Departments and other advisors recommend so.

Monday, March 8, 2021:
Invitations to Award Ceremony sent to award recipients and sponsors

Friday, March 12, 2021:
RSVP due for Awards Ceremony

Saturday, March 20, 2021:
9:00 AM – 9:30 AM: Optional Display Set Up
9:30 AM - 10:00 AM: Public viewing begins
10:00 AM – 11:30 AM: Keynote and Awards Ceremony
11:55 AM: Public viewing ends

Thursday, April 22, 2021:
NJAS State Science Fair at Nebraska Wesleyan University

PRIZES

- MSEF Plaques or Certificates for all participants
- NJAS Award Medals (Top 6, each division)
- Cash prizes for category and grand prizewinners
- Gift certificates or cash awards, all participants
- Trophies (top six in each division)
- Plaques (top three in each category with five or more entries)
- Additional Specialized Awards

2021 MSEF RULES

1. Any 6th through 12th grade student who has not attained the age of 21 in a public, private or parochial school in Douglas, Sarpy or Washington Counties may enter a project in the Metropolitan Science and Engineering Fair (MSEF). MSEF is the only means for students in the Eastern Region to qualify for the Nebraska Junior Academy of Sciences (NJAS).

2. MSEF accepts projects from either individuals or teams of two. An individual or team may enter only one project and it must be the personal work of that individual or the members of the team. Refer to MSEF Rule 6 for additional rules and regulations relating to team projects.

3. All MSEF/NJAS project entries are expected to comply with entry rules of the International Science and Engineering Fair (ISEF). This includes a Research Plan/Project Summary (Form 1A) and Approval Form (Form 1B). Forms 1A and 1B, a Research Plan and projects requiring Safety Review Committee (SRC) MUST have forms completed BEFORE experimental research begins! Research plans involving humans, vertebrates, and potentially hazardous biological agents MUST receive Safety Review Committee (SRC) approval BEFORE actual experimental RESEARCH BEGINS! The contact information for the MSEF SRC is MSEFSRC@omahazoo.com. For rules questions, start with ISEF Rules Wizard: https://ruleswizard.societyforscience.org/

4. Any projects involving live vertebrate animals or human subjects must comply with ISEF Life Research Rules. Projects involving DNA, tissue, pathogenic agents or controlled substances require additional forms, which may be downloaded from the ISEF web site www.societyforscience.org/isef/.

- **Individual project submissions due by January 26:**
    - Electronic submissions:
        - MSEF Digital Registration Form (includes student's name, title, and abstract)
    - Mail hard copies of:
        - Form 1 (Checklist for Adult Sponsor)
        - Research Plan/Summary
        - Form 1A (Student Checklist)
        - Form 1B (Approval Form)
        - other required forms as determined by ISEF Rules Wizard
        - $10 entry fee (payable to MSEF)
    - Individual project submissions due by February 5:
        - Virtual Project Board
        - Presentation Video (Share link to pre-recorded video presentation)
        - Written report

5. Team Projects consist of two members. A team project cannot be converted to an individual project without authorization. A new member may not be added to a continuing Team Project.

   Both members of the team should be able to serve as spokesperson, be fully involved with the project, and be familiar with all aspects of the project. The final work should reflect the coordinated efforts of both team members and will be evaluated using the same rules and judging criteria as individual projects.

- **Team project submissions requirements due by January 26:**
    - Electronic submission:
        - one MSEF Digital Registration Form (includes both partners' names, title, and abstract)
    - Mail hard copies of:
        - Form 1B (Approval Form) for Partner #1
        - Form 1B (Approval Form) for Partner #2
        - Form 1 (Checklist for Adult Sponsor)
        - Research Plan/Summary. Include in the outline each person's tasks
        - Form 1A (Student Checklist)
        - other required forms as determined by ISEF Rules Wizard
        - $20 entry fee (payable to MSEF)
    - Team project submissions due by February 5:
        - Virual Project Board
        - Presentation Video (Share link to pre-recorded video presentation)
        - Written report

6. Forms and a non-refundable registration fee of $10.00 per student MUST be received by to January 26, 2021. Schools may request an invoice if submitting entry fees for participating students. Applications received after this date will not be accepted unless the MSEF Rules Chair is contacted before then.
   Correspondence, forms, and fees must be sent to:
   MSEF

2001 S. 6th St.
Omaha, NE 68108

Forms or additional information may be obtained by contacting the MSEF Rules Chair, Dave Dow, at dowchemistry@gmail.com, or visiting MSEF website at http://www.msefomaha.com

7. Categories of Projects: Participants' projects must be classified into one of the following categories on the registration form:

   - Animal Sciences (ANIM)
   - Behavioral and Social Sciences (BEHA)
   - Biochemistry (BCHM)
   - Biomedical and Health Sciences (BMED)
   - Biomedical Engineering (ENBM)
   - Cellular and Molecular Biology (CELL)
   - Chemistry (CHEM)
   - Computational Biology and Bioinformatics (CBIO)
   - Earth and Environmental Sciences (EAEV)
   - Embedded Systems (EBED)
   - Energy: Sustainable Materials and Design (EGSD)
   - Engineering Mechanics (ENMC)
   - Environmental Engineering (ENEV)
   - Materials Science (MATS)
   - Mathematics (MATH)
   - Microbiology (MCRO)
   - Physics and Astronomy (PHYS)
   - Plant Sciences (PLNT)
   - Robotics and Intelligent Machines (ROBO)
   - Systems Software (SOFT)
   - Translational Medical Science (TMED)

8. Category selection is the responsibility of the student and teacher. ISEF category descriptions: https://www.societyforscience.org/isef/categories-and-subcategories/all-categories/
   The fair director may change category designation to allow similar types of projects to be judged together. On the day of the fair, if the judges feel that a particular project is misclassified, it may be transferred to a more appropriate category with the approval of the judging teams involved and the fair director.

9. Judging will be done within the specific procedures announced to the entrants. Entrants must be present for judging to be eligible for awards.

10. Projects will be rated according to the following criteria used by Nebraska Junior Academy of Sciences:

    60% Scientific Method or Engineering Goals
    20% Communication Skills (oral, written and virtual)
    20% Personal Growth (relevance of project, creative thinking, age appropriate understandings, attitude)

11. MSEF/ NJAS awards presentation will occur on March 20, 2020 at Lauritzen Gardens.

12. All participants will receive a certificate. Superior projects will be awarded a plaque, trophy or other honor for the participant.

WRITTEN REPORT

- Write a report of your project.
- Include a title, introduction, problem statement or question and hypothesis, experimental procedure used in detail, analysis of data using descriptive statistics, a discussion of results, conclusions reached, and suggestions for further research.
- Remember to include summary data tables, diagrams, drawings and photographs, and credits for all sources used (bibliography) and help received.
- Written report should be in Google pages, pdf, word document or the equivalent.
- Writing style guides will help you format your paper. Feel free to use any writing style guide, but use it consistently throughout your paper.
- Written report MUST be electronically submitted ***no later than*** Friday, February 5, 10:00 PM

VIRTUAL PROJECT BOARD

1. Virtual project board contains items normally found on a science project board e.g. Title, Problem, Hypothesis, Photos/Graphs, Results, Conclusions. These should be on clickable/pause able separate slides/pages for manual viewing (in Power Point, Google pages, pdf word document or the equivalent) or one enlargeable slide of all parts.
2. **Virtual project board MUST be electronically submitted *no later than* Friday, February 5, 10:00 PM.**
3. Resources for building the virtual project board (refer to MSEF rules to ensure required portions are included):
    - Science fair project presentation templates https://templates.office.com/en-us/science-fair-project-presentation-tm01018373
    - PowerPoint templates for science projects https://www.sarasotacountyschools.net/site/handlers/filedownload.ashx?moduleinstanceid=3665&dataid=53404&FileName=STEM%20Fair%20Project%20PowerPoint%20Template.pdf

PRESENTATION VIDEO

- Prepare a **four to eight minutes maximum** verbal presentation of your project, telling in your own words what you did.
- Adequate presentation of your project to the judges and others is essential for you to get the recognition that you deserve for your work!
- Practice your presentation before friends, parents, or your teacher, anticipating possible questions.
- Include how you came up with the idea for your project, problem posed, hypothesis, research and methods used, project conclusions and results.
- Generally it should be made at home or school with a relatively plain, natural background.
- Practice presentation and use of video equipment *before* making this video, including assurance that audio is easily heard!
- Video should be done in ONE TAKE and NOT edited! Only exceptions include unanticipated distractions, malfunctions in audio or video while taping.

- DO dress nicely (for success).
- It should NOT include transitions, cinematic effects or music that are added post-recording.
- Do NOT include your name, name of school/business/institution, name of teacher/sponsor/mentor!
- **Presentation video MUST be electronically submitted *no later than* Friday, February 5, 10:00 PM.**
- Resources:
    - "You Can Make A Narrated PowerPoint Video!" https://www.youtube.com/watch?v=Y5dgwwa5XRA
    - How to narrate a PowerPoint presentation https://support.microsoft.com/en-us/office/record-a-slide-show-with-narration-and-slide-timings-0b9502c6-5f6c-40ae-b1e7-e47d8741161c

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