

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 have a chance to win awards and prizes. With increasingly limited enrollments and scholarships available at select schools, science fair participation will help your chances for acceptance. 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/Nebraska Junior Academy of Sciences (MSEF/NJAS) is open to all Metro students in grades 7-12. It will happen Saturday, March 14, 2009 at UNO's Milo Bail Student Center. A banquet will follow at 6:30 p.m. The MSEF/NJAS will give students a chance to display their project and have it judged by area instructors or practicing professionals in the project's field. This will give students entering the Greater Nebraska Science and Engineering

Fair (GNSEF) valuable presentation experience and a chance to use judges' comments to help improve their project before the GNSEF, where they can win additional prizes and scholarships, including all-expenses paid trips to the International Science and Engineering Fair. It is not required for students to enter the MSEF to participate in the GNSEF. In addition, the top five MSEF/NJAS Junior and Senior winners will compete in the state NJAS fair at Nebraska Wesleyan in April with an opportunity to attend the National NJAS fair.

A group of representatives from area schools and colleges, businesses, and government agencies, listed later in this booklet, are sponsoring and promoting the fair. Science teachers in your school as well as practicing science and engineering professional people in the metropolitan area will assist you with your project. MSEF/NJAS Rules and Regulations, Registration, Research Plan, Approval Forms and Abstract Forms, all of which may be freely reproduced, as well as other useful information, are included in this booklet. GOOD LUCK on your project! Information, forms and examples of past projects are available at our web site, <http://www.msefomaha.org>.

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:

1. Look at what interests you. Find a broad subject in science, mathematics, or engineering, then narrow it down into a limited area of study that may be thoroughly investigated.

2. Preliminary research in your subject area may help. Go to your science teacher and to the library and look through some of the many books and pamphlets on science fair projects. 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.

3. Follow the scientific method. Find a problem, then state a preliminary hypothesis. Begin to plan your project and refine your hypothesis to reflect the area that you want to do. Projects need only be a simple investigation of a scientific statement, idea or process. In addition to experimentation, projects may also represent collections, demonstrations, theoretical explanations or engineering designs.

4. 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. Don't forget to ask others for information or assistance. Classmates, teachers, professional scientists, engineers, and technicians may be helpful. Be courteous when questioning professionals by having done background research first and coming up with questions beforehand as well as asking them when they would have time to answer your questions. Credit all sources that you use, including drawings and ideas used.

5. Complete a Research Plan (Form 1A or 1A-Team) and Approval Form (Form 1B) and turn it in to your supervising teacher for approval. If your project may be entered in the Greater Nebraska Science and Engineering Fair (GNSEF), mail a copy of this form to the GNSEF (if it will NOT be entered at GNSEF, turn this in with your registration form). **IMPORTANT NOTE:** Research plans MUST receive Safety Review Committee (SRC) approval **BEFORE** actual experimental RESEARCH BEGINS! This is MANDATORY for ANY project which will be entered in the GNSEF later. Contact GNSEF at www.gnsef.org for more information

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 problem you have stated. Consider factors or 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, conclusions reached, and data generalizations.
3. Continue your library research and discussions with others as you encounter failures, new problems, or successes. Experiment and research as completely as you can, but remember to isolate variables and stick to the problem you are researching. Use controls, which have the same conditions as the experimentals except for the factor being investigated, and repeat the experiment to confirm that your results are valid. Record all results in your project notebook.

III. Project Completion and Display.

Adequate presentation of your project to the judges and others is essential for you to get the recognition that you deserve for your work!

1. Write a report of your project. Include a title, introduction and problem statement, experimental procedure used in detail, a discussion of results, conclusions reached, and suggestions for further research. Use standard English and research paper format. Remember to include summary data tables, diagrams, drawings and photographs, credits for all sources used (bibliography) and help received.
2. Type a shortened version of your report, known as an abstract, of 250 words or less. Include this with your report and several copies with your entry forms.

3. Prepare your exhibit as a display version of your report. Looking at photographs of winning past exhibits may be useful. Construct a display, watching size restrictions and other requirements in the attached rules, making it eye-catching and attractive. Keep safety in mind. Be aware of what facilities will be available in the display area. Common displays include presentation of your problem, hypothesis, data and results, and conclusions on separate panels of the display with other items placed in front on the table. Organize your exhibit into an interesting and neat display, including appropriate graphs, photographs, and essential apparatus and other materials. Major lettering should be large enough to be viewed from a distance. Don't forget your notebook and abstract, but avoid overcrowding.
4. Prepare a 5 to 8 minute verbal presentation of your project, telling in your own words what you did. Be ready for the judge to visit you by practicing your presentation before friends, parents, or your teacher, anticipating possible questions. Remember to bring everything with you on Fair day! GOOD LUCK

Science Project Websites:

- www.gnsef.org/resources.html
- www.sciserv.org/isef
- www.super-science-fair-projects.com
- scienceclub.org/scifair.html
- www.ipl.org/div/projectguide
- school.discovery.com/sciencefaircentral
- www.all-science-fair-projects.com/
- users.rcn.com/tedrowan/primer.html
- www.state.sc.us/energy/K-12/science_fair.htm
- www.scifair.org/
- www.usc.edu/CSSF/Resources/Good_Project.html
- www.bcpl.info/kidspage/sciencefair.html
- www.sciencepage.org/scifair.htm

• SUGGESTED SCHEDULE

- **Before December:** Find idea for project, complete Research Plan, other required forms
- **After research plan finished:** Work on project, recording important data, details
- **January:** Prepare report, finish abstract and other entry requirements
- **February:** Enter MSEF with all required forms; complete display board, start presentation

BEFORE EXPERIMENTAL RESEARCH BEGINS, Complete Research Plan and Approval Forms (Form 1A or Form 1A-Team and Form 1B).

**All potential GNSEF participants: contact GNSEF at www.gnsef.org to submit research plan.
*MANDATORY: ALL GNSEF PROJECTS!***

IMPORTANT DATES

- **Monday, February 2, 2009:**
Registration Form, Form 1, Research Plan (Form 1A + attachment) and Approval Form (Form 1B), 10 copies of abstract and other applicable forms are due.
- **Friday, March 13, 2009:**
Projects must be set up at the UNO Milo Bail Student Center between 6 and 8 p.m.
Last day to purchase banquet tickets for \$15.00
- **Saturday, March 14, 2009:**
MSEF/NJAS Project Judging and Display starting at 8:00 A.M.. at the UNO Milo Bail Student Center.
Public viewing in the afternoon. Do not remove projects until after end of awards presentation!
MSEF/NJAS Banquet, 6:30 P.M. at the UNO Milo Bail Student Center. **Banquet ticket required!**
Awards presentation (open to the public), 7:30 P.M..

PRIZES

MSEF Plaques or Certificates for all participants	Gift certificates or cash awards, all participants
NJAS Award Medals (Top 5, each division)	Trophies (top three, each division)
Cash prizes for category and grand prize winners	Special awards

2007-8 MSEF DONORS

INVESTORS

(over \$500)

URS Corporation
Lozier Foundation

CONTRIBUTORS

(\$100 -\$500)

DLR Group
Drake-Williams Steel
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Henry Doorly Zoo
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Peter Kiewit Sons Inc.
Streck Laboratories, Inc.
Sean and Sarah Suiter
Thiele GeoTech, Inc.
Valmont Industries, Inc.
John Wilson

SUPPORTERS

(under \$100)

Alvine & Associates, Inc.
Roger Andrews
Creighton Prep Science Club
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Scott Keep
Nielsen-Baumert Engineering Inc.
Omaha Steaks International Inc.
Larry and Karen Rainwater
Tadros Associates, LLC
Terracon Consultants, Inc.
Utility Engineering Corporation

RULES AND REGULATIONS

1. Any 7th through 12th grade student who has not attained the age of 21 in a public, private or parochial school in the metropolitan Omaha area may enter a project in the Metropolitan Science and Engineering Fair/National Junior Academy of Sciences (MSEF/NJAS).
 2. MSEF accepts either individual or team projects. 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 rule 13 for additional rules and regulations relating to team projects.
 3. All MSEF/NJAS project entries are expected to comply with entry rules of the Greater Nebraska Science and Engineering Fair (GNSEF), available at each area high school science department. This includes a RESEARCH PLAN (Form 1A) and Approval Form (Form 1B). These forms are attached. The GNSEF or your Safety Review Committee (SRC) MUST receive all Research Plans and Forms 1A and 1B for GNSEF projects BEFORE experimental research begins!
 4. Any projects involving live vertebrate animals or human subjects must comply with GNSEF life research rules. Projects having research involving DNA, tissue, pathogenic agents or controlled substances require additional forms, which may be downloaded from the Intel International Science and Engineering Fair (ISEF) web site www.societyforscience.org/isef/ or e-mail Dave Dow, ddow@prep.creighton.edu
 5. Entries must include your Registration Form and Research Plan, Approval Forms (Form 1A and 1B), ten (10) abstract copies and your registration fee. These must be received in complete form **Monday, February 2, 2009**. Forms or additional information may be obtained by contacting MSEF/NJAS or Dave Dow, ddow@prep.creighton.edu, phone 402-393-1190 or visiting the MSEF website at <http://www.msefomaha.org.html>
 6. Registration fee is \$12.00, which is not refundable for any reason. **Forms and registration fee MUST be received by February 2, 2009** (contact if a problem). Applications received after this date will not be accepted.
 7. An awards banquet will be held at the UNO Milo Bail Student Center Cafeteria at 6:30 p.m., March 14, 2009. All entrants and their families and friends are urged to attend. Parents must purchase banquet meal tickets no later than Friday, March 13. Banquet meal tickets are not refundable after that time. Parents are encouraged to come to the free 7:30 p.m. awards ceremony even if you cannot be present for dinner. Participants will receive a complimentary meal ticket if they plan to attend the banquet.
 8. Categories of Projects: Each contestant's project must be classified into one of the following categories on the registration form:
 1. Animal Sciences
 2. Behavioral and Social Sciences
 3. Biochemistry
 4. Cellular and Molecular Biology
 5. Chemistry
 6. Computer Science
 7. Earth and Planetary Science
 8. Engineering: Electrical/Mechanical
 9. Engineering: Materials/Bioengineering
 10. Energy and Transportation
 11. Environmental Management
 12. Environmental Sciences
 13. Mathematical Sciences
 14. Medicine and Health Sciences
 15. Microbiology
 16. Physics and Astronomy
 17. Plant Sciences
- Category selection is the responsibility of the student and teacher. Category criteria are the same as used by the GNSEF. A description of the type of projects included in each category is available from MSEF/NJAS on request and is included in the teacher packet. The fair director may switch a project entry to a different category to be consistent with our interpretation of category descriptions and 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 as equitably as possible 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:

Creative ability:	30 points
Scientific thought:	30 points
Thoroughness:	15 points
Skill:	15 points
Clarity:	10 points

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

12. Other specific rules:

A. Project Display Project exhibit size is limited to 76 centimetres deep (front to back), 122 centimetres wide (side to side), and 274 centimetres high (floor to top).

B. Technical Rules

(1) **NO** plants, chemicals (including water unless supplied by MSEF/NJAS), live animals, flames, flammable materials, or other potentially hazardous or unsafe materials are permitted at the fair. See checklist on next page.

(2) Except for certain basic supplies (e.g. tables, 110 volt power supply link-up, etc.), all materials, including extension cords, should be supplied by and the projects must be set up by

the participant. The entrant is responsible for the cost of such materials and supplies and their protection and care. The MSEF/NJAS assumes no responsibility for loss of or damage to projects.

(3) All technical rules of the current International Science and Engineering Fair (ISEF) will be followed whenever applicable, except as noted in the preceding rules.

13. Team Projects:

Teams may have either two or three members. A Team Project cannot be converted to an individual project. A new member may not be added to a continuing Team Project, but two original team members may continue their research if the third member no longer participates.

Each team should select a team leader (NJAS representative) to coordinate the work and act as spokesperson. However, each member 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 all team members and will be evaluated using the same rules and judging criteria as individual projects. Each team member must **individually** submit an **MSEF/NJAS Registration Form** and **Form 1B**. However, team members must jointly submit the **Checklist for Adult Sponsor**, one **Research Plan (1A)**, one abstract, one response to #10 that outlines each person's tasks on **Research Plan (1A)**, and other required forms. Full names of all team members must appear on the abstract and other forms.

PROJECT/DISPLAY CHECKLIST

This is a copy of the form used by the Rules and Regulations Committee to check that all forms have been completed and that the display complies with all rules. Rules will be strictly enforced!

I. DOCUMENTATION/CERTIFICATION

ALL PROJECTS:

- _____ Registration Form and Fee
- _____ Form 1
- _____ Research Plan (1A, attachment)
- _____ Abstracts (6 copies)
- _____ Form 1B (Approval Form)

IF APPLICABLE:

- _____ ISEF Form 2 (Qualified Scientist)
- _____ ISEF Form 3 (Designated Supervisor)
- _____ ISEF Form 4 (Human Subject)
- _____ ISEF Form 5 (Informed Consent for Human Subject Research)
- _____ ISEF Form 6 (Human and Animal Tissue)

Download ISEF forms from their web site at <http://www.societyforscience.org/isef/>

II. DISPLAY/SAFETY (See ISEF)

- _____ Maximum Size (76 cm deep X 122 cm wide X 274 cm high--floor to top).
- _____ NO reference to school on display.
- _____ NO live animals or plants.
- _____ NO preserved animals, animal parts (except sealed insects) or plants.
- _____ NO photos/diagrams or vertebrates in abnormal positions.
- _____ NO human parts (except teeth, hair, histo slides).
- _____ NO soil/waste samples.
- _____ NO chemicals (including water unless supplied by MSEF/NJAS).
- _____ NO food.
- _____ NO syringes.
- _____ NO flames or flammables.
- _____ NO items dangerous to public (hazardous/unsafe).
- _____ NO Class III/IV lasers.
- _____ Adequate insulation for temperatures over 100 degrees C.
- _____ NO open top dry cell batteries.
- _____ Shield with ground box on high voltage--out of reach
- _____ Shield large vacuum tubes.
- _____ Electric circuits/cords--approved capacity/insulated.

MSEF/NJAS Registration Form

(Required for EACH entrant; please TYPE or print legibly!)

Code Number: _____

Student Name: _____ Age: _____
Home Address: _____ City: _____ State: _____ Zip+4: _____
Social Security Number (optional): _____ Home Phone: _____
School Name: _____ Grade (Circle One): 7 8 9 10 11 12
Title of Project: _____

Individual or Team Project? Individual _____ Team (requires this + Form 1B for each member) _____

Specific Project Category (category may be changed based on entries):

____ Animal Sciences	____ Earth & Planetary Science	____ Mathematical Sciences
____ Behavioral & Social Sciences	____ Engineering: Electrical/Mechanical	____ Medicine & Health Sciences
____ Biochemistry	____ Engineering: Materials/Bioengineering	____ Microbiology
____ Cellular & Molecular Biology	____ Energy and Transportation	____ Physics and Astronomy
____ Chemistry	____ Environmental Management	____ Plant Sciences
____ Computer Science	____ Environmental Sciences	

Is an electrical outlet needed? NO Yes

Metropolitan Science and Engineering Fair (MSEF) Photo Release

The signature below gives permission for _____ (entrant) to have her/his picture taken. These pictures are MSEF property and their intended use is for the promotion of the MSEF only.

Parent/Guardian Signature

Date signed

=====

TEACHER - SUPERVISOR CERTIFICATION

I agree to sponsor the student named above, supervise her/his MSEF/NJAS science project and assume responsibility for compliance with rules of the Metropolitan Science and Engineering Fair.

Teacher/supervisor Signature

Date signed

Sponsor Name: _____ **e-mail address:** _____

Position: _____ **School/Institution Name:** _____
Address: _____ **City:** _____ **State:** _____ **Zip+4:** _____
Office Phone: _____ **Office Fax:** _____ **Home Phone:** _____

Include Form 1, Research Plan (Form 1A + attachment) and Approval Form (Form 1B)*, 6 copies of your abstract, other applicable forms (see checklist) and registration fee of \$12.00* with this form*.

*Required for each team member if this is team project. **Return before February 2, 2009 DEADLINE to:**

MSEF/NJAS
7400 WESTERN AVE
OMAHA NE 68114-1878

Banquet Tickets are FREE for MSEF participants. For others, please enclose \$15.00 per ticket (payable to Metropolitan Science and Engineering Fair) with this form or purchase tickets during setup on Friday, March 13 (NOT available day of fair). I would like to purchase _____ banquet tickets at \$15.00 each.

Enclosed is \$_____ for registration fee; \$_____ for banquet tickets. TOTAL: \$_____

Entry confirmation will be sent to you prior to the fair

Code
Number _____

MSEF/NJAS Abstract Form

Ten (10) copies of this abstract must be enclosed with your registration form. **DO NOT** put your name on this form! *It will be marked with your code number.* **PLEASE TYPE**, since the judges will use this abstract.

Title of Project:

Specific Category:

Year In School (Circle One): 7 8 9 10 11 12

In the space below, TYPE your abstract (*must not exceed 250 words*), outlining the purpose of the project, procedure followed, results obtained and conclusions drawn. **DO NOT** type on the back of this form!
