

Equity

“The commitment to science for all implies inclusion of those who traditionally have not received encouragement and opportunity to pursue science—women and girls, students of color, students with disabilities, and students with limited English proficiency. It implies attention to various styles of learning, adaptations to meet the needs of special students and differing sources of motivation.”

NSES, P. 221

SciMath^{MN} Statement of Equity for Mathematics and Science Education

Equity means equitable access to high-quality science and mathematics education and equitable treatment in classrooms, schools, and post-secondary education institutions for every student leading to high levels of knowledge, skill, and educational attainment in mathematics and science. Transforming instruction in mathematics and science to achieve an equitable education system depends on the commitment and participation of all stakeholders, including students, families, business, industry, communities, policy makers, and educators at all levels. Working collaboratively, these stakeholders can change an educational system to provide challenging learning opportunities and high achievement in mathematics and science for all students.

SciMath^{MN} believes all students can and must learn mathematics and science. SciMath^{MN} is committed to effecting improvement in student performance. The outcome of effective and equitable mathematics and science instruction is the high achievement of all students, enabling them to be active participants and critical thinkers in a rapidly changing society. This vision includes:

- High standards and expectations in mathematics and science for all students
- Equitable access to rich mathematics and science content for all students
- High quality mathematics and science instruction suitable to the needs of all students
- Knowledge about and sensitivity to equity issues by teachers, school administrators, professional development providers, and pre-service faculty
- Policies that support and facilitate equity
- Allocation of time and resources to support systemic change
- Instruction in mathematics and science geared toward inclusiveness with respect to gender, ethnicities/cultures, socioeconomic status, disabilities, and languages

SciMath^{MN} Statement of Equity (cont.)

In order to support the principle that equity permeate all components of mathematics and science education, equity standards are established in the following areas:

- School, District, and State Policies
- Community Partnerships
- Curriculum and Instruction
- Assessment
- Preservice Education
- Professional Development
- Administration
- Structure and Climate

School, District, and State Policies

- Schools, districts and the state have and enforce policies that address issues of equity.
- Policies and practices are aligned to ensure that staff and administrators respect and promote diversity.
- Resources are allocated to address issues of equity in all program areas.

Community Partnerships

- Parents, caregivers, students, community members, and business partners of diverse backgrounds are crucial to discussions and actions that address equity in science and mathematics.
- Outreach activities empower parents, caregivers, students, community members, and business partners to engage in mathematics and science education.
- Alliances and collaborations among and between community members of various backgrounds are fostered to support equitable educational opportunities.

Curriculum and Instruction

- Equity is addressed as an integral component of a mathematics and science curriculum framework that ensures focused and coherent instruction.
- Curriculum materials are selected to ensure that they are free of bias, are representative of various groups and strongly encourage participation of all students in mathematics and science.
- Instructional strategies support learning for all students.
- All students have equal access to high quality learning materials, including electronic resources of information and a variety of technological tools.
- All students have equitable opportunities to learn to use technology.

Assessment

- Student assessments are aligned with science and mathematics curriculum standards, are free of bias, and are sensitive to diverse student populations.
- Educators use more than one type of assessment tool when assessing students' work.
- Assessment instruments are free of bias.
- Assessment of an individual student's performance uses comparisons of performance over time to help recognize patterns of success and/or difficulty.

SciMath^{MN} Statement of Equity (cont.)

Preservice Education

- Preservice programs prepare teachers to teach science and mathematics to diverse populations of students.
- Preservice education faculty are knowledgeable about and understand issues of equity, relate subject matter to various cultural backgrounds and perspectives, share instructional strategies that reduce gender-bias, and model strategies that include students with a variety of needs in standards-based instruction.
- Learning environments encourage and support the participation and success of students from diverse backgrounds in becoming educators.
- Active recruitment of faculty, students, administrators, and support personnel from underrepresented groups is nurtured.

Professional Development

- Equity issues are integral to professional development activities and include staff members examining their beliefs about and expectations of all students.
- Continued support in educating diverse populations and preparing students for living and working in a diverse society is given through inservice professional development activities that ensure equitable and inclusive instructional practices.
- All staff, including members of underrepresented groups, have the opportunity to participate in leadership and professional development programs in mathematics and science education.

Administration

- Administrators actively generate and promote policies that address issues of equity.
- Administrators are responsible for implementing school, district, and state equity policies.
- Formal and informal expectations of staff are aligned with equity policies.
- Hiring and retention of staff from underrepresented groups is valued and promoted.

School Structure and Climate

- Staff members use teaching strategies appropriate for students in diverse classrooms and are knowledgeable about and sensitive to the differences and perspectives of diverse populations.
- Staff, students, and community members have personal interactions with each other that reflect mutual respect.
- Staff and community provide opportunities for students to learn about, understand and value one's own culture and the cultures of others.

Adopted 5/19/97 by SciMath^{MN} Board of Directors

If you or a group from your school community would like more information or support in achieving equity in science and mathematics education please contact:

SciMath^{MN}
638 Capitol Square Bldg.
550 Cedar St.
St. Paul, MN 55101
(612) 296-4058; Fax: (612) 297-7340

Acknowledgments

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Selected Equity Resources

All students can learn science, but some students have to deal with barriers that, with knowledge and sensitivity, teachers, administrators, and community members can break down. This is a beginning list of resources to help teachers move toward greater equity in their classrooms. See also references listed in the *Professional Education Organizations* and *Business, Professional, and Governmental Organizations* in this chapter and the Equity section of *Chapter 2: Best Practice*.

American Association of University Women Educational Foundation. (1992). *How schools shortchange girls*. Washington, D.C.: Author and National Education Association.

Atwater, M. M. (1994). "Research on cultural diversity in the classroom." In D. Gabel (Ed.), *Handbook of research on science teaching and learning* (pp. 558-576). NY: Macmillan.

Banks, J. A. (1994). *An introduction to multicultural education*. Needham, MA: Allyn & Bacon.

Barba, R. H. (1995). *Science in the multicultural classroom: A guide to teaching and learning*. Needham, MA: Allyn & Bacon.

Carey, S. J. (1993). *Science for all cultures: A collection of articles from NSTA journals*. Arlington, VA: National Science Teachers Association.

"The Changing Lives of Children." (1997, April). *Educational Leadership*, Special issue on many aspects of teaching all children.

"Diversity." (1997, February). *The Science Teacher*, 64(2). Special issue on many aspects of diversity.

Hollis, E. R., King, J. E., & Hayman, W. C. (Eds.). (1994). *Teaching diverse populations: Formulating a knowledge base*. Albany, NY: State University of New York Press.

Johnson, R. (1996, December). *The SciMath^{MN} Report on Equity Issues in Science and Mathematics Education in Minnesota*. St. Paul, MN: SciMath^{MN}.

Kahle, J. B., & Meece, J. (1994). "Research on gender issues in the classroom." In D. Gabel (Ed.), *Handbook of research on science teaching and learning* (pp. 542-557). New York: Macmillan.

Lang, M. (in development, 1997). *Connecting with the learner: An equity toolkit*. Michigan Dept. of Education, 608 W. Allegan, Lansing, MI 48933. (517) 373-4223.

Maldonado, B. (Ed.). *Bilingual directory*. Chicano Latino Affairs Council, Department of Administration, 50 Sherburne Ave., Rm. G-4, St. Paul, MN 55155. (612) 296-9587. <http://www.state.mn.us/ebranch/ssac>

McKendall, V., & Swanson Kroll, B. (1996). *SciMath^{MN} Equity Initiative: Progress Report: Phase 1*. Minneapolis, MN: Rainbow Research, Inc.

Mid-Atlantic Eisenhower Consortium for Mathematics and Science Education. (1994). *Equity Materials in Mathematics, Science and Technology*. Philadelphia, PA: Author.

"Multicultural Education." (1996, Autumn). *Theory into Practice*. Special issue focusing on multicultural education.

Multiculturalism in math, science, and technology: Readings and activities. (1993). Menlo Park, CA: Addison-Wesley.

National Science Resources Center, National Academy of Sciences, Smithsonian Institution. (1997). *Science for all children: A guide to improving elementary science education in your school district.* Washington, D.C.: National Academy Press.

Northwest Regional Educational laboratory. (1997, April). *Science and mathematics for all students: It's just good teaching.* Portland, OR: Author.

Peacock, A. (Ed.). (1991). *Science in primary schools: The multicultural dimension.* New York: Macmillan.

Powell, M. J. (1994). *Equity in the reform of mathematics and science education: A look at issues and solutions.* Austin, TX: Southwest Educational Development Laboratory.

Rosser, S. V. (Ed.). (1995). *Teaching the majority: Breaking the gender barrier in science, mathematics, and engineering.* New York, NY: Teachers College Press.

Streitmatter, J. (1994). *Toward gender equity in the classroom: Everyday teachers' beliefs and practices.* Albany, NY: State University of New York Press.

Thorp, S. (Ed.). (1991). *Race, equality and science teaching.* Hatfield, Herts.: Association for Science Education

U.S. Department of Education. (1994). *The national agenda for achieving better results for children and youth with disabilities.* Washington, D.C.: Author.

U.S. Department of Education, National Center for Education Statistics. (1995). *Understanding racial-ethnic differences in secondary school science and mathematics achievement.* Washington, D.C.: Author.

Selected Internet Sites on Equity:

Barrier Free Education from EASI (see *Professional Education Resources*): <http://www.rit.edu/~easi/>

Center for Children and Technology. "Opening technology for girls," and "Technology for inclusive teaching": <http://place.scholastic.com/ed/research/index.htm>

DO-IT, at the University of Washington - modifications for people with disabilities: <http://weber.u.washington.edu/~doit/>

Equity Online from the Women's Educational Equity Act (WEEA) Equity Resource Center: <http://www.edc.org/CEEC/WEEA/>

The Faces of Science: African Americans in the Sciences: <http://www.lib.lsu.edu/lib/chem/display>

The Hall of Multiculturalism: <http://www.tenet.edu/academia/multi.html>

Mitigative Strategies for Teaching Science to Students with Disabilities: <http://www.edc.org/FSC/NCIP>

Multicultural Mathematics and Science: Effective K-12 Practices for Equity: <http://www.ericse.org/eric/digest-mo6.html>

NSTA Multicultural Science Education Position Statement: <http://www.nsta.org/handbook/position.htm>

Strategies for Teaching Science to Students with Disabilities: <http://www.as.wvu.edu/~scidis>

Women and Minorities in Science and Engineering: http://www.ai.mit.edu/people/ellens/Gender/wom_and_min.html

Instructional Technology

“Effective science teaching depends on the availability and organization of materials, equipment, media and technology. An effective science-learning environment requires a broad range of scientific materials as well as specific tools for particular topics and learning experiences.”

NSES, P. 44

The *National Science Education Standards* note that the use of technology in the science classroom is one of the key components in effective science teaching. However, the standards make few recommendations for the use of specific technologies. Content standards for grades 5-8 state that the use of computers for the collection, summary, and display of evidence is part of this standard. “Students should be able to access, gather, store, retrieve, and organize data, using hardware and software designed for these purposes” (p. 145). The 9-12 standards state that a variety of technologies, “such as hand tools, measuring instruments, and calculators, should be an integral component of scientific investigation” (p. 175).

- **Effective technology helps facilitate teaching and learning behaviors recommended in the standards.** The vision of the Standards encompasses changes in the role of teacher and students, the pattern of classroom interaction, and how knowledge is constructed. Students are viewed as engaged learners: strategic about how to learn, collaborative, and more responsible for their own learning. Teachers are viewed as facilitators of the learning: listening, clarifying, and collaborating. These shifts in traditional roles result in changes in classroom interactions. Student to student discourse increases as students ask more questions of each other, the classroom teacher, and outside experts. Students learn, not in isolation, but as a result of experiential, inductive, hands-on work and social interaction. When used effectively, instructional technology gently interferes with traditional patterns of interactions, role, and knowledge construction and can facilitate the changes described in the NSES.
- **Effective technology supports tasks that are compelling and important to students.** Authentic tasks require authentic tools. Inquiry into questions generated from student experiences is the central strategy for teaching science. To answer these questions, students engage in tasks that include data collection and analysis of first hand events and phenomena. Other questions may encourage students to gather information from experts in industry, the community, and government. To accomplish these tasks, students need access to technology tools for knowing and doing that are routinely used in science today.
- **Effective technology supports teacher and student involvement in scientific inquiry as best practices.** Best practices are pedagogical approaches that increase student efficiency in practicing target behaviors and that allow adjusting the instructional time on task to enable students to reach new and/or more complex outcomes. Science best practices involve students and teachers in scientific inquiry: posing and researching questions of significance, forming hypotheses, collecting data through experimenting, and analyzing results. The answers to these questions are largely unknown in advance and the findings are often of interest beyond the classroom.

“ Good science programs require access to the world beyond the classroom.”

NSES, p. 218

Tools for Improving Teaching & Learning

Science teachers who wish to align their practice with the national standards should consider integrating instructional technologies into their teaching. Keeping up with current technologies and their effective use is an important part of every teacher’s professional development. The notion of scientific literacy for all implies that effective technologies be accessible to students whenever they need them. “As needed” access suggests science teachers focus their students’ time, energy, and effort, as well as their own, on technologies that have the most potential to facilitate the teaching and learning behaviors implied in the Standards and that support scientific inquiry. Below is a selected list of technologies that when used effectively can enhance student learning. As new technologies emerge it is important to gauge how they can be used effectively.

- **Internet Technology:** Combining hands-on research, observation, and the Internet, thousands of children have been linked in on-line cooperative projects and authentic explorations of everything from animal migration to acid rain.
- **Digital Image Processing Technology:** Using image enhancement technology (public domain software) and a computer, students pose and answer questions about body systems, astronomy, geologic formations, and other real world phenomena.
- **Probeware:** Using personal computers or programmable calculators attached to probes, students can measure a range of parameters such as temperature, voltage, motion, and EEG signals quickly, accurately, and interactively. They set up science experiments, weather stations, climate studies, ecology stations, and test energy use of appliances.
- **Science Simulation/Modeling Utilities:** Using personal computers and simulation/modeling software, students test hypotheses and visualize and solve problems.

Outstanding teaching is taking place in many classrooms. Using the right technology can help assure that your classroom is one of them.

Internet Resources in Science Education

SciMath^{MN} Discussion List puts you in contact with teachers across the state. Ask questions or make and respond to comments on issues of professional interest.

World Wide Web Resources

Extensive links to hundreds of sites of interest to science teachers can be found on the MSTA website. Also check this web site for updates of this chapter of the *Framework*.

- Minnesota Science Teachers Association (MSTA): <http://www.informns.k12.mn.us/scimathmn/science>
- SciMath^{MN} resources can be found at: <http://www.informns.k12.mn.us/scimathmn>

To subscribe to the SciMath^{MN} Discussion List send an electronic mail message to: majordomo@informns.k12.mn.us

The content of the message should be: `subscribe scimathmn your-e-mail-address`

Safety

“Safety is a fundamental concern in all experimental science. Teachers of science must know and apply the necessary safety regulations in the storage, use, and care of the materials used by students. They adhere to safety rules and guidelines that are established by national organizations such as the American Chemical Society and the Occupational Safety and Health Administration, as well as by local and state regulatory agencies. They work with the school and district to ensure implementation and use of safety guidelines for which they are responsible, such as the presence of safety equipment and an appropriate class size. Teachers also teach students how to engage safely in investigations inside and outside the classroom.”

NSES, p. 44

Safety in the Science Classroom

As teachers and students “do” science they work with flames, chemicals, living and preserved organisms, and a variety of equipment. Evaluating everything we do from a “safe science” perspective can prevent injury or even loss of life. Safety is everyone’s responsibility, from kindergarten to twelfth grade, from student to administrator. These recommendations are a composite of position statements on safety from the National Science Teachers Association (NSTA) and National Science Education Leadership Association (NSELA), along with recommendations from Jakel, Inc.’s *Total Science Safety System*, and Flinn Scientific. They are not intended to be exhaustive but only a beginning guide. Each teaching environment is different and teachers and the school community must work together to ensure safe learning opportunities for students.

Safety and School Officials

- safety supplies and equipment are adequate and appropriately placed.
- ventilation systems are adequate and functioning properly.
- class sizes are kept at safe limits (24 students for laboratory courses).
- chemicals are labeled and stored properly in a locked room with two exits.
- every room has a phone connection to the office and to outside emergency help.
- lights and refrigerators are spark-free.

It is the teacher’s responsibility to report safety issues to supervisors. In case of accident, the school administrator shares responsibility with the teacher if a potential safety hazard was previously reported in writing.

"Communities that want good science programs must support them with physical facilities that accommodate active exploration, positive collaboration, and safe investigation."

NSTA Pathways, HS Ed.,
p. 139

Safety and Teachers of Science, K-12

Safety issues are ubiquitous in a science teaching setting and must be discussed in all situations. At the beginning of each course or year, teachers outline proper procedures for handling supplies and equipment with students and establish expectations for safe conduct in the science classroom. To ensure that all parties are aware of these expectations, students and parents sign a safety contract. Sample safety contracts for elementary and secondary students are included here to be adapted to specific situations. Often demonstrations are needed to ensure that students understand the terms used in safety explanations. Making a note on lesson plans whenever safety issues are discussed provides documentation of student training.

Every responsible teacher of science:

- remembers that student safety is a primary concern.
- plans what to do in potentially hazardous situations.
- instructs students about potential hazards and precautions to be taken before every activity.
- puts hazardous materials safely away immediately after use.
- has a firm goggle policy: *whenever chemicals, glassware, heat, or tools are used, goggles must be worn.*
- purchases appropriately sized goggles with flexible edging so that they fit tight against the skin and are marked "Z87".
- reads Material Safety Data Sheets (MSDS) to learn of proper handling and potential hazards of chemicals.
- uses goggles and other safety measures with household chemicals (vinegar, salt, cleaning solutions, bleach, etc.) even though they have no MSDS sheets for them.
- insists that students wash their hands thoroughly after working with things like chemicals, animals, animal parts, and owl pellets.
- never leaves students unsupervised when they are doing science.
- keeps a list of emergency phone numbers by every phone.
- checks out field trip sites for potential safety concerns.
- has enough supervision on field studies and trips (minimum of 1 chaperone to 10 students for secondary; 1 to 5 for primary).

Other considerations:

- Use of road kills: Permits to salvage road killed mammals and birds are required from the Minnesota Department of Natural Resources. The U.S. Fish and Wildlife Service also requires permits for collecting birds. See references following for more information.
- Use of human blood: Absolutely avoid any human blood experimentation.
- Field trips: Have a first aid/artificial respiration/CPR expert along on any field trips involving water. Take extra precautions and have adequate safety equipment when doing field studies.
- Chemical storage: Store chemicals by family to avoid unwanted chemical reactions if a container should leak.
- Lasers: Ensure that no one looks into a laser beam or its reflection.
- Take precautions when using rock hammers, projectiles, compressed gas, etc.
- Use of animals: Be aware of cultural beliefs and practices among families of the school community regarding the use and disposal of animals. In addition, students should never experiment with live, vertebrate animals. Consult the rules for the International Rules for Precollege Science Research, available from Science Service and NSTA position papers for more information regarding the use of vertebrate animals in student investigations.
- Petri dishes and microbes: Special precautions need to be taken when doing microbial studies. Because any microbes that grow are in large concentrations in petri dishes, care must be taken to isolate them from students and teachers. The National Institute for Occupational Safety and Health recommends use of plastic petri dishes which are taped shut after being exposed. It is best that these petri dishes are never opened. To dispose of used plates, autoclave them and put them in a plastic bag before throwing them in the trash. If an autoclave is not available at your school or local hospital, soak the dishes overnight in a freshly made 20 percent bleach solution (one part bleach to four parts water) in a covered large mouth jar or plastic container. The bleach solution can also be used to wipe down surfaces and clean pipettes and other equipment. Use rubber gloves and goggles!
- Hazardous materials: Stewardship of environmental and dollar resources requires that teachers do their homework before ordering hazardous materials or equipment. Sometimes proper disposal of chemicals and biological materials can be difficult and expensive. Evaluate the risks and benefits of the activities you plan; is there a safer way to teach the same concept? Buying smaller quantities, even if more expensive, can be better for the environment as well as safer for teacher and student. To in information on the proper disposal of hazardous waste, check the resources at the end of this section.

“ Collaborative inquiry requires adequate and safe space.”

NSES, p. 218

Things to dispose of—properly, of course:

- samples of asbestos from the earth science storeroom.
- old demonstration specimens that are stored in formaldehyde or formalin.
- carcinogenic chemicals.
- outdated, unmarked, or unidentified chemicals.

Minnesota's Right to Know Law requires:

- annual training of employees.
- Material Safety Data Sheets (MSDS) for all used or stored hazardous materials.
- a hazardous materials list.
- labeling of all chemicals.
- a chemical hygiene plan.

More information can be obtained from the Minnesota Department of Labor and Industry, listed in the references.

Other Safety Resources:

The National Science Teachers Association and National Science Educational Leadership Association have position papers that refer to safety on the topics below. Check them out on the web: <http://www.nsta.org/> and <http://science.coe.uwf.edu/NSELA/NSELA.html>

- Guidelines for Responsible Use of Animals in the Classroom
- Minimum Safety Guidelines for Presenters and Workshop Leaders
- Laboratory Science
- Science Teaching Conditions
- Class Size in Science Laboratory Rooms

The Minnesota Department of Children, Families and Learning offers all Minnesota school districts science safety training and the software *The Total Science Safety System: Minnesota Version* for all their teachers of science, grades K-12. Detailed information on legal responsibilities, safety assessment helps, references, and more comprehensive safety procedures for all areas of science is given. Contact State Science Specialist, Kathleen Lundgren, at the MN Department of Children, Families, and Learning for more information. (612) 296-4071, kathleen.lundgren@state.mn.us .

Sample Elementary Science Safety Contract



I will :

- Follow all directions given by the teacher.
- Wear safety goggles whenever the teacher directs.
- Conduct myself in a responsible manner at all times when doing science.
- Handle animals respectfully.
- Always wash my hands after handling chemicals or animals.
- Immediately report any injury or spill to the teacher.
- Use proper techniques and be careful with equipment and sharp instruments.

I have read, understand and agree to follow all these safety procedures.

Student Signature

Date

Parent/Guardian Signature

Date

Please indicate if your child has any allergies or other medical conditions of

which the teacher should be aware.

Allergies: _____

Other: _____

Sample Secondary Science Safety Contract

1. Written and verbal instructions concerning procedures and/or precautions are given for my protection. I will read and listen carefully, and follow all directions.

2. Experiments done in class are for instruction. They are planned in order to teach an idea. I will perform only authorized experiments.

3. I will handle only those chemicals or equipment for which I have received instructions or training. No control for gas, air, or water is to be turned on except for lab work. Electrical outlets are only to be used for electrical plug-ins—other inserts are dangerous.

4. Tasting, smelling, or mixing unknown substances can be very dangerous. I will not do so unless instructed to do so in a planned, approved experiment, with proper techniques.

5. Chemicals are labeled to identify them. I will always carefully read the label to be sure I am using the correct substance. To avoid contaminating chemicals, I will not return used or unused chemicals to reagent containers. I will dispose of chemicals as my teacher directs and never mix chemicals in the sink drain. To avoid splattering when mixing acids, I will add acid to water (“Do what you oughter, acid to water.”)

6. Horseplay and practical jokes in the science classroom are dangerous and can be expensive. I will practice safe conduct in the classroom.

7. Fire is dangerous and care must be taken when working with it. I will not reach across a flame or bring a

flammable substance near flames. I will confine long hair and loose clothing to prevent it from igniting. Know where the fire extinguisher and fire blanket are located and how and when to use them. All fire must be extinguished, gas off, and materials capped, before departing from the classroom for a fire drill or other school activity. I will not carry any lighted alcohol lamps or splints away from the lab station. No aerosol spray is ever to be used in a science lab by a student unless directed by the teacher. Alcohol burners are to be lit only while in use and must not be refueled when fire is present.

8. Safety equipment (eyewash, shower, first-aid kit) is provided in the science classroom in case of emergency. I know how and when to use this equipment.

9. Hot materials, such as glassware, hot plates, Bunsen burners, and chemicals can cause serious burns. I will be extremely careful when working with these to prevent injury to myself and others. I will be sure that the open end of a test tube points away from everyone while the test tube is being heated or shaken. I will always heat test tubes evenly and use boiling chips to prevent liquid “shooting.”

10. Broken glass is dangerous. I will use a broom and dustpan to immediately pick up all broken glass and place it in the broken glass container.

11. Safety goggles are required by law [Minnesota Statutes, Section 126.20 (Ex1967, C14, S1-6)]. Goggles must be worn covering the eyes during all activities using fire or glassware; mixing,

handling or heating chemicals; chipping rock; or whenever danger exists to the eyes. I will wear my safety goggles unless permission to remove them is granted by the teacher. I will also wear other necessary apparel required for specific work, i.e. apron, gloves, shoes, etc.

12. If an incident should occur that results in injury to myself or others in the science classroom or damage to equipment, I will immediately report it to my teacher, no matter how minor the injury or damage may appear. Spilled mercury from broken thermometers or other sources must be avoided. Chemical spills on skin or clothes should be flushed with water immediately. All accidents, cuts, or spilled chemicals, should be reported immediately to the instructor.

13. I will not eat, drink, or chew gum in the science classroom. I will always wash my hands carefully after handling chemicals or animals.

14. I will use proper techniques and be careful with sharp instruments.

15. It is important to know the exits to be used in case of emergencies. Students must not sit in the aisles which might prevent emergency exit from the classroom. Likewise, projects, materials, or equipment must not be stored so as to slow room evacuation. I am familiar with the exits and the appropriate action to take when the emergency signal is heard.

I have read and understand all the above safety procedures. I agree to abide by the safety rules as set forth above and also any additional printed or oral instructions provided by the teacher and/or district.

_____ Student Signature Date _____

_____ Print Name Legibly

_____ Parent/Guardian Signature Date _____

Please indicate if your daughter/son has any allergies or other medical conditions of which the teacher should be aware.

Allergies: _____

Other: _____

Safety Resources

References:

- Dean, R. A., Dean, M. M., and Gerlovich, J. A. (1993). *Safety in the elementary classroom*. Washington, D.C.: National Science Teachers Association.
- Flinn Scientific, Inc. (1997). *Chemical catalog/reference manual*. Batavia, IL: Author.
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- Gerlovich, J. A., & Hartman, K. (1996). *The total science safety system: Elementary and secondary editions* (4th ed., Minnesota version).
- Horn, T. (1993). *Working with DNA and bacteria in precollege science classrooms*. Reston, VA: National Association of Biology Teachers.
- Merck & Co., Inc. (1983). *The Merck index*. (10th ed.). Rahway, NJ: Author.
- National Science Education Leadership Association, Position Statements: <http://science.coe.uwf.edu/NSELA/NSELA.html>
- National Science Teachers Association, Position Statements: <http://www.nsta.org/handbook/position/htm>
- Science Service, Inc. (1997). *International rules for precollege science research*. Washington, D.C.: author.
- Weast, R. C. (1996). *CRC handbook of chemistry and physics*. Cleveland, OH: CRC Press.
- Young, J. A. (March, 1997). "Chemical Safety." *The Science Teacher*, 64:43-45.

Organizations:

Chemical Safety Day Program

Dept. of Environmental Health and Safety,
Univ. of MN
Integrated Waste Management Facility
501 23rd Ave. SE, Minneapolis, MN 55455
(612) 626-1553
(Hazardous waste disposal.)

Laboratory Safety Workshop

192 Worcester Rd., Natick, MA 01760-2252
(508) 647-1900; Fax: (508) 647-0062

MN Department of Children, Families & Learning

Kathleen Lundgren, Science Specialist
634A Capitol Square, St. Paul, MN 55101
(612) 296-4071; Fax: (612) 296-3775
kathleen.lundgren@state.mn.us
<http://cfl.state.mn.us/science/science.htm>
(Safety workshop and software.)

MN Department of Labor and Industry

443 Lafayette Rd., St. Paul, MN 55155
(612) 296-6529; Fax: (612) 282-5405
(Information on MN Right to Know law.)

MN Department of Natural Resources Section of Wildlife (Attention: Permits)

Box 7, 500 Lafayette Rd., St. Paul, MN 55155
(612) 296-6157; (800) 766-6000
(Permits to salvage road killed mammals or birds.)

Occupational Safety & Health Admin. (OSHA) Region 5

230 S Dearborn St., Rm. 3244,
Chicago, IL 60604
(312) 353-2220; Fax: (312) 353-7774
<http://www.osha.gov/>

Rollins Environmental Services (formerly Aptus)

21750 Cedar Ave. S, Lakeville, MN 55044
(612) 469-8351; Fax: (612) 469-5140
(Under state contract to dispose of hazardous waste.)

State Fire Marshall, Division of Public Safety

444 Cedar St., 100-M, St. Paul, MN 55101
(612) 215-0500

U.S. Environmental Protection Agency Region 5

77 W Jackson Blvd., Chicago, IL 60604
(312) 353-2000; (800) 621-8431
<http://www.epa.gov/Region5/home.html>

U.S. Fish and Wildlife Service

Migrating Bird Permit Office
1 Federal Dr., P.O. Box 45, Federal Bldg.
Fort Snelling, MN 55111-0045
(612) 725-3775
<http://www.fws.gov/>
(Permits to collect dead bird specimens.)

Support & Opportunities

“The challenge of professional development for teachers of science is to create optimal collaborative learning situations in which the best sources of expertise are linked with the experiences and current needs of the teachers.”

NSES, P. 58

Teachers striving to improve the learning experiences they provide for students soon turn their attention to organizations that can help them develop strategies that support instructional improvement, answer questions that arise, or obtain curricular resources. The resources that follow are designed to support the efforts of individuals and organizations as they strive to improve science education. Included are local, regional, state, and national resources.

The major organizations whose first priority is science education, MSTA, NSTA, SciMath[™], and the Minnesota Department of Children, Families and Learning, are annotated. Next comes a list of education organizations which teachers of science may find helpful. The next list is a selection of professional societies, national education centers, federal departments and agencies, and other sources that may be helpful for specific curriculum.

Statewide informal science institutions including nature centers, zoos, museums, parks, etc. are listed. Also included are public and private four year post secondary institutions and regional service cooperatives which provide professional development, possible student mentors, and many other opportunities for students and teachers.

Finally, check out the annotated list of extracurricular opportunities in science for enriching experiences for students.



Minnesota Science Teachers Association (MSTA)

What is MSTA about?

The mission of MSTA is to stimulate, coordinate, and improve science teaching and learning for all.

MSTA was formed in 1964, the first organization of its type in Minnesota. It was affiliated with the Minnesota Academy of Science until 1987 when MSTA incorporated and became a separate entity.

MSTA publishes a quarterly newsletter, convenes annual Fall and Spring conferences for science educators, and holds a variety of special grade level, discipline, and regional meetings for science teachers around the state. The Fall Conference is held in October in the metro area and is co-hosted with the Minnesota Council of Teachers of Mathematics (MCTM). The Spring Conference is held at various regional sites throughout the state, usually in March or April. Each year MSTA awards an elementary, middle school, and secondary Science Teacher of the Year. In addition, MSTA keeps its members informed about important legislation and other science education related activities through mailings as well as electronically on the World Wide Web.

MSTA's Board of Directors consists of representatives from geographical regions, science disciplines, informal education, the science specialist from the Minnesota Department of Children, Families and Learning (MDCFL), and SciMath^{MN}. Members of the Executive Committee include the president, president-elect, past president, treasurer, MDCFL science specialist, and MSTA's executive director.

Why belong to MSTA?

With the publication of documents such as the *National Science Education Standards* (NSES) by the National Research Council, *Benchmarks* by the American Association for the Advancement of Science, and the *Minnesota K-12 Science Framework* by SciMath^{MN} as well as the supporting environment and requirements of the Minnesota Graduation Standards, Minnesota science educators find themselves in one of those wonderful periods of dramatic and forward-looking educational change, the era of standards-based education. The vision of this reform, science for all, is rich in promise, opportunities, and challenges for helping young learners become knowledgeable, skilled, and comfortable in the neighborhood of science. Membership in MSTA will help you keep up-to-date with standards-based education and provide ways for you to shape it in your classroom, school, district, and state.

Membership in MSTA has many other benefits. They include:

- opportunities for sharing with and learning from other science education professionals;
- participation in a network of science teachers designed to enhance curriculum, assessment, and instruction;
- receiving regular information and updates through newsletters and other media;
- collegial involvement with other science educators;
- avoiding professional isolation;
- price break on conferences;
- increasing effectiveness as a teacher;
- enhancement of one's professional sense of worth and value;
- addressing the needs of the science education profession, e.g., recruitment of new teachers and being proactive rather than reactive regarding issues affecting science education.

For membership
information contact:

**Minnesota Science
Teachers Association**
222 Security Bldg.,
2395 University Ave.
St. Paul, MN 55114
(612) 644-6254
<http://www.informns.k12.mn.us/scimathmn/science>



For more information
contact:

**National Science
Teachers Association**

1840 Wilson Blvd.,
Arlington, Virginia
22201-3000
(703) 243-7100 or
(800) 830-3232
<http://www.nsta.org>

National Science Teachers Association (NSTA)

The National Science Teachers Association (NSTA), founded in 1944 and headquartered in Arlington, Virginia, is the largest organization in the world committed to promoting excellence and innovation in science teaching and learning for all. NSTA's current membership of more than 53,000 includes science teachers, science supervisors, administrators, scientists, business and industry representatives, and others involved in science education.

Journals are published eight times a year and one is included with each NSTA membership.

- *Science and Children* - for elementary teachers
- *Science Scope* - for middle level teachers
- *The Science Teacher* - for high school teachers
- *Journal of College Science Teaching* - for college science teachers

NSTA also publishes a newspaper, *NSTA Reports*, and two student magazines, *Dragonfly* for elementary students, and *Quantum* for high school mathematics and science students. NSTA conducts national and regional conventions that attract more than 30,000 attendees annually.

NSTA provides many programs and services for science educators, including awards, professional development workshops, and educational tours. NSTA offers professional certification for science teachers in eight teaching level and discipline area categories. In addition, NSTA has a World Wide Web site with links to state, national, and international science education organizations, an on-line catalog of publications, and two "discussion rooms" to foster interaction and ongoing conversations about science education.

NSTA serves as an advocate for science educators by keeping its members and the general public informed about national issues and trends in science education. NSTA disseminates results from nationwide surveys and reports and offers testimony to Congress on science education-related legislation and other issues. The organization has position statements on issues such as teacher preparation, laboratory science, the use of animals in the classroom, laboratory safety, and elementary and middle level science.

NSTA is involved in cooperative working relationships with numerous educational organizations, government agencies, and private industries on a variety of projects.

National Science Education Leadership Association (NSELA)

The National Science Education Leadership Association promotes the development of efficient and effective supervisory practices as a means to improve science education. NSELA facilitates communication among and provides opportunities for science supervisors and teacher-leaders, K-12, to discuss and take action on matters of common interest and concern.



For more information
contact:

**National Science
Education Leadership
Association**

P.O. Box 5556,
Arlington, VA 22205
<http://science.coe.uwf.edu/NSELA/NSELA.html>



For more information
contact:

SciMath^{MN}

638 Capitol Square
Bldg., 550 Cedar St.,
St. Paul, MN 55101
(612) 296-4058;
Fax: (612) 297-7340
e-mail: [scimath-mn@
informns.k12.mn.us](mailto:scimath-mn@informns.k12.mn.us)
Internet: [http://www.
informns.k12.mn.us/
scimathmn](http://www.informns.k12.mn.us/scimathmn)

**SciMath^{MN} –
Raising Science & Mathematics Education to the Power of Minnesota**

A Catalyst for Change

Founded in 1993, SciMath^{MN} is a partnership among business, education, and state government to pursue statewide improvement in the teaching and learning of K-12 mathematics and science. Its mission is to increase the participation and achievement of all Minnesota students in mathematics and science.

Strategy for System-Wide Improvement

SciMath^{MN} strives to create alignment among voluntary national standards for mathematics and science education, the Minnesota Graduation Standards, local policy, and classroom practice. Its initiatives focus on three areas:

Policy and Leadership Development: Assisting in state and institutional policy development that promotes mathematics and science literacy for all students.

Public Awareness: Building a positive, ambitious public climate for quality science and mathematics education for all Minnesota students.

Professional Development: Strengthening the preparation of new teachers of mathematics and science and expanding the knowledge and skills of practicing teachers.

SciMath^{MN} initiatives are overseen by a board of directors including K-12 educators, higher education, government representatives, and the business community. Housed with the Minnesota Department of Children, Families and Learning, SciMath^{MN} works closely with the department's mathematics and science specialists.



Kathleen Lundgren,
Science Specialist,
MN Dept. of Children,
Families, & Learning
 634A Capitol Square,
 St. Paul, MN 55101
 (612) 296-4071;
 Fax: (612) 296-3775
 kathleen.lundgren@
 state.mn.us
<http://cfl.state.mn.us/science/science.htm>

To find out how to contact your regional MEEP coordinator, consult the MN Department of Children, Families, & Learning web page at <http://www.educ.state.mn.us/> or call 612-296-2626

Minnesota Department of Children, Families and Learning

Science Specialist

The Science Specialist at the Minnesota Department of Children, Families and Learning coordinates science education for the State. Specific duties include:

- Direct service to Minnesota schools in their science curriculum, instruction, and assessment.
- Leadership in the area of science for the Minnesota Graduation Standards.
- Collaboration with SciMath^{MN} on the implementation of the National Science Education Standards and the development and implementation of the Minnesota K-12 Science Framework.
- Leadership to a statewide, regionalized system, called the Science Best Practice Network, to increase the capacity of teachers of science in the areas of curriculum, instruction, and assessment.
- Safety planning for state classrooms, labs, and field sites.
- Representation of K-12 science education on state and national boards.
- Collaboration with statewide organizations, institutions, and businesses to improve the quality of science education and science literacy in Minnesota.

Minnesota Educational Effectiveness Program (MEEP)

MEEP provides ongoing regional support for districts and building sites for implementation of the Graduation Standards. Regional coordinators provide assistance and training for superintendents, principals, and teachers as they embed standards and implement performance packages. For more information, contact

Diane Cirksena
 Team Leader, MEEP, MN DCFL
 626 Capitol Square, 550 Cedar St.
 St. Paul, MN 55101
 (612) 282-5987, Fax (612) 297-2845
 dcirksena@inet.educ.state.mn.us

Regional Science Best Practice Network

The goal of the Science Best Practice Network is to provide support and training for teachers of science, enabling them to continuously improve science instruction in their classrooms. Best Practice Teams can provide regional support for teachers and districts as they implement the Minnesota Graduation Standards. Teachers can call on Best Practice Teams for advice, to observe and give feedback, and to support risk-taking as they try out new methods, materials, and activities. Contact the Minnesota Educational Effectiveness Program (MEEP) coordinator in your region or the State Science Specialist, Kathleen Lundgren for more information.

Professional Education Organizations

This list of professional education organizations is not all-inclusive nor can it remain accurate for long. Please see the MSTA web page to get the latest version of the list, to suggest additions, and to report changes that you discover.

AAAS	American Association for the Advancement of Science 1333 H St. NW, Washington, D.C. 20005 (202) 326-6400; Fax: (202) 371-9849 http://www.aaas.org/	APASE	Association for the Promotion and Advancement of Science Education 1111 Homer St., Suite 200 Vancouver, BC V6B 2Y1 (604) 687-8712; Fax: (604) 687-8715 http://www.apase.bc.ca
AAGC	American Association for Gifted Children 1121 W Main St., Suite 100 Durham, NC 27701 (919) 683-1400; (919) 783-6152 http://www.jayi.com/jayi/aagc/	AWIS	Association for Women in Science 1200 New York Ave. NW Washington, D.C. 20005 (202) 326-8940; Fax: (202) 326-8960 http://www.awis.org
AAPT	American Association of Physics Teachers 1 Physics Ellipse, College Park, MD 20740 (301) 209-3300; Fax: (301) 209-0845 http://www.aapt.org	CEE	Center for Excellence in Education 7710 Old Springhouse Rd., Suite 100 McLean, VA 22102 (703) 448-9062; Fax: (703) 422-9513 http://rsi.cee.org/
AASA	American Association of School Administrators 1801 N Moore St., Arlington, VA 22209 (703) 875-0778; (703) 841-1543 http://www.aasa.org/	CELL	Center for Environmental Learning and Leadership University of Minnesota 1518 Cleveland Ave. N, Rm. 220 St. Paul, MN 55108 (612) 625-8153
ACS	American Chemical Society 1155 16th St. NW, Rm. O-816 Washington, D.C. 20036 (800) 451-9190; Fax: (202) 833-7732 http://www.acs.org	CGEE	Center for Global Environmental Education 1536 Hewitt Ave., St. Paul, MN 55104 (612) 659-3105; Fax: (612) 641-2489 http://cgee.hamline.edu
AETS	Association for the Education of Teachers of Science The University of West Florida, 11000 University Pkwy., Pensacola, FL 32514-5753 (904) 474-2856; Fax: (904) 474-2860 http://science.coe.uwf.edu/aets/aets.html	CESE	Coalition for Earth Science Education Geological Society of America 3300 Penrose Pl., P.O. Box 9140 Boulder, CO 80301 (303) 447-2020
AFT	American Federation of Teachers 555 New Jersey Ave. NW Washington, D.C. 20001 (202) 879-4400 http://www.aft.org	CELS	Coalition for Education in the Life Sciences c/o Center for Biology Education University of Wisconsin-Madison 11271 Genetics/Biotechnology Bldg. 425 N Henry Mall, Madison, WI 53704 (608) 262-5266; Fax: (604) 262-6748
ASMC	Association of Science Materials Centers, Science Resource Center Mesa Public Schools 143 S Alma School Rd., Mesa, AZ 85210 (602) 898-7815	CEC	The Council for Exceptional Children 1920 Association Dr., Reston, VA 22091 (703) 620-3660 http://www.cec.spec.org/
ASCD	Association for Supervision and Curriculum Development 1250 N Pitt St., Alexandria, VA 22314-1453 (703) 549-9110; Fax: (703) 299-8631 http://ascd.org	CSMEE	Center for Science, Math & Engineering Education Milton Harris Building 2001 Wisconsin Ave NW Washington, D.C. 20007 http://www.nas.edu/ (303) 447-2020

ERIC	Educational Resources Information Center Search 16 Clearinghouses for references on any educational topic http://www.aspensys.com/eric/	LDA	Learning Disabilities of Minnesota 400 Selby, Suite D St. Paul, MN 55102-4508 (612) 222-2696; Fax: (612) 222-0326 http://www.lदानatl.org/
ENC	Eisenhower National Clearinghouse for Mathematics and Science Education Ohio State University, 1929 Kenny Rd. Columbus, OH 43210 (614) 292-7784; Fax: (614) 292-2066 http://www.enc.org	McRel	Mid-Centent Regional Educational Laboratory 2550 S Parker Rd., Suite 500 Aurora, CO 80014 (303) 337-0990; Fax: (303) 337-3005 http://www.mcrel.org
EJSE	Electronic Journal of Science Education http://unr.edu/homepage/jcannon/ejse.html	MSC	Midwest Consortium for Mathematics and Science Education 1900 Spring Rd., Suite 300 Oak Brook, IL 60521 (708) 571-4700 http://www.ousd.k12.ca.us/netday/links/Partnerships/msc.htm
EOHSI	Environmental and Occupational Health Sciences Institute Public Education and Risk Communications Division Resource Center 681 Frelinghuysen Rd., P.O. Box 1179 Piscataway, NJ 08855-1179 (908) 445-0110; Fax: (908) 445-0122 http://www.eohsi.rutgers.edu/rc	MN Area Chemistry Teachers c/o MSTA, 222 Security Bldg. 2395 University Ave., St. Paul, MN 55114 (612) 644-6254 http://informns.k12.mn.us/scimathmn/science/	
EASI	Equal Access to Software Information c/o American Association for Higher Education 1 Dupont Circle, Suite 360 Washington, D.C. 20036 (202) 293-6440 x 48	MAS	MN Academy of Science 408 St. Peter St., Suite 410 St. Paul, MN 55102 (612) 227-6361; Fax: (612) 227-8758 http://www.mnacadsoci.org/
Go4ST8	Go4ST8 Physics Teachers c/o MSTA, 222 Security Bldg., 2395 University Ave., St. Paul, MN 55114 (612) 644-6254 http://informns.k12.mn.us/scimathmn/science/	MASE	MN Administrators for Special Education 1884 Como Ave., St. Paul, MN 55108 (612) 645-6272; Fax: (612) 645-7518
ISTE	International Society for Technology in Education 1787 Agate St., Eugene, OR 97403-1923 (541) 346-4414; Fax: (541) 346-5890 http://www.iste.org	MAEE	MN Association for Environmental Education c/o MN National Wildlife Refuge, 3815 E 80th St., Bloomington, MN 55425 (612) 770-6742 http://www.seek.state.mn.us/gp6.html
ITEA	International Technology Education Association 1914 Association Dr., Reston, VA 20091 (703) 860-2100; Fax: (703) 860-0353 http://www.iris.org/~iteawww/ITEA.html K-12 Serve America Clearinghouse R-460 VoTech Ed Bldg., 1954 Buford Ave. University of MN, St. Paul, MN 55108 (800) 808-7378; (612) 625-6278; Fax: (612) 625-6277	MASCD	MN Association for Supervision and Curriculum Development 8900 Portland Ave. S Bloomington, MN 55420 (612) 885-8637 http://hillside.sowashco.k12.mn.us/ascd/ascd.html
LDA	Learning Disabilities Association 2104 Park Ave. S, Minneapolis, MN 55404 (612) 871-9011 http://www.lदानatl.org/	MASA	MN Association of School Administrators 1884 Como Ave., St. Paul, MN 55108 (612) 645-6272; Fax: (612) 645-7518

MASSP	MN Association of Secondary School Principals 1910 W County Rd. B, Suite 109 St. Paul, MN 55113 (612) 636-8366 http://www.nassp.org/	MEA	MN Education Association 41 Sherburne Ave., St. Paul, MN 55103 (612) 227-9541 http://www.mnea.org
	MN Best Practice Network in Science 634A Capitol Square, St. Paul, MN 55101 (612) 296-4071; Fax: (612) 296-3775 kathleen.lundgren@state.mn.us	MEGT	MN Educators of the Gifted and Talented 5701 Normandale Rd. Minneapolis, MN 55424 (612) 927-9546
MBOT	MN Board of Teaching 608 Capitol Square, 550 Cedar St. St. Paul, MN 55101 (612) 296-2415	MESPA	MN Elementary School Principals' Association 555 Park St., Suite 110, St. Paul, MN 55103 (612) 227 7209; Fax: (612) 227-0284
MCOSEE	MN Coalition of Organizations for Sex Equity in Education 52 Windsor Court New Brighton, MN 55112 (612) 633-6542	MFT	MN Federation of Teachers 168 Aurora Ave., St. Paul, MN 55103 (612) 227-8583
PTA	MN Congress of Parents, Teachers, and Students 1910 W County Rd. B, Suite 118 Roseville, MN 55113 (612) 631-1736; (800) 672-0993; Fax: (612) 633-3082	MHC	MN Humanities Commission 26 E Exchange St., St. Paul, MN 55101 (612) 224-5739 http://www.thinkmhc.org/
	MCGT	MJAS	MN Junior Academy of Science 408 St. Peter St., Suite 410 St. Paul, MN 55102 (612) 227-6361; Fax: (612) 227-8758 http://www.mnacadsci.org
	MN Council for the Gifted and Talented 5701 Normandale Rd Minneapolis, MN 55424 (612) 927-9546 http://www.pacer.org/state/yellowst.htm	MSTA	MN Science Teachers Association 222 Security Bldg., 2395 University Ave. St. Paul, MN 55114 (612) 644-6254 http://informns.k12.mn.us/scimathmn/science/
	MCTM	MSBA	MN School Boards Association 1900 W Jefferson Ave. St. Peter, MN 56082-3015 (507) 931-2450; Fax: (507) 931-1515
	MN Council of Teachers of Mathematics 1467 Centennial Dr., St. Paul, MN 55113 (612) 633-4653 http://www.informns.k12.mn.us/scimathmn.mctm	MNTOPS	MN Teachers of Physical Science c/o MSTa, 222 Security Bldg. 2395 University Ave., St. Paul, MN 55114 (612) 644-6254 http://informns.k12.mn.us/scimathmn/science/
MN DCFL	MN Dept. of Children, Families & Learning Kathleen Lundgren, Science Specialist 634A Capitol Square, 550 Cedar St. St. Paul, MN 55101 (612) 296-4071; Fax: (612) 296-3775 http://cfl.state.mn.us/science/science.htm	MTEA	MN Technology Education Association 6400 Parkers Lake Rd., Bemidji, MN 56601 (218) 755-2998 http://www.anoka.k12.mn.us/mtea.html
MDCFL	MN Dept. of Children, Families & Learning 550 Cedar St., St. Paul, MN 55101-2273 (612) 296-6104; Fax: (612) 296-3272 http://www.educ.state.mn.us/	NEWEST	NASA Educational Workshops for Elementary School Teachers c/o NSTA, 1742 Connecticut Ave. NW Washington, D.C. 20009 (202) 328-5800 http://web.fie.com/htdoc/fed/nas/any/k12/prog/any/naspgaba.htm
MESTA	MN Earth Science Teachers Association c/o MSTa, 222 Security Bldg. 2395 University Ave., St. Paul, MN 55114 (612) 644-6254 http://informns.k12.mn.us/scimathmn/science/		

NEWMAS	NASA Educational Workshops for Mathematics and Science Teachers c/o NSTA, 1742 Connecticut Ave. NW, Washington D.C. 20009 (202) 328-5800 http://web.fie.com/htdoc/fed/nas/any/k12/prog/any/naspgaba.htm	NBPTS	National Board for Professional Teaching Standards 26555 Evergreen Rd., Suite 400 Southfield, MI 48076 (810) 351-4444; (800) 532-1813; Fax: (810) 351-4170 http://www.nbpts.org
NAS	National Academy of Science 2101 Constitution Ave. NW Washington, D.C. 24018 (202) 625-4725 http://www.NAS.edu/	NCEE	National Center for Earth Science Education American Geological Institute, 4220 King St. Alexandria, VA 22302-1507 (703) 379-2480; Fax: (703) 379-7563
NAEP	National Assessment of Educational Progress - The Nation's Report Card 800 N Capitol St. NW, Suite 825 Washington, D.C. 20002-4233 http://www.nagb.org/	NCSE	National Center for Science Education P.O. Box 9477, Berkeley, CA 94709-0477 (510) 526-1674; (800) 290-6006; Fax: (510) 526-1675 http://www.natcensci.ed.org/
NAGB	National Assessment Governing Board 800 N Capitol St. NW, Suite 825 Washington, D.C. 20002-4233 http://www.nagb.org/	NCWGE	National Coalition for Women and Girls in Education c/o National Women's Law Center 1616 P St., NW, Washington, D.C. 20005 (202) 328-5180
NAGC	National Association for Gifted Children Peter Rosenstein, Executive Director 1155 15th St. NW, Suite 1002 Washington, D.C. 20005 (202) 785-4268 http://www.nagc.org	NCTM	National Council of Teachers of Mathematics 1906 Association Drive, Reston, VA 20191-1593 (703) 620-9840; Fax on demand: (800) 220-8483 http://www.nctm.org
NARST	National Association for Research in Science Teaching Ohio State University 1929 Kenny Rd., Suite 100 Columbus, OH 43210 (913) 532-7688 http://science.coe.uwf.edu/narst/narst.html	NESTA	National Earth Science Teachers Association 2000 Florida Ave. NW Washington, D.C. 20009 (202) 462-6910; Fax: (202) 328-0560 http://www.agiweb.org/agj/member/nesta96.html
NABT	National Association of Biology Teachers 11250 Roger Bacon Dr., #19 Reston, VA 22090 (703) 471-1134; (800) 406-0775 http://www.nabt.org/	NEA	National Education Association 1201 16th St. NW, Washington, D.C. 20036 (202) 833-4000 http://www.nea.org
NAESP	National Association of Elementary School Principals 1615 Duke St., Alexandria, VA 22314-3483 (703) 684-3345 http://www.naesp.org	NISE	National Institute for Science Education School of Education, University of Wisconsin-Madison 1025 W Johnson St., Madison, WI 53706 (608) 263-9250; Fax: (608) 262-7428 http://www.wcer.wisc.edu/NISE/
NAGT	National Association of Geology Teachers Dept. of Geology, Western WA University Bellingham, WA 98225 (206) 650-3587	NMLSTA	National Middle Level Science Teachers Association Ohio Dept. of Education, 65 S Front St. Columbus, OH 43215 http://www.nsta.org/nmlsta/
NASSP	National Association of Secondary School Principals 1904 Association Dr., Reston, VA 22091 (703) 860-0200 http://www.nassp.org		

NRC	National Research Council 2101 Constitution Ave. NW Washington, D.C. 20418 (202) 334-2000 http://www.nas.edu/	REAM	Retired Educators Association of MN 816 Ridge Pl., St. Paul, MN 55118
NSELA	National Science Education Leadership Association P.O. Box 5556, Arlington, VA 22205 (703) 524-8646 http://science.coe.uwf.edu/NSELA/NSELA.html	SSMA	School Science and Mathematics Association Bloomsburg University, Bloomsburg, PA 17815-1301 (717) 389-4639 http://science.coe.umf.edu/ssma/ssma.html
NSF	National Science Foundation 4201 Wilson Blvd., Arlington, VA 22230 (703) 524-7660 http://www.nsf.gov/	SciMath^{MM}	SciMath^{MM} 638 Capitol Square, 550 Cedar St. St. Paul, MN 55101 (612) 296-4058; Fax: (612) 297-7340 http://www.informns.k12.mn.us/scimathmn.html
NSTA	National Science Teachers Association 1840 Wilson Blvd., Arlington, VA 22201 (703) 243-7100; (800) 830-3232 http://www.nsta.org/	SEED	Seeking Educational Equity and Diversity Cathy Nelson, 1125 Harbor Ln. N Plymouth, MN 55447 (612) 473- 9350; Fax: (612) 473- 9350
NAAEE	North American Association for Environmental Education P.O. Box 400, Troy, OH 45373 (513) 676-2514 http://www.eelink.umich.edu	TAG	The Association for the Gifted c/o Council for Exceptional Children, 1920 Association Dr. Reston, VA 22091-1589 (703) 620-3660 http://www.cec.sped.org/home.htm
NCREL	North Central Regional Educational Laboratory 1900 Spring Rd., Suite 300 Oak Brook, IL 60521 (708) 571-4700; (800) 356-2735; Fax: (708) 571-4716 http://www.ncrel.org	TIES	Technology and Information Educational Services 1925 W County Rd. B2 Roseville, MN 55113-2791 (612) 638-2339 http://www.ties.k12.mn.us
NCR-TEC	North Central Regional Technology in Education Consortium 1900 Spring Rd., Suite 300 Oak Brook, IL 60521 (708) 218-1272; Fax: (708) 571-4716 http://rtec.org/	ΔC	Triangle Coalition for Science and Technology Education 5112 Berwyn Rd., College Park, MD 20740 (301) 220-0634; Fax: (301) 474-4381 http://www.triangle-coalition.org
OERI	Office of Educational Research and Improvement U.S. Dept. of Education Eisenhower Federal Activities Program 555 New Jersey Ave. NW Washington, D.C. 20208-5572 (202) 219-2206 http://gopher.enc.org	USDE	U.S. Dept. of Education 400 Maryland Ave. SW, Rm. 4181 Washington, D.C. 20202-4135 (202) 401-3000 http://www.ed.gov/
PACER	Parent Advocacy Coalition for Educational Rights 4826 Chicago Ave. S Minneapolis, MN 55417 (612) 827-2966 http://www.stw.ed.gov/RFI/pacer.htm	WCER	Wisconsin Center for Education Research School of Education University of Wisconsin-Madison 1025 W Johnson St., Madison, WI 53706 (608) 263-4200 http://www.wcer.edu/

Business, Professional, and Governmental Organizations

American Association of Petroleum Geologists

P.O. Box 979, Tulsa, OK 74101-0979
(918) 584-2555; Fax: (918) 560-2678

American Association of University Women

1111 16th St. NW, Washington, D.C. 20036
(202) 785-7700; Fax: (202) 872-1425
<http://www.aauw.org/>

American Indian Sciences and Engineering Society

1630 30th St., Suite 301, Boulder, CO 80301
(303) 492-8658
<http://bioc02.uthscsa.edu/aisenet.html>

American Cancer Society

1599 Clifton Rd. NE, 2nd Floor, Atlanta, GA 30329
(800) 227-2345; Fax: (404) 325-2217
<http://www.cancer.org/>

American Council on Science and Health

1995 Broadway, New York, NY 10023
(212) 362-7044; Fax: (212) 362-4919
<http://www.acsh.org>

American Forests

P.O. Box 2000, Washington, D.C. 20013-2000
(202) 667-3300; Fax: (202) 667-7751
<http://www.amfor.org>

American Institute of Biological Sciences

730 11th St. NW, Washington, D.C. 20001-4521
(202) 628-1500
<http://www.reston.com/aibs/aibs.html>

American Society for Biochemistry and Molecular Biology

9650 Rockville Pike, Bethesda, MD 20814
(301) 530-7145; Fax: (301) 571-1824

American Statistical Association

1429 Duke St., Alexandria, VA 22314
(703) 681-1221; Fax: (703) 684-2037
<http://www.amstat.org/>

Association for Women in Science, Inc.

1522 K St. NW, #820, Washington, D.C. 20005
(202) 408-0742; Fax: (202) 408-8321
<http://www.tripod.com/goodworks/jobs/106.htm/>

Bureau of Land Management

1849 C St. NW, Washington, D.C. 20240
(202) 208-3435 (Public Affairs)
(801) 539-4244 (Minerals Outreach Coordinator)
<http://www.blm.gov/>

Center for Disease Control, Office of Public Affairs

U.S. Dept. of Health and Public Services
1600 Clifton Rd. NE, Atlanta, Georgia 30333
(404) 639-3286; Fax: (404) 639-7394
<http://www.cdc.gov>

Earth Day Network

14610 13th Ave. N, Plymouth, MN 55447
(612) 476-1077

Energy Efficiency & Renewable Energy

Clearinghouse - U.S. Department of Energy
P.O. Box 3048, Merrifield, VA 22116
(800) 363-3732
energyinfo@delphi.com

Energy Information Center

MN Dept. of Public Service
121 7th Pl. E, Suite 200, St. Paul, MN 55101-2145
(612) 296-5175; (800) 657-3710; Fax: (612) 296-0201
<http://www.dpsv.state.mn.us/>

Environmental Education Consortium

1930 Como Ave., St. Paul, MN 55108
(612) 603-4980; Fax: (612) 293-8990

EPA Regional Environmental Education

Coordinator for Region 5, Suzanne Saric
(312) 353-1155

ERIC Clearinghouse for Science, Mathematics, and Environmental Education

1929 Kenny Rd., Columbus, OH 43210
(614) 292-6717; (800) 276-046; Fax: (614) 292-0263
<http://www.aspensys.com/eric/>

Ethical Science Education Coalition

167 Milk St., #423, Boston, MA 02109
(617) 367-9143

Forest Service, Office of Public Affairs

U.S. Department of Agriculture
P.O. Box 96090, Washington, D.C. 20090
(202) 205-1760; Fax: (202) 205-0885
<http://www.fs.fed.us/>

Foundation for Science and Disability

236 Grand St., Morgantown, WV 26505
(304) 293-5201 x513

Geological Society of America

3300 Penrose Pl., P.O. Box 9140
Boulder, CO 80301-1806
(303) 447-2020; Fax: (303) 447-1133
<http://www.aescon.com/geosociety>

History of Science Society

Committee on Education, Dept. of History
University of Kansas, Lawrence, KS 66045
(913) 864-4361
<http://www.u.washington.edu/~hssexec/index.html>

Industry Initiatives for Science and Math Education

c/o Deskin Research Group
2270 Agnew Rd., Santa Clara, AC 95054
(408) 496-5340; Fax: (408) 496-5333

Junior Engineering Technical Society (JETS)

1420 Kings St., Suite 405, Alexandria, VA 22314-2715
(703) 548-5387; Fax: (703) 548-0769
<http://www.asee.org/jets/>

Minerals Management Service, Dept. of the Interior

1849 C St. NW; Washington, D.C. 20240
 (703) 787-1080; Fax: (703) 787-1010
<http://www.mms.gov/>

Minnesota Association for Human Genetics

University of MN, UMHC Box 485
 420 Delaware St. SE, Minneapolis, MN 55455
 (612) 625-0425

Minnesota Biotechnology Association

400 Mill Pl., 111 3rd Ave. S, Minneapolis, MN 55401
 (612) 288-2377; Fax: (612) 288-2378
<http://www.holoweb.com/mnbio>

Minnesota Corn Growers

14198 Commerce Ave. NE, Prior Lake, MN 55372
 (612) 447-2676; Fax: (612) 447-2072
<http://www.wirefeed.com/mncorn/>

Minnesota Eisenhower Mathematics & Science Education State Grant Program

988 Capitol Square Bldg., 550 Cedar St.
 St. Paul, MN 55101
 (612) 296-2703; Fax: (612) 296-3272

Minnesota Environmental Initiatives

527 Marquette Ave., Minneapolis, MN 55402
 (612) 334-3388

Minnesota Geological Survey

2642 University Ave. NE, Minneapolis, MN 55418
 (612) 627-4780
<http://www.geo.umn.edu/mgs/>

Minnesota Institute for Talented Youth

1600 Grand Ave., St. Paul, MN 55105
 (612) 696-6590

Minnesota Office of Environmental Assistance

520 Lafayette Rd. N, 2nd Floor, St. Paul, MN 55155
 (612) 296-3417; Fax: (612) 215-0246

Minnesota Office of Tourism—Explore MN

121 E 7th Pl.; St. Paul, MN 55101
 (612) 296-5029; (800) 657-3700
<http://www.tccn.com/mn.tourism.mnhome.html>

Minnesota Department of Natural Resources (DNR)

Information & Education Bureau
 500 Lafayette Rd., St. Paul, MN 55101
 (612) 296-3336

Minnesota Pollution Control Agency (MPCA)

Public Information Office
 520 Lafayette Rd., St. Paul, MN 55101
 (612) 296-6619

Minnesota Renewable Energy Society

2928 5th Ave. S, Minneapolis, MN 55408
 (612) 529-8171
<http://www.freenet.msp.mn.us/ip/env/mres/top.html>

Minnesota State Horticulture Society

1755 Prior Ave. N, Falcon Heights, MN 55113
 (612) 643-3601

National Association of Conservation Districts

P.O. Box 855, League City, TX 77574
 (800) 825-5547; Fax: (713) 332-5259

National Center for Environmental Publications/Information (NCEPI)

EPA Publications Clearinghouse
 P.O. Box 42419, Cincinnati, OH 45242
 (800) 490-9198; Fax: (513) 489-8695
<http://www.epa.gov/NCEPIhom/index.html>

National Corn Growers Association

1000 Executive Pkwy., #105, St. Louis, MO 63141
 (314) 275-9915
<http://www.ncga.com>

National Aeronautic and Space Admin. (NASA)

<http://cass.jsc.nasa.gov>

National Energy Information Center, EI-231

Energy Information Administration
 1000 Independence Ave. SW, Rm. 1F-048
 Washington, D.C. 20585
 (202) 586-8800; Fax: (202) 586-0727
infoctr@eia.doe.gov

National Science Resources Center (NSRC)

Arts and Industries Bldg., Rm. 1201
 Smithsonian Institution, MRC-50-2
 Washington, D.C. 20560
 (202) 357-2555; Fax: (202) 786-2028
<http://www.solstice.crest.org/>

National Weather Service - Mpls. Forecast Office

1733 Lake Dr. W, Chanhassen, MN 55317
 (612) 361-6680
<http://www.crhnwscr.noaa.gov/mpx.html>

National Weather Service - National Oceanic and Atmospheric Administration

Office of Meteorology, SSMC2, 14th Floor
 1325 East West Hwy., Silver Spring, MD 20910
 (301) 713-0622
<http://www.nws.noaa.gov/>

National Wildlife Federation

8925 Leesburg Pike, Vienna, VA 22184
 (800) 432-6564; Fax: (703) 442-7332
<http://www.nwf.org/nwfi/>

National Oceanic & Atmospheric Admin. (NOAA), Office of Public Affairs

14th & Constitution Ave. NW, Rm. 6013
 Washington, D.C. 20235
 (202) 482-6090; Fax: (202) 482-3154
<http://www.noaa.gov/>

National Park Service, U.S. Dept. of the Interior

P.O. Box 37127, 1849 C St. NW
 Washington, D.C. 20013-7127
 (202) 208-4747
<http://www.nps.gov/>

Northern States Power Company (NSP)

Community Development Department
414 Nicolet Mall, Minneapolis, MN 55401
(612) 330-6677 (work-based learning)
(612) 330-6538 (speakers); (612) 330-6048 (tours)
<http://www.nspco.com/>

Nuclear Information and Resource Service

1424 16th St. NW, Suite 601, Washington, D.C. 20036
(202) 328-0002; Fax: (202) 462-2183
<http://www.nirs.org>

Project WILD

Box 7, 500 Lafayette Rd., St. Paul, MN 55155
(612) 297-2423

Science Association for Persons with Disabilities

3322 W 2200 North, Ogden, UT 84404
(209) 453-2000; Fax: (209) 453-2001

Science Service

1719 N St. NW, Washington, D.C. 20036
(202) 785-2255
<http://www.sciserv.org>

Science CentrUM

University of Minnesota, 180 Westbrook Hall
77 Pleasant St. SE, Minneapolis, MN 55455
(612) 624-5092; Fax: (612) 625-2568

Sharing Environmental Education Knowledge (SEEK)

520 Lafayette Rd., St. Paul, MN 55155-4100
(612) 215-0231; (800) 657-3843
<http://www.seek.state.mn.us/>

Sigma Xi, the Scientific Research Society

P.O. Box 13975, Research Triangle Park, NC 27709
(919) 549-4691; Fax: (919) 549-0090
<http://www.sigmxi.org/>

Soil and Water Conservation Society

7515 NE Ankeny Rd., Ankeny, IA 50021
(515) 289-2331; Fax: (515) 289-1227
<http://www.swcs.org/>

Southeast Environmental Education Committee

Quarry Hill Nature Center
701 Silver Creek Rd. NE, Rochester, MN 55907
(507) 281-6114; Fax: (507) 287-1345

Technical Education Research Center (TERC)

2067 Massachusetts Ave., Cambridge, MA 02140
(617) 547-0430; Fax: (617) 349-3535
<http://www.terc.edu>

Time for Trees School Environment Program

Tree Trust, 6300 Walker St., St. Louis Park, MN 55416
(612) 920-9326; Fax: (612) 920-4558

Underwater World, Mall of America

120 E Broadway, Bloomington, MN 55425
(612) 883-0202; Fax: (612) 883-0303

Union of Concerned Scientists

Two Brattle Square, Cambridge, MA 02238
(617) 547-5552; Fax: (617) 864-9405
<http://www.ucsusa.org/>

U.S. Department of Health and Public Services

National Institutes of Health, Office of Science Ed.
6100 Executive Blvd., Rm. 5H01
Rockville, Maryland 20892
(301) 402-2469; Fax: (301) 402-3034

U.S. Consumer Information Center

Pueblo, CO 81009
<http://www.pueblo.gsa.gov/>

U.S. Department of Agriculture

Washington, D.C. 20250
(202) 720-2791
<http://www.usda.gov/>

U.S. Environmental Protection Agency (EPA)

Public Information Center, 3404
401 M St. SW, Washington, D.C. 20460
(202) 260-2080; Fax: (202) 260-6257
public-access@empmail.epa.gov

U.S. Geological Survey, Education Comm. (USGS)

U.S. Department of the Interior
101 E National Center, Reston, VA 21092
(703) 648-7114; Fax: (703) 648-7069
<http://www.usgs.gov/>

U.S. Geological Survey, Water Resources Div.

2280 Woodale Dr., Moundsview, MN 55112
(612) 783-3100
<http://wwwmn.cr.usgs.gov>

U.S. Metric Association

10245 Andasol Ave., Northridge, CA 91325
(818) 368-7443
<http://amar.colostate.edu/~hillger/>

World Resources Institute

Environmental Education Project
1709 New York Ave. NW, Washington, D.C. 20006
(202) 636-6300; Fax: (202) 638-0036
<http://www.wri.org/wri/enved/>

Minnesota Informal Science Resources

Museums, Parks, Nature Centers & Zoos

In addition to this list, check other informal science organizations in your community. Think about museums, parks, nature centers, National Wildlife Refuges, Wildlife Management Districts, businesses and industries. How about linking up with soil and water conservation boards, city committees or commissions? This is not an exhaustive list; add other resources from your community and check the MSTA web page (<http://www.informns.k12.mn.us/scimathmn/science>) for additions and corrections.

Agassiz Environmental Learning Center

P.O. Box 388, Fertile, MN 56540-0388
(218) 945-3129; Fax: (218) 945-3213

Audubon Center of the North Woods

P.O. Box 530, Sandstone, MN 55072
(320) 245-2648; Fax: (320) 245-5272
audubon@audubon-center.com

Bakken Library and Museum of Electricity in Life

3537 Zenith Ave. S, Minneapolis, MN 55416
(612) 927-6508; Fax: (612) 927-7265
<http://bakkenmuseum.org/>

Bell Museum of Natural History

10 SE Church St., Minneapolis, MN 55455
(612) 624-9050
<http://www.umn.edu/bellmuse/>

Belwin Outdoor Education Lab

1553 S. Stagecoach, Afton, MN 55001
(612) 436-5243

Bonanza Education Center

908 Orchard, Ortonville, MN 56278
(320) 839-3118

Camp Courage Environmental Center

8046 83rd St. NW, Maple Lake, MN 55358
(320) 963-3121
<http://www.lkkdlink.net/~ccourage/>

Carpenter Nature Center

12805 St. Croix Tr., Hastings, MN 55033
(612) 437-4359; Fax: (612) 438-2908
<http://www.presscent.com/org/carpentr/>

Center for Early Learning & Living of the Sciences

3915 Adair Ave., North Wing, Minneapolis, MN 55422
(612) 588-1964

Center for Endangered Cats

P.O. Box 1052, Forest Lake, MN 55025
(612) 586-2600

Chippewa Soil and Water Conservation District

629 N 11th St., Montevideo, MN 56265
(320) 269-2139; Fax: (320) 269-2130

Coon Rapids Dam Regional Park Visitor Center

10360 W River Rd., Brooklyn Park, MN 55444
(612) 424-8172; Fax: (612) 424-4628

Deep Portage Conservation Reserve

Rt. 1 Box 129, Hackensack, MN 56452
(218) 682-2325; Fax: (218) 682-3121
<http://www.deep-portage.org/>

Dodge Nature Center

1795 Charlton St., West St. Paul, MN 55118
(612) 455-4531

Eagle Bluff Environmental Learning Center

Route 2, Box 156A
Lanesboro, Minnesota 55949
(507) 467-2437; Fax: (507) 467-3583
eagleblf@means.net

Earth Museum

3730 Toledo Ave. N, Robbinsdale, MN 55422
(612) 521-4434

Eastman Nature Center, Elm Creek Park Reserve

13351 Elm Creek Rd., Osseo, MN 55369
(612) 420-4300

Eloise Butler Wild Flower Garden & Bird Sanctuary, Theodore Worth Park

Theodore Worth Pkwy. & Glenwood Ave.
Minneapolis, MN 55422
(612) 370-4903

Environmental Research Lab

6201 Congdon Blvd., Duluth, MN 55804
(218) 720-5733; Fax: (218) 720-5539

Farm by the Lake Nature Center

PO Box 329, Bagley, MN 56621
(218) 694-2084

Foley Environmental Education Center

Star Route 77, Pine River, MN 56474
(218) 543-6161

Forest History Center

2609 County Rd. 76, Grand Rapids, MN 55744
(218) 327-4482

Forest Resource Environmental Network

FREE Network, c/o University of Minnesota
2004 Folwell Ave., St. Paul, MN 55108-6128
FREENET@forestry.umn.edu

Green Lake Environmental Learning Center

9916 Lake Ave. S., Spicer, MN 56288
(612) 796-2181

Harriet Alexander Nature Center
2520 Dale St., Roseville, MN 55113
(612) 482-8266

Hartley Nature Center
P.O. Box 3503, Duluth, MN 55803
(218) 724-8735

Headwaters Science Center
P.O. Box 1176, Bemidji, MN 56601
(218) 751-1110
<http://www.northernnet.com/science/index.html>

Hennepin Parks Natural Resources Management
3800 County Rd. 24, Maple Plain, MN 55359
(612) 476-4663

Heritage Park Nature Center
225 33rd Ave. S, St. Cloud, MN 56301
(320) 255-7255

Heron Lake Environmental Center
RR 3, Box 352, Lakefield, MN 56150
(507) 662-6168

Hormel Nature Center
1304 21st St. NE, Austin, MN 55912
(507) 437-7519

International Wolf Center
1396 Hwy. 169, Ely, MN 55731
(218) 365-4695
<http://www.wolf.center>

Iron World Discovery Center
P.O. Box 392, Hwy. 169 W, Chisholm, MN 55719
(218) 254-3323

Lake Carlos Environmental Center
8231 County Rd. 11 NE, Alexandria, MN 56308
(320) 846-2431; Fax: (320) 846-0201

Lake Superior Center
353 Harbor Dr., Duluth, MN 55802
(218) 720-3033

Laurentian Environmental Center
(218) 749-1288
Mounds View Public Schools
500 10th St. NW, New Brighton, MN 55112
(612) 639-6022; Fax: (612) 639-6033

Lake Superior Zoological Gardens
7210 Fremont St., Duluth, MN 55807
(218) 624-1502

Lawndale Learning Center
Rural Rt. 2 Box 49, Herman, MN 56248
(612) 677-2203

Long Lake Conservation Center
Palisade, MN 56469
(218) 768-4653; Fax: 768-2309
HN3328@Hands Net.org

Lowry Nature Center, Carver Park Reserve
7025 Victoria Dr., Victoria, MN 55386
(612) 472-4911

Maplewood Nature Center
2659 E 7th St., Maplewood, MN 55119
(612) 738-9383

Midwest Monarch Project
3116 Harbor Dr. SE, Rochester, MN 55904
(507) 285-5670; Fax: (507) 287-1345

Minneapolis Planetarium
300 Nicolet Mall, Minneapolis, MN 55401
(612) 372-6644

Minnesota Children's Museum
10 W 7th St., St. Paul, MN 55102
(612) 225-6000; Fax: (612) 225-6006

Minnesota Landscape Arboretum
3675 Arboretum Dr., P.O. Box 39
Chanhassen, MN 55317
(612) 443-2460
<http://www.soils.umn.edu:8003/arb.htm>

Minnesota Recreation and Park Association
5005 W 36th St., St. Louis Park, MN 55426
(612) 920-6906

Minnesota State Parks
MN DNR, Parks and Recreation Division
500 Lafayette Rd., St. Paul, MN 55155-4039
(612) 296-9223
<http://www.seek.state.mn.us/stparks.html>

Minnesota Valley National Wildlife Refuge
3815 E 80th St., Bloomington, MN 55425
(612) 335-2323
<http://ecologia.nier.org/english/usrguide/mvmwr.html>

Minnesota Zoo
13000 Zoo Blvd., Apple Valley, MN 55124
(612) 432-9000
<http://www.wcco.com/community/mnzoo/>

Mississippi National River & Recreation Area
National Park Service
175 E 5th, Suite 418, St. Paul, MN 55101-2901
(612) 290-4160; Fax: (612) 290-3214
<http://www.nps.gov/miss/>

Natural Resource Research Institute (NRRI)
5013 Miller Trunk Hwy., Duluth, MN 55811
(218) 720-4300

Neilson Spearhead Center for Ecological Research & Education
Mississippi Headwaters Audubon Society
Box 193, Bemidji, MN 56619
(218) 759-9335; Fax: (218) 751-1110

Oliver Kelly Farm

15788 Kelley Farm Rd, Elk River, MN 55330
(612) 441-6896

Oxbow Park and Zollman Zoo

5731 County Rd. 105 NW, Byron, MN 55920
(507) 775-2451
<http://www.web-site.com/oxbow/>

Pezuta Zizi Cultural & Environmental Learning & Resource Center

Rt. 2, PO Box 91, Granite Falls, MN 56241
(320) 564-4777

Pipestone National Monument

Box 727, Pipestone, MN 56164
(507) 825-5464
<http://www.nps.gov/pipe/>

PLUS Center, College of St. Scholastica

1200 Kenwood Ave., Duluth, MN 55811
(218) 723-6467

Prairie Wetlands Learning Center

Rt. 1 Box 78, Fergus Falls, MN 56537
(218) 739- 2291; (800) 266-4972; Fax: (218) 739-9534

Prairie Winds Zoo

121 Marine Ave., Adrian, MN 56110
(507) 483-2238

Prairie Woods Environmental Learning Center

12718 10th St. NE, Spicer, MN 56288
(320) 354-5894; Fax: (320)796-6786
dhcnice@midstate.tds.net

Quarry Hill Nature Center

701 Silver Creek Rd. NE, Rochester, MN 55906
(507) 281-6114

The Raptor Center

1920 Fitch Ave., St. Paul, MN 55108
(612) 624-4745; Fax: (612) 624-8740
<http://www.raptor.cvm.umn.edu/>

Red River Valley Natural History Center

University of Minnesota Natural Res. Dept.
Crookston, MN 56716
(218) 281-6510

Red Wing Environmental Learning Center

5354 Tower View Drive, Red Wing, MN 55066
(612) 388-7339

Richardson Nature Center

8737 E Bush Lake Road, Bloomington, MN 55438
(612) 941-7993

River Bend Nature Center

Box 265, Faribault, MN 55021
(507) 332-7151

St. Paul's Como Zoo

Midway Pkwy & Kaufman Dr., St. Paul, MN 55103
(612) 488-4041

Sandstone Environmental Learning Center

119 4th St., Sandstone, MN 55072
(320) 245-524

Scandia Woods Environmental Learning Lab

502 E 3rd St., Morris, MN 56267
(320) 589-2379

Science Museum of Minnesota

10th and Wabasha, St. Paul, MN 55102
(612) 221-9488
<http://www.sci.mus.mn.us/>

Sherburne National Wildlife Refuge

Rt. 2, Zimmerman, MN 55398
(612) 389-3323

Soudan Underground Mine

P.O. Box 335, Soudan, MN 55782
(218) 753-2245

Spring Lake Park Reserve-Youth Lodge

13600 Pine Bend Tr., Rosemount, MN 55068
(612) 437-3800

Springbrook Nature Center

6431 University Ave. NE, Fridley, MN 55432
(612) 572-3588
<http://www.pconline.com/~calico/index1.htm>

Staring Lake Outdoor Center

13765 Staring Lake Pkwy., Eden Prairie, MN 55347
(612) 949-8479

Superior National Forest, Education Coordinator

P.O. Box 338, Duluth, MN 55801
(218) 720-5324

Tamarack Nature Center

5387 Otter Lake Rd., White Bear Township, MN 55110
(612) 429-7787

University of Minnesota Landscape Arboretum

3675 Arboretum Dr., Chaska, MN 55318
(612) 443-2460

Voyageurs National Park

P.O. Box 50, International Falls, MN 56649-8904
(218) 283-9821

Wargo Nature Center

Rice Creek Chain of Lakes Regional Park
7701 Main St., Lino Lakes, MN 55038
(612) 429-8007

Warner (Lee & Rose) Nature Center

15375 Norell Ave. N
Marine on the St. Croix, MN 55047
(612) 433-2427; Fax: (612) 433-2430

Western Lake Superior Sanitary District

2626 Courtland St., Duluth, MN 55806
(218) 722-3336

Westwood Hills Nature Center

8300 W Franklin Ave., St. Louis Park, MN 55426
(612) 924-2543; Fax: (612) 797-9691

Wetland Pines Prairie Sanctuary

RR 2, Box 45A, Warren, MN 56762
(218) 745-5663

Wolf Ridge Environmental Learning Center

230 Cranberry Rd., Finland, MN 55603
(218) 353-7414 or (800) 523-2733
<http://www.vicon.net/~internnet/wolf.htm>
wrelc@mr.net

Wood Lake Nature Center

735 Lake Shore Drive, Richfield, MN 55423
(612) 861-9365

The Works

12705 Wayzata Blvd., Minnetonka, MN 55305
(612) 797-0102

Minnesota Post-Secondary Institutions

Public and private four year institutions and community and technical colleges are listed here. Look to them for professional development, student enrichment programs, and community partnership opportunities.

Alexandria Technical College

1601 Jefferson St., Alexandria, MN 56308
(320) 762-0221; (888) 234-1222
<http://www.atc.tec.mn.us/>

Anoka-Hennepin Technical College

1355 W Hwy. 10, Anoka, MN 55303
(612) 576-4700; (800) 247-5588
<http://www.ank.tec.mn.us>

Anoka-Ramsey Community College

33270 Polk St. NE, Cambridge, MN 55008
(612) 689-7000; Fax: (612) 689-7050
<http://www.an.cc.mn.us/>

Anoka-Ramsey Community College

11200 Mississippi Blvd., Coon Rapids, MN 55433
(612) 427-2600; Fax: (612) 422-3341
<http://www.an.cc.mn.us/>

Arrowhead University Center

1515 E 25th St., Hibbing, MN 55746
(218) 262-6751; Fax: (218) 262-6791
<http://www.hibbing.tec.mn.us>

Augsburg College

731 21st Ave. S, Minneapolis, MN 55454
(612) 330-1212; Fax: (612) 330-1330
<http://www.augsburg.edu>

Bemidji State University

1500 Birchmont Dr. NE, Bemidji, MN 56601
(218) 755-2011; Fax: (218) 755-4048
<http://www.bemidji.msus.edu>

Bethel College

3900 Bethel Dr., St. Paul, MN 55112
(612) 638-6230; Fax (612) 638-6001
<http://www.bethel.edu/>

Carleton College

1 N College St., Northfield, MN 55057
(507) 663-4305; Fax: (507) 663-4204
<http://www.carleton.edu/>

Central Lakes College

501 W College Dr., Brainerd, MN 56401
(218) 828-2525; (800) 933-0346
<http://www.clo.cc.mn.us/>

Central Lakes College

1830 Airport Rd., Staples, MN 56479
(218) 894-1051; (800) 247-6836
<http://www.clo.cc.mn.us/>

Century College,

A Community & Technical College
3401 Century Ave., White Bear Lake, MN 55110
(612) 779-3200

College of St. Benedict

37 College Ave. S, St. Joseph, MN 56374-2099
(612) 363-5407; Fax: (612) 363-6099
<http://www.csbsju.edu/>

College of St. Catherine

2004 Randolph Ave., St. Paul, MN 55105
(612) 690-6525; Fax: 690-6024
<http://www.stkate.edu/>

College of St. Scholastica

1200 Kenwood Ave., Duluth, MN 55811
(218) 723-6033; Fax: (218) 723-6290
<http://www.css.edu/>

Concordia College

901 S 8th St., Moorhead, MN 56562
(218) 299-3000; Fax: (218) 299-3947
<http://www.cord.edu>

Concordia College

275 N Syndicate, St. Paul, MN 55104
(612) 641-8211; (612) 659-0207
<http://www.csp.edu/>

Dakota County Technical College

1300 E 145th St., Rosemount, MN 55068
(612) 423-8301; (800) 548-5502
<http://www.metro.mnscu.edu/DakotaTC/>

Fergus Falls Community College

1414 College Way, Fergus Falls, MN 56537
(218) 739-7500
<http://www.ff.cc.mn.us/>

Fond du Lac Tribal & Community College

2102 14th St., Cloquet, MN 55720
(218) 879-0800; (800) 657-3712
<http://www.fdl.cc.mn.us/>

Gustavus Adolphus College

800 College Ave. W, St. Peter, MN 56082
(507) 933-8000; Fax: (507) 933-7041
<http://www.gac.edu>

Hamline University

1536 Hewitt Ave., St. Paul, MN 55104
(612) 641-2800; Fax: (612) 641-2030
<http://www.hamline.edu>

Hennepin Technical College

9000 Brooklyn Blvd., Brooklyn Park, MN 55445
(612) 425-3800; (800) 345-4655

Hennepin Technical College

9200 Flying Cloud Dr., Eden Prairie, MN 55347
(612) 944-2222; (800) 345-4655

Hibbing Community College

A Community and Technical College
1515 E 25th St., Hibbing, MN 55746
(218) 262-6700; (800) 224-4422

Inver Hills Community College

2500 80th St. E, Inver Grove Heights, MN 55076
(612) 450-8500

Itasca Community College

1851 E Hwy. 169, Grand Rapids, MN 55744
(218) 327-4460; (800) 996-6422

Lake Superior College

A Community and Technical College
2101 Trinity Rd., Duluth, MN 55811-3399
(218) 733-7600

Macalester College

1600 Grand Ave., St. Paul, MN 55105
(612) 696-6207; Fax: (612) 696-6689
<http://www.macalstr.edu/>

Mankato State University

Ellis and South Rd., P.O. Box 8400
Mankato, MN 56002-8400
(507) 389-2463; (800) 722-0544
<http://www.mankato.msus.edu/>

Mesabi Range Community & Technical College

1100 Industrial Park Dr., P.O. Box 0648
Eveleth, MN 55734-0648
(218) 744-3302; (800) 345-2884

Mesabi Range Community & Technical College

1001 Chestnut St. W, Virginia, MN 55792
(218) 749-7700; (800) 657-3860

Metropolitan State University

700 E 7th St., St. Paul, MN 55106-5000
(612) 772-7638; Fax: (612) 772-7632
<http://www.metro.msus.edu>

Metropolitan State University - Minneapolis Campus

730 Hennepin Ave., Minneapolis, MN 55403
(612) 341-7250; Fax: (612) 373-2751
<http://www.metro.msus.edu>

Minneapolis Community & Technical College

1501 Hennepin Ave., Minneapolis, MN 55403-1779
(612) 341-7000; (800) 247-0911; Fax: (612) 370-9428
<http://www.mctc.tec.mn.us>

Moorhead State University

1104 7th Ave. S, Moorhead, MN 56563
(218) 236-2161; (800) 593-7246; Fax: (218) 236-2168
<http://www.moorhead.msus.edu>

Normandale Community College

9700 France Ave. S, Bloomington, MN 55431
(612) 832-6000
<http://www.nr.cc.mn.us/>

North Hennepin Community College

7411 85th Ave. N, Brooklyn Park, MN 55445
(612) 424-0702
<http://www.nh.cc.mn.us/>

Northland Community & Technical College

1101 Hwy. 1 E, Thief River Falls, MN 56701
(218) 681-0701; (800) 959-6282
<http://www.northland.cc.mn.us/>

Northwest Technical College

905 Grant Ave. SE, Bemidji, MN 56601
(218) 755-4270; (800) 942-8324
<http://www.ntc-online.com/>

Northwest Technical College

900 Hwy. 34 E, Detroit Lakes, MN 56501
(218) 847-1341; (800) 492-4836
<http://www.ntc-online.com/>

Northwest Technical College

Hwy. 220 N, East Grand Forks, MN 56721
(218) 773-3441; (800) 451-3441
<http://www.ntc-online.com/>

Northwest Technical College

1900 28th Ave. S, Moorhead, MN 56560
(218) 236-6277; (800) 426-5603
<http://www.ntc-online.com/>

Northwest Technical College

405 SW Colfax, P.O. Box 56, Wadena, MN 56482
(218) 631-3530; (800) 247-2007
<http://www.ntc-online.com/>

Northwestern College

3003 Snelling Ave. N, Roseville, MN 55113
(612) 631-5250; Fax: (612) 631-5269
<http://www.nwc.edu>

Pine Technical College

1000 4th St., Pine City, MN 55063
(320) 629-6764; (800) 521-7463

Rainy River Community College

1501 Hwy. 71, International Falls, MN 56649
(218) 285-7722; (800) 456-3996

Red Wing-Winona Technical College

308 Pioneer Rd. & Hwy. 58, Red Wing, MN 55066
(612) 386-6300; (800) 657-4849

Red Wing-Winona Technical College

P.O. Box 409, Winona, MN 55987-0409
(507) 454-4600; (800) 372-8164

Ridgewater College

A Community and Technical College
2 Century Ave. SE, Hutchinson, MN 55350
(320) 587-3636; (800) 222-4424

Ridgewater College

A Community and Technical College
2101 15th Ave. NW, P.O. Box 1097
Willmar, MN 56201
(320) 235-5114; (800) 722-1151

Riverland Community College

A Community and Technical College
2200 Tech Dr., Albert Lea, MN 56007
(507) 379-3300; (800) 333-2584

Riverland Community College

A Community and Technical College
1900 8th Ave. NW, Austin, MN 55912
(507) 433-0600; (800) 247-5039

Rochester Community & Technical College

851 30th Ave. SE, Rochester, MN 55904-4999
(507) 285-7210
<http://www.roch.edu/rctc/index.html>

St. Cloud State University

720 4th Ave. S, St. Cloud, MN 56301-4498
(612) 255-2122; (800) 369-4260
<http://condor.stcloud.msus.edu>

St. Cloud Technical College

1540 Northway Dr., St. Cloud, MN 56303-1240
(320) 654-5000; (800) 222-1009

St. John's University

Collegeville, MN 56321
(612) 363-2247; Fax: (612) 363-2115
<http://www.csbsju.edu/>

St. Mary's University of Minnesota

School of Graduate & Special Programs
2510 Park Ave. S, Minneapolis, MN 55404
(612) 874-9877
<http://www.smumn.edu/>

St. Mary's University of Minnesota-Winona Campus

700 Terrace Heights, Winona, MN 55987-1399
(507) 457-1503; (800) 635-5987; Fax: (507) 457-1633
<http://www.smumn.edu/>

St. Olaf College

1520 St. Olaf Ave., Northfield, MN 55057
(507) 646-3000; Fax: (507) 646-3549
<http://www.stolaf.edu/>

St. Paul Technical College

235 Marshall Ave., St. Paul, MN 55102
(612) 221-1300; (800) 227-6029
<http://www.sptc.tec.mn.us/>

South Central Technical College

1225 SW 3rd St., Faribault, MN 55021
(507) 334-3965; (800) 422-0391
<http://www.Internet-Connections.net/web/sctc>

South Central Technical College

1920 Lee Blvd., North Mankato, MN 56003
(507) 389-7200; (800) 722-9359
<http://www.Internet-Connections.net/web/sctc>

Southwest State University

1501 State St., Marshall, MN 56258
(507) 537-7021; (800) 642-0684; Fax: (507) 537-7154
<http://www.southwest.msus.edu>

Southwestern Technical College

1011 1st St. W, Canby, MN 56220
(507) 223-7252; (800) 658-2535

Southwestern Technical College

1593 11th Ave., Granite Falls, MN 56241
(320) 564-4511; (800) 657-3247

Southwestern Technical College

401 West St., Jackson, MN 56143
(507) 847-3320; (800) 658-2522

Southwestern Technical College

P.O. Box 250, Pipestone, MN 56164-0250
(507) 825-5471; (800) 658-2330

University of Minnesota - Crookston

105 Selvig Hall, Crookston, MN 56716
(218) 281-8343; Fax: (218) 281-8050
<http://www.crk.umn.edu/>

University of Minnesota - Duluth

10 University Dr., 515 Darland Administration Bldg.
Duluth, MN 55812-2496
(218) 726-7106; Fax: (218) 726-6535
<http://www.d.umn.edu>

University of Minnesota - Morris

309 Behmler Hall, Morris, MN 56267
(612) 589-6020; Fax: (612) 589-3811
<http://www.mrs.umn.edu>

University of Minnesota - Rochester Continuing Ed & Extension Center

855 30th Ave. SE, Rochester, MN 55904-4945
(507) 280-2828; Fax: (507) 280-2839
<http://www.roch.edu/umrc/Welcome.html>

University of Minnesota - Twin Cities

100 Church St. SE, 202 Morrill Hall
Minneapolis, MN 55455
(612) 626-1616; Fax: (612) 625-3875
<http://www.umn.edu/tc/>

University of St. Thomas

2115 Summit Ave., St. Paul, MN 55105
(612) 962-6500; Fax: (612) 962-6930
<http://www.stthomas.edu/>

University of St. Thomas - Minneapolis Campus

10th St. & LaSalle Ave., Minneapolis, MN 55403
(612) 962-4000; Fax: (612) 962-4125
<http://www.stthomas.edu/>

Vermilion Community College

1900 E Camp St., Ely, MN 55731
(218) 365-7200; (800) 657-3608

Winona State University

8th and Johnson Streets, Winona, MN 55987
(507) 457-5000; (800) 242-8978; Fax: (507) 457-5586
<http://www.winona.msus.edu>

Winona State University, Rochester Center

Hwy. 14 E, 859 30th Ave. SE
Rochester, MN 55904
(507) 285-7100

Worthington Community College

1450 College Way, Worthington, MN 56187
(507) 372-2107; (800) 657-3966

Minnesota Service Cooperatives

Formerly the Educational Cooperative Service Units (ECSU), the Regional Service Cooperatives offer a variety of science related options including teacher workshops, teacher networks, resource materials and kits which can be borrowed, special projects, and consulting help for schools and districts. (Offerings vary somewhat by region.) In addition, some offer science-focused events for children.

Region 1 & 2 - Northwest Service Coop

114 W 1st St., Thief River Falls, MN 56701
(218) 681-8005; Fax: (218) 681-2028

Region 3 - Northeast Service Coop

505 S 12th Ave., Suite 2, Virginia, MN 55792
(218) 741-0750; Fax: (218) 741-1719

Region 4 - Lakes Country Service Coop

1001 E Mount Faith, Fergus Falls, MN 56537
(218) 739-3273; Fax: (218) 739-2459

Region 5 - North Central Service Coop

1100 5th St. NE, Suite 1, Staples, MN 56479-9502
(218) 894-1930; Fax: (218) 894-3045

Region 6 & 8 - Southwest/West Central

Box 1087, Marshall, MN 56258
(507) 537-6800; Fax: (507) 537-7327

Region 7 - Central Service Coop

Box 1576, 4150 2nd St. S, St. Cloud, MN 56302
(612) 255-3236; Fax: (612) 255-2998

Region 9 - South Central Service Coop

1610 Commerce Dr., North Mankato, MN 56003
(507) 389-1425; Fax: (507) 389-1772

Region 10 - Southeast Service Coop

210 Woodlake Dr. SE, Rochester, MN 55904
(507) 288-1282; Fax: (507) 288-7663

Region 11- Metropolitan Service Coop

3499 Lexington Ave. N, St. Paul, MN 55126
(612) 490-0058; Fax: (612) 490-1920

Student Extra Curricular/Competition Opportunities

Opportunities for students outside the school day can enrich students' science education. Check out organizations like Girl and Boy Scouts, 4H, FFA, etc. in your community. This is not an exhaustive list; add other resources from your community and check the MSTA web page (<http://www.informns.k12.mn.us/scimathmn/science>) for additions and corrections.

Bayer/NSF Award for Community Innovation

Minnesota Academy of Science (MAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.nsf.gov/bayer-nsf-award.html>

Comment: Teams of four students, grades 6-8, identify community issues and propose a creative solution using science and technology.

Craftsman /NSTA Young Inventors Awards

National Science Teachers Association
1840 Wilson Blvd., Arlington, VA 22201
(888) 494-4994
<http://www.nsta.org/programs/craftsman.htm>

Comment: Students in grades 4-6 design and build a tool, keeping an "Inventor's Log" which is submitted with a photo of the tool.

Directory of Student Science Training Programs for Precollege Students

Science Service, Inc.
1719 N St. NW, Washington D.C. 20036
(202) 785-2255; Fax: (202) 785-1243

Comment: Annual publication that lists programs and internships in the sciences for students in grades 9-12.

DuPont Challenge Science Essay Awards Program

60 Revere Dr., Suite 200, Northbrook, IL 60062
(708) 205-3000

Comment: Students submit essays on a science topic of their choice.

Duracell/NSTA Scholarship Competition

National Science Teachers Association
Duracell/NSTA Scholarship Competition
1840 Wilson Blvd., Arlington, VA 22201
(202) 328-5800
<http://www.nsta.org/programs/duracell.shtml>

Comment: Students submit a photograph of a self-contained working device that they designed and constructed, and that is powered by one or more Duracell batteries. The official entry form is accompanied by a description and a wiring diagram of the device.

Envirothon

Board of Water and Soil Resources (BOWSER)
1 W Water St., Suite 200, St. Paul, MN 55107
(612) 297-5615; Fax: (612) 297-5615

Comment: Multidisciplinary, environmental problem-solving program for students grades 9-12 culminating in an annual series of competitions.

First Step To Nobel Prize in Physics

Institute of Physics, Polish Academy of Sciences
al. Lotników 32/46, (PL) 02-668 Warszawa
(022)435212; Fax: (022)430926
<http://nobelprizes.com/firststep/>

Comment: High school students from around the world submit papers on their original physics research projects.

For Inspiration and Recognition of Science and Technology (FIRST)

200 Bedford St., Manchester, NH 03101
(800) 871-8326; Fax: (603) 666-3907

Comment: High school students team up with engineers to design, construct, and test their "Champion Robot" and then compete in a tournament.

Health Occupations Students of America (HOSA)

6021 Morriss Rd., #110, Flower Mound, TX 75028
(972) 874-0062; (800) 321-4672

Comment: Students compete in anatomy and physiology and medical terminology exams.

International Physics Olympiad

American Association of Physics Teachers
1 Physics Ellipse, College Park, MD 20740
(301) 209-3300

Comment: Teams of five high school students take individual practical and laboratory exams.

International Rivers Network

Center for Global Environmental Education
1536 Hewitt Ave., St. Paul, MN 55104
(612) 659-3105; Fax: (612) 641-2489
<http://www.irn.org/row/row/html>

Comment: K-12 students design artwork or write poetry about their watershed and the importance it has had in their lives.

International Science and Engineering Fair (ISEF)

Minnesota Academy of Science (MAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.mnacadsci.org/>

Comment: Students prepare an exhibit on their original math, science, and engineering research projects. They advance from regional or state fairs to the ISEF.

Junior Solar Sprint

Minnesota Renewable Energy Society
2928 5th Ave. S, Minneapolis, MN 55408
(612) 781-3585

Comment: Junior high and middle school students design, build, and race model solar cars.

Junior Science and Humanities Symposium (JSHS)

Sponsors: US Army, Navy & Marine Corps
Minnesota Academy of Science (MAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.mnacadsci.org/>

Comment: Students submit papers describing their research to a regional science fair or to the MAS. Students selected will be invited to make oral presentations of their work at the symposium.

Kids for Saving Earth Worldwide

P.O. Box 421118
5425 Pineview Ln., Plymouth, MN 55442
(612) 559-1234; Fax: (612) 559-6980

Comment: Clubs formed by and for children pre-K-9 to work on local environmental concerns.

The Lunch Box Derby

c/o Growers of Washington State Apples
P.O. Box 550, Wenatchee, WA 98807
<http://www.lunchbox.org/>

Comment: Elementary students work in teams to design and construct race cars made of fresh fruits and vegetables that will travel the greatest distance.

National Engineering Design Challenge

Junior Engineering Technical Society (JETS)
1420 Kings St., Suite 405, Alexandria, VA 22314
(703) 548-5387; Fax: (703) 548-0769
<http://www.asee.org/jets/>

Comments: Teams of students design, fabricate, and demonstrate a working solution to a social need.

The National Gallery for America's Young Inventors

c/o The Partnership for America's Future, Inc.
80 W Bowery St., Suite 305, Akron, OH 44308-1148
(216) 376-8300; Fax: (216) 376-0566

Comment: Students, grades K-12, submit their idea that has been patented, won a national inventor's competition, or has been manufactured for nomination.

Odyssey of the Mind

Intermediate District 287, Gifted Education Services
1820 N Xenium Ln., Plymouth, MN 55441
(612) 550-7212
<http://www.mnacadsci.org/>

Comment: Teams of students present solutions to various novel problems. Teams with winning entries are invited to attend a competition in which they are asked to find solutions to other problems.

Research Engineering & Apprenticeship Program (REAP) (Sponsored by Office of Army Research)

Minnesota Academy of Science (MAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.mnacadsci.org/>

Comment: Students apply to do summer research at a college near their home with a mentor obtained by MAS and present their research at the Junior Science and Humanities Symposium.

Save Our Streams (SOS), Isaac Walton League

Center for Global Environmental Education
1536 Hewitt Ave., St. Paul, MN 55104
(612) 659-3105; Fax: (612) 641-2489

Comment: Groups adopt a stream or river for a year or more, checking water quality, looking for signs of trouble, and taking action to solve pollution problems.

Science Bowl

MN Academy of Science (MAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.mnacadsci.org/>

Comment: Teams of students from a high school answer questions orally in a variety of categories.

Science-By-Mail, Museum of Science

1 Science Park, Boston, MA 02114
(800) 729-3300; Fax: (617) 589-0474
<http://www.mos.org/mos/sbm/>

Comment: Member groups or classes receive two packets of materials to do science activities and a scientist pen-pal.

Science Clubs

MN Junior Academy of Science (MJAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.mnacadsci.org/>

Comment: Science clubs who affiliate with the MN Academy of Science participate in statewide events and community service.

Science Fairs

MN Academy of Science (MAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.mnacadsci.org/>

Comment: Students prepare an exhibit on their original math, science, and engineering research projects and enter a regional fair to qualify for the MAS State Fair.

Science Olympiad

MN Academy of Science (MAS)
408 St. Peter St., Suite 410, St. Paul, MN 55102-1119
(612) 227-6361; Fax: (612) 227-8758
<http://www.mnacadsci.org/>

Comment: School teams, grades 6-12, compete in a series of science knowledge and skill competitions.

Solar Boat Regatta

Minnesota Renewable Energy Society
2928 5th Ave. S, Minneapolis, MN 55408
(612) 781-3585

Comment: Students grades 7-12 design, build, and race solar powered boats.

Space Science Student Involvement Project (SSIP)

NSTA, Attention: SSIP Competition
 1840 Wilson Blvd., Arlington, VA 22201-3000
 (703) 243-7100
<http://www.nsta.org/programs/ssip.htm>

Comment: Students depict an intergalactic scene (grades 3-12), illustrate and explain an original futuristic aircraft or spacecraft design (grades 3-5), address an environmental problem using a satellite (grades 6-8), propose experiments that could be performed at a NASA facility (grades 9-12), or plan an expedition to Mars (grades 9-12).

Student Ideas for a Better America

c/o The Partnership for America's Future, Inc.
 80 W Bowery St., Suite 305, Akron, OH 44308-1148
 (216) 376-8300; Fax: (216) 376-0566
 Comment: Students, grades K-12, invent a product and submit it to this national competition.

Tests of Engineering Aptitude, Mathematics and Science (TEAMS)

Junior Engineering Technical Society (JETS)
 1420 Kings St., Suite 405, Alexandria, VA 22314-2715
 (703) 548-5387; Fax: (703) 548-0769
<http://www.asee.org/jets/>

Comment: Teams of high school students learn team development and problem solving skills and then participate in an open book, open discussion engineering problem competition.

Thinkquest

<http://ie.advanced.org/thinkquest/>
 Comment: Challenges students, ages 12-18, to use the Internet as a collaborative, interactive teaching and learning tool.

Thomas Edison/Max McGraw Scholarship Program

National Science Teachers Association
 1840 Wilson Blvd., Arlington, VA 22201
 (202) 328-5800
<http://www.nsta.org/programs/maxmcgrw.htm>

Comment: Students, grades 9-12, submit a proposal on a completed experiment or a projected idea which would have practical application in science and/or engineering.

Toshiba/NSTA ExploraVision Awards

National Science Teachers Association
 1840 Wilson Blvd., Arlington, VA 22201
 (703) 243-7100
<http://www.nsta.org/programs/explora.htm>

Comment: Teams of students in K-3, 4-6, 7-9, 10-12 envision how a present technology might look 20 years from now and submit a 10 page paper and 10 storyboard frames for a possible videotape.

Valley Fair Physics/Physical Science Day

Steve Ethen, Burnsville High School
 600 E. Hwy. 13, Burnsville, MN 55337
 (612) 707-2269; Fax: (612) 707-2102

Comment: Students complete calculations and answer questions about their experiences on the rides at Valley Fair on special days set aside for physics and physical science students.

Westinghouse Science Talent Search

Science Service
 1719 N St. NW, Washington D.C. 20036
 (202) 785-2255
<http://www.sciserv.org/weststs.htm>

Comment: Seniors in high school submit a report of an independent research project in the sciences, official entry form, transcript, test scores, and teacher recommendations to compete for scholarships.

Young Inventors Program & Fair

Metropolitan Service Coop/Science Museum of MN
 3499 Lexington Ave. N, St. Paul, MN 55126
 (612) 490-0058; Fax: (612) 490-1920

Comments: Students grades K-12 focus on problem-solving, scientific inquiry, and creativity to make and present an invention.

Grants

“Every teacher of science needs an easily accessible budget for materials and equipment as well as for unanticipated expenses that arise as students and teachers pursue their work”

NSES, P. 220

At the same time as national reforms call for inquiry-based instruction, science teachers are faced with budget cuts and rising prices. In addition, technology takes a big bite out of many school budgets. Teachers can supplement meager budgets by writing grant proposals and/or award applications. Many local businesses and service organizations are interested in supporting schools in their area. Ask them! National foundations and organizations also have grants and awards available to teachers at all levels, K-12. Here are some suggestions for tapping into these sources.

Tips for Writing Successful Grant Proposals

Writing a grant is like writing a college research paper. Begin by outlining the idea. Do background research, form a bibliography, confer with those who will be judging your ideas, and finally submit the proposal by the due date. Just like college papers, successful proposals are well written, concise, follow the directions, and include original ideas. Unlike college papers you must start long before the deadline because there are no extensions for late papers.

Beginning the process

Writing a successful grant proposal or award application takes time. It's best to begin at least three months before the due date. Start by contacting the funding agency for the proposal guidelines. Check that your school is eligible for funding. Ask for samples of proposals that have been funded. These will give you information on ideas that were funded and how successful proposals were written. If possible, speak directly with a grant officer at the agency about your ideas and ask for advice on writing your proposal. Check to see if your district or Service Cooperative has a grant writer and engage their help.

Background Research and Developing a Budget

If the funding agency approves your eligibility, work with your project team to write the objectives for the project and outline the plan. Gather data that support your ideas, and keep track of all the references you use to support your rationale in a bibliography. It will be clear to you whether or not this is called for by the grant. Determine the budget for your project including an explanation of each item in the budget. Now, call the grant agent again to share your outline and budget with him or her. S/he may suggest that you revise your plans because the budget is too large or your project is not clear enough. Some agencies will ask you to send a preliminary proposal for their approval.

Writing the Proposal

Once you've gotten the go-ahead from the funding agency, you're ready to write the grant proposal. Read the guidelines for submitting the grant proposal, and follow them exactly. This may seem silly to stress, but many good proposals are rejected because they do not conform to guidelines. Education Technology News warns, "Perhaps a third of applications get turned down (because) whoever wrote the proposal just didn't bother to check (the directions)." If the directions say to double space, DO NOT space and a half. If there is a 500-word maximum, don't exceed it! While guidelines for grant proposals will differ, most ask for an abstract, a description of the proposal, the rationale for the project, an explanation of how the project will be evaluated, a time line, a list of who will be involved in and responsible for the project, the impact of the project, the number of students and teachers involved, and a detailed budget. Title each section using the titles given in the guidelines.

Writing the abstract

Summarize your project allowing the reviewer to quickly identify the major points and thrust of the proposal. This may be the most important section, since, in some cases, readers decide which proposals to review based on the abstract!

Writing the description of the proposal

Start with, "This proposal seeks funding to..." then state exactly what you plan to do. You can also begin by listing the project goals and objectives unless there is another section in the guidelines for these. Many first-time grant writers start with background information—big mistake! You want the readers to understand your project after reading the FIRST paragraph. Expand the proposal in the next paragraphs. Write clearly and simply; do NOT use jargon or flowery phrases. Great ideas sell proposals; convoluted writing gets in the way. Include diagrams or flow charts that will help the readers understand the project.

Rationale section

Convince the grant readers that your project should be funded. Explain the needs of your students. Use quotes from your background research to support your project; reference the quotes to a bibliography. Address any questions that you think the readers might have.

Evaluation section

Explain the criteria that you will use to evaluate the success of your project. Refer to the objectives of your proposal, and address how you will evaluate each one. Include the people who will be involved in the evaluation process and when it will take place.

Time line

Chart the time line for your project including planning sessions, workshops, deadlines, and evaluation.

Personnel

List teachers and other people who will be involved in your project; include their credentials. It is important that the readers be convinced that you and your team have the expertise and experience to accomplish the goals. Consider including professionals from the community; this often strengthens proposals and will enhance your project. When a grant addresses the needs of a specific population (ethnic/race, ESL, students with special needs, gender, etc.), it is important to involve representatives of the population and provide evidence of their support of the project.

Impact of the project

State the immediate impact of the proposal and then stress broader impacts. For example, indicate that the project will directly affect 250 students and eight teachers but has the potential to impact science instruction in the entire district. On the other hand, DON'T make promises unless you are CERTAIN you can deliver; grant readers have lots of experience and know what's what.

Number of students and teachers involved

Readers will check that your project serves the population that they are targeting; include statistics that will assure them that your school fits their criteria.

Budget

List the budget items for your project and include a rationale for each item. Be sure that the materials and activities that you propose to fund fit the objectives of your project.

Letters of Support and Resumes

The final steps involve obtaining letters of support and resumes from project leaders. Check the grant guidelines to determine who should write letters of support, then ask those people to support your project. It is important to give them plenty of time to write their letters, so check the due date for your grant proposal and plan ahead. Include a copy of your proposal with the request for a letter of support, and list important points that should be included in the letter. At the same time, ask project leaders and community professionals to develop one-page resumes outlining their qualifications. In some cases you might also include letters of support from project leaders. To strengthen your proposal, be sure to include letters from community professionals explaining their roles and willingness to participate in the project.

Before you Mail Your Proposal

Now, read the guidelines again, and check your proposal. Did you address every point? Finally, SPELL CHECK your work. There should be no grammatical or spelling errors. Have your project team review the proposal, then ask someone who is not involved in the proposal to read and critique it. Tighten up your work as s/he suggests.

- Re-read the guidelines one more time to ensure you have followed them exactly.
- Check that the number of pages complies with the guidelines.
- Include letters of support.
- Include your resume and resumes of teachers who will be involved in the project.
- Be sure to include any signatures that are required.
- Enclose the correct number of copies of the proposal.
- Send the proposal through mail with receipt required to ensure delivery on the correct day.

If you aren't funded, don't be discouraged. Call your grant agent and ask for feedback. Then resubmit following his or her suggestions. If you are funded, congratulations. Now the real work begins!

Checklist for Seeking Outside Funding:

- _____ Meet with your project team to outline the idea and develop the project objectives.
- _____ Contact the funding agency or company for guidelines and preliminary approval.
- _____ Do background research and develop a bibliography to support your ideas.
- _____ Develop a time line and budget for the project.
- _____ Contact the funding agency to check ideas and budget.
- _____ Carefully read the guidelines for submitting a proposal and follow them.
- _____ Write the grant proposal.
- _____ Be sure that you have addressed every point in the guidelines.
- _____ Meet with your project team to review the proposal.
- _____ Have someone proofread your work.
- _____ Make revisions.
- _____ Obtain letters of support.
- _____ Make copies of your proposal.
- _____ Mail your proposal.

Selected Sources of Funds

The following are a sampling of some national and regional awards and grant programs for which individual or teams of teachers can apply plus a few that are for school districts (Apple, large EPA grants, and Challenge.) Larger grants available from the National Science Foundation and other organizations must usually be affiliated with higher education institutions. Don't overlook your local industries, businesses, and service organizations. It pays to contact them and ask if they are interested in funding your project. Many are looking for opportunities to contribute to their local schools. Be aware that phone numbers and e-mail addresses can change. Check the MSTA/SciMath^{MN} web site (<http://informns.k12.mn.us/scimathmn/science>) for current information. If your district is really serious about grant writing, a one-year subscription to Foundation and Corporate Grant Alert, which is a 10-12 page monthly newsletter announcing grant opportunities, is available from Capitol Publications, Inc., 1101 King St., Suite 444, Alexandria, VA 22314; (800) 655-5597.

A Pledge and a Promise Environmental Awards: (\$20,000, \$12,500, \$5,000, and \$2,500) Awards K-college programs that improve the environment. Contact: (407) 363-2389 or <http://www.bev.net/education/SeaWorld>

Apple Education Grants: For programs in K-12 schools that integrate Apple's technology into student-centered interdisciplinary projects. Contact: (408) 974-2974

Challenge Grants for Technology in Education Awards: (Grants in sums of \$500,000 - \$1,000,000 for districts or school systems) Contact: <http://www.ed.gov/Technology/Challenge/ProjectDesc/index.html>

Cisco Systems Virtual Schoolhouse Grants: (\$410,000) Grants to 50 elementary and secondary schools for equipment to connect to the Internet. Contact: <http://www.cisco.com/edu>

C-SPAN in the Classroom: Grants for video equipment to 30 teachers to develop innovative projects that use C-SPAN programming in the classroom. Contact: (202) 626-4858 or www.c-span.org/contest.html

Environmental Protection Agency: (less than \$25,000) Grants to educate teachers, students, or the public about environmental issues and careers. Contact: Josephine Brown at (404) 562-9672

Environmental Protection Agency: (\$25,000 or more) Grants to educate teachers, students, or the public about environmental issues and careers. Contact: George Walker at (202) 260-8619

General Mills Foundation School Reform Program: (\$1,000 - \$100,000) Grants for projects that strengthen K-12 education. Contact: (612) 540-7890; e-mail: mills999@mail.genmills.com

Medtronic Foundation STAR Grants: (\$500 and up) Grants to K-12 teachers for projects that enhance science education near Medtronic facilities. Contact: (612) 574-3343

NABT Awards: Awards to biology teachers that can be used for science equipment and projects. Contact: Sherry Grimm, Awards Manager, NABT, 11250 Roger Bacon Dr. #19, Reston, VA 20190

NSTA Awards: Awards to teachers that can be used for science equipment and projects. Contact: <http://www.nsta.org>

Pioneering Partners For Educational Technology: Grants to teams of teachers for projects that

use technology. Contact: Pioneering Partners/GTE Telephone Operations, Mail Code IWAARJZ, P.O. Box 407, Westfield, IN 46074 or e-mail: mkenney@greatlinks.cic.net

Presidential Award for Excellence in Science Teaching: (\$7,500 grant to school) Grants to one elementary and one secondary science teacher winner in every state. Smaller cash awards for state finalists. Contact: (703) 306-0422

Scholastic's Ms. Fizzle Award: (\$1,000 - \$10,000) Awards to teachers K-6 for science projects that promote the philosophy of the National Science Education Standards. Contact: (212) 343-6801

School Nature Area Project (SNAP): Works with Minnesota K-12 schools to develop nature areas on their school grounds and develop and adapt related curriculum ideas. Contact: Char A. Bezanson, SNAP, St. Olaf College, Northfield, MN 55057; e-mail: bezanson@stolaf.edu

3M Education Grants: (\$2,500) Grants for K-12 science education programs in geographic areas where 3M has a major presence. Contact: (612) 736-3781

Toshiba America Foundation: (\$4,500-\$9,000) Grants for grade 7-12 student-focused projects that improve math and science education. Contact: (212) 596-0600; e-mail: foundation@tai.toshiba.com, or Internet <http://www.toshiba.com/new/taf.html>

Toyota TAPESTRY Grants: (\$10,000) Grants to 50 individual or teams of teachers for environmental and physical science projects. Contact: (800) 807-9852; e-mail: ecrossley@nsta.org