Minnesota Department of Education

Science Update
March 2017

"Women's Work"
Nature, March 2013

This periodic update from the Minn. Dept. of Education (MDE) is sent to a few email lists, including the Minn. Science Teachers Assn. (MnSTA) and district/organization contacts. We encourage you to forward this to other teachers and science leaders. See MDE contacts at the end of this document.

Note: MDE does not endorse any resource or event that is not conducted by MDE.

***** indicates an item that was not in the previous edition

News

MnSTA Adopts Position Statement on Elementary Science

The Minnesota Science Teachers Association (MnSTA) strongly supports the concept that science must be a basic component in the daily curriculum of every elementary school student at every grade level. In the last decade, numerous reports have been published calling for reform in education. Each report has highlighted the importance of early experiences in science to allow students to develop lifelong curiosity for the natural world and problem-solving skills that empower them to participate in an increasingly scientific and technological world.

In their recently released position statement on Elementary Science, MnSTA recommends that every elementary student in Minnesota should receive the equivalent of at least 3 hours of science instruction per week. See the full position statement.

* Chemical Disposal Service

The Chemical Safety Day Program is again being offered during the coming spring, summer, and fall months. The program is designed to assist schools and colleges in disposing of unwanted chemicals and hazardous waste from science, art, industrial technology, and maintenance departments. Pick-up are made throughout the state. The program is operated by the University of Minnesota with help from the Minnesota Department of Education. Information on the program can be found at this link. We look forward to making your school a safer place.

Teacher Events and Workshops

* Be a Pilot for a new Science PD Offering

Join your K-12 science teaching colleagues for an engaging workshop on the practice of **Constructing Explanations and Designing Solutions**. We will pilot a new K-12 online professional development

resource you can share with science teachers in your district or school. MnSTA is partnering with Hamline University to try-out and perfect some initial offerings at several regional gatherings. More events will be announced soon.

- Eagan, March 7, 4:30 – 6:15, contact jill.jensen@charter.net
- Rochester, March 30, time TBA, contact dvoegeli@isd2899.k12.mn.us
- Fergus Falls, March 31, 9:30 - 2:30, contact tschmitt@barnesville.k12.mn.us

**** Engineering is Elementary* Teacher Educator Institute, April 5-7, St. Paul**

Investigate the basics of the *Engineering is Elementary* curriculum, effective pedagogy, and facilitation strategies to support engineering education in elementary grades through:

• Hands-on experience with 2 EiE units
• Information about all 20 units
• Professional development discussions
• Review of EiE resources
• Sharing your experiences and planning with colleagues

This three-day workshop prepares you to facilitate EiE professional development workshops for teachers in your school, district, or region. For information and registration go to this link.

Project Learning Tree Trainings, Various dates and locations

Project Learning Tree provides engaging, hands-on environmental education lessons that use trees and the natural world to teach science, math, ELA and social studies concepts and skills. Participants get and activity guide, CEUs and lunch. Most workshop are free. Go to this DNR site for information and registration.

A new resource is a book for 7-12 teachers, *SE Forests and Climate Change*, provides lessons on the history of climate science, how climate affects our forests and ecosystems, and how people are working to manage and adapt forests.

PLT K-8 workshops: Mar. 25, Apr 22, June 28
PLT Climate Change 7-12 Workshops: Mar 22, Apr 15, June 21

*** Minerals Education Workshop, June 20 – 22, Ely**

The MMEW is a three-day workshop held annually for K-12 earth science educators that offers short courses and field trips focused on the geology and mineral resources of Minnesota. On the first day of the workshop, participants may choose among 16 different short course topics taught by professional geologists, academics, government scientists, and K-12 educators. Many of the courses introduce curriculum ideas for various grade levels. The second and third days of the workshop will involve field trips designed to familiarize participants with the geology and mineral resources in northeastern Minnesota.

Participants will receive a variety of resource materials including rock and mineral samples, lesson plan ideas, posters, maps, videos, and other useful information. Cost is $40. Information and registration are at this site.

*** Earth Science/STEM Teacher Leadership Academy, Houston TX**

The academy will provide teachers with Earth science content, hands-on activities, resources and real-world science experiences that they can use with their students in the classroom and with their colleagues in professional development settings. The program will be residential in Houston, and all academy-related travel, lodging, and subsistence costs will be covered by a grant from ExxonMobil. We have space for up to 25 participants and encourage teams of three or four to attend from each state or school district (although this is not a requirement). All expenses including travel are paid by ExxonMobil and American Geosciences Institute.

- K-5, June 25 - 30
- Middle School, July 16 – 21

In the year following the academy, participants are asked to extend the program's impact by conducting one or more teacher professional development workshop sessions at local, regional, and/or national science education meetings. Brochure for this and other AGI programs are available at this site.

*** Driven to Discover: Citizen Science 2017, June 26-30, July 10-14, St. Peter and St. Paul**

Immerse yourself in authentic field science with UMN scientists AND deepen your classroom practice for full scientific investigations that include analysis and communication. We utilize established citizen science projects as spring-boards to engage students in on-going ecology research that inspire their own investigations. Our goal is to have student work reflect the language and mathematics of science. Join a collaboration between the UMN Monarch Lab and UMN Curriculum and Instruction Department to strengthen your teaching of critical STEM content, current ecology research, and using claims, evidence and reasoning to further science literacy within your classroom.

The first four days are at Gustavus Adolphus College and remaining days at the University of Minnesota. There are additional meetings and support during the school year and Participants receive a $2266 stipend or 3 graduate credits, equipment, supplies and more benefits. See more information at this site or contact Sarah Weaver at weave048@umn.edu

STEM Rivers Institutes, June 26 – 28 or July 24 – 26

Hamline University presents FREE, three day field-based professional development opportunities that inspires, educates, and prepares 3rd-8th grade teachers to engage students in STEM disciplines through hands-on, inquiry-based investigations at local watersheds. Details and information are at this website.

St. Croix River Institute, June 26-28, 2017 (Monday-Wednesday)
Mississippi River Institute, July 24-26, 2017 (Monday-Wednesday)

G-Camp, June 26 – July 13, Texas and adjacent States

G-Camp is an 18-day field camp for 5th - 12th grade science teachers that provides first-hand experience with the principles of geology in the field, helps you develop new curriculum and virtual fieldtrips for your classroom, and makes learning fun and exciting out-of-doors. All expenses are paid for participants except for transportation to and from College Station, TX. Former participants say it has been a life-changing experience for them! G-Camp link.

Summer Institute for Climate Change Education, June 26-28, St. Paul

Climate Generation is a recognized leader in climate change education nationally, and we are joining forces with University of Minnesota's Institute on the Environment, where leading climate change research is happening. Hear directly from climate change and solutions experts, and engage with hands-on activities that will help bring these concepts to life in your classroom.

Join a network of teachers from across the country dedicated to bringing science, critical thinking, and problem solving about climate change into the classroom. The location is the University of Minnesota's Institute on the Environment, with the opportunity for a field trip to the Cedar Creek Ecosystem Reserve on the 29th (extra fee).

Registration: $150 (includes breakfast and lunch each day!) Lodging is available ($48/night single, double/shared $36)2 Graduate Credits optional (fee). Click here for information and registration

Minnesota Modeling Instruction workshops, July 10 – 14, Shakopee

The Modeling Instruction method relies less on presentation and more on engaging students using experimentation to construct and revise scientific models to explain physical phenomena. Workshop being held at Shakopee High School this summer:

- Introduction to Chemistry modeling July 10 – 14
- Introduction to Physics modeling July 10 – 14
- Mechanics Modeling July 17 – 21

For information contact Casey Rutherford crutherf@shakopee.k12.mn.us

*** Biotechnology/Microbiology for Teachers in the Classroom, July 17-21 and July 24-28, St. Paul**

The BioTIC Institute brings middle- and high-school biology teachers together to talk teaching and to get up to speed on the rapid advancements in biotech research, careers, applications, and issues. BioTIC also provides a review and enrichment of inquiry-based practices and curriculum enrichment that support the Minnesota science standards related to cell structure, disease, genetics, and biotechnology.

The Institute provides a two-week summer workshop, two Saturday follow-up session during the school year, a stipend, four graduate credits, board and room for outstate participants and teacher-focused training. For more information and to apply online visit this site.

*** WaterWorks! A Drinking Water Institute for Educators, August 7-9, Lakeville**

Enrich your water-related curriculum, investigate drinking water quality and chemistry, learn about inquiry-based models for your classroom, and find resources within your community. This three-day, hands-on workshop allows grade 4-10 science teachers to gather information from expert presenters about how safe, reliable drinking water is delivered to your community, as well as drinking water issues facing Minnesota. Meals and resource binder provided. Choose between two graduate credits or stipend. Join the ranks of over 350 teachers that have participated in *WaterWorks!* throughout Minnesota over the last 16 years. Funded by the Minnesota Dept. of Health and the American Waterworks Association. Application and information at this link.

*** Exhibit at STEM Day at the Fair, August 24, St. Paul**

The 8th annual SciMathMN STEM Day at the State Fair, Minnesota's annual celebration of all things STEM will again open the Great Minnesota Get Together. Past years have seen a broad variety of hands-on activities for fair goers in robotics, aeronautics and aerospace, programming, modern manufacturing, and a host of other STEM fields. The event attracts a wide variety of fair goers with a growing number of families coming the first day of the fair specifically to attend STEM Day. More information is at this site. Groups wishing to apply to be an exhibitor can apply here.

Teacher and School Awards and Opportunities

Presidential Award nominations and applications are now available.

Nominate exemplary science teachers (including yourself) for the Presidential Award for Excellence in Mathematics and Science Teaching. This is the most prestigious award in this field and includes recognition activities in Washington DC and a $10,000 award. This year, teachers of grades 7-12 are eligible submit an application that describes content understanding, instructional strategies, assessment practices, professional development and leadership. Just completing the application provides professional growth. The application is due May 1. For information go to the PAEMST website.

School Programs and Grants

GIS Mapping Contest: *My Hometown on the Map*

Minnesota students are challenged to create a map that tells a story about their hometown using free Geographic Information System (GIS) online resources. All students are eligible and schools can submit up to five entries. Each entrant receives a Competition tee-shirt. The best map in each division receives a $100 gift certificate to Amazon. E The competition is open until April 21. The competition website is at this link. Information about the free GIS license for schools is at this MDE website.

*** Wolf Center Virtual Field Trip**

The International Wolf Center is offering to bring you live educational wolf virtual field trip programs through a simple, easy to use videoconference. The International Wolf Center is a non-profit organization located in Ely, a northern Minnesota town. Our WolfLink virtual field trips provide you with expert wolf educators, a wide variety of wolf-related programming, and the opportunity to observe our ambassador wolves in their enclosure. We offer a variety of programs, suited to various age groups from youth through adults. Wolf Discovery Kits are also available to rent and provide tangible items for participants to experience. Our 2017 rate is $75 per program! Our programs are offered through the Tandberg system as well as Zoom. Zoom simply requires an internet connection and a computer!

Please visit this link for more information and to register for an amazing WolfLink virtual field trip, and feel to free to contact us by phone or email as well!

Genes in Space – Design and Launch your DNA Experiment to Space!

We invite students in grades 7 through 12 to design DNA experiments for space. Students will pioneer DNA research on the International Space Station to address real-life challenges of deep space exploration. Five finalist teams will receive mentoring from Harvard and MIT PhD scientists, present at the 2017 International Space Station R&D Conference, and receive miniPCR DNA Discovery System™ for their education institutions. Winners will also attend Space Biology Camp and send their DNA experiment to space! Submission deadline is April 21st 2017.

Teachers – Here's how you can turn contest submissions into a class assignment that's aligned with national standards. Find us on the web

Scientists in the Classroom

The Scientists in the Classroom program is a platform for teachers and scientists to collaborate as colleagues, peers and partners in the scientific enterprise to further science education. While the scientist can act as a resource for the teacher and students, the teacher and students can, in turn, help the scientist better understand how to convey their work to a larger, more diverse, and often skeptical audience.

By connecting early career scientists with educators, we hope to both enrich middle and high school students' climate change and evolution education, and to give scientists a better understanding of the challenges faced when teaching these often socially contentious and misunderstood topics. Click here for information.

Student Awards and Competitions

Minnesota Youth Institute

The Minnesota Youth Institute engages high school students in solving local and global hunger issues. The interactive, day-long program on May 15 brings teens from across the state to the University of Minnesota for an immersive science experience and an opportunity to connect with research and industry leaders. MNYI serves as a gateway to the World Food Prize Symposium and global travel, paid internships while still in high school, and a scholarship to the University of Minnesota. To apply for the institute, students write a paper proposing a solution to a critical global challenge in a specified country. Papers are due April 15. For more details visit the program site.

Clean Tech Competition

The Clean Tech Competition is a unique, worldwide research and design challenge for pre-college youth. The program encourages scientific understanding of real-world issues and the integration of

environmentally responsible energy sources. Each year, the Clean Tech Competition addresses an issue that is grounded in core technological competency areas and focuses on the next great engineering challenges. This year's challenge is to "Create a Greener Future." The competition is designed to foster a deeper understanding of STEM (science, technology, engineering, and math) related concepts, recognize outstanding talent, and prepare the next

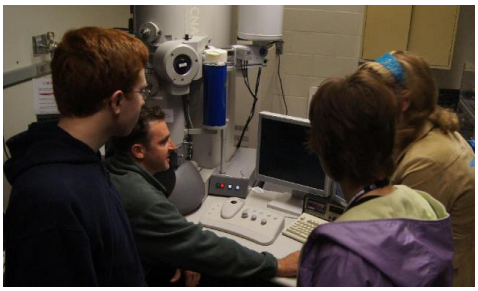
generation of globally competitive innovators. Click here for more information. The registration deadline is March 24.

Midwest Regional Science Bowl, April 22, Detroit

We are calling for students, science educators, and parents! Participation is free and food will be provided! There will also be a cash prize for the Coach of winning Junior and Senior division teams.

The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) is proud to announce our 2017 NOBCChE Midwest Regional Science Bowl for middle school and high school students at Wayne State University in Detroit, Michigan. Students are divided into Junior (5th – 8th grades) and Senior (9th - 12th grades) levels. For general information, visit this link.

Materials Camp, June 13 – 16, Minneapolis



The MN ASM materials camp will provide a hands-on experience into the world of materials science and engineering. This FREE commuter camp is for students entering their Junior or Senior year in high school in fall 2017. They receive a unique science experience under the direction of industry and education based "Materials Mentors". The program is a combination of mini-demonstrations, field trips with extensive involvement in laboratory facilities to actively explore materials science & engineering principles. An application is due by March 31. This is a competitive program for inquisitive learners with strong math and science aptitude. Details and registration are at this site.

Minnesota Competitions and Programs

Many competitions, out-of-school programs and field trip opportunities are posted at the Mn-STEM website and listed in the Reach for the Stars Catalog of Programs and Activities.

MDE Contacts:

Dawn Cameron, Science Assessment Specialist
John Olson, Science Content Specialist, @JohnCasperOlson
Doug Paulson, STEM Integration Specialist, @DPaulsonSTEM
Jim Wood, Science Assessment Specialist
Send submissions for the Science Update to John Olson

Other Minnesota Links:

Minn. Dept. of Education Science Page
Minn. Science Teachers Association
Frameworks for MN Science and Mathematics Standards
Get – STEM Connections between schools and businesses
Mn-STEM STEM programs and resources for families, schools and community
Sharing Environmental Education Knowledge environmental education resources
Minnesota Academy of Science: Science Fair, Science Bowl and other competitions
Mn DNR Education website: Curriculum, professional development, posters, etc.