

Science Update

January 2018

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. Archived editions are at [this site](#). 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



Get ready for the Super Bowl
Click on the picture for the link

News

New board will oversee educator licensing



As of January 1, the MN Board of Teaching and the MDE licensure division will be combined into a new state agency, Professional Educator Licensing and Standards Board (PELSB). It will oversee the transition to a new tiered licensure system. As a result, all active standard five-year license expiration dates will be extended by one year. [Visit this MDE site for information about the transition. This link goes to the new PELSB website.](#)

Equity presentations available

Dr. Deb Morrison from the University of Washington, led a workshop for the Science District Leaders Network on Nov. 29. The slides for her presentation, [STEM Teaching Tools: Professional Learning Resources for Equitable 3D Instruction](#) are available to the public.

The presentation used several of the teaching resources (STEM Teaching Tools) that have been developed by the University of Washington on teaching practices. Most are two page pdfs with links to examples. Go to the [STEM Teaching Tools](#); and follow @STEMTeachTools (Twitter); and [facebook.com/STEMTeachingTools](#)



Deb also gave the keynote at the STEM Network/Ignite conference: [Equity Research in Practice: Exploring Options for Closing Opportunity Gaps in STEM Learning.](#)

MDE Statewide Testing Teacher Newsletter

The Statewide Testing division at the Mn Dept. of Education has a newsletter for teachers. It includes news about new developments in assessments, hints for interpreting data from statewide tests, resources for teaching, and announcements of professional development and test development opportunities. To receive the Teacher Newsletter electronically, email mde.testing@state.mn.us.

Science and Engineering Practices in Action (SEPA)

A new series of Minnesota-developed web-enhanced science professional development modules are now available. These are designed for groups of teachers, such as PLCs or regional groups, to study together ideas for teaching science. The resources for group activities and discussions, including videos of classroom instruction, are delivered online and the groups can select members to be facilitators.

The SEPA modules are developed by Hamline University and are based on *A Framework for K-12 Science Education*, a compilation of current research that will likely influence on our next science standards. The first two sets of modules are available and more will be added during the year.

You can experience the SEPA modules at several free workshops being organized by the MnSTA regional directors. For more information about exploring and using the SEPA modules, contact

lee.m.schmitt@gmail.com

Teacher Events and Workshops

***Learn to Love Nature in Winter, Jan. 6, Savage**

The Jeffers Foundation is presenting this FREE teacher training on Saturday 8:30 – 3:30 at McColl Pond Environmental Learning Center. Earn 7 CEUs and learn techniques for outdoor instruction in the winter. Get teaching aids including Jeffers Journals for your class. Lunch and snacks are provided. For information or to register: David Grack david.grack@charter.net or 763-684-1455.

***Engineering for Animals, Jan 23, Duluth**



Great Lakes Aquarium provides an engaging space for students to experience authentic STEM learning. Learn how our resident animals help students explore engineering and develop problem solving skills! Animal exhibit design requires considering multiple perspectives. The Exhibit Design Class can enhance an on-site visit (and many extensions beyond a field trip) challenging students to think critically to engineer and problem solve just like our animal care staff, exhibit designers and conservationists.

Guest speakers include two of our very own talented exhibit designers – answering questions like; how we invite visitors to engage with a space, design elements to tell a meaningful story, what animals do need to lead healthy enriched lives, and what is the best way for husbandry staff to clean or feed behind the scenes? All participants in this workshop will qualify to apply for 2 free classes for up to 25 students each! The workshop from 4:30 – 7 p.m. is FREE and includes a light dinner at 4:15. Go to the [Aquarium PD site](#) for this and more workshops.

***Mn Earth Science Teachers Conference, Feb. 2, Plymouth**

Get to know your fellow Earth science teachers from across the state at the Minnesota Earth Science Teachers' Association Annual Conference. The keynote topic is Climate Change Education and the concurrent breakout session topics are:

- Using Visualization to Support Inquiry-based Learning
- Geology of Mars
- Geology of the Mississippi River Gorge in the Twin Cities
- Citizen Science: Good Questions!

Classroom resources will be given to all attendees. This conference supports the teaching of the MN Earth and Space science benchmarks articulated in the MN Academic Standards in Science. Find out about the keynote speakers, breakout sessions, tours, and registration at [this conference site](#).

Project Learning Tree Workshops

Through a suite of activity guides ranging from early childhood to high school, PLT offers award-winning lessons designed for indoor and outdoor classroom use. Interdisciplinary, hands-on lessons are designed to engage students in math, science, social studies, language arts, art, music, and P.E.



The only way to get PLT is to attend a workshop!

- [PLT K-8](#), Feb 3, Savage
- PLT Online Workshops: [Tremendous \(k-2\)](#), [Early Childhood](#), [K-8](#)

Schoolyard Gardens Conference, March 2, Chaska



Schoolyard Gardens provide an incomparable, hands-on opportunity for students to meet academic standards, engage with community partners, learn about agriculture, healthy eating, cultural competency, and connections with natural systems. Whether you are a beginner or schoolyard garden veteran, join us at the Minnesota Landscape Arboretum to learn innovative strategies for sustaining and engaging diverse learners in a thriving schoolyard garden. [Conference Webpage](#).

Talk Climate Institute, March 12 – 13, St. Paul

Join Climate Generation: A Will Steger Legacy for this two-day intensive workshop designed to empower people to talk about climate change. Understand the powerful factors that shape opinions, gain the practical skills needed to influence behavior, and inspire commitments to solutions.

Participants will have the opportunity to:

- Learn about climate change and how to decipher credible sources
- Understand what influences people to make decisions and how to communicate effectively to inspire solutions
- Cultivate your own personal climate story and learn how to use it as a tool to build understanding
- Learn about innovative solutions and commit to taking action on the individual and community level

More information at [this link](#).

***Institute for Climate Change Education, June 26-28, Collegeville**

Join a network of teachers from across the country dedicated to bringing science, critical thinking, and problem solving about climate change into the classroom!

Participants will have the opportunity to:

- Hear from experts and scientists on their research on climate science and climate change solutions
- Dive deep into Climate Generation's Next Generation Climate curriculum, a six lesson, interdisciplinary, middle school climate change curriculum that has students investigate the cause of the global temperature change, research the major repercussions of climate change, and find out how they can monitor and minimize those repercussions
- Experience Minnesota's biomes in St. John's University's 3,000 acre Arboretum, learn how they use their solar array as a teaching tool, and tour LEED certified buildings



Visit the [Climate Generation workshop website](#) for more details and registration.

***Minnesota Modeling Instruction Workshops, July 9-20, Shokopee**

Shokopee High School will host three different Modeling Workshops this summer:

- Mechanics – Jim Reichling and Eric Gettrust
- Chemistry – LeeAnn Richardson and John Vaden
- Biology – Anita Schuchardt
 - July 16-20 only

Contact Casey Rutherford crutherf@shokopee.k12.mn.us For more information go to the [Workshops website](#) or [Modeling Instruction website](#)

CDC Public Health Fellows, July 16-20, Atlanta

The Centers for Disease Control and Prevention (CDC) is recruiting teachers and educational leaders to bring public health into middle and high schools across the United States and beyond. Selected fellows tour CDC's state-of-the-art facilities and work with CDC scientists to design innovative lessons using today's emerging public health topics. Apply now by January 15, 2018. For more information, visit the [program's website](#).

Engineering education courses and certification

The University of St. Thomas Center for Engineering Education provides flexible engineering education for teaching professionals and will be offering two online courses this spring. These courses are designed to develop an understanding of engineering and build educators' engineering portfolio. Participants take the courses that fit their learning needs with a four course sequence which leads to a Graduate Certificate in engineering education. The spring courses, which are \$1200 each, are EGED 530 Fundamentals of Engineering and EGED 531 Engineering Design. Find more information [at the program website](#) and contact deb.besser@stthomas.edu.

Teacher and School Awards and Opportunities

***Achieve's Science Peer Review Panel**

"Science PRP" is an elite group of educators who work to evaluate and share [high-quality lesson sequences and units](#) that are designed for the Next Generation Science Standards (NGSS).

Join the Science PRP and connect with a network of educators across the country committed to advancing science education for all students, develop your expertise in the NGSS, and work to make better science instructional materials more widely available to the science education field. This opportunity includes free, valuable professional learning experiences designed to deepen your understanding of the NGSS and the evaluation process for instructional materials.

Any materials that are determined to be high quality by the Science PRP will be publicly shared on nextgenscience.org/hqngss so educators and curriculum developers across all states and districts can benefit from these materials. Apply to join the Science PRP [here](#), and learn more about it [here](#). The deadline is January 15.

Green Ribbon Schools Award, *Support Event Jan 18

After a long delay the US Department of Education announced that it will again offer the Green Ribbon School Award for 2018. This award honors Pre-K-12 schools, districts, and higher education institutions that have accomplishments in all three of the following pillars:

- reducing environmental impact,
- improving health and wellness and
- providing effective environmental education.

Applying for the award helps the school community analyze and set goals for energy and water usage, waste reduction, nutrition programs, environmental instruction and other sustainable practices. The revised deadline for Minnesota applications is **March 7**. The application and further information are posted at [this site](#), They will be replaced soon with the correct dates. For more information and to indicate your interest in applying, contact John.C.Olson@state.mn.us.

A virtual round table discussion is offered on January 18th, either 11:30 – 1 or 3:30 – 5. Online breakout sessions will give ideas to people considering the program, provide mentoring support to people applying, or share ideas for sustaining the effort. [Visit this MN Green Building Council site](#) for details and registration.

Presidential Award for Elementary Math and science teachers



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 K-6 are eligible to apply.** The application describes content understanding, instructional strategies, assessment practices, professional development and leadership. The process of preparing the application provides professional growth. The application is due May 1. For information go to the [PAEMST website](#).

***3M TWIST (Teachers Working in Science and Technology) June 18 – July 27, Maplewood**

The 3M TWIST program allows about 40 middle and high school math, science, and technology teachers to spend six weeks during the summer working closely with a 3M host on an actual 3M research project.



The objective is to provide active and challenging technical experiences for teachers in an industrial setting. TWIST is based on the idea that the way to learn science is to do science – an axiom that applies as much to teachers as it does to their students.

Participants receive a stipend of \$4500. [Visit this 3M site for more details and registration.](#) The deadline is January 19 for the Minnesota sites.

***National STEM Scholars program for middle school teachers**

Ten National STEM Scholars receive advanced education in the development of STEM projects for classroom implementation, spend a full day with a national thought leader in STEM education and build a national network of colleagues for information sharing. STEM Scholar classrooms also have an opportunity to speak with astronauts on the International Space Station during the school year and work directly with providers of space technology education nationwide. Participants selected through a competitive application receive:

- Advanced education and leadership professional development on the campus of Western Kentucky University June 3-9, 2018. All expenses – travel, lodging, meals – are included
- A notebook/tablet (Chromebook or similar) to facilitate ongoing collaboration
- A credit of up to \$2,500 for technology and supplies to implement a classroom Challenge Project
- Sponsored attendance at the National Science Teacher Association (NSTA) Conference in St. Louis in April 2019. All expenses – registration, travel, lodging, meals – are included
- Year-long mentorship and support provided by Western Kentucky University faculty

[Applications are available at this site](#) and are due February 1.

School Programs and Resources

International Wolf Center Virtual Fieldtrips – WolfLink Programs

Imagine your student's reaction if they came face-to-face with a wolf! Through two-way video



conferencing, our educators and ambassador wolves will keep your students on the edge of their seats while learning about these mysterious predators in a LIVE program from northern Minnesota! You and your students will see our live wolves in their naturalized habitat while meeting interdisciplinary state and national education standards. Six different lessons are offered that have been developed by wolf experts specifically for your grade level.

Teachers can also order a [Wolf Discovery Kit](#) – a big box full of hands-on wolf and prey artifacts like bones, fur, and more! For more information, email wolflink@wolf.org or call 218-365-4695, ext. 124.

Genetics Instruction Study

BSCS is conducting a five-year study that will explore how to design text-based instruction about human genetic variation to reduce the prevalence of racial bias in the United States. Participating biology teachers will be provided with stipends to conduct a short computer-based study during a single class period that teaches students about human genetic disorders like sickle-cell anemia and cystic fibrosis.

To learn more about this opportunity, please contact Dr. Brian Donovan at bdonovan@bscs.org, by Friday, January 19, 2018.

Student Programs, Awards and Competitions

National Youth Science Camp – Inform your seniors

Two Minnesota students completing their senior year will spend three weeks in July in the mountains of West Virginia with **all expenses paid**. They will interact with students selected from all states and several countries as they explore many science topics, meet prominent scientists and collect field data. In addition they will have selections of canoeing, horseback riding, camping and other recreational activities. Teachers should encourage students with leadership qualities, an interest in science, and a love of the outdoors to apply. There are often few applicants. This award is coordinated by MDE. For information go to [this site](#) or contact john.c.olson@state.mn.us. The deadline is March 1.



*Inspiring Girls Expeditions



Each year expedition teams of 8-9 teenage girls and 3 instructors spend 12 days exploring and learning about glaciers and the alpine or marine environment. Through scientific field studies with [our team](#) of professional [glaciologists](#), [scientists](#), [artists](#), and [mountaineers](#), you will build critical thinking skills, gain self-confidence, and make lasting friendships.

[One team explores Mount Baker](#), an ice-covered volcano in the North Cascades of Washington State. Another team sleeps under the midnight sun while [exploring an Alaskan glacier](#). Our third team [explores the connections between glacier and ocean by kayak](#) in Resurrection Bay, near Seward, AK. A team in Switzerland explores the [natural wonders of the Findelen glacier](#).

Our two newest expeditions take a team into the Rocky Mountains where they get personal with the alpine landscape through rock climbing, and into Glacier National Park, Canada, where they [learn about dynamic glaciers and hardy glacial ecosystems](#). Financial assistance is available. [Go to this site for more information](#). Applications are due January 19.

*Genesys internships for current HS juniors

Genesys Works is a competitive professional skills development and paid internship program for incoming high school seniors. We provide an opportunity to gain real-world skills like public speaking, Microsoft Office, business technology, and more – all while having fun!

Genesys Works provides a **paid corporate technology internship** where students will work for 12 months at a top Twin Cities company like 3M, Medtronic, General Mills, or Ameriprise Financial, all while earning \$12,000 their senior year! We also provide college and career support through our college access programming in which 100% of our students are accepted to college, and we guarantee all participants acceptance, too! Applications are now being accepted until March 1 through this [Genesys website](#). You may call their office with questions (651)-789-0088

***Clean Tech Competition**

The **Clean Tech Competition** is an international research and design challenge for 15-18 year old pre-university students. This is an educational opportunity for students across the world that challenges students to be innovative while encouraging their passion for the sciences. The 2018 challenge, [Solving Climate Change](#), asks students to develop a clean technology solution to the many problems associated with climate change. Teams consist of 1-3 students plus adult team leader that develop a written proposal. There is no limit to the number of teams per school and there is no entry fee. [Visit the competition website](#) for more information. Registration deadline is March 16

Science of Agriculture Challenge

Do you have students with strong interests in STEM, including bio energy, design, robotics, machinery, forestry, invention, structures, food security, materials, natural resources, geography, water quality, conservation, engineering, economics, food science, animal health, habitat, or any other food, fiber, agriculture or natural resources related subject?

Through the University of Minnesota Extension Center for Youth Development and Minnesota 4-H, youth in grades 6 through high school in teams of 3-5 (any age combination) can participate in the project-based Science of Agriculture Challenge. Winning team members can win up to \$1000 each in scholarships, and all teams will attend the Challenge event to be held at the University of Minnesota in June. More information is at [this link](#).

Science and STEM Competitions

This is the time of the year to organize your teams and inform your students.

- [Science Bowl](#),
- [Science and Engineering Fair](#),
- [Science Olympiad](#),
- [FIRST Robotics](#)
- [FIRST Tech Challenge, FIRST LEGO League](#)
- [Wind Energy Challenges](#)
- [NSTA student competitions](#): Bright Schools, eCybermission, ExploraVision

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 Science 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.