

## Science Update

May 2019

This periodic e-newsletter 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 MnSTA site](#). See MDE contacts at the end of this document.



Science Standards Committee  
completes their work

**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

### Science Standards Review – Current status and availability



The Science Standards Review Committee completed its work and presented a recommendation of science standards and benchmarks to the Commissioner of Education. After approval, the final draft will be published. The standards will become official through the Minnesota Rulemaking process.

The recommendations of the committee may be accessed at the bottom of the [MDE Science website](#). This draft may be used by school districts and educators for initial planning purposes. There could be changes before the final draft is published. The committee is also recommending that full implementation of the standards be in the 2023-24 school year. MDE will publish recommendations for an implementation timeline.

### Give your used textbooks a second life, in Africa

Your used textbooks and other books can help stem the drought of books in African schools and libraries. Books for Africa, based in St. Paul, collects, ships and distributed books to students of all ages. As a general guideline, books should be less than fifteen years old. You may drop off books at their St. Paul warehouse or ship them to the Atlanta warehouse. [Learn more.](#)

## Teacher Events and Workshops

### \*iFly STEM Field Tri Open House, May 23 or May 28, Minnetonka

Experience how flying *accelerates* learning with iFly's STEM Education Program during our Open House Event! We will explore the STEM principles behind our wind tunnel technology through exciting lectures, test flights and lab activities. Participants will also review important details on our curriculum for grades 2-12. Each registered guest for this 6 – 8 PM event will receive a test flight and everything you need to know about booking a STEM experience at iFLY! [More information.](#)

### \*Connecting Your Classroom to the Outdoors, June 1, Lanesboro

Spend the day learning outdoor education techniques from experienced outdoor educators. Get your hands dirty designing your own science experiments outdoors. In the evening participate in some Eagle Bluff classics like the ropes course and campfire (weather permitting). The **free** workshop utilizes The Raptor Center's "Raptor Lab" an online platform with three modules that highlight 2 different aspects of wildlife careers, and provides the structure for students to develop their own project using the scientific process. [More information.](#)

### Native Skywatchers Educators Workshop, June 10 - 11, Cloquet

This two-day workshop at the Fond du Lac Tribal and Community College is designed for all educators & persons interested in increasing their knowledge of Ojibwe and D(L)akota Star Knowledge. A new focus this year will include: Earth and Sky, and interdisciplinary STEM connections. The workshop includes multiple hands-on activities so participants will be able to experience the culture and the science in the most authentic and meaningful way possible. [Learn more here.](#)



### \*MN STEM Conference, June 12, St. Paul



***Transcending Boundaries: Connecting School, Career and Community through STEM*** is the theme for the annual STEM conference sponsored by [SciMathMN](#) and this year co-sponsored by [The Works Museum](#). Join colleagues from Minnesota's STEM learning ecosystem to consider the role of STEM education in providing inclusive environments, adequate resources, and career-connected learning that prepare the next generation for the future. Conference attendees and presenters will include: preK-12, university, informal, community, and afterschool educators and leaders; industry partners, professional organizations, employers and funders; and policy makers and community members. [More information and registration.](#)

A pre-conference **STEM Social** will be held on June 11 from 4:30-7:30pm at [REM5VR Lab](#) in St. Louis Park. Join us for networking, interesting conversation, and to experience virtual reality. Appetizers and non-alcoholic beverages will be provided and there will be a cash bar. This event is **free**, though registration is required. You do not need to be attending the conference to come to this event. We hope to see you there. [Information and Registration.](#)

### \*SciGirls Strategies Live Stream, June 12, online

During this special live stream from 1 – 2 PM, participants will learn about the latest research on best practices for engaging girls, based on a comprehensive literature review and extensive feedback from Twin Cities PBS SciGirls educators and trainers. The PBS [SciGirls](#) approach (for the TV show, website, and educational materials) is rooted in research about how to engage girls in STEM. Funded by the National Science Foundation, Twin Cities PBS conducted a literature review to update the strategies with the latest gender equitable and culturally responsive research. A quarter of a century of studies have converged on a set of common strategies that work, and they have become the framework for over 200 SciGirls outreach programs across the U.S. Click here to [Join the Zoom Meeting.](#)

## **Agriculture in the Classroom Teacher Tours, various dates and locations**

The Summer Teacher Tours are a fantastic opportunity to get first-hand experience with agriculture and explore **FREE** ag-themed, standards-based resources. We would love to have you join us for one or more tours this summer! [Learn more.](#)

**June 12: Feed, Seeds and STEM Teacher Tour in Carver County:** Stops include: dairy farm, seed company, Bongards Creamery

**June 27-28: Redwood and Renville County Teacher Tour:** Stops include: Grandview Valley Winery, Stony Creek Farm, The Shrimp Shop, Hilltop Harvest, Tiffany Farms Inc, Gilfillan Estate

**July 11-12: STEM in Agriculture Teacher Tour in Martin and Brown Counties:** Stops include: Avery Weigh-Tronix, Christensen Farms (Research Farm), Morgan Creek Winery, Eversman Farms (Solar Farm), Patsche Farm (Drone, GPS and other technology)

**July 30: Farmamerica Hands-on Learning with Hops and Hemp Teacher Tour in the Waseca area:** stops include: Farmamerica, Half Pint Brewery, Midwest Hemp Farms greenhouse, hops field, hemp extraction site



### **\*Teaching in the Outdoor Classroom Workshop, June 17-20, Fergus Falls**

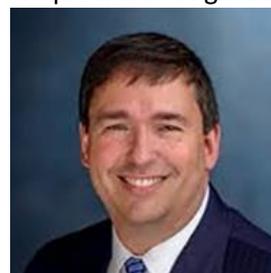
Explore innovative ways to use an outdoor classroom during this preK-12th immersion workshop at the Prairie Wetlands Learning Center. It is held concurrently with the Summer Explorers Biology Camp for youth entering 5th and 6th grades. Observe professionals and apply outdoor classroom methods by leading the same youth daily, outdoors, in a supportive, team-teaching environment. [Learn more.](#)

### **Green and Sustainable Chemistry Workshop, June 18-20, Minneapolis**

The Center for Sustainable Polymers in partnership with the Minnesota Corn Growers Association are offering a **FREE** three-day workshop at the University of Minnesota to high school chemistry teachers on green and sustainable chemistry. The workshop was developed through the University of Minnesota Materials Research Science and Engineering Center (MRSEC) Research Experiences for Teachers (RET) program. A stipend, graduate credits and lab materials are available. Applicants from across the state of Minnesota are welcome. Applications are due March 15. [Learn more.](#)

### **Gifted and Talented Symposium, June 18 – 20, Austin**

The annual Hormel Foundation Gifted and Talented Education Symposium provides an opportunity for educators, counselors, administrators and parents to gain greater understanding of the unique needs of gifted and high potential learners. Participants attend in-depth sessions focusing on foundational knowledge, creativity, curriculum strategies, and social/emotional needs of gifted and high potential learners provided by the field's finest regionally, nationally and internationally recognized presenters. All are welcome to register and attend the symposium



The keynote speaker this year is Stephan Pruitt, who is well-known as the leader of the Next Generation Science Standards development. His inspiring presentation is *What 4 Words Changed Your Life?* (and the lives of the many students teachers change every day.) [Learn more.](#)

### **Minnesota Minerals Education Workshop, June 18-20, Grand Rapids**

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. The workshops have been held in various

locations throughout Minnesota since its inception in 1997. The workshop is organized by the Minnesota Center for Mineral Resource Education. [Learn more.](#)

### **Implementing Integrated STEM in the Classroom, Minneapolis**

The NSF funded grant, *Design and Development of a K-12 STEM Observation Protocol*, includes a professional development program engaging teachers in learning how to implement integrated STEM in their classrooms. In a 5-day summer institute, teachers learn models and strategies for STEM integration through participation in model STEM activities, and are given opportunities to develop their own STEM units. In the 2019/2020 academic year, each participant will teach two integrated STEM units. These lessons will be observed and videotaped. Teachers will have the opportunity to reflect on their STEM teaching through classroom coaching sessions using their classroom video facilitated through a STEM observation protocol tool. The benefits include a stipend and a budget for classroom materials. The summer institutes are

- Elementary teachers: June 24 - 28
- Secondary teachers: July 29 – August 2

To register, contact Gillian Roehrig at the University of Minnesota, [roehr013@umn.edu](mailto:roehr013@umn.edu)

### **Become a SciGirls Strategies Trainer, June 25 – 28, St. Paul**

Twin Cities PBS (TPT) invites schools and school districts across Minnesota and Wisconsin to participate in *SciGirls Strategies: Gender Equitable Teaching Practices in CTE Pathways for High School Girls!* This program provides high school-level Career and Technical Education and Science, Technology, Engineering, and Math teachers and district leaders a **FREE** four-day workshop on employing gender-equitable equitable teaching strategies with the goal of attracting and retaining more female students in CTE/STEM classes.

This course will be held at Twin Cities PBS (TPT) studios in St. Paul and trains participants to provide professional development. Transportation and lodging will be reimbursed along with a stipend and funding for implementation. For more information contact Alex Dexheimer, [adexheimer@tpt.org](mailto:adexheimer@tpt.org).

### **Rivers Institutes: St. Croix, June 24- 26; Mississippi, July 22-24**



Join us this summer as Hamline University's Center for Global Environmental Education (CGEE) presents its acclaimed Rivers Institute, a **FREE**, three-day, field-based professional development opportunity for educators.

The Rivers Institutes are designed to increase teachers' science content knowledge and investigation skills and help area educators translate their professional experiences into meaningful, engaging classroom investigations. [Learn more.](#)

### **\*Voyage of Discovery, Grand Portage and Isle Royale, Various dates in July and August**

The Voyage of Discovery is a **free** two day overnight camp experience for educators, youth ages 9 – 12 and an adult mentor. Each trip begins and end at Grand Portage National Monument and includes a day trip aboard the Sea Hunter III to Isle Royal National Park. Participants will learn camping skills, cultural and natural history of Lake Superior, Grand Portage and Isle Royal and about tribal management of natural resources. The dates are July 13 – 14, August 3-4 and August 23 -3 – 24. Registration deadline is June 17. [More information.](#)

### **\*Biomolecular Structure Class (BIOC 2000), July 8 – 19, NDSU, Fargo**

The target audiences for this course are current or future high school STEM teachers in ND, SD or western Minnesota. This course focuses on providing an analytical understanding of the atomic structure of biomolecules like proteins, nucleic acids and their complex macromolecular assemblies and will provide teachers with tools and resources to teach their students. This is an opportunity for professional development of high

school STEM teachers, allowing them to incorporate items listed in the National Science Education Standards in their instruction. Course enrollment is limited to 10 and includes housing, meals, and upon completion a stipend to cover tuition. [More Information](#).

### **ArcGIS Mapping Training, July 20 and 27, online**

Geographic Information Systems (GIS) helps people understand the world and make informed decisions. Teachers Teaching Teacher in GIS (T3G) is for educators committed to helping other educator use GIS The T3G focus is on teaching and learning -- not "how to do GIS better" but "how to help other educators grasp why and how to teach with GIS, and how to learn more." The T3G training is two days (4 hours each) of synchronous interactive online training from ESRI the leading provider of GIS resources for education and industry. [Learn more](#).

### **ChemEd Conference, July 21 – 25, Naperville, IL**

Join hundreds of people who love chemistry and STEM education at North Central College for [ChemEd 2019](#). Registration is [now open](#). This is your chance to connect and share ideas, discover and learn new labs and activities, and network with other science educators. The 2019 ChemEd Conference will be applicable for STEM educators from K-12 and college.

### **\*AAAS Workshop for Life Science Instruction, Chicago, July 31**

Middle school science and high school biology teachers are invited to submit an application to attend a **free** one-day workshop presented by [Project 2061](#), the science education initiative of the American Association for the Advancement of Science (AAAS). The workshop is also open to science specialists or administrators with science curriculum responsibilities.

The workshop will introduce participants to a pair of curriculum units designed to give students a coherent understanding of matter and energy in living organisms:

- *Toward High School Biology* is designed for use in middle school and focuses on helping students understand what happens to atoms and molecules during the chemical reactions that result in the growth and repair of living organisms.
- *Matter and Energy for Growth and Activity* is for high school biology students and expands on the middle school unit to help students understand the relationship between matter and energy changes.

[More information](#).

### **WaterWorks! A Drinking Water Institute, August 5-7, Oakdale**

Enrich your water-related curriculum, investigate drinking water quality and chemistry, learn about inquiry-based models for your classroom, and find water 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 400 teachers that have participated in *WaterWorks!* throughout Minnesota over the last 18 years. Funded by the Minnesota Dept. of Health and the American Waterworks Association. [Learn more](#).

### **Summer Institute for Climate Change Education, August 5-7, Washington DC**



Climate Generation has offered the [Summer Institute for Climate Change Education](#) for the past 14 years as a way to give educators the tools and confidence to integrate climate change into their classroom. This summer, we are focusing on integrating climate change into social studies,

humanities; and ELA at our Summer Institute in Washington D.C. August 5-7. We are so lucky to have partners Frank Niepold, NOAA's Senior Climate Education Program Manager, and Natalie Stapert of the Lowell School helping us plan a fantastic agenda. [Registration](#) is open and [scholarships](#) are available.

### **\*Lake Superior Shipboard Science Workshop, August 5 – 12, Duluth and Lake Superior**

Learn about Great Lake tribal approaches to natural resource management and research incorporating Traditional Ecological Knowledge, Ojibwe Cultural Relationships to Water, and Western Science. Gain an understanding of Great Lakes ecology and water quality and get hands-on experience monitoring water quality and biota. Leave with exemplary curricula and resources

Participants will convene in Duluth, Minnesota board a bus, travel to St. Ignace, Michigan, and sail across Lake Superior to Duluth on the S/V Denis Sullivan, arriving just in time for the Parade of Tall Ships to sail under the famous Duluth lift bridge. [Information and Application.](#)

### **\*Minnesota Zoo: ZOOMS INSTITUTE for Teachers: August 5-8, Apple Valley**

See the Zoo in a whole new way! This four day workshop will engage teachers in utilizing animals and the Zoo as a tool to integrate engineering concepts into their curriculum, based on the Minnesota State Science Standards. Sessions focus on Engineering BY Animals, Engineering FROM Animals (biomimicry), and Engineering FOR Animals. Through hands on activities, expert talks and behind the scenes experiences, see how STEM is being used by aquarists, conservationists, and zoo staff to help care for and conserve wildlife both in the zoo and in the wild. [Learn more.](#)



### **\*Climate Change and the new Science Standards, Sep. 28, Bloomington; Nov. 7, St. Cloud**



Join Climate Generation to unpack the new middle and high school state science standards including climate change causes, as well as solutions, as they relate to energy and engineering!

- Gain experience with phenomena-based learning
- Integrate climate change and American Indian contributions into science instruction
- Identify learning progressions
- Engage in hands-on activities to support the new science standards

This day-long workshop is supported by Xcel Energy. [More Information](#)

## **Teacher and School Awards and Opportunities**

### **\*Green Ribbon School Award**

Forest Lake Area High School is a 2019 recipient of the US Department of Education Green Ribbon Schools Award. They join 34 other schools from across the nation in achieving this prestigious. A few highlights of their accomplishments are:

- Energy reductions through the installation of solar panels
- Student well-being support provided by junior and senior students serving a mentors for ninth and tenth graders
- Comprehensive environmental education in multiple content areas and a strong environmental club.

Highlights of their programs are available [here](#). Information about the award program and how to apply is available [here](#).



### **\*Grants for STEM Education Programs**

nVent believes a skilled workforce, one that reflects the diversity of our customers and communities, is critical to the ongoing success of our company and society as a whole. To help develop a healthy talent pipeline, nVent focuses a portion of its giving on STEM – science, technology, engineering and math – education opportunities for young people, particularly underrepresented and underprivileged groups in communities where nVent has business operations. nVent is especially interested in programs that offer hands-on learning experiences and introduce young people to STEM related career opportunities. [More Information.](#)

### **\*NCSE Climate and Evolution Workshop Funding for Schools or Districts**

The National Center for Science Education is offering funding for a limited number of professional development workshops specifically focused on teaching evolution and climate change effectively and confidently. Proposals can be submitted by single schools, school districts, collaboration of districts, or other area cooperatives. Funding can cover participant stipends, substitutes, materials, meals and refreshments, and limited travel. NCSE Teacher Ambassador will work with teacher colleagues on teaching climate change and evolution accurately, effectively, and without conflict. For more information contact [hoge@ncse.com](mailto:hoge@ncse.com).

### **Knowles Science Teacher Fellowship**

Each year, the Knowles Teacher Institute awards approximately 35 Fellowships to early-career high school biology, chemistry, physics and mathematics teachers. Through our signature program, we support our Fellows in their efforts to develop teaching expertise and lead from the classroom.

Throughout the five-year program, Knowles Teaching Fellows receive mentoring and coaching from a staff of experienced teachers and teacher educators, financial support, and membership in a nationwide community of more than 400 science and mathematics educators. [More information.](#)

## **School Programs and Resources**

### **\*ZOOMS Design Challenge: Engineering for Animals**

The Minnesota Zoo ZOOMS Design Challenge offers students in grades 3-12 a chance to use the engineering design process to develop a solution to a ‘real’ problem faced by zookeepers and staff at the Minnesota Zoo. From designing an animal enrichment to renovating a zoo exhibit, the problem will challenge students to use STEM to solve the problem and present a solution. Teachers receive resources and support from the zoo to ensure a meaningful experience for all. Selected students will be invited to showcase their solutions at the ZOOMS Design Exhibition in March 2020 at the Minnesota Zoo for a chance to win a backstage pass experience with our animals! **FREE** for all teachers and students to participate! [More information](#) and registration.

### **Wolf 101, videoconference**

My, what big ears you have! Join us as we look at the physical and social adaptations wolves use to survive in their environment. Students will be given an opportunity to observe our ambassador wolves utilizing these amazing tools. This is one of six videoconferencing programs offered by the International Wolf Center. They also offer a Wolf Discovery kit for classroom use. [Learn more.](#)

### **\*The Human Element, Video and lesson plans**

In an arresting new documentary from the producers of *Chasing Ice*, environmental photographer James Balog captures the lives of everyday American on the front lines of climate change. Four sections of the documentary (Earth, Air, Water and Fire) and related lesson materials are available **Free** to educators. [More information.](#)

**\*Happening: A Clean Energy Revolution, video available free to teachers**



Watch as Robert Redford's son James Redford explores the factors driving the transition to clean energy in his feature documentary HAPPENING. To further engage students, the Redford Center created TEACHING HAPPENING, an interdisciplinary, modular curriculum developed to work alongside HAPPENING. [Click here to watch a short trailer.](#)

**Free** to teachers, the classroom version of the film runs 50 minutes and the curriculum is aligned with national standards for grades 6-12 in Science and English. To access your **free** HAPPENING streaming link and educational curriculum, [click here](#)

## Student Programs, Awards and Competitions

**\*Summer Engineering Experience for Kids (SEEK), June 17 – July 5, Brooklyn Park**



This **FREE** three week summer enrichment program serves current 3<sup>rd</sup> – 5<sup>th</sup> grade students. Participating students will experience STEM (Science Technology Engineering and Mathematics) based curriculum and projects at a local school. Each week, the students will take on a new project, culminating with a presentation, design competition and physical competitions. Here is the [video](#) from last summer's program. [Information and application](#)

**EX.I.T.E Camp for Girls, July 29, 31, Aug. 2, 6, 8, Bloomington**

EX.I.T.E. (EXploring Interests in Technology and Engineering) Camp at the PACER Center is a **free** summer STEM camp for middle school girls with disabilities. Camp encourages future engagement with STEM subjects and helps girls discover the range of possibilities that exist through amazing experiments, activities and mentors. Campers learn how fun these subjects can be and many make friendships that last beyond camp. Application deadline is May 31. [Learn more.](#)

### Science and Engineering Competitions

- [Minnesota Science Olympiad](#)
- [Science and Engineering Fair and Science Bowl](#)
- [FIRST Lego League, FIRST Tech Challenge, FIRST Robotics](#)
- [Supermileage Challenge](#)
- [Real World Design Challenge](#)
- [Toshiba/NSTA ExploraVision](#)
- [NSTA Angela Award](#) – girls grades 5 – 8
- [MN Scholars of Distinction](#) – high school
- [National Youth Science Camp](#) – two Minnesota Delegates



### Minnesota Programs and Competitions

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:

[John Olson](#), Science Content Specialist, @JohnCasperOlson

[Jim Wood](#), Science Assessment Specialist

[Judi Iverson](#), 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.