

Science Update

September 2020

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. Frequent updates and new events are posted on the MnSTA Facebook page and Twitter feed @mnsta1.

MnSTA Conference on Science

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 or has been substantially updated.

News

*STEMTC – Frameworks for MN Science and Math Standards website Survey

SciMathMN needs input on the future of the STEM Teacher Center (a.k.a. The Frameworks). With the new science standards to be phased in beginning with the 2021-2022 academic year, the question is whether or not the website is essential enough to the K-12 education community to warrant its upgrading and continuation. This survey is attempting to capture who uses the site, for what purposes, and, if changes are to be made, what suggestions are there. The data will assist the SciMathMN board to make decisions about the site moving forward and potentially use this data with funders. If you are a user of the Minnesota STEM Teacher Center/The Frameworks website, please take a moment to [complete this survey](#).

*Teach Outdoors MN

Teach Outdoors Minnesota, a coalition of environmental educators, is encouraging all teachers to create learning environments outside. It's a COVID-19 safe practice that benefits students and teachers physically, emotionally and academically. Teach Outdoors MN has issued a [position statement](#) and has developed a [website](#) to support teachers going outside, even during a Minnesota winter.

- Outdoor education is not just moving the classroom outside
- The benefits of learning outside are holistic for teachers and students
- Minnesota leads the nation in outdoor education opportunities
- Winter is no obstacle to going outside to learn, even in Minnesota



Photo credit: Karen Christenson, St. Anthony Park Elementary School

Preparations this year for the new Science Standards

The MDE Science webpage has been updated with many of the documents that districts and schools need for planning, including

- Standards documents in text and spreadsheet versions
- Standards implementation timeline recommendations and alternatives
- Licensure in support of the new science standards
- Resources for instruction and learning

It would be good to start using the pedagogy associated with the new standards as we continue to teach using the current (2009) standards. One approach is to start tweaking lessons to strengthen the use and teaching of some of the Science and Engineering Practices. A goal should be to have students actively involved in making sense of phenomena, and through that work develop skills and learn concepts. See this [MnSTA newsletter article](#) for more suggestions and resources.

Preparing for Science MCA-IV

The Science MCA-IV, based on the 2019 Minnesota Academic Standards, will first be administered in 2023–24. In order to prepare for this administration, field testing of new test formats and item types will begin in spring 2021. New features will include: 1) the presentation of information on multiple tabs on the same page, and 2) the inclusion of constructed-response items where students are required to write a response. Resources will be provided this winter to familiarize students with these new formats and item type. Note: Field test items do not count towards a student's score.

Additionally, the Science MCA-IV test specifications are now available on the [MDE website](#). Test specifications describe how the revised 2019 Minnesota Academic Standards will be assessed on the Science MCA-IV.

Teacher Events and Workshops

Minnesota State Centers of Excellence Teacher Training – Sep 16. – Dec. 2 - Online



This is an interactive twice per month webinar series for STEM educators, grades 5 - 12. Webinars will feature ready-to-implement activities and resources with guidance for implementing in virtual and distance learning settings. This series is designed to help educators inspire interest in students and set them on the right track to pursue career pathways that lead to high-demand (and high-pay in many cases) jobs in Minnesota. [More Information.](#)

*STEM Forward Virtual Fall Educator Forum, Nov. 4, Online

Don't miss this opportunity to engage in meaningful conversations and hands-on virtual learning around equity and inclusion, gamifying your learning through Google for littles, standards updates and conversations around computer science incorporation in all classrooms, the changing science standards, virtual science labs, career connected learning, and much more.

Cohosted by SciMathMN and STEM Forward, the Fall Educator Forum is taking place virtually via Zoom on Wednesday, November 4, 2020, from 4:30 to 7:30 PM. [Click here to view the program and/or register.](#)

*MnSTA Virtual Conference on Science Education, November 12 -17, Online

Lower Cost, More convenient, No need for subs, Same great sessions!

We welcome you to share, learn, and grow together with us in our first entirely virtual MnCOSE! Sessions will be evenings Thursday, Friday, Monday and Tuesday plus unconference sessions on Saturday morning. However you do not need to spend your entire evening in front of a screen or make difficult decisions about which session to attend. **All sessions will be recorded and available to registrants for a year.**



Theme: ***A New Vision for Science Education in Minnesota; All Students, All Standards, All Voices!*** Conference strands are:

- Distance Learning
- 3-Dimensional Learning
- Equity, Diversity and Inclusion in Science Education
- Elementary Science Education
- Life Science Education
- Chemistry Education
- Physics Education
- Earth Science Education

All strands will include a focus on the new science standards.



You will be able to participate in sessions presented by educators and exhibitors. We welcome you to connect through our event app and/or on the web! This virtual experience may lend even more ways to connect directly with others than in our past events.

The member rate is \$50, \$75 for nonmembers which includes membership. Check out details and the schedule at the [MnSTA Conference website](#). Share great ideas for teaching with your fellow science teachers from the comfort of your home or classroom.

*NOVA –History Reconsidered, October 28, Online

Join NOVA Education for the second installment of their science and social justice webinar series on Oct. 28, 2020 at 5 PM CT. To engage US history truthfully and accurately means we must interrogate how the US history of violence and exploitation helped generate its economic foundations. These realities shape the lives of our students, and the landscapes of our schools.

In this talk Dr. Clint Smith will help crystalize how this history has shaped the contemporary social, political, and cultural context of our world today — specifically our schools — and how to talk about it with your students. The recording of the first installment, *History of Scientific Racism*, is also available. [NOVA Science and Social Justice Website](#)

*Hamline Univ. MA degree program

Hamline University offers scholarships and discounts for the Master of Arts in Natural Science and Environmental Education, as well as for certificates such as climate literacy, E-STEM, and nature-based early learning. Scholarships of up to \$1200 are available for new students, and many people qualify for tuition discounts through our [Learning partner](#) program. For information about the program, contact Patty Born, pselly01@hamline.edu

Mn Earth Science Teacher Assn. News

MESTA is canceling their Earth Science Teaching Conference, typically held in February, so you might want to check out the earth and space science strand at the MnSTA Conference on Science Education. The MESTA email listserv is now revived. Share questions, resources, and events with fellow earth science teachers. Check out the [new MESTA website](#) for details and to join the listserv.

Teacher and School Awards and Opportunities

*Water Warriors Grant to high schools

The “Water Warriors” competitive grant opportunity is available to Minnesota public and charter schools for the purpose of implementing water conservation curriculum and projects and to support the learning of water conservation concepts and leadership skills for students in grades 9-12. This grant is offered by the Minnesota Department of Education (MDE).

Two to four high schools will receive up to \$2500 each to design and implement student-led projects related to water conservation. Please see the grant instructions for the specific, allowable outcomes for this grant program at [MDE’s grant opportunity site](#) beginning November 1. The application is due December 4 and the funding is available Feb. 1 – June 30, 2020. For questions contact john.c.olson@state.mn.us

MnSTA Science Teaching Award

Be rewarded for great teaching. Members of the Mn Science Teaching Assn. are encouraged to apply for the MnSTA Science Teaching Award. An elementary teacher and a secondary teacher will each receive a \$1,000 grant for use in their classrooms and they will be recognized at the MnSTA conference. Here are some projects that have received funding:

- Gardening
- Data collection devices
- Tradebooks
- Investigation materials
- Recycling stations
- Ecology materials
- Balloon launch materials

The application is relatively easy and is due **November 1**. The nomination and application information is available at [this link](#).



*Green Ribbon Schools Award

Be recognized for environmental and sustainability efforts and spur your school to greater accomplishments. This award honors schools, districts and colleges who are

- reducing energy and resources consumption
- improving health and wellness
- providing effective environment education

Awardees receive a plaque for the school, local recognition, use of the Green Ribbon School Logo on their website, and an invitation to the national award ceremony and related activities in Washington, DC.



The information and applications are posted on the [MDE Green Ribbon Schools webpage](#) and are now available from john.c.olson@state.mn.us. The application is due in January.

Presidential Awards

Nominate yourself or a colleague for the 2021 award. Teachers of grade 7-12 science, engineering, mathematics, and computer science are eligible. This is a great opportunity to reflect on your teaching and increase your leadership in science education. The application is not due until May and there are opportunities for support from past awardees. Look for more information at the [PAEMST website](#).



Eric Friberg, science teacher at Henry Sibley High School, is the Minnesota science recipient of the 2019 Presidential Award for Mathematics and Science Teaching (PAEMST). He has taught biology, AP Biology and English Learners Biology since 2011.

Eric works to put students in a position to have a relevant, rigorous, and active science education. With his team, he redesigned the biology instruction to be tightly aligned to standards, relevant to students, structured for efficient learning, integrated with technology, and built on phenomena that connect to students' lives. These changes have led to both high levels of achievement and narrowed gaps. Seeing a need in his classroom, Eric led the creation of an EL sheltered science program that has increased engagement and access to science and English for immigrant students. Read Eric's profile at the [PAEMST Awardees page](#).

Other Awards

Check out information about the following awards programs and consider applying.

- [National Board Certification for Teachers](#)
- [National Science Teachers Assn. Awards](#)
- [National Association of Biology Teachers Awards](#)

School Programs and Resources

*Native Skywatchers Live (Virtual) event, Nov.13, Online

Join us for a live show at 10 AM featuring the Native Skywatchers - D(L)akota team. Bringing together Indigenous Astronomy and NASA- Moon to Mars & STEM on Station, this event will engage K-12 learners and everyone! This is part of a series of 7 live shows through Arpil. [More information](#)



*Arboretum Field Trip in-a-box

Based on our popular grade school Arboretum Fall-season Field Trip and Plantmobile themes, new mailed-to-you [Field Trip in-a-Box Classroom Activity Sets](#) provide Arboretum style hands-on plant science experiences no matter if you are in-person, on-line, or in a hybrid learning model. Choose from Apples & Pollinators (Grades 1-6), Minnesota Harvest Time (Grades 1-3), or It's a Bulbs Life (Grades K-2).

Field trip-in-a-box = Hands-on materials + virtual content + option to add a live interactive session with an Arb. Educator. School scholarships are available.

*Science Documentary available to high schools

An inspiring science documentary featuring Nobel Laureate Dr. Jim Allison is available free to high school educators to inspire future scientists. [Jim Allison: Breakthrough](#) is a moving, true story of a warm-hearted, stubborn scientist, and his visionary quest to find a cure for cancer. A team of teachers created a robust accompanying [Educator Toolkit](#) with lesson plans, lab activities, career exploration activities, and more, all aligned with NGSS and AP Bio standards.

*H₂O for Life Programs

[Water Warriors](#): Each year Lead4Change, a nationwide student leadership program, hosts a Challenge encouraging students to make a difference in their local communities. This year, schools in Minnesota participated in and revamped the Race2Reduce program to help develop their projects and ideas. And the big news?! Their hard work paid off because they won the grand prize of \$10,000 for the charity of their choice, H2O for Life!

[Water Guardians](#): Water Guardians is a free web-based curriculum consisting of five lesson plans that will take your students on a journey from the start of the Mississippi River, down to the Gulf of Mexico, and off to other parts of the world. During this time you and your students will learn about the global water crisis and be inspired to make change in your own communities and beyond. Whether you are back in the classroom or, for many, still learning from home, we think you will find this program to be fun, engaging and educational!

*Project WET: Water Education Today

Project WET Curriculum and Activity Guide 2.0 training is available through the Minnesota DNR. Go to the [DNR Project WET website](#) for more information about this virtual training. The [Project WET website](#) has information on how the curriculum correlates with the NGSS. Project WET also has a new online version of its *Climate, Water and Resilience* curriculum coming out later this fall.

*Race for the Planet

Project Green Schools is thrilled to announce the second year of *Race for the Planet* to be conducted by schools/communities around the country in 2020-2021, and we invite you to be part of this new way to engage students, schools and communities in climate action. Participants will compete in energy and environmental games and challenges held throughout the year focusing on energy, water, waste, and sustainability, to raise funds to support a unique project goal to Green Up Your School/Community. For example, you could host *Race for the Planet* during Climate Week, Earth Day/Week, Field Day, etc. [More Information](#)

*Southeast Minnesota Karst Geology

The flow of groundwater in southeast Minnesota is fascinating and complex because the unique geology is like no other area of the state. In a new educational video series, the movement of groundwater is explored and brought to life using realistic graphics, animation, and aerial footage of the region's geology. By understanding how groundwater moves through the soil and various layers of rock, viewers can better understand how water-soluble contaminants like nitrate-nitrogen can enter drinking water wells and streams. The five videos and three graphics can be found at [this link](#).



There are also four new lesson plans that teachers can use to provide an overview of karst geology starting with Minnesota's basic geological history and processes and ending with student projects that explore best practices

for protecting groundwater in karst regions. Lesson plans and links to other education resources can be found at [this link](#).

***Success beyond the Classroom**

The STEMLink program provides career and higher education connections for students in grades 5 – 6. This year Virtual STEMLink will feature unique content each month, including

- Two recorded sessions with STEM professionals that feature a hands-on activity
- “A Day in the Life” career blog updated weekly featuring STEM professionals
- Live Q&A with STEM professionals (twice a month)

For information: [STEMLink website](#).

***WolfLink video conferences – Free opportunity**

For many years, specific funding sources have allowed the International Wolf Center to present live in-person programs throughout Minnesota classrooms for free. Unfortunately, the pandemic means we will not be able to enter classrooms this school year. Since we know how important science-based wolf education is, and with the support of those donors, we've decided to waive all fees for WolfLink videoconference programs in Minnesota for the next nine months. This offer is good for just one grade level per school. If you are a teacher located in Minnesota and would like to register for a FREE WolfLink videoconference program, please [follow this link](#).

***Virtual Bell Museum experiences**



These virtual programs are designed to connect your group with a Museum educator online for a live, interactive program. Whether your students are learning from home or in the classroom (or both), using a videoconferencing platform, students can participate to learn about our natural world and the universe around us. Programs include: Pollinators, Ecosystem Exploration, Biomimicry, Solar System Investigation, and Life in the Universe. [More information](#).

Outdoor Learning Toolkit

MN Early Childhood Outdoors has prepared for PreK - 5th grade to support schools in transitioning from a primarily indoor model to a primarily outdoor teaching model during the COVID-19 health emergency. To access the toolkit, fill out [this survey](#).

How to Teach Outdoors

The Minnesota DNR offers some practical strategies for outdoor classroom management. If being outdoors allows you some “mask-off” time, and you are new to teaching students outdoors, check out [this page](#)!



UM Chemical Safety Day Program

The program assists educational institutions and nonprofit organizations throughout the state of Minnesota, in disposing of unwanted chemicals and hazardous waste from science, art, industrial technology, and maintenance departments. University of Minnesota Environmental Health and Safety staff travel throughout the state, multiple times a year directly to your location, allowing for convenient waste pickup. Information on the program is at the [Chemical Safety Day website](#).

Student Programs, Awards and Competitions

*Science Bowl

The Minnesota Academy of Science invites you to register one or more high school or middle school teams for the virtual 2021 Minnesota Regional Science Bowls. Participation is first-come, first-served, so [register](#) today! Students not only expand their STEM knowledge by preparing for Science Bowl, they gain confidence in their abilities and strengthen critical teamwork skills. Science Bowl offers a fun opportunity for your STEM students to shine! Deadlines: High School December 15, Middle School Jan. 15. This year, our regional competitions will follow the virtual Science Bowl format developed by the National Science Bowl last year. [Learn more.](#)

*Toshiba/NSTA Exploravision

The Toshiba/NSTA ExploraVision competition challenges K-12 students to envision a future technology while engaging in Next Generation Science Standards. Inspire a lifelong love of STEM and discovery in an engaging, hands-on way! It's not too late to register your teams. Deadline for project submissions is February 8, 2021. Download our [FREE lesson plans](#) for teachers and [register online](#) today.

Youth Environmental Activists (YEA! MN)

Join this network of high school students taking action for a just transition to a resilient climate future for all. YEA! MN provides mentorship to individual student leaders, as well as education and support for an entire school club. We can help you choose a project, launch a school club, navigate power dynamics at your school, plan an effective campaign, engage your audience, and transform your community. Information is at this [Climate Generation site.](#)

Youth Eco Solutions (YES!)

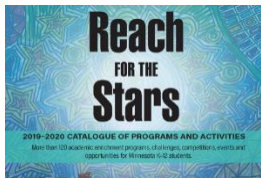
YES! is a unique youth program that develops youth leaders while inspiring widespread adoption of renewable energy technologies, waste, and energy conservation best practices, local foods, habitat restorations, and water quality and conservation improvement projects. In addition, students are gaining leadership and workforce skills such as problem solving, communication, teamwork, innovation, and project management. Participating YES! teams from grades 7-12 are guided by adult coaches. Throughout the year, YES! Coordinators work intensively with teams to evaluate community needs, create action plans, and identify and involve community partners. For information go to the [YES! Website.](#)

Science and Engineering Competitions

Check out the follow program for your classes and individual students.

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





Minnesota Programs and Competitions

Many competitions, out-of-school programs and field trip opportunities are 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

[Sarah Carter](#), STEM and Computer Science 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](#) a.k.a. STEM Teacher Center

[Get – STEM](#) Connections between schools and businesses

[EE Portal @MAEE](#) environmental education resources

[Minnesota Academy of Science](#): Science Fair, Science Bowl and other competitions

[Mn DNR Education website](#): Curriculum, professional development, posters, etc.

[Youth Eco Solutions](#) (YES!) – Statewide, youth-led program for hands-on eco related projects