

Science Update

November 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 Education-
still continuing!

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

*6th Grade Earth Science Workshop Interest Survey

The Minnesota Science Teachers Association is planning a week-long summer workshop for teachers who will likely teach 6th grade science when the new science standards are implemented. Since the 6th grade standards and benchmarks will be focused on Earth and Space Science content and three-dimension instruction, those will be the components of the workshop. The first year of this workshop has received some funding for planning, but it is likely that most of the cost will require a fee paid by the supporting school or the participant. [This survey](#) is designed to get input for planning the content and the marketing for the workshop. Thank you for completing the survey. Watch for announcements of the workshop in January or February.

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](#).

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. Look for the announcement below of a webinar below to explain the constructed response pilot.

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.

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

Teacher Events and Workshops

*MnSTA Virtual Conference on Science Education, November 12 -17, – Continuing!

Even when the conference is “over,” you can still register and use the recorded sessions. The exhibitors section is a great place to compare curriculum materials, resources, organizations and graduate programs.

Recorded highlights include:

- *Engaging Diverse Voices in STEM*, Maynard Okereke, “Hip Hop M.D”
- *Mental Health and Self Care for Educators*, Dr. Jules Nolan, Phoenix School Consulting
- *Engaging Students in Three-Dimensional Science Investigations*, Brett Moulding, Framework and NGSS writer



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 through May.**

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 include a focus on the new science standards.

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.



***Science MCA IV and Constructed-Response Questions, webinars Nov. 18, Dec.1**

The Science MCA-IV, which is based on the 2019 Minnesota Academic Standards in Science, will first be administered in spring 2024. To prepare for this new assessment, MDE is investigating whether constructed response (open-ended) question types are appropriate for assessing students on these standards. This webinar will provide an overview of the timeline for and steps in the investigation of including constructed response questions on the MCA-IV, as well as reasons we are exploring this question type. This topic will also be included in the MCA-IV session at the MnSTA Conference on Science Education on Tuesday Nov.17 at 5:00 PM

- November 18, 2020, 3-3:30 pm (Register [here](#))
- December 1, 2020, 4-4:30 pm (Register [here](#))

***Smithsonian COVID-19 curriculum resource – Intro Webinar, Nov. 18, 10 AM**

Science educators will play an important role in educating students about COVID-19 and the underlying science and social science of the pandemic. At the Smithsonian, we believe that students are more likely to engage in protective behaviors if they understand the science of WHY they are being asked to engage in these behaviors (e.g., wearing face masks, physical distancing, contact tracing, sorting through claims and evidence, etc.) To that end, the Smithsonian Science Education Center and its collaborators developed a free hands-on guide for youth and their families, available in 25 languages to support English Learners: <https://ssec.si.edu/covid-19>. This webinar will demonstrate some of the practical hands-on activities science educators and caregivers can use with students to help them better understand how to protect themselves and others from COVID-19. For more information, contact BlanchardKP@si.edu.

***Teach Climate Workshop: Scientific and Social Solutions, Nov. 19, noon**



Discover new ways of engaging in climate change solutions and learn how to build climate action and resilience in the classroom. Educators who attend this workshop will explore the connection between climate change education and the Sustainable Development Goals of the United Nations, and explore resources for investigating solutions in your classrooms with Elizabeth Bagley from Project Drawdown. [More Information](#).

***Culturally Responsive and Antiracist Science Teaching, Nov. 23: noon, Webinar**

In this edWebinar, educators will learn:

- Principles of culturally responsive and anti-racist education, including self-reflective resources
- Approaches to incorporating these strategies into science instruction, such as selecting relevant and provocative science phenomena and using everyday language

Specific examples will be explored, and attendees will be provided resources to accompany each section of the presentation so they are prepared to start implementing their newly learned strategies. [More Information.](#)

***Introduction to Modeling Methods – distance learning course– Sundays Jan. 10 – May 2**

In this Distance Learning course, we will delve into the Modeling Cycle, its basis in cognitive science, and the practical ways that teachers use Modeling Instruction in the science classroom. This course will sample Life Sciences and Physical Sciences in order to explore the Modeling pedagogy through multiple content lenses. By utilizing both student mode and teacher mode, participants will use readings, virtual whiteboarding, discussions, and reflections to engage in modeling practices that will lead to improved student learning. [More Information.](#)

***Virtual Mississippi River Delta Institute, Weekly Jan 12 – Feb 3. 6-8 PM**

This free professional development program from Hamline University combines online and hands-on activities that will inspire, educate and prepare 3rd-8th grade teachers to engage students in STEM disciplines through experiential, inquiry-based investigations. It will incorporate expert presentations about Delta environments, rich media resources ready for use with students, community-building with other educators, and independent offline explorations. All educators are welcome to apply, including past institute participants. [Learn more and apply.](#)



***Middle Grades STEM Teacher Training. Jan. 28, Feb. 25, Mar 25, online**

The Minnesota State Engineering Center of Excellence is sponsoring a [virtual training for the Middle Grades STEM project-based curriculum](#) by the Southern Regional Education Board (SREB), the nation's largest school improvement network, virtual teacher training.

Training Highlights (8 AM – 4 PM)

- Covers full curriculum for three student-centered projects.
- Projects can be taught in virtual, hybrid, or in-person classroom settings.
- Aligned to the National Science Standards, mathematical practices, and common core literacy standards.
- Appropriate for 5th-9th grade.
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***KidWind Virtual Workshops**

We have distilled our award winning KidWind workshops into 6-hour [virtual renewable energy trainings](#) that you can do from the comfort of your living room. These are hands-on workshops where you will learn enough content knowledge to get going as well as a wide variety of practical activities for your classroom. We also share ideas to help you navigate distance and hybrid learning.



***Computer Science in Minnesota**

Code.org just released their [annual report](#) which says that [Minnesota](#) is the worst state in the nation for access to Computer Science. The Minnesota Computer Science Teachers' Association is calling for science teachers to advocate for Computer Science classes and join [MN CSTA](#) for a free membership.

***Knowles Teacher Initiative for new science teachers**

Each year, approximately 35 Fellowships are awarded to early-career high school biology, chemistry, physics and mathematics teachers. 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 450 mathematics and science educators. Deadline January 18. [More information, referral and application.](#)

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

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](#).

*Grants for Teachers Facilitating Virtual Instruction

The National Geographic Society’s COVID-19 Remote Learning Emergency Fund for Educators supports individual educators, or an individual educator working in collaboration with other educators or National Geographic Explorers, to design instructional resources that help educators effectively teach in remote or hybrid learning environments. [More Information](#).

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

*Smithsonian COVID-19 curriculum resource

Science educators will play an important role in educating students about COVID-19 and the underlying science and social science of the pandemic. At the Smithsonian, we believe that students are more likely to engage in protective behaviors if they understand the science of WHY they are being asked to engage in these behaviors (e.g., wearing face masks, physical distancing, contact tracing, sorting through claims and evidence, etc.) To that end, the Smithsonian Science Education Center and its collaborators developed a free hands-on guide for youth and their families, available in 25 languages to support English Learners: <https://ssec.si.edu/covid-19>.

*Green Careers for a Changing Climate

The [Green Careers for a Changing Climate](#) Instructional Supplement from Climate Generation contains resources



to help young people grades 6 - 8 learn about Green STEM Careers — careers that can help solve climate change impacts using STEM skills. Includes connections to Project Drawdown solutions and can be used in any subject area! The Green Careers for a Changing Climate Instructional Supplement contains resources to help young people learn about Green STEM Careers — careers that can help solve climate change impacts using STEM skills. Includes connections to Project Drawdown solutions and can be used in any subject area!

*Boundary Waters resources

NO BOUNDARIES TO THE BOUNDARY WATERS is an educational program of Friends of the Boundary Waters Wilderness designed to bring the ecology and wonder of the Boundary Waters into classrooms across Minnesota. Our program inspires student observation and develops critical thinking about the natural world.

We provide FREE resources that start at the computer but end outdoors to meet the wide and shifting range of needs in Minnesota schools at this time. The flexible curriculum is created for students in grades 6–12 and designed to adapt to grade levels, schools, focus areas, and teacher preference. The program meets state standards in science, Language Arts, Social Studies, and Math. The program is looking for a small group of schools to pilot the No Boundaries program. [More information at this Get-STEM site.](#)

*Twig Science Reporter

Twig Science Reporter, is a FREE topical science service that connects students and teachers to real global and local phenomena and STEM news through engaging, high-quality videos and learning resources. All you need to do is sign up at [Twig Education](#). There is a new episode each week. We want every student to have access to the information and tools they need to become engaged and productive citizens. In the 21st century, that requires continually developing STEM skills and science literacy.

*10 Plants that changed Minnesota – Free book

This book and the Teacher Handbook by Mary Meyer of the Landscape Arboretum is available free to all life science teachers in Minnesota. Send your name, mailing address along with the grade and classes your teacher to Mary Meyer, meyer023@umn.edu. Also watch the recording of her presentation at the MnCOSE conference.

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.

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.

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](#).

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](#)!



Student Programs, Awards and Competitions

*Regional and State Science and Engineering Fairs

Minnesota has seven regional science fairs in February and a state fair at the end of March. *Even if your school does not hold a science fair, students from your school who complete science projects can attend their regional fair, giving them the chance to join the 500 middle & high school students advancing to the state-level competition.*

The state fair will be held virtually this year and include exciting opportunities for networking and enrichment -- as well as the chance to advance to international competition and win prizes and awards from 35 different companies and organizations. We know that completing a research project this year may be especially challenging. So we are pulling together special resources and supports for teachers and students. Learn more at <http://www.mnmas.org>

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.](#)

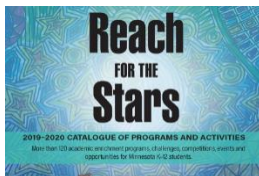
Toshiba/NSTA Exploravision

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.

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