

Science Update

February 2021



Teach outdoors,
learn outdoors,
In Winter!

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.

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

Progressing toward the new Science Standards

The pandemic-induced changing learning models have often shifted attention away from the plans for transitioning to the new science standards. The MDE science webpage has been updated with resources for science instruction during this year with an eye towards implementing new standards. Some topics to pay attention to:

- Distance learning and return-to-school resources
- Science Standards Rulemaking
- Standards Transition timeline and alternatives
- Teacher licensing
- Planning for MCA IV and Test Specifications

The Minnesota Science Teacher Association (MnSTA) newsletter has included a series of articles by John Olson, MDE Science Specialist, on the preparations for the new standards. They are archived at the [MnSTA Science Standards webpage](#). The recent articles include:



- [How do we prepare to implement the new Science Standards? \(May 2019\)](#)
- [How do I improve my distance learning lessons to deepen the learning of my students? \(March 2020\)](#)
- [How can I reflect on my teaching and build for next year? \(June 2020\)](#)
- [How do we keep working toward the new science standards during this demanding year? \(Sept 2020\)](#)
- [As we transition into three-dimensional instruction, what are some lesson-planning models to use? \(Jan 2021\)](#)

*District Science Leader Network

District-level staff that coordinate science education are invited in networking and professional development sessions of this group. This included district curriculum coordinators and science coaches. We will be offering

sessions this spring on introducing science pedagogy for the new standards, curriculum planning, and evaluating instructional materials. Meetings will be online this spring. If you have this role and have not been receiving notices, contact john.c.olson@state.mn.us.

Teacher Events and Workshops

***Teach Outdoors! Minnesota virtual workshops, Wednesdays Jan - May, 3:30 – 4:30**

Join experienced environmental educators in Minnesota to learn how you can integrate opportunities to teach outdoors into your curriculum. All activities and lesson shared are connected to Minnesota Academic Standards. CEUs will be included. Sessions will be recorded and available. [Information and Registration](#).

- Feb 10: MN DNR Teacher Resources Overview
- Feb. 17 Ice Fishing
- Feb 24: Mysteries in the Snow: Winter Animal Tracking

[More resources for teaching outdoors!](#)

Strategies for Integrating Climate Science into the Elementary Classroom, Feb. 11, Webinar

Join the Climate Literacy and Energy Awareness Network (CLEAN) to learn more about how to teach climate science in your classroom. The CLEAN collection contains 700+ free, online, peer-reviewed, NGSS aligned, and ready-to-use educational resources for teaching about climate and energy including activities, lab demonstrations, visualizations, and videos which are easily searchable through various tags. CLEAN has just added **over 65 lesson plans, data visualizations, and videos** appropriate for elementary-aged learners. Teachers can search the collection [here](#). Additionally, CLEAN has created some [support pages](#) designed to provide guidance on integrating climate science into the elementary classroom. [Register here](#).

Use of Real-time Websites to Teach Weather, Feb. 13, noon – 2 PM, online

Weather is a complex phenomenon involving a number of variables that are constantly changing as well as interacting with each other over the course of a “typical day” and longer time scales. But there is nothing more thrilling than to be able to correlate such phenomena with real-time data and/or maps—including satellite imagery-- that can be found on the Internet. [Circle of Illumination Science Education](#) invites **6th grade teachers** in Minnesota to participate in a webinar that will help them learn how to harness the power of such web sites, deepen their content mastery of earth and atmospheric science as well as provide them with many ideas for hands-on activities. 2 CEUs will be given. To register, email Dr. Amy Lilienfeld

This will be the first in a series of free workshops to be offered throughout the spring of 2021 by Circle of Illumination Science Education in which participants will learn how to use data from a variety of government web sites to enhance the teaching of the revised academic science standards. [More information](#)

***Dinner on the Lakes – virtual talk series**

Please join us for Dinner on the Lakes, an informal talk series developed by educators for educators and their families. We invite you to cozy up to your computer whether you are working late or eating dinner with your family to listen and participate in the topic of the evening. Participants will learn about upcoming events and opportunities and can network with each other in this growing community of practice. [Register](#)

All talks are on the third Tuesday of the month from 6 p.m. to 7 p.m.

- February 16: Animal Encounters in a Virtual World, Danielle Tikalsky, Great Lakes Aquarium
- March 16: iNaturalist and the CGLL Great Lakes Bioblitz, Marte Kitson, Minnesota Sea Grant

- April 20: Exploring Vernal Pools with Students, Billie Waugh, South Terrace Elementary School
- May 18: Citizen Science in the Classroom, Jennifer Flynn, Hermantown Elementary School

***Nature Heals: Schoolyard Gardens Conference, March 1-5, online**



Minnesota's schoolyard-gardens community gathers to explore the power of nature to heal fellow Minnesotans touched by the events of 2020. Educators, Master Gardener volunteers, Farm to School advocates, and garden coordinators from all four corners of Minnesota will convene to share their love of plants and learn more about the ways nature can heal and transform.

This year's theme is dedicated to our hardworking, dedicated schoolyard garden/Ag educators, Master Gardener Volunteers, and teachers. The conference goal is to provide opportunities for participants to refuel and recover from this difficult school year. To this end, all presentations will include an activity or technique that offers well-being resources and stress relievers to help teachers finish the school year strong. [Information and Registration](#)

***What IS Social Justice Teaching in the Science Classroom
NSTA virtual Miniseries, March 6,13,20,27**



Join NSTA for this special four-part, interactive, virtual miniseries, which is jointly hosted by the Association for Multicultural Science Education (AMSE) and NSTA's Committee on Multicultural / Equity in Science Education. Scheduled throughout the month of March, this miniseries is your source for resources and strategies for motivating and enhancing the participation of traditionally underrepresented students in science through the lens of equity and social justice. All sessions are Saturdays 10:30 – 1:00 Central Time. [Information](#)

- March 6: Designing for Rightful Presence in K-12 Science Teaching and Learning
- March 13: Critical Affinity Spaces for Science Educators
- March 20: Toward Field-Based Science Education that Contributes to Just, Sustainable and Culturally Thriving Worlds
- March 27: Defining Social Justice in our Science Classroom

Talk Climate Institute, March 23-24, Online



Join Climate Generation for a virtual two-day workshop to learn new ways to talk about climate change that inspires confidence, ignites conversation, and mobilizes action. Talk Climate focuses on personal stories—you will develop your own climate story and share with your fellow Talk Climate attendees. Throughout the program, writing, reflective listening, and art activities support your story development and confidence in talking about climate change. Scholarships are available. Price: \$10 per session (includes recording). [Information and registration.](#)

***NSTA Engage Virtual Conference April 12 – May 8**



Experience NSTA's premier event of the year with Engage: Spring21. The conference will feature inspiring keynote presentations, motivating sessions, unconferences, Marketplace Partner workshops, thought leadership, and so much more. Participate in rich, real-time dialogue with like-minded educators from around the country, listen to expert speakers on your own schedule, and drop in on lively social networking events at Engage: Spring21. All sessions will be available in the on-demand library for 90 days following the event. [More Information](#)

- Elementary April 12 – 17
- Middle Level April 19 – 24
- High School April 26 – May 1
- Postsecondary and Informal Education May 3 – 8

Opportunity to strengthen your Earth Science credentials, May 19 – July 1, online

Earth Science Essentials, an advanced online review of Earth Science for high school and middle school science teachers, will be offered May 19 – July 1, 2021 through Minnesota State University Moorhead. The course materials are available free for self-study. Participation in the course via tuition provides college undergraduate or graduate credit. [Learn more](#)

***Engaging Students in Investigation using GRC, elementary July 12 – 13, secondary July 14-15, online**

Join us for two days of professional learning that will model effective science instruction that is consistent with research about how students learn. These sessions based on a *Gather, Reason, and Communicate* framework will model effective ways to engage students and teachers in doing science Investigations in person and virtually, which leads to deeper science knowledge using instructional strategies consistent with the new Minnesota Science Education Standards.

Brett Moulding and Peter McLaren will lead this workshop, live online. Participants will receive a copy of the book *Engaging Students in Science Investigation Using GRC* and the materials to do the investigations during the PD. The book describes how to engage students in doing three-dimensional science investigations aligned to standards. The book and professional development provide insights and recommendations for how to effectively use a set of over 360 investigations to teach to the new standards. The investigations were developed by teachers working in collaboration with Brett Moulding and presented in a useful lesson plan format. Registration information will come soon.

***ESTEP Professional Development for the new 6th grade Earth Science Standards, in person**

This will be a one week, bootcamp style, regional workshop that incorporates earth and space science content of the new standards, as well as teach you how to develop three-dimensional units. We'll help you choose phenomena, write storylines and lessons, and walk you through investigations that you can use to engage your students. We will provide ongoing support as you begin your journey and create regional cohorts so you aren't doing it alone.

- Bemidji, July 26-30
- Metro area, August 2 – 6

The workshop is organized by the Minnesota Science Teachers Association and led by well-known Minnesota earth science teachers and professors. [Article introducing the program](#). [Workshop Information and application](#).

***Summer Institute for Climate Change Education Regrounding in Truth, July 28-30, online**



Gain the skills, tools, and resources to teach climate change in all subject areas. This three-day experience from Climate Generation will include networking with a national audience, as well as one full day dedicated to working, planning, and learning with regional cohorts. On-screen time will be segmented, with the opportunity to choose which sessions you would like to attend.

[Information and Registration](#)

***BEETLES Making Observations Professional Development**

The BEETLES Project (Better Environmental Education, Teaching, Learning & Expertise Sharing) has updated their professional development session Making Observations to be more inclusive and integrate indigenous perspectives on science. The Making Observations PD session is intended to "help learners make careful observations while encouraging wonder and curiosity". The session includes a free leader guide, session handouts, student activity, and session video.

This updated session was revised to "reflect previous feedback from [Youth Outside](#) and our deepened understanding of how BEETLES approaches can support equitable, inclusive, and culturally relevant learning experiences." Session materials can be found [here](#).

MnSTA Virtual Conference on Science Education (MnCOSE), still available

Now that the conference is “over,” you can still register and use the recorded sessions. All sessions are recorded and available to registrants through May. 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

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](#). Gain great ideas for teaching from your fellow science teachers from the comfort of your home or classroom.



Teacher and School Awards and Opportunities

*Presidential Awards Finalists

The 2020 Presidential Awards for Mathematics and Science Teaching go to elementary teachers who record a lesson and write about several aspects of their teaching and leadership. The state finalists are selected by a Minnesota committee and then their applications move on the national review. The Minnesota finalists are



Anna Edlund teaches in a variety of classroom and outdoor settings in Eastern Carver County Schools



Byron Gilliland teaches first grade at Goodview Elementary School in Winona Public Schools



Brian Hare teaches 6th grade at E-STEM Middle School in Saint Paul Public Schools

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 April and there are opportunities for support from past awardees. Look for more information at the [PAEMST website](#).

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

*Landscape Arboretum Field Trip-in-a-Box

The Arboretum team of educators has developed two new hands-on plant science Activity Sets for elementary school classrooms for this winter. Based on the popular Arboretum Field Trip and Plantmobile themes, these mailed-to-you sets provide Arboretum style hands-on plant experiences no matter if you are in-person, on-line, or in a hybrid learning model. [All Field trip in-a-box sets](#).

For Grades 2 - 5 there is "[Go with the Flow: Plants and Water Pathways](#)".

For Grades K - 2 there is "[Grow it, Eat it: Roots to Shoots](#)".

In addition, the Arboretum has many scholarship opportunities available for schools with greater than 50% free and reduced lunch percentage. Scholarships provide \$175 classroom activity set materials + Virtual content for Free. Scholarship information



*Race for the Planet



Project Green Schools (PGS) is currently reaching out to schools in our second year of "Race for the Planet: VIRTUAL HOME EDITION". We invite you to be part of this exciting way to engage students, schools, and communities in meaningful climate action. Participants compete in games and challenges focusing on energy, water, waste, and climate change, to raise support and funds that support a unique project goal that Green's Up Your School/Community.

Hosting kits with instructions, challenge materials, videos for opening/closing ceremonies, marketing & fundraising materials are available to registered participants.

Note: We suggest hosting *Race for the Planet events (held virtually at this time)* during Earth Day/Week, Field Day, or a time that is meaningful to your community. [Information and Registration](#).

*STEAM at Work for Kids

[STEAM at Work 4 Kids](#) is a website for all kinds of kids, especially ages 8-12, to meet all kinds of people who work in all kinds of STEAM fields. Our goal is to inspire kids to dream big and see themselves working in science. When they find an interesting topic, kids can learn more by reading the recommended books and websites following each interview.

*SciStarter citizen science projects

Citizen science enables people from all walks of life to advance science research. Have your class join a project or start your own. A couple examples:

Play in the Snow – gather data on the snowfall around backyards to validate scientific measurements. All that is needed is a yardstick
Track Plastic Pollution – make observations of where plastic debris ends up.

[SciStarters website.](#)



*Change the Face of Computer Science

Code.org has produced a video to inspire or encourage black students to try computer science and let them know they belong. [Video link.](#) [Code.org resources for schools.](#)

Experiential Learning lessons and kits

Are you a science teacher looking to better engage your middle school students with hands-on learning? Is your school a low performing school? We are offering a partnership opportunity to one middle school in the state, which thinks that its students will benefit from curriculum-aligned experiential learning. We will offer the following: ten experiential learning lessons/kits during the academic year, fully aligned to the scope and sequence of science learning, and a rubric to measure the development of 21st century skills in students through our lessons. We will provide PD, including strategies to contextualize our lessons to the classrooms prior to implementation. A partial implementation during the current academic year may be considered. All resources and PD will be offered at no cost to the selected partner school. Please contact Pathikrit (pathikrit@science60.com) for more information about this opportunity.”

Engineering Machine Design Contest



The Engineering Machine Design Contest is an opportunity for teams of 3-10 students in 5th – 12th grade to design and build a complex machine using everyday objects with the guidance of a coach. The completed machine will use multiple steps to complete a simple task. The contest theme for 2021 is **Driving Change through Transportation!** We look forward to seeing how this year's theme is interpreted by teams and conveyed in their machines. Regional competitions will take place from late February to early April with the Championship event in late April or May. [Learn more.](#)

WolfLink video conferencing

Through two-way videoconferencing on Zoom, the International Wolf Center 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! Some programs are free to Minnesota schools while outside funding lasts. [More Information.](#)

Get the Lead Out program

Get the Lead Out! is a program of the Minnesota Pollution Control Agency. Our goal is to spread awareness about the effects of lead-based fishing tackle on the common loon and other Minnesota wildlife and to promote the use of lead-free fishing tackle. We will be offering free virtual outreach presentations to classes of all grade levels beginning in January 2021. Contact us at leadout@state.mn.us if you have questions. [GTLO Fact Sheet](#)



Student Programs, Awards and Competitions

*Youth Climate Justice Summit, Feb 23-24

The Youth Climate Justice Summit is a day of youth action, learning, and a chance to directly participate in government. Join workshops led by youth and partners in the movement for climate justice. Meet with MN legislators that represent your district to talk with them about what matters to you. Join the YEA! Network campaign for climate justice education, learn about how you can help stop the Line 3 tarsands pipeline, and more. Plus, meet youth from across Minnesota and discuss how to make change in your communities! [Information, schedule and registration.](#) Register even if you cannot attend the whole event.



National Youth Science Camp June 28 - July 21, Virtual

Two high school seniors (class of 2021) from Minnesota will join delegates from all states and selected countries will attend this all-expenses-paid program. Normally delegates gather in the mountains of West Virginia to engaging science activities and outdoor adventures. This year the virtual experience will include world-class lectures, directed studies and seminars with prestigious and up and coming STEM professionals who are making a difference in their fields of study and changing the world for good. Participants must commit of a minimum 4.5 hour daily participation between 5 PM and 9:30 PM Central time. For [program information](#) visit the NYSC website or contact john.c.olson@state.mn.us. The [application](#) is due Feb. 28.

*Minnesota on the Map – GIS competition

Create an online GIS (Geographic Information System) story map on any topic of interest within the borders of Minnesota. Research the topic, map geographic findings, and present findings in a story map entry. Each school or club submits up to five entries to the state competition. Winners at the state level go on to national competition. Registration is due April 9 and the entries deadline is May 21. [Information and Registration.](#) The site also has training for students. All Minnesota schools and youth organizations are eligible for free ArcGIS Online Accounts. [GIS Information](#) from the Department of Education.

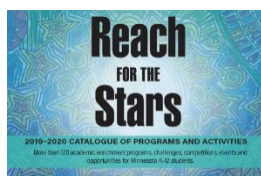
Science and Engineering Competitions

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