

Science Update

May 2020



Science teaching
for social justice

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

This edition of the Science Update primarily focuses on Minnesota events that are still scheduled either in person or virtual. It also highlights Minnesota resources that could be helpful in the distance-learning environment. A continuously updated listing of events that were previously scheduled and have now been cancelled, rescheduled or gone virtual are at this [Science Update Changes](#) site.

News

*Teaching Science for Social Justice

The events of this summer are raising the concerns for equity and justice in our consciousness and sense of urgency. Science educators are examining the role that our instruction can provide in addressing these issues. MnSTA and MDE are planning some events and resources for this summer. Watch for email and website updates. A recent NSTA blog suggests approaches and provides resources for [Social Justice in the Science Classroom](#). A good launching point for science instruction strategies is STEM Teaching Tool #67 [Focusing Science and Engineering Learning on Justice-Centered Phenomena across PK-12](#) and other tools it references.

*Guidance for science In-person and at-home instruction

The Minnesota Department of Education had developed several guidance documents for the [Student Instruction COVID-19 Resources](#) webpage. A new document provides specific **recommendations for returning to in-person or hybrid science instruction** with COVID-19 restrictions should be available soon.

It joins the previous [Science Standards Support for Distance Learning](#). This document draws heavily from the work done by state science leaders across the country through the Council of State Science Supervisors (“CS-cubed”) to support science learning during closures, including advice for science leaders, teachers, families and students. In addition, CS³ has produce several briefs with practical suggestions and resources:

- Supporting Equitable Home-Based Science Teaching and Learning during Extended School Closures (for educators)
- Phenomena: Not just for the Classroom (for families)
- Continuing Science at How with Science Notebooks (for families)

- Pass the Science Please: Science Talk Moves (for families)
- Teachers Guide: Phenomena, Science Notebooks and Science Talk Moves (for educators)

These are available at this [STEM Teaching Tools website](#).

***MnSTA collection of distance learning resources and lesson plans**

At the urging of Education Commissioner Mary Cathryn Ricker, professional teaching organizations have collected examples of distance learning lesson plans. These are intended to be examples of how lesson plans can be designed, especially for students without internet technology devices. MnSTA has developed a site where teachers can upload lesson plans to share and can access those that are posted. To view the lessons and to contribute go to the [MnSTA Resources for Teaching Remotely](#) webpage. You will also find other resources posted there, including suggestions for elementary teachers and links for remote learning resources.

MnSTA and MDE conducted a webinar on *Promising Practices for Science Distance Learning* in May. The recording of the webinar at [MnSTA Resources for Teaching Remotely](#).

Teacher Events and Workshops

Note: Check the websites and contact organizers to be certain that the events are still scheduled. Some organizations are waiting to see what changes happen for gathering of people during the pandemic.

Teaching in the Outdoor Classroom Workshop, June 22 – 25, 2020, Fergus Falls

This pre K – 12th grade workshop is for all who teach children. Explore innovative ways to use the outdoors as a classroom with integrated curriculum. Strengthen your outdoor teaching and reflection skills, and apply them to your indoor curriculum. Benefit from the immediate opportunity to apply workshop content with a small group of motivated youth. Gain knowledge and real-world experience in the prairie pothole ecosystem with direct carry-over to any geographic location, any age, and any season. Each participant receives certificate for 28 clock hours, hands-on practice using field equipment, printed copy of The Compass to Nature booklet, and much more. Free lodging available in the PWLC dormitory. For more info and to register, visit the [Friends of the PWLC web site](#).

***Project PEACE by Youth: Promoting Environmental Action and Community Empowerment, June 25, webinar**

This project is seeking teachers in Minnesota and nearby states that are interested in supporting student environmental champions. The program will train teachers to teach students in utilizing [EnviroAtlas](#), [EarthEcho International](#) and [Roots and Shoots](#) resources along with other data resources to learn more about the environmental health of their school/community and choose an environmental health issue in their community they want to tackle. Students will collect their own data, share and seek input from their peers, report the impact to their school/community environment and health and begin a call to action. Please join us for our Informational webinar on June 25, 2020 at 8:20 am CST. [More information](#).

***Team Teaching with Mother Nature, June 29 – July 1, Savage**

Be inspired this summer in an exciting workshop offered by Jeffers Foundation at the McColl Pond Environmental Learning Center. This is the much-requested advanced version of their professional development training. The three days are jam-packed with multi-disciplinary, hands-on activities to engage and inspire your students. Strategies for successful outdoor instruction, a focus on academic standards, an emphasis on STEM and opportunities to share ideas with other educators are special features of the workshop. [More Information](#).



***NSTA Distance Learning Strategies and Assessment Webinars, July and August, Online**

In the four-part web seminar series on *Distance Learning That Supports Student Sensemaking*, participants will explore ways in which they can continue to give students experiences with relevant, intriguing phenomena to create the need to engage in science learning using distance-learning strategies. The focus will be on synchronous and asynchronous online learning, but we'll also consider how to connect students to their learning communities through smartphones and local computers (no internet access). More information for [the July series](#), for [the August series](#).

Modeling Instruction Workshops, July

The Modeling Method corrects many weaknesses of the lecture-demonstration method of instruction typically seen in STEM classrooms. These weaknesses include the fragmentation of knowledge, student passivity, and the persistence of naive beliefs about the physical world. Instruction uses *modeling cycles*, which move students through all phases of model development, evaluation and application in concrete situations — thus promoting an integrated understanding of modeling processes and acquisition of coordinated modeling skills. The workshops are now offered online. [More Information.](#)

***Great River Educator Workshop, July 8 online and July 29 or Aug 5 Mississippi River**



Be introduced to and learn more about your local national park right here in the Twin Cities: the Mississippi National River and Recreation Area! Metro elementary educators teaching in grades 3-6 – this free two-part workshop is for you! The Great River Educator Workshop is designed as an inspiring introduction to the Mississippi River and how it can connect to your classroom.

The first part of the workshop is an online session 9 am – noon, helping you discover the exciting education programs offered by the park and how you can take advantage of them for next school year. The second part features an up-close look at the river in a kayak! We want you to know more about the great Mississippi River and its importance to the Twin Cities area through an interpretive paddle on the water. [Information and Registration.](#)

***Trimming our Sails Workshop Series, starts July 15, weekly online**

Minnesota and Wisconsin educators for grade 4 – 12 are invited to the virtual workshop series, *Trimming our Sails: Land-Based Workshops about the Great Lakes and Inland Waters!* Join Minnesota and Wisconsin Sea Grant for a 6-week workshop series that explores Great Lakes Literacy Principle 6: How the Great Lakes influence humans, and how humans influence the Great Lakes. Learn from educators who have participated in shipboard science workshops, researchers, and Center for Great Lakes Literacy staff about Great Lakes science along with classroom and field applications. The workshops occur Wednesday mornings and recordings will be available. [More Information.](#)

***Mississippi River Virtual Institute, July 20 – 22, Hybrid Online**

This unique free program uses a hybrid model combining live online content from river and education experts with experiential outdoor investigations conducted close to home.

Don't miss this live, interactive three-day professional development opportunity that inspires, educates, and prepares third- through eighth-grade teachers to engage students in STEM disciplines through experiential, inquiry-based investigations of local watersheds. This workshop will be helpful for

teachers preparing to teach the new science standards for elementary and middle school earth and life science. [More Information.](#)

Stay-In-stitute for Climate Change Education, July 22-24, Online



This three-day experience will take you beyond your computer screen, and into your backyard and neighborhood to do authentic scientific and social data collection, move your body, and make observations of the world around you.

Join a network of teachers from across the country dedicated to teaching climate change as an interdisciplinary issue!

- Prepare your students to be global citizens
- Use phenomena and place-based learning to ignite curiosity
- Support student engagement in climate solutions
- Network with educators in climate change education.
- A Minnesota cohort will be supported throughout the year.

[More Information](#) Scholarships are available.

***From the Solar System to the Cosmos, July 20 – 24, online**

Are you trying to find an innovative way to bring real astronomical data into your classroom? [Vera C. Rubin Observatory](#) is developing a series of online astronomy investigations that provide a pathway for students to engage in a rich and interactive experience. During this FREE workshop, you will have an opportunity to work through five different investigations and engage in conversations with peers about how the investigations and related support materials can be adapted to work in your classroom contexts and support your learning outcomes. Each day we will spend two hours online together and an additional hour offline. The online workshop meets 1pm CDT. Sessions will be recorded for those who may have time conflicts. [For more details or to register.](#)



***Technology Integration Workshop, July 27-29, Online**

TIW is a virtual professional development opportunity for K-12 educators to learn ways to enhance their curriculum through the integration of 21st century technology skills. Participants update a unit plan during the workshop and participate in a virtual job shadow with a corporate volunteer. [More Information.](#)

***ASM Material Camp for Teachers, July 27-31, online**

Learn new ways to connect science to you your students online and in person with hands-on labs that can be done anywhere. This free workshop is designed for middle and high school teachers of STEM subjects. There are several dates available and the Minnesota focused cohort is July 27-31. [More Information](#)

Computer Science Professional Learning, July 27-31, online

Code.org is offering [Computer Science Discoveries and Principles workshop](#) at no cost to most teachers accepted into the program. The professional learning program prepares teachers to offer the CS Discoveries courses for grades 6-10 or the CS Principles course for grades 9 – 12. Twin Cities PBS is partnering with this program which begins with the summer workshop and provides year round support.

***Smithsonian Leadership Development Institute, July 28-30, online**

The Smithsonian Science Education Center is holding its first fully virtual leadership development event this summer. As part of the SSEC's Leadership and Assistance for Science Education Reform (LASER) programming, the Smithsonian K-12 Science Education: Action Planning Institute (API) will tackle the challenge of ensuring science/STEM education remains a priority in classrooms and communities during COVID-19 and beyond. During this fully customizable program, live and asynchronous sessions will foster critical conversations on topics most relevant to K-12 science education today such as social emotional supports, equity and accessibility, and facilitating three-dimensional science investigations remotely. [More Information.](#)

MN Zoo STEM Teacher Workshop, Aug 3-6, Apple Valley

See the Zoo in a completely 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. 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. [Information and Registration](#)



MN State Centers of Excellence Teacher Training Institute, Aug 12, White Bear Lake

This program is a professional development opportunity for all types of educators teaching Science, Technology, Engineering, and Mathematics (STEM) related courses or out-of-school programs. The curriculum and programs on which we offer training are designed to inspire students and put them on track to pursue career pathways to rewarding careers in Minnesota. The workshop is for any STEM educator that seeks to inspire their students through hands-on, experiential-based STEM activities that connect directly with career pathways in Minnesota agricultural, healthcare, engineering, and manufacturing industries. [More information](#)

Exploring Environmental STEM at the Blaine Wetland Sanctuary, August 29, Blaine

Adventure in nature play and hands-on teaching strategies at a unique wetland site with this workshop 9 am – noon. Practice environmental STEM teaching strategies including: the 5E model; nature play; science activities for your site; and how to do field trips. Participants experience the 5E's...engage, explore, explain, elaborate, and evaluate...all at Blaine Wetland Sanctuary! We act out seasons, build different nests, create art connecting natural systems, investigate insulators, identify plants, and more. The [Blaine Wetland Sanctuary](#) is an open space park that holds a special wetland called a fen, some of the rarest plants in Minnesota, and a unique mile-long boardwalk. The BWS park and the online curriculum are free to visitors. [Registration.](#)

***Accomplished Science Teaching: Building Student Understanding, online**

This course from PBS TeacherLine is the first in the Accomplished Science Teaching course series. The courses for PreK-12th grade educators may be taken individually or as a series. [More Information.](#)

Teacher and School Awards and Opportunities

Watch for 2020-21 information about the following awards programs and consider applying.

- [MnSTA Teaching Award](#)
- [Presidential Award for Excellence in Mathematics and Science Teaching](#)
- [Green Ribbon Schools Award](#)
- [National Board Certification for Teachers](#)
- [National Science Teachers Assn. Awards](#)

School Programs and Resources

This listing features Minnesota organizations offering resources for distance learning. Many of these programs might be modified by the next school year depending on instruction models that will be in place.

***Project PEACE by Youth: Promoting Environmental Action and Community Empowerment**

This project is seeking teachers in Minnesota and nearby states that are interested in supporting student environmental champions. The program will train teachers to teach students in utilizing [EnviroAtlas](#), [EarthEcho International](#) and [Roots and Shoots](#) resources along with other data resources to learn more about the environmental health of their school/community and choose an environmental health issue in their community they want to tackle. Students will collect their own data, share and seek input from their peers, report the impact to their school/community environment and health and begin a call to action. Please join us for our Informational webinar on June 25, 2020 at 8:20 am CST. [More information.](#)

3M Science at Home

3M has launched a new, free-to-use digital program for teachers called [Science at Home](#), where 3M scientists and engineers will produce simple, at-home experiments that reinforce core scientific principles using commonly found household items. It is fully accessible now. The content is geared toward students ages 6-12.



Bakken Museum Digital Workshops

Some of The Bakken Museum's most popular education programs are now available as digital interactives! These online versions of shows and workshops are perfectly tailored to various distance learning formats. Workshops feature a Hyperdoc—an online worksheet that follows the videos so students can make predictions, answer questions, and try experiments in our Virtual Laboratory. Programs can be watched as one continuous program or in smaller segments, as a whole class or by students individually. [More Information.](#)

Bell Museum Resources

Today more than ever before the Bell is a [museum without boundaries](#), sharing virtual experiences, activities, and ways to dive deeper into the world around you, whether you're exploring online, from your window, out in nature, or looking up at the stars.

Big River Journey Online!

Students can explore the Mississippi River from home. They will

- peer into the tiny world of aquatic invertebrates; investigate a 'river crime' spree and learn how to reduce runoff pollution;
- play fun learning games and dive into engaging interactives;
- get a captain's view of the river from the pilothouse;
- explore dozens of videos, 360-landscape panoramas, and more!

These interactive learning stations are available free for schools. [All Aboard!](#)

*Just for Kids – Minnesota Valley Wildlife Refuge

Enjoy the Outdoors at Home. The US Fish and Wildlife service is offering distance learning packets for outdoor exploration at home, at the refuge or a neighborhood park. The elementary grade-banded packets feature videos from the refuge and hand-on activities. [More Information.](#)

*Explore STEM@Home Education Programs

Youth will complete a series of hands-on activities offline, at-home while receiving guidance from STEM professionals via live video conferencing. Youth can choose to engage with instructors and other youth as little or as much as they want! Twice a day is a scheduled time for youth to connect online, learn about, and reflect on the hands-on, experiential activities for that day. This program from the Minnesota State Engineering Center of Excellence for students entering 6th-9th grade is offered weekly through July 10. [More Information.](#)



Minnesota Zoo Distance Learning Teacher Resources

Elementary grades: “Operation: Curiosity and Wonder” are sets of lessons and activities that can be used by schools and families at home. These daily lessons involve exploring natural phenomena. Activities support learners with a range of technology needs, from no or limited technology (pdfs) to those working on digital platforms daily (digital). Students explore their outside environment and make connections about the natural world. The lessons were developed with input from MDE, the MN Education Equity Partnership and MnSTA. The website is also updated weekly with topics ranging from nature play to backyard science and conservation activities (website). [Kindergarten to Second Grade Resources Third](#), [Fourth and Fifth Grade Resources](#)

Middle School: [The 6-8 ZOOMS Mini-Engineering Design Challenges](#) offer opportunities for students to be inspired by nature and use this to engineer a solution to a problem, much like our zookeepers do at the Minnesota Zoo. Show Us Your Mussels lessons are designed to support middle school teachers in teaching students about water quality and how to save endangered native freshwater mussels in Minnesota. These stand-alone lessons integrate English Language Arts, Humanities, and science content to meet state standards.

High School: [The 9-12 ZOOMS Mini-Engineering Design Challenges](#) offer opportunities for students to be inspired by nature and use this to engineer a solution to a problem, much like our zookeepers do at the Minnesota Zoo. More lessons are being developed in this age range and will be updated weekly!
High School

Physics Force Videos

The University of Minnesota Physics Force has been offering large-scale demonstration shows for many years. They now have made video clips of their show and have posted them on the [Physics Force YouTube Channel](#).



Project Hero: Ecology Quests



Project Hero is a free online platform that offers standards-oriented and authentic project-based learning experience for empowering and engaging students to take action for their local endangered species and ecosystems.

Each Quest students undertake is a unique learning and activation journey that focuses on locally-relevant environmental issues. We present multi-media content, lessons, and activities for exploring and understanding the threats to local species and ecosystems. Every quest culminates in a hands-

on project to empower your students to make a meaningful impact in their environment. Current Quests include the Minnesota Freshwater Quest. [Information](#)

***Project WET Distance Learning and Online Resources**

Project WET provides water education curriculum supplemental activities that focus on watershed dynamics. Normally teachers receive access to the materials by attending a workshop through the MN Department of Natural Resources. Now the training is available through an online format. By using the online training resources and completing an assignment, teachers will receive the *Project WET Curriculum and Activity Guide*. The [Making a Splash with Project WET](#) website describes the method to accomplish this training.

Project WET also has a suite of free and discounted resources that educators, partners and children can use to learn about water while meeting standards in math, language arts, science and fine arts. Go to [Home and Distance Learning Resources](#).

Raptor Lab

The Raptor Center at the University of Minnesota's [Raptor Lab](#) is an online learning environment focused on providing students with an authentic learning experience in science and environmental education. Using role play, inquiry-based learning, and technology the Raptor Lab aims to put students in the shoes of real-world scientists, applying the process of scientific investigation to solve real-world problems. The Raptor Center also has additional resources to [Learn about Raptors](#).

Team Teaching with Mother Nature – at Home!



The Jeffers Foundation fosters environmental stewardship through education. Normally Jeffers educates teachers through in-person workshops on Team Teaching with Mother Nature. Given the current shelter-in-place guidelines, we are seeking ways to connect with teachers, students, and families through short videos encouraging children to get outdoors as part of their learning at home. Some example topic of the video are *A Listening Walk*, *Recycling in Nature*, and *Seeds are Smart*. Access them at [Jeffers@Home](#): Fun with Mother Nature at home.

Three Rivers Digital Learning

The [Three Rivers Park District digital programming](#) brings the outdoors to you via Facebook. Tune in to explore nature, meet farm animals, try new art projects, and more.

Waters to the Sea Mississippi River Adventure

A free learning adventure, offering dozens of multimedia activities, map-based explorations, and short videos on a variety of science, engineering and social studies topics. [More Information](#).

WolfLink Video Conferencing

The International Wolf Center is offering two-way [videoconferences](#) for free via Zoom. They include live wolves in the naturalized habitat and programs adapted to your grade level.



Works Museum At-Home Engineering Resources

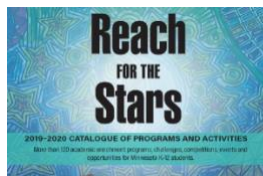
[The resources](#) include home engineering activities, a document of the engineering design process and links to other resources

Student Programs, Awards and Competitions

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 posted at [the Mn-STEM website](#) and listed in the [Reach for the Stars Catalog of Programs and Activities](#).

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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