

# MnSTA Newsletter

Volume 60 No. 1 A Quarterly Publication of the Minnesota Science Teachers Association Inc. Fall 2021

## MnCOSE21-Special Edition

*Clear Vision for Science Education:  
All Students, All Standards, All Voices  
Thursday, Oct 28 - Monday, Nov 1, 2021*

We welcome participants from all around the state to our second virtual MnSTA Conference on Science Education. This week we will be providing toolkits to encourage local gatherings of educators to participate in the rich networking of MnCOSE in smaller groups without the travel and lodging expense of a full in-person conference.

Consider sharing all that you have learned in this past year as we gather together to grow!

We have developed a new set of conference strands to capture this unique moment in our science education experience. Each strand will be facilitated by pairs of dedicated strand leaders. Each session will be hosted live by our strand leaders as they welcome and support each presenter through their session.

Our 2021 MnCOSE strands include some traditional content-focused strands as well as some focusing on the teaching and learning pedagogy within science content and across grade bands. In addition to their placement in relevant strands, each MnCOSE21 session will also be tagged with the relevant science content and most appropriate grade range.

### ***MnCOSE21 Strands are:***

- \*Life Sciences
- \*Physical Sciences (Chemistry & Physics)
- \*Earth & Space Sciences
- \*Leveraging Technology: Lessons Learned from Distance Learning
- \*Diversity and Inclusion: Equity, Culturally Respon-

sive Teaching, Social-Emotional Learning in the Science Classroom

\*Science Communities: Learning, Growing, and Connecting with Others

\*Exhibitor Sessions: Presentations by Exhibitors on Products and Services

We are intentionally embedding grade level identification of sessions across all strands, so that educators of pre-K, elementary, middle, high, and 12+ students can identify sessions most helpful to them across the conference. See pages 11-19 for speakers, vendors and virtual conference norms.

For the complete session schedule go to [https://www.mnsta.org/cgi/page.cgi/MnCOSE21\\_Session\\_Preview.html](https://www.mnsta.org/cgi/page.cgi/MnCOSE21_Session_Preview.html)

To register for the virtual conference go to [https://mnsta.org/cgi/page.cgi/Register\\_NOW\\_for\\_MnCOSE21.html](https://mnsta.org/cgi/page.cgi/Register_NOW_for_MnCOSE21.html)



MnCOSE20's Video Content will REMAIN AVAILABLE via the Whova app (Google/Android, Apple) through June 30, 2021! [More Information.](#)

## President's Message-Angela Osuji



It is taking me a long time to write this message as I am coping with a difficult shoulder injury. I did not envisage at the time of the injury that it would be this difficult. My capacity to move and do things has become limited. But this experience has

provided me an opportunity to reflect more on Diversity, Equity, and Inclusion for ALL my students and how I, as their science teacher and fellow scientist, have advocated for them and for us. I am particularly thinking at this time of my less physically, emotionally, and cognitively able students.

I am thinking of all those times when my injured students or my wheelchair-bound students would hop into class or wheel into class after the bell rang and I have already started class. They have to also leave five minutes early to avoid the crowd in the hall and we still continue class after their exit. In doing this, they miss the beginning of class and the ending of class as well as all the little community-building activities or end-of-class words of encouragement that their classmates receive. I am thinking of all the times they have to go from my first-floor class to their other class on the third floor using an elevator that moves slower than a snail even when they are lucky enough to get it unlocked with a key by a staff. I would guess that my colleague on that floor was not waiting for them before class begins either.

I am thinking of the many times I have thrown aside my microphone because it was so echoey while my student with a hearing loss was in front me and how irregular the itinerant services received by the student were as a result of limited staff. I am thinking of the times the student would give me their own specially assigned microphone and the connection between us would not work and I proceed with the lesson for the rest of the class anyway.

I am thinking of my students with low vision or blindness, who could not or would not wear their glasses, or even when they do, there was no significant difference in what they are perceiving. I could count the number of times I have created a lesson with the student at the center of my lesson creation.

I am thinking of my student with epilepsy who would have several petite mals in the course of the day and not a lot of people would know. How even when I do know, I would want to make learning as “normal” as possible. I am also thinking of all the others who have other hidden disorders that we do not know of unless we have gained their trust enough for them to let us into what is going on.

I am thinking of this newly arrived student in my class who conceptually understands science in a different language but has difficulty giving me “access” to their brain because of the barrier between our formal means of communication in science and in school - something we often refer to as ‘academic language’.

As an equity-focused, justice-centered educator, I am cognizant of the stereotypes and biases associated with ‘dis’ability. I know I take into consideration my student’s Individual Education Plans for planning and accommodation. At the same time, my present temporary injury has brought forth so many areas I have failed to advocate for ALL of my students and many areas I still need learning, training, or professional development on. I am also cognizant of my need to be a more courageous and effective advocate.

This year’s conference on science education- the Minnesota Conference on Science Education (MnCOSE21) is aptly theme “Clear Vision for Science Education: All Students, All Standards, All Voices”. The conference is gearing up to be a spectacular event, more exciting than our previous MnCOSE21. The MnCOSE21 will feature outstanding Keynotes on Science Equity and Justice. In addition to our usual disciplinary strands of Chemistry, Physics, Life Sciences, and Earth & Space Science, we have added strands in Leveraging Technology, Science Communities, Equity, Diversity, and Inclusion in Science Education as well as Exhibitor Sessions.

I am deeply grateful to the MnCOSE21 planning team and strand leaders. As always they have been diligent, energetic, and committed to presenting a conference that is exciting, full of knowledge and application, and above all has the capacity to enable us to move closer to realizing our vision.

I look forward to seeing you at MnCOSE21! I also look forward to seeing you at the annual meeting of our organization at the last session of the conference and thank you for all the work you are doing for science and science education in Minnesota.

## Teacher Feature-Brad Hubred

Our featured teacher for this issue of the MnSTA newsletter is Brad Hubred. Brad teaches 5th and 6th grade science at Moose Lake Elementary School. He has been teaching at Moose Lake Elementary for 7 years. Previously he has taught in Bullhead City, Arizona, Little Falls, Mn, and Johns Creek, Arizona. This fall was his 19th year as a science educator.

Brad’s favorite activities he teaches are the starburst rock cycle lab, and trebuchet lab. With the starburst lab the kids get to see the rock cycle in action and see how all types of rocks are formed. The trebuchet lab allows the kids to get hands on experience building a trebuchet, and launching it. They get to see a compound machine in action, and identify the simple machines used to make it work, as well as measure many different types of energy being used and transferred!

Brad also runs a summer science camp with colleague Charlie Borak that is all hands on. It runs for 2 weeks at the end of July, and beginning of August. It is one of his favorite times to teach because he can take bits and pieces of his favorite lessons and activities and mash them together for some summer fun. This summer they took a field trip to the Soudan Underground Mine State Park.

Brad teaches how he would want to learn. Fun, jokes, and then comes the learning. He feels it is important to form relationships with the students before they can learn. He has a sound system in his classroom that has a microphone. He uses the microphone all day because it makes him feel like he is on stage. He states, “Teaching is a mixture of connecting the heart, and mind along with some improv comedy along the way. If you were to walk into my classroom on any given day you would probably see me wearing some random costume, while either singing or doing the lawnmower dance with a Parry Gripp song playing in the background. Quickly transitioned into a lesson, or activity that the kids can explore. Hit them with the fun, followed by the learning!” Brad always connected with kids growing up. He loved science because of his middle school science teacher, Tom Deering. He connected the two and ended up teaching middle school science himself! He also loved sports growing up so coaching appealed to him as well so he could continue to be around the sports. He is the assistant coach for the varsity boys hockey team in Moose Lake.

Brad truly is a remarkable educator. He is currently leading the efforts in making Moose Lake

the 2nd blue ribbon city in the world. He has been writing a one page handwritten letter to each one of his students since 2008 telling them all of the positive things he sees in them. This is part of his suicide prevention presentation. Two years ago he ordered 200 “Who I am Makes a Difference” ribbons from a non-profit organization called “blueribbons.org” to go along with his suicide prevention program he already had in place. Soon after the order he got a phone call from the founder of the organization Helice “Grandma Sparky” Bridges. She wanted to hear how he was using the ribbons, and asked him along with one of his students to join her in the table reading of her Broadway play she wrote titled “Bing, the Sound That Makes Dreams Come True”. The next year he again ordered 200 ribbons for his suicide prevention presentation, and this time Grandma Sparky invited him along with one of his students to join a class she taught called “Standing Strong Together.” The class was via zoom with people from all over the country. Some of the topics discussed during the six, two hour sessions included learning how to follow your dreams, treating others with kindness, and how the blue ribbon ceremony works. He was so inspired by the class that he decided to bring the blue ribbon ceremony out from his classroom walls and into the community.

His first step was to go to the Moose Lake Chamber of Commerce with his students and present the executive director of the Chamber, the school superintendent, and the mayor of Moose Lake all with ribbons. They told them about what they wanted to do with the project and they were totally on board. He then began a GoFundMe account in an effort to raise enough money to buy 5,000 ribbons to honor the entire city of Moose Lake, and to have one of his colleagues and one of his students take the “Standing Strong Together” class this fall. The GoFundMe was so successful that they raised enough money in a week. It paid for his colleague (Charlie Borak) and a student to take the class, and ordered the 5,000 ribbons.

The planning phase kicked into full swing with his student, Piper and him going to the Moose Lake Chamber meeting and introducing his project, as well as the Moose Lake Community School school board. Both parties were excited about the opportunity and were on board. At this point the local media began contacting him about doing stories. They were interviewed by the “Pine Journal” out of Cloquet, the “Star Gazette” out of Moose Lake, as well as a news

(Brad Hubred.....continued on page 4)

# Teacher Feature-Brad Hubred

*(Brad Hubred.....continued from page 3)*  
story on KBJR tv out of Duluth.

The next phase was to attend the launch ceremony for the “First Blue Ribbon City in the World” in Carlsbad, California on August 18th. Hannah Katz was the leader of the launch, along with the help of Grandma Sparky. This was an amazing experience meeting celebrities, and authors all coming together to help eradicate bullying and prevent suicide. He took many ideas from their launch to bring to Moose Lake.

He launched a school wide K-12 ceremony on October 13th via Zoom at his school. On October 19th at 5:00 they will do a city-wide launch outside by the hockey arena. They have food trucks arranged, and a local radio station (WKLK) to broadcast our event live and do interviews of all involved. He has a letter from Governor Walz supporting the event, Jacob Warkentin, a representative of Congressman Pete Stauber will speak, and there will be a TV news station at the event. Grandma Sparky is also flying in from California to help with the launch. He is going to treat her to small town life, and take her to his family cabin and take her on her first 4 wheeler ride! Brad’s principal, Kraig Konietzko had this to say about Brad, “The Moose Lake Community School is so fortunate to have Brad as one of our fantastic staff members. Brad is currently a fifth and sixth grade science teacher and is simply spectacular in all facets of being a general education classroom teacher. He simply exemplifies the positive attributes that I look for in describing a superior teacher: professionalism, leadership, trustworthiness, communicator, and the ability to make strong connections with staff and students.

Brad’s instruction and work ethic within the classroom is a characteristic of his high energy and level of commitment. He is a school leader in many best practices that he incorporates into his daily science teachings. Brad’s students annually perform higher than the state average on the Minnesota Comprehensive Assessments.

Brad is certainly a difference maker for parents and classroom students, but he is also a difference maker for our staff. Some of his most recent accomplishments include helping organize the Technology Mentor program to help staff integrate technology into their 21st century classrooms to enhance student learning. In addition, Brad was absolutely instrumental in leading our science com-

mittee on the purchase of a new science curriculum this school year. He is also responsible for organizing efforts to take fifth grade students to StarBase, a week-long, STEM based program located at the 148th Fighter Wing in Duluth, MN. Brad is also passionate about student self-esteem and suicide prevention. He presents each of his sixth grade students a handwritten one page letter highlighting all the positives he sees in them. Brad is solely responsible for making Moose Lake the second “Blue Ribbon” city in the world designed to eradicate bullying and bring awareness to suicide prevention.

Brad and other district science teachers participate in weekly PLC meetings designed to collaboratively develop instructional practices, analyze student achievement and data, enhance professional development, share and expand resources, as well as improve overall education, networking, and communications.

I would encourage you to meet him, visit with him, and learn a bit about him. Brad is a “down to earth” person who has some real neat life experiences. His temperament will put you at ease, his passion will get you excited about public education, and his personality will sell you on his genuine honesty and the quality of this individual. Brad is certainly one of Minnesota’s finest public school educators! Please feel free to contact [kraig.konietzko@isd97.org](mailto:kraig.konietzko@isd97.org) if you have any questions about Brad Hubred.”

You may contact Brad at [brad.hubred@isd97.org](mailto:brad.hubred@isd97.org)



*Brad Hubred receives the torch from the leader of the first blue ribbon city in the world Hannah Katz in Carlsbad, California on August 18th, 2021 while Helice “Grandma Sparky” Bridges watches on.*



*Brad demonstrating the properties of dry ice and bubbles at his summer science camp*

# Invasive Species

## Invasive Species and Your Classroom

Classroom exposure to animals and plants, living and preserved, provides students with valuable knowledge and connection with the natural world. For some students, science courses may be their only opportunities to interact with certain organisms. Unfortunately, release of classroom organisms is also one of the known pathways for invasive species introductions. As you know, crayfish are commonly used in classroom lessons and historically, there was a national curricula that involved releasing classroom crayfish into the environment. The invasive species program at the Minnesota Department of Natural Resources (DNR) is working to improve its communication to schools regarding invasive species. You can play an important role in protecting Minnesota waters. The following describes important information about invasive species regulations that you should be aware of.

- There are some invasive species that are illegal to possess, import, purchase, sell, propagate, transport or introduce to a free-living state in Minnesota without a permit. This applies whether these “prohibited invasive species” are alive or dead. Please periodically check the DNR’s invasive species laws page for a complete species list. There are two prohibited invasive crayfish and one proposed prohibited invasive crayfish, pictured below. Because crayfish identification is very difficult and all three species are available in the biological supply and aquarium trades, we recommend asking the seller for the scientific name of the crayfish prior to purchasing them. You may use preserved specimens of red swamp crayfish by following the conditions outlined in the general permit on this webpage. Additional species to avoid include state and federal noxious weeds and federally-listed injurious wildlife.

- Live crayfish or crayfish eggs of any species are illegal to import into Minnesota without a permit. There is currently no legal mechanism for permitting importation of live crayfish for classroom use. As an alternative, live crayfish can be purchased from a licensed aquaculture facility in Minnesota. If you would like information on the aquaculture businesses raising native crayfish, the list of licensed private aquaculture hatcheries is available for a small fee through the Department of Administration. You can call or email them to request the list (651-201-3206, [jacki.bellefeuille@state.mn.us](mailto:jacki.bellefeuille@state.mn.us)).

- It is generally illegal to release non-native organisms into the environment. Please visit our responsible consumers webpage for information,

including alternatives to releasing animals and plants into the environment when they can no longer be cared for or are no longer wanted.



Red swamp crayfish (*Procambarus clarkii*). Prohibited. Photo: Minnesota Aquatic Invasive Species Research Center



Yabby crayfish (*Cherax destructor*). Prohibited.



Marbled crayfish (*P. virginalis* or *P. fallax* forma *virginalis*). Proposed prohibited.

Your participation is a vital component of successful invasive species prevention in Minnesota. If you have any questions, concerns or suggestions about Minnesota’s invasive species regulations, please contact the DNR’s invasive species program (Chelsey Blanke, [chelsey.blanke@state.mn.us](mailto:chelsey.blanke@state.mn.us), 651-259-5350).



## MDE Science Specialist Transition

John Olson is retiring and the MN Dept. of Education (MDE) is in the process of hiring a new science specialist. During the transition, emails with MDE science questions should be directed to [mde.academic-standards@state.mn.us](mailto:mde.academic-standards@state.mn.us). John will continue

with science education teaching, professional development, and some projects.

## News

### Rulemaking for the science standards nearly done

The Dual Notice of Adoption was published on Monday, May 17, 2021. The department did not receive the required number of hearing requests so the virtual hearing scheduled for July 23, 2021, was canceled. The proposed rule has been submitted to the Office of Administrative Hearings for final review by the administrative law judge, probably with the next month. The rulemaking developments are posted on the Science Rulemaking page. [https://education.mn.gov/MDE/about/rule/rule/K12Sci/Transition to the new science standards](https://education.mn.gov/MDE/about/rule/rule/K12Sci/Transition%20to%20the%20new%20science%20standards)

With the delay of the date for full implementation of the new standards by 2024-25, districts and teachers will need to decide if they want to delay the transition timeline they may have developed. One factor they may be considering is that the MCA exam will not transition to the new standards until spring 2025. However the new standards and the shifts in pedagogy associated with them are likely to result in improved science learning and it may be wise to give students those opportunities as soon as is feasible. Plus the improved learning may help them perform better on the current MCA. Districts have several factors to consider in their transition plans, including staffing, curriculum materials, and time for planning. Read John Olson's MnSTA article about the standards delay and planning for the transition. [https://www.mnsta.org/MN\\_Science\\_Standards.html#16](https://www.mnsta.org/MN_Science_Standards.html#16)

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

As you clean out your classrooms this fall or purchase new instructional materials, consider donating the used books to Books for Africa. Based in St. Paul, this non-profit organization is the largest donator of books to African schools and libraries with over 50 millions books donated to date. You may drop them off at their St. Paul warehouse or ship them to their Atlanta warehouse. Also consider a fund-raiser to cover the costs for shipping to Africa. Information at the Books for Africa website. <https://www.books-forafrica.org/donate/donate-books.html>

## Teacher Events and Workshops

### MnSTA Conference on Science Education, Oct 28-Nov. 1, Online

*A Clear Vision* for Science Education: All Students, All Standards, All Voices is the theme for the fall MnCOSE conference. This virtual event allows you to once again participate from the comfort of your home without travel or substitute costs. In addition, just like last year, your registration gets you access to all presentations for the rest of the school year. Plus, stay tuned for information about local events taking place with the conference!

The 2021 MnCOSE strands include some traditional content-focused strands as well as some strands focusing on the teaching and learning pedagogy within science content and across grade bands. In addition to their placement in relevant strands, each MnCOSE21 session will also be tagged with the relevant science content and most appropriate grade range. MnCOSE21 Strands are

- Life Sciences
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- Earth & Space Sciences
- Leveraging Technology: Lessons Learned from Distance Learning
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- Science Communities: Learning, Growing, and Connecting with Others
- Exhibitor Sessions: Presentations by Exhibitors on Products and Services

Save the date and plan to share your great ideas. More Information. <https://www.mnsta.org/cgi/page.cgi/article.html?aid=1866&zine=show>

## New Climate Literacy Certificate

With the new Climate Literacy Certificate from the Hamline School of Education and Leadership, students will learn the communication, education, and organizing skills to drive solutions to climate change. The certificate, which can be completed in one year, is open to anyone with a bachelor's degree. Students can complete the certificate entirely online, or in a hybrid online/on-campus format if they choose. More Information. <https://www.hamline.edu/HUNewsDetail.aspx?id=4295051091>

## Project WET online training: Climate, Water and Resilience

Project WET's hands-on, science-based Climate, Water & Resilience curriculum helps educators feel confident addressing climate change in the classroom and beyond. Aligned with Common Core and NGSS standards, this program guides teachers and students through nine engaging activities that empower them to combat climate change and build a more resilient future. The curriculum covers a wide variety of phenomena encompassed by climate change, including weather vs. climate, the greenhouse effect, sea-level rise, ocean acidification, soil moisture and agriculture, freeze-thaw cycles, aquatic invasive species, shared water resources, and waterborne disease. The virtual training provides one year access to the self-paced training and the digital educator guide. More Information. <https://project-wet-store.myshopify.com/products/climate-water-resilience-virtual-training-pack>

## Teacher and School Awards and Opportunities

### Climate Generation receives NSCE Friend of the Planet Award

The National Center for Science Education (NCSE) has awarded Climate Generation a 2021 Friend of the Planet award in recognition of the organization's tireless efforts to help individuals and communities engage in solutions to climate change. The Friend of the Planet awards are presented annually to a select few whose efforts to support NCSE and advance its goal of defending and supporting the teaching of climate science have been truly outstanding.

Based in Minneapolis, Climate Generation: A Will Steger Legacy, provides support for climate change education and advocacy through curriculum materials, educator training, public education, and youth empowerment. More Information about Climate Generation programs. <https://www.climategen.org/>

## MN Teachers selected for NCSE Curriculum Study

Janelle Milliken, Cheryl Moertal and Laura Unterholzner have teamed up at Century High School in Rochester for the past 20 years. Now they are taking on the challenge to develop a new 9th-grade environmental science course. They chose to participate in the NCSE curriculum study to deepen their understanding of how to address misconceptions on the topic as well as to make connections with like-minded educators. Information about the program.

<https://ncse.ngo/ncse-launches-curriculum-study-investigate-efficacy-lessons>

## Be recognized for going green: Green Ribbon Awards

The Green Ribbon Schools Award from the U.S. Department of Education honors schools, districts and higher education institutions that save energy and reduce operating costs, create environmentally friendly learning spaces, promote student health, and incorporate environmental sustainability into the curriculum. Awardees receive a plaque for the school, local recognition, and an invitation to the national award ceremony in Washington, D.C.

Schools compete an application that documents their accomplishments and submits it to the MN Dept. of Education by early January. Most Minnesota schools that submit a quality application receive the national award. More Information and application materials. <https://education.mn.gov/MDE/dse/stds/sci/grn/>

## More Support for going green: GreenStep Schools

Picture this: One step at a time... , teams of schools, districts, students, parents, and a supporting community of volunteers, non-profits, businesses, and local and state government agencies all working together to help schools and their community take actions and build their capacity to meet the challenges and opportunities of the future: preparing children for a changing economy, protecting our environment and community health, and harvesting the benefits of a clean energy future—all with guidance, assistance, and recognition from MN GreenStep Schools.

Minnesota GreenStep Schools program a free and voluntary statewide best practices framework, community of practice, and recognition program for public and private K-12 schools and districts to reduce environmental impact and costs, improve health and well-being of students and staff, and provide effective environmental and sustainability education. More Info <https://sites.google.com/umn.edu/mngreenstepschools/home>

## Presidential Awards have a new timeline

Nominations are now open for the Presidential Award for Excellence in Mathematics and Science Teaching. This year the award is available to Secondary teachers. This includes teachers of engineering and computer science. This is a great opportunity to reflect on your teaching strengths, document your accomplishments, and grow your leadership. The recognition includes ceremonies in Washington DC and \$10,000. There is support in completing the application from past awardees. The application period begins September 1 and ends February 6. More Information <https://www.paemst.org>.

## Other Awards

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

- National Board Certification for Teachers <https://www.nbpts.org/national-board-certification/>
- National Science Teachers Assn. Awards <https://www.nsta.org/awards-and-recognition-program#:~:text=The%2520annual%2520NSTA%2520Awards%2520and,the%25202019%25E2%2580%259320%2520award%2520cycle>.

## School Programs and Resources

### Science Instruction Safety Documents updated and online

The Council of State Science Supervisors (CSSS) in conjunction with the safety professionals at Flinn Scientific, updated the former CSSS safety documents into digital formats and modernized these three individual resources (2021) for use by educators across the USA.

There is an Elementary Science Safety Document; a High School Science Safety Document; and an Elementary/Middle School STEM & Tool Safety Document for free download. These are recommended for posting on your district's science intranet site for ready access by all your teachers of science and support staff. Information and downloads. [https://www.flinnsci.com/cosss/?fbclid=IwAR2kHu\\_nrCQzGuwW6qHAnnZtp80rbOzJAzkxvPRpTYHU0ia7qUqDBOfLO\\_U](https://www.flinnsci.com/cosss/?fbclid=IwAR2kHu_nrCQzGuwW6qHAnnZtp80rbOzJAzkxvPRpTYHU0ia7qUqDBOfLO_U)

### Summer Olympics and Science

Check out the resources explaining the science behind the Olympics, which have been posted on the MnSTA website. <https://www.mnsta.org/cgi/page.cgi/article.html?aid=1913&zine=show>

## Nova Labs presents Evolution Lab

Explore the evidence for evolution while playing the Evolution Lab game. There are 6 interactive "missions" in the game. By completing the missions and interactive worksheet, students gain a better understanding of evolution. Information. <https://lptv.pbslearningmedia.org/resource/nvev-sci-mission1/nova-evolution-lab-interactive-lesson-mission-1/>  
**Innovate to Mitigate- National Competition to address global Warming**

Innovate to Mitigate challenges 8th–12th grade students to submit ideas that will mitigate climate change by reducing greenhouse gases.

- Invite your students to study and submit innovative mitigation strategies
- Engage students in problem-based learning that has meaningful real-world impact
- Foster collaboration on communication strategies, social impacts, energy conservation, technical innovations, or carbon sequestration
- Give students the chance to earn public recognition and prizes!

Information: <https://www.terc.edu/innovatetomitigate/>

### Future City Competition: Design a Waste-free City

DiscoverE's Future City starts with a question—how can we make the world a better place? To answer it, 6th, 7th, and 8th grade students imagine, research, design, and build cities of the future that showcase their solution to a citywide sustainability issue. Past topics include stormwater management, urban agriculture, public spaces, and green energy. The 2021-2022 theme is Designing a Waste-Free City.

Cost is \$25 per school or program. Student teams work with their educator and STEM mentor to create the competition deliverables. Looking for a mentor to help your students in this competition? Contact MnDOT STEM Outreach <https://mail.google.com/mail/u/0/?fs=1&tf=cm&source=mailto&to=STEMOutreach.DOT@state.mn.us>! Information on the Future City Competition. [https://futurecity.org/?utm\\_content=&utm\\_medium=email&utm\\_name=&utm\\_source=govdelivery&utm\\_term=](https://futurecity.org/?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=)

## Minnesota Forests: Ojibwe and Dakota PLT lessons

Use Minnesota forests as your "window to the world" to integrate indigenous Ojibwe and Dakota content into your K-8 curriculum. Your students will love the hands-on learning and connections to the real world!

MN Project Learning Tree has developed seven lessons [https://www.dnr.state.mn.us/plt/plt-objibwe-dakota-lessons.html?utm\\_content=&utm\\_medium=email&utm\\_name=&utm\\_source=govdelivery&utm\\_term=](https://www.dnr.state.mn.us/plt/plt-objibwe-dakota-lessons.html?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=) to help meet Minnesota's academic standards in science, social studies, and ELA, while sharing relevant, place-based knowledge about the people who have inhabited our state for hundreds of years. The webpage also includes important teacher tools for understanding about Indian lands in Minnesota [https://www.dnr.state.mn.us/plt/plt-objibwe-dakota-lessons.html?utm\\_content=&utm\\_medium=email&utm\\_name=&utm\\_source=govdelivery&utm\\_term=#text-2-1](https://www.dnr.state.mn.us/plt/plt-objibwe-dakota-lessons.html?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=#text-2-1) treaties, vocabulary and pronunciation guides [https://www.dnr.state.mn.us/plt/plt-objibwe-dakota-lessons.html?utm\\_content=&utm\\_medium=email&utm\\_name=&utm\\_source=govdelivery&utm\\_term=#text-2-2](https://www.dnr.state.mn.us/plt/plt-objibwe-dakota-lessons.html?utm_content=&utm_medium=email&utm_name=&utm_source=govdelivery&utm_term=#text-2-2) and more.

### STARBASE STEM Kits: Surviving Mars, on-line and in-person resources

Fifth grade students become Mars explorers as they engage in hands-on STEM lessons to plan and prepare of a mission to Mars. Students experience all area of STEM as the determine the purpose of the mission, design a Mars Base, practice coding, program a robot, design a Mars lander, investigate the vacuum of Space, conduct experiments with a virtual rocket and more! Students will make observations, ask questions, conduct experiments, collect and analyze data, make predictions, and create and analyze designs. Connections to STEM careers are embedded throughout the activities. Free kits are available for each student. Program preview <http://www.starbasemn.org> password: starbase. For information [starbase@starbasemn.org](mailto:starbase@starbasemn.org)

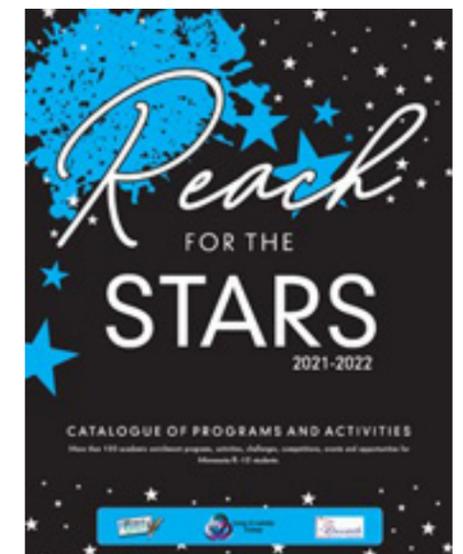
STARBASE Minnesota is offering its free Destination Mars STEM unit and kits to 5th grade students and teachers throughout Minnesota. Destination Mars is a truly special, hands-on STEM curriculum developed the STARBASE team of licensed teachers and tested and loved by hundreds of teachers and

thousands of students in the past year. The more than twenty lessons are aligned to Minnesota standards and are engaging, high quality, and ready-to-use with supplies for each student to explore, investigate, design, and create. The teacher guide and STARBASE website resources provide the tools teachers need to help students solve problems, think critically and creatively, and explore connections to real-world STEM careers. To preview the kits and curriculum, or to register your school, please go to <https://www.starbasemn.org/stemkits/>. Destination Mars STEM kits are available on a first come, first served basis and available in late October. Register now to reserve kits for your students!



### Reach for the Stars

Looking to ignite your students passion for learning? Explore the 2021–22 Reach for the Stars catalogue—your guide to more than 120 high-quality academic enrichment programs, competitions, events and activities to supplement classroom teaching and broaden student performance. Download a FREE color PDF or text-only version at <https://www.synergyexchange.org/reach-for-the-stars> Here is a direct link to the psotcard: <https://bit.ly/3pqVkJXq>



# Department of Education

## Free resources for teaching how science works

Decoding Science [https://www.nap.edu/resource/25303/interactive/index.html?utm\\_source=NASEM+News+and+Publications&utm\\_campaign=d18874372b-Eblast\\_Decoding\\_Science\\_Ed\\_2021\\_05\\_27&utm\\_medium=email&utm\\_term=0\\_96101de015-d18874372b-102201965&goal=0\\_96101de015-d18874372b-102201965&mc\\_cid=d18874372b&mc\\_eid=1e54d40e2e](https://www.nap.edu/resource/25303/interactive/index.html?utm_source=NASEM+News+and+Publications&utm_campaign=d18874372b-Eblast_Decoding_Science_Ed_2021_05_27&utm_medium=email&utm_term=0_96101de015-d18874372b-102201965&goal=0_96101de015-d18874372b-102201965&mc_cid=d18874372b&mc_eid=1e54d40e2e) is a free interactive resource from the National Academies of Sciences, Engineering and medicine. It's all vetted by experts and ready to use in your classroom.

A 90-second video on how science works  
Clear answers to challenging questions  
Stories from real-life scientists  
And more...

## PLT "Explore Your Environment" K-8 Activity Guide Released

Project Learning Tree (PLT) released a new curriculum guide to engage kindergarten through grade 8 students in exploring their environment. Fifty field-tested, hands-on activities integrate investigations of nature with science, math, English language arts, and social studies.

Educators can obtain a copy of PLT's Explore Your Environment: K-8 Activity Guide <https://www.plt.org/curriculum/k-8-activity-guide-explore-your-environment/> directly from PLT's Shop <https://shop.plt.org/Shop/ProductDetails/k8guide>, from Amazon and other places where books are sold, or by attending a local PLT professional development workshop <https://www.plt.org/trainings/attend-a-training/> conducted by PLT's 50-state network of 75 coordinators and 1,000 facilitators across the country. Minnesota PLT site <https://www.dnr.state.mn.us/plt/index.html>

## Student Programs, Awards and Competitions

### Science and Engineering Competitions

- 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 MN 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-retired [johnolson98@gmail.com](mailto:johnolson98@gmail.com).

Jim Wood, Science Assessment Specialist [jim.wood@state.mn.us](mailto:jim.wood@state.mn.us)

Judi Iverson, Science Assessment Specialist [judi.iverson@state.mn.us](mailto:judi.iverson@state.mn.us)

Sarah Carter, STEM and Computer Science Specialist [sarah.carter@state.mn.us](mailto:sarah.carter@state.mn.us)

Send submissions for the Science Update to John Olson [john.c.olson@state.mn.us](mailto:john.c.olson@state.mn.us)

Send submissions for the Science Update to John Olson [john.c.olson@state.mn.us](mailto:john.c.olson@state.mn.us)

Send submissions for the Science Update to John Olson [john.c.olson@state.mn.us](mailto:john.c.olson@state.mn.us)

### Other Minnesota Links:

Minn. Dept. of Education Science Page <http://education.state.mn.us/MDE/dse/stds/sci/>

Minn. Science Teachers Association [mnsta.org](http://mnsta.org)

Frameworks for MN Science and Mathematics Standards <http://scimathmn.org/stemtc/>

Get – STEM Connections between schools and businesses <https://getstem-mn.com>

Mn-STEM STEM programs and resources for families, schools and community <http://mn-stem.com/stem/>

Sharing Environmental Education Knowledge environmental education resources <https://www.seek.state.mn.us>

Minnesota Academy of Science: Science Fair, Science Bowl and other competitions <https://www.mnmas.org/>

Mn DNR Education website: Curriculum, professional development, posters, etc. <http://www.dnr.state.mn.us/education/index.html>

Youth Eco Solutions (YES!) – Statewide, youth-led program for hands-on eco related projects <https://yesmn.org/>

<https://yesmn.org/>

MnSTA, Inc. is an IRS 501 (c) (3) Charitable Educational Corporation, incorporated as a tax exempt, non-profit organization with the Minnesota Secretary of State. Donations and dues are tax deductible charitable contributions for itemized deductions on IRS form 1040 Schedule A. The newsletter is an exempt program service provided to the membership. A membership form is found on the last page

# MnCOSE-Keynote Speakers



## Okhee Lee

Professor in the Steinhardt School of Culture, Education, and Human Development  
Steinhardt School, New York University

Okhee Lee is a professor in the Steinhardt School of Culture, Education, and Human Development at New York University. She was a member of the NGSS writing team and served as leader for the NGSS Diversity and Equity Team. She was also a member of the Steering Committee for the Understanding Language Initiative at Stanford University. Her research involves integrating science, language, and computational thinking with a focus on English learners. Her latest work focuses on justice-centered STEM education to address pressing societal challenges using the case of the COVID-19 pandemic.

Lee's keynote will commence after the welcome session on Thursday, October 28th at 5:30 pm



## Joanne Jones-Rizzi

Vice President of Science, Equity, and Education  
Science Museum of Minnesota

Joanne has a decades-long career working on systemic, ecological change within museums, specializing in expanding meaningful access through exhibitions relevant to audiences who do not yet think of museums as their cultural institutions. She advises museums nationally and internationally on culture, identity, anti-racism, exhibition development, and community engagement.

Jones-Rizzi's keynote is scheduled for Friday, October 29th at 5:00 pm.



## MnCOSE-Strand Speakers



### **Holly Menninger**

Director of Public Engagement and Science Learning Bell Museum, University of Minnesota

An entomologist by training, Dr. Holly Menninger is a science communicator by passion and practice. She has worked at the intersection of science and society – in policy, natural resource management, and science engagement. She is currently the director of public engagement and science learning at the Bell Museum, leading the museum’s interpretive efforts including K-12 education and public programs, exhibits and the planetarium.

Menniger will speak at 7:00 pm on Thursday, October 28th at 7:00 pm. Her talk is titled *C'mon in! The Public Science Big Tent has Opportunities for You!*



### **Chris Woods**

Educator Daily STEM

Chris Woods has been a teacher in Michigan for 20+ years, and recently wrote the book “Daily STEM: How to Create a STEM Culture in Your Classrooms & Communities.” He also shares simple STEM resources on his website [dailystem.com](http://dailystem.com), social media, and as host of “The STEM Everyday Podcast.”

Most of all, Chris loves being a STEM nerd & finding creative ways to inspire every student every day!

Woods will speak on Friday, October 29th. His talk is titled *Simple STEM for Elementary in any Environment*.

### **Dr. Hillary Barron. Equity, Diversity and Inclusion Strand Speaker.**

Dr. Barron will speak on Friday, Oct. 29th at 6:00 pm. Her talk is titled, *Equity, Diversion and Inclusion in Science Education*.

## MnCOSE-Strand Speakers



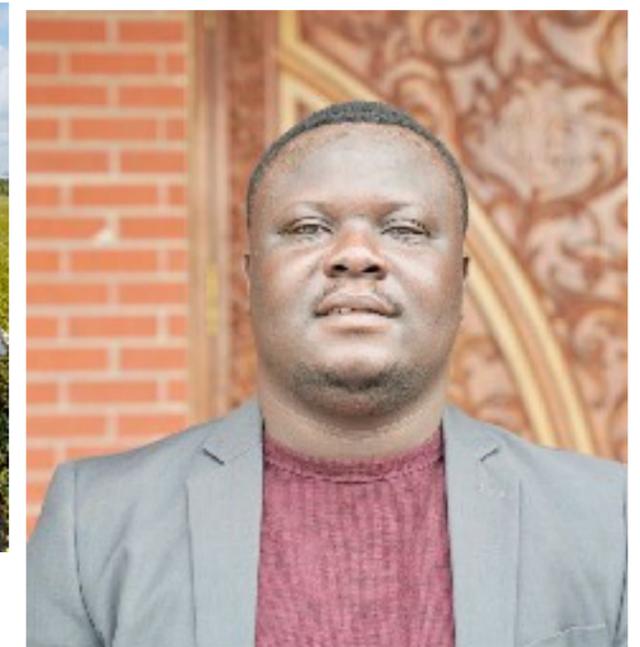
### **Ami Lee Thompson**

Assistant Professor of Biology, Dragonfly Researcher, K-12 Environmental Educator North Carolina Wesleyan College

Ami earned her PhD in Conservation Biology from the University of Minnesota in 2019. Before entering graduate school, Ami work as a naturalist for the Wisconsin and Minnesota Department of Natural Resources, was a National Park Ranger, and started her own environmental education consulting business (which she still runs today). She has been an author on six biology educational curricula, written interpretive text for museums, and flown across to county to facilitate programs where she was a mentor for aspiring young women scientists. Her biological passion is dragonflies; when she is not chasing dragonflies across bogs in helicopters or chain sawing holes in the ice looking for dragonfly nymphs, she sits on the board of the Minnesota Dragonfly Society and the Dragonfly Society of the Americas.

Ami will be speaking on Saturday, October 30th at 9:00 am.

Her talk is titled *Teaching Life Science with Dragonflies*: Join Dr. Ami Thompson to explore the wonderful world of Odonata! Dr. Thompson is scientist with years of experience working with K-12 teachers, writing curriculum and leading professional development workshops. She’ll provide some scientific background on an organism we all know and love, and then dive into a few examples of ways dragonflies can serve as engaging vehicles to teach many different life science concepts and processes.”



### **Dr. Samuel Nyarko**

Post-Doctoral Fellow STEM Education Innovation & Research Institute, IUPUI

Samuel C. Nyarko Postdoctoral Fellow in the STEM Education Innovation and Research Institute at Indiana University & Purdue University, Indianapolis. He carries out research in diversity, equity and inclusion, collaborative learning practices and climate change education. He has taught in high schools and colleges in Ghana and the United States in the past 11 years. He is a member of the National Association of Geoscience Teachers (NAGT) DEI committee and the American Geophysical Union interdisciplinary DEI committee. He is a social constructivist and shares in the philosophy that diversity in knowledge creation is the closest we can go to achieve accurate knowledge.

Dr. Nyarko will speak on Monday, Nov. 1 at 5:00 pm. His speech is titled, *Creating Inclusive Practices in the Earth Sciences: The Role of Teacher Communities*.

## MnCOSE-Special Speaker on New Science Standards



**Peter McLaren**

Executive Director Next Gen Education LLC

Peter McLaren is the Executive Director of Next Gen Education, LLC. Mr. McLaren works as a consultant and professional development provider to schools and districts in support of the implementation of the Next Generation Science Standards and other three-dimensional state science standards based on the Framework for K-12 Science Education (NRC, 2012). Mr. McLaren served as a member of the national committees including the writing committee for the Next Generation Science Standards (NGSS), the National Academy of Engineering' Guiding Implementation of K-12 Engineering Education committee, and the National Academy of Science Committee for Developing Assessments for the Next Generation Science Standards.

McLaren will speak on Friday, October 29 at 8:00 pm. His talk is titled, *Engaging Students: Using Crosscutting Concepts to Prompt Student Sensemaking of Phenomena*.

The 2019 Minnesota K-12 Academic Standards in Science reflects the importance of every student's engagement with natural scientific phenomenon at the nexus of three dimensions of learning; Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts. Of these three dimensions, it is the dimension of crosscutting concepts which unify the study of science and engineering across all domains of science. Though the dimension of crosscutting concepts is essential to support student learning in science and engineering it is also the dimension that many

educators have had the least experience in using in their practice.

This workshop will provide science educators at all levels with meaningful insights into how to use the dimension of crosscutting concepts to structure prompts that engage students in reasoning how and why phenomena occur. The intent of this session is to help participants create consistent and clear questions and prompts structured around crosscutting concepts that could be used within each phase of an instructional model such as the 5E model (Bybee & Landes, 1990). When crosscutting concepts are used consistently in classroom instruction, they provide a common language between educators and students. By designing questions and prompts using crosscutting concepts, they serve to structure student thinking to be directed to key aspect(s) of the phenomenon being investigated and sets the stage for meaningful formative assessment opportunities.

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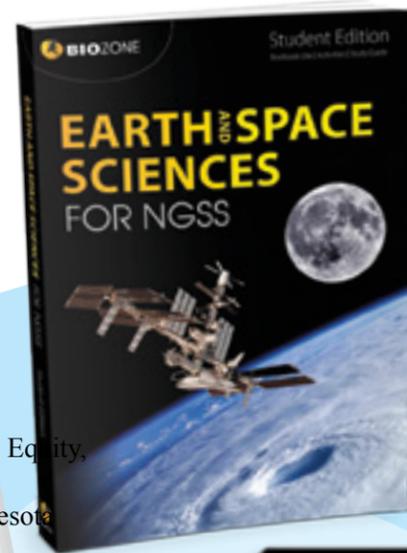


## Explore BIOZONE's extraordinary suite of resources

Joanne Jones-Rizzi

Vice President of Science, Equity, and Education  
Science Museum of Minnesota

Description  
Joanne has a decades-long career working on systemic, ecological change within museums, specializing in expanding meaning-



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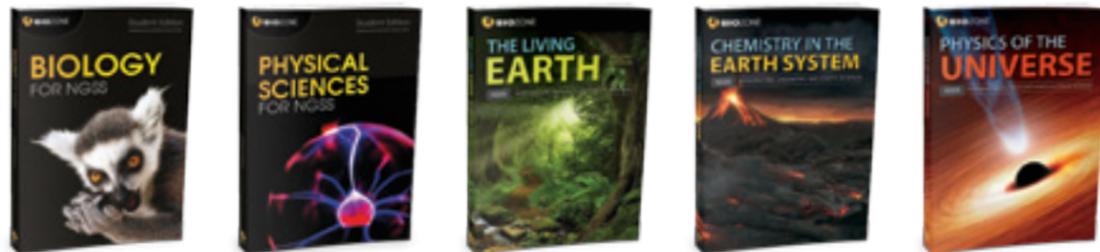
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Visit [bellmuseum.umn.edu/virtual-k12](http://bellmuseum.umn.edu/virtual-k12) to get started.



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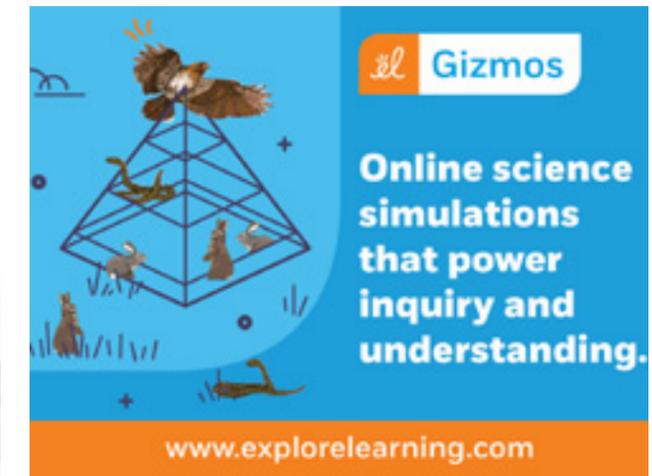
*Inspire Science* is a K-12 Science program designed to ensure students are at the heart of the learning experience. *Inspire Science* brings Science and Engineering practices to life by helping students to think scientifically and build, deepen, and apply core ideas and concepts.

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## MnCOSE Virtual Norms

We are establishing these norms for this entire event to ensure the best and most safe experience for all participants.

### Guidelines when participating in MnCOSE Virtual

1. Be nice!
2. Engage as an active participant.
3. Understand that sessions will be recorded and made available to conference participants.
4. Use your name and affiliation as your participant name (your virtual nametag)!
5. Use chat features only for relevant topics.
6. Be aware of your surroundings while participating in sessions.
7. Understand that initially audio and video will be muted upon entering sessions and use interactive audio and video appropriately.

### The following are not permitted and are grounds to be immediately removed from any session:

1. Disrespectful language or actions that are discriminatory on the basis of race, color, religion (creed), gender, gender expression, age, national origin (ancestry), disability, marital status, sexual orientation, or military status.
2. Promotion of goods or services for sale during a session [apart from exhibitor sessions].

### Use of Session Recordings

Conference participants may not download, distribute, or sell session recordings, or otherwise use in any way other than intended, in part or in whole, without obtaining written permission from MnSTA and the presenter.

### User-Generated Content

Some areas of the conference platform allow you to provide content (in chat areas, forums, associated social media pages, etc.) By posting, uploading, publishing, distributing, or transmitting information such as photos, videos, reviews, messages, content, or other personal information (collectively "User-Generated Content") on the conference platform, blogs, or other communities, you represent and warrant that you are the sole author and owner of such content, and you further represent and warrant that you have permission from anyone included in any photos or videos, or if a child, you have permission from the child's parent or guardian.

Your User-Generated Content must not be defamatory, slanderous, indecent, obscene, pornographic or sexually explicit or be used for commercial gain. MnSTA has the right but not the obligation, in its sole discretion, to remove, reject, refuse to post, modify or edit User Generated Content but does not regularly review User Generated Content. MnSTA takes no responsibility and assumes no liability for any User-Generated Content

### Question and Answer Sessions at MnCOSE

1. You may type questions directly into the "Session Q & A" section on the screen.
2. Strand Leaders will moderate questions with the presenter.
3. Q & A sessions will be recorded as a part of the session recording.

### Virtual Conference How To's

1. Mute/Unmute audio using the microphone button.
2. Mute/Unmute video using the camera button.
3. Participate in chat...click chat window in Whova.
4. Additional interactive features are available and can be described by the strand leader!

*Thank you for making this the best event for all!*

**The Minnesota Science Teachers Association**

fosters excellent science education in Minnesota for all!



## Keep Your MnSTA Profile Up-To-Date

MnSTA does its best to keep you abreast of everything happening in science education in Minnesota. We do this via several outlets including:

- MnSTA Website
- MnSTA Facebook and Twitter pages (@MnSTA1)
- Weekly Digest of postings (sent via email)
- Monthly Science Update from MDE Science Specialist John Olson (sent via email)
- Quarterly Newsletter (availability announced via email)
- Occasional email messages to all members

The best way to make sure you are receiving email notices and all of the above information, please make sure that MnSTA has your correct email address, mailing address, and your permission to send this information to you. Your profile also contains information about your school, disciplines you teach, and the grade levels you work with. These can all be updated at any time.

You can update your MnSTA profile by going to the MnSTA website ([www.mnsta.org](http://www.mnsta.org)) and logging in. Click on the My Profile link. You will then see links to Update Profile, Update Address, Update Photo, and Change Password. If you have any questions about this, please feel free to contact MnSTA.

## MnSTA Board Directory

Below, you will find information about your MnSTA Board Members. The listing includes the board member's school (or organization), mailing address, work phone, FAX number, and e-mail address. The board wishes to make itself as accessible as possible for our members. Please feel free to contact your discipline representative, regional representative, or executive board members if you have ideas, concerns, or wish to help with the mission or operation of MnSTA. We are always looking for members who wish to serve MnSTA as Board Members, Non-Board Service Chairs or Members, and as Committee Chairs or Members.

### Executive Board:

Exec. Secretary	Karen Bengtson	St. Cloud Area School Dist. 472 1000 44th Ave N. St. Cloud MN 56303
	320-253-9333	karen.bengtson@isd742.org
President	Angela Osuji	Washburn High School 201 W 49th St. Minneapolis, Mn 55419
	612-668-3400	Angela.Osuji@gmail.com
President-elect	Jill Jenson	Scott Highlands Middle School 14011 Pilot Knob Rd. Apple Valley, MN 55124
	952-423-7581	jill.jensen@district196.org
Treasurer	Joe Reymann	Retired e: joereymann@comcast.net
Incoming Treasure	John Olson	Metropolitan State Univ. 700 E. 7th St. St. Paul, MN 55107
		johnolson98@gmail.com.

### Discipline Directors:

Biology	Michelle Housenga	Minneapolis Washburn HS 201 West 49th St. Minneapolis, MN 55419
	612-720-5705	Michelle.housenga@mpls.k12.mn.us
Earth Science	Dana Smith	Bemidji Middle School 1910 Middle School Ave. NW Bemidji, MN 56601
	218-333-3215	dana_smith@isd31.net
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	507-376-6121	jose.morales777@gmail.com
Elementary/Greater MN	Kanday Noles Stevens	Southwest Minn State Univ. 1501 State St. Marshall, MN 56258
		kandy.nolesstevens@smsu.edu
Elementary/Metro	Lee Filipek	Southview Elementary 1025 Whitney Dr. Apple Valley, MN 55124
	952-431-8370	Lee.Filipek@District196.org
Higher Ed	Diana Fenton	College of St. Benedict/St. Johns U 37 College Ave. S. St. Joseph, MN 56374
	320-363-5968	dfenton@csbsju.edu
Informal Ed	Caitlin Potter	Cedar Creek Ecosystem Science Reserve 2660 Fawn Lake Dr. NE E. Bethel 55005
		caitlin@umn.edu
Alternative Ed.	VAcant	
Physics	Phillip Sexton	Minnetonka High School 18301 Hwy 7 Minnetonka, MN 55345
	612-401-5700	phillip.sexton@minnetonkaschools.org
Private Schools	Steve Heilig	St. Paul Academy & Summit School 1712 Randolph Ave. St. Paul 55105
	651-696-1432	sheilig@spa.edu

### Region Representatives:

Region 1&2: North	Jennifer Aakre	TrekNorth Jr.&St.High School 2400 Pine Ridge Ave. NW Bemidji, MN 56601
	218-444-1888	jaakre@treknorth.org
Region 1&2: North	Caitlin Djonne	Park Rapics Schools 501 Helten Ave. Park Rapids, MN 56470
	218-237-6312	cdjonne@parkrapids.k12.mn.us
Region 3: Northeast	Nikki Ojanen	Cloquet Middle School 2001 Washington Ave. Cloquet, MN 55720
	218-879-3328	nojanen@isd94.org
Region 4: Westcentral	Harrison Aakre	Alexandria Area High School 4300 Pioneer Rd. Alexandria, MN 56308
	haakre@alexschools.org	
Region 5: Northcentral	Miranda Graceffa	Crosslake Community School 36972 Cty Rd 66 Crosslake, MN 56442
	218-330-6154	mgraceffa@crosslakekids.org

