# 2020 MISF STEM Education Conference—Virtual Breakout Sessions

August 4, 5, and 6

A list of materials to have available for each session will be made available in advance to all attendees. Recommended grades are listed in the left column.

## Opening Session

**Welcome and MISF STEM Program Sponsor Highlight**  
*Tim Benz, Minnesota Independent School Forum (MISF) President*

**Keynote: Global Perception of Science and the Need for Advocacy**  
*Dr. Jayshree Seth, 3M Corporate Scientist and Chief Science Advocate*

The keynote address will provide an overview of the 3M State of Science Index, a global survey of more than 14,000 people in 14 countries to uncover what people think of science and how they perceive its impact on their daily lives. Many of the survey findings highlight the importance of reducing real and perceived barriers to science appreciation and STEM education—in order to ensure that we have a healthy pipeline of future scientists and engineers to solve tomorrow’s challenges. Jayshree will share her personal journey as she explores ways we can advocate for science and promote STEM awareness, equity, and access for all.

## Tuesday, August 4

**8:00–9:00 am**

### Unplugged Computer Science Activities You Can Implement Tomorrow
*Rachel Fees, STEM Supplies*

Computer science is one of the fastest growing STEM fields, and there are now expectations for students to learn computer programming and other 21st century skills even as young as Kindergarten! Luckily, computer science can be taught without ever touching a computer. This workshop will explore the fundamentals of computer science, all while being unplugged. The session will take you through a number of screen-free activities using items you already have in your home or classroom. You will learn about encryption and decryption, binary, and conditional coding all while using basic supplies.

**3:00–4:30 pm**

### Exploring enviroSTEM with Blaine Wetland Sanctuary
*Heidi Ferris, Growing Green Hearts & Rebecca Haug, City of Blaine*

Join us to experience the 5Es—engage, explore, explain, elaborate, and evaluate—all using scientific research and curriculum from the new Blaine Wetland Sanctuary. We’ll act out seasons, build different nests, create art to connect natural systems, investigate insulators, identify plants, and more. We will explore enviroSTEM pedagogy, the 5E model applied to nature play, and prepare educators for enviroSTEM lessons and hikes, as well as free field trips to the Blaine Wetland Sanctuary. The Sanctuary is an open space park that includes a special wetland called a fen, some of the rarest plants in Minnesota, and a unique mile-long boardwalk.

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**K-8**

### SciGirls Strategies for Educating Girls in STEM
*Demetrius Trundle & Leah Defenbaugh, SciGirls/Twin Cities Public Television*

SciGirls aims to change how girls see the world and how the world sees girls. In this interactive session, educators will learn strategies for engaging girls and underrepresented youth in STEM. Educators will leave the session with FREE strategies, tips, and activities to implement immediately.

**3-8**

### Impactful Prototyping 101
*Angela Anderson & Amanda Kopischke, Incubate to Innovate*

Expand your view of prototyping beyond product development. Be equipped with tools and resources to create impactful prototyping experiences for your students, for all ages and all disciplines. Receive a free, lifetime membership to the ChangeMakers for Impact online network, in addition to our ChangeMaker Field Guide Tool Kit.

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**K-12**

### Getting Ready for the New Minnesota Science Standards: Science & Engineering Practices
*Beth Murphy, MISF & Renee Nesnidal, Science from Scientists*

Minnesota’s new science standards challenge educators to think differently about how they teach and what students should learn, focusing not only on what scientists and engineers know, but also how they think and what they do. In this workshop, we will dig in to the eight Science & Engineering Practices (SEPs)—the common behaviors all scientists and engineers engage in as they investigate the world and design solutions to problems. You’ll develop a deeper understanding of SEPs, explore how MN’s new science standards emphasize the SEPs and relate to the NGSS, and consider implications of the SEPs for science teaching and learning in your classes, at your school, and throughout K-12.

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*Dr. Jayshree Seth, 3M Corporate Scientist and Chief Science Advocate*

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<tr>
<th>Time</th>
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<th>Speaker(s)</th>
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<tbody>
<tr>
<td>6-12</td>
<td>Green STEM Careers as Solutions to Climate Change</td>
<td>Megan Van Loh &amp; Lindsey Kirkland, Climate Generation: A Will Steger Legacy</td>
<td>Green STEM Careers are those that use any combination of science, technology, engineering, and math to help reduce greenhouse gas emissions and support a sustainable economy. Dive into how STEM skills and Green careers can address climate change through activities and the short documentary, <em>Green Careers for a Changing Climate!</em></td>
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<td>9:30–11:00 am, Wednesday, August 5</td>
<td>STEM You Can Use Tomorrow</td>
<td>Mark Nechanicky, Albert Lea Area Schools</td>
<td>In this session, attendees will explore a variety of STEM resources and lesson ideas, with practical tips for using them with students. Examples of topics that will be covered include: math number talks, video calls with scientists and authors, virtual field trips, Twitter-based professional learning networks, and mixed-grade computational thinking activities—as well as how to use technology to partner classrooms for math, science, makerspace activities, and after-school coding clubs. Attendees will receive copies of resources and activities that they can implement tomorrow.</td>
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<td>9-12</td>
<td>The Power of Transportable Skills: Assessing the Demand and Value of the Skills of the Future</td>
<td>Vic Dreier and Mary Arrasmith, Project Lead The Way</td>
<td>Essentials Skills, 21C Skills, STEM Skills... this group of skills go by different names and titles. Transportable skills are the most requested skills in the entire job market, with the top four skills requested by employers all being transportable skills. Further, transportable skills protect workers from automation. The share of jobs requesting these skills within STEM-related occupations is considerably higher (68%) than in non-STEM careers (49%). New research shows these skills are already in high demand for students to be successful when they enter the job market and are even becoming key for high school students seeking their first job or internship. Are you focusing on transportable skills with your students? Come learn how these skills can be integrated into your high school STEM classes and how students can communicate their experiences and skill attainment to employers, colleges, and internship partners.</td>
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<td>1:00–2:30 pm, Wednesday, August 5</td>
<td>Online Resources for Minnesota’s Math and Science Standards</td>
<td>Jim Davnie, SciMathMN</td>
<td>In this session participants will explore the online Minnesota STEM Teachers Center. The Center provides teachers and administrators with resources on each Minnesota academic standard in math and science, concepts for implementing them in your classroom, links to resources, and support for implementing the standards with special student populations including English Language Learners and students receiving special education services.</td>
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<td>3-8</td>
<td>Explore Engineering through Experiential Learning Activities and Challenges</td>
<td>Melissa Huppert, Minnesota State Engineering Center of Excellence</td>
<td>The Minnesota State Engineering Center of Excellence is excited to share its newly developed Explore Engineering Kits and Curriculum for 3rd-5th and 6th-8th grade! This FREE curriculum is designed to inspire interest in engineering-related careers among students, increase educators’ self-efficacy to teach basic engineering principles, and support educators in teaching STEM principles through hands-on lesson plans, tools and resources. Framed by the Experiential Learning Model, this curriculum is appropriate for in-classroom and out-of-school programs. The curriculum also focuses on Life Skill Development (e.g. teamwork, effective communication, critical thinking, problem-solving and creative thinking), Entrepreneurial Mindset, and Literacy. This is an excellent resource for all STEM educators!</td>
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<td>TrailblazersLIVE</td>
<td>Amanda Svedarsky, Prime Therapeutics</td>
<td>TrailblazersLIVE was created by Minnesota STEM leaders concerned about the gender gap in STEM careers. First starting with in-person events, the initiative is now creating a virtual platform for girls to learn about the journeys of young women who have chosen to pursue careers in STEM. Join this session to learn about girls and women in STEM and TrailblazersLIVE’s plans and resources, as well as participate in a discovery conversation about supporting girls as they navigate their personal STEM journeys.</td>
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<td>9:30–11:00 am, Thursday, August 6</td>
<td>Mistakes, Failure and Confusion: Essentials in Creating a Culture of Learning</td>
<td>Paul Bernabei, Top 20 Training</td>
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<td>K-12</td>
<td>If we want students to explore and create, we need to establish a culture of learning in which mistakes, failure, and confusion are celebrated. This session focuses on (1) the negative beliefs students often have when they make mistakes, fail, or experience confusion; (2) how these beliefs keep them stuck in their comfort zone; and (3) how we can help students move into their curious zone by more effectively responding to and celebrating student mistakes, failure, and confusion.</td>
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<td>1:00–2:30 pm, Thursday, August 6</td>
<td>Integrating Computer Science into other Content Areas</td>
<td>Sarah Carter, Minnesota Department of Education</td>
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<td>K-5</td>
<td>All students, even at the youngest levels, need opportunities to engage in computational thinking and computer science. But, the school day is already full—so what can we do? In this session we will explore activities that integrate computer science with other content areas. Attendees will also be encouraged to share their experiences with integration, including best practices and tools.</td>
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<td>1-3</td>
<td>An Easy and Fun way to Spark interest in STEM: Introducing FIRST LEGO League Explore</td>
<td>Jeannie Badger, Cheryl Moeller &amp; Vicki Coaty, High Tech Kids</td>
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<td>High Tech Kids will provide an interactive demonstration illustrating how to easily implement FIRST LEGO League Explore to engage students in STEM at an early age. Designed for grades 1-3, FIRST LEGO League Explore teams work together to discover how science and technology impact the world around them. Guided by adult coaches, each team works with LEGO elements to build a motorized model and create a Show Me poster related to their research of a yearly theme. This session is intended for teachers who are interested in starting or continuing a FIRST LEGO League Explore program at their schools.</td>
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<td>No More Random Acts of STEM: The Power of the STEM Plan and the Team Behind It</td>
<td>Vic Dreier &amp; Paul Schiele, Project Lead The Way</td>
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<td>STEM can provide exciting learning experience for teachers, students, and families. But, STEM is more than the isolated subjects that make up the acronym. So much work is being done to bring STEM learning to students, but how do we ensure that these experiences connect to one another? How do these experiences support individual student learning in meaningful ways? Come learn how planning and collaboration can bring integration and connection across your STEM electives, Coding Labs, STEM labs, Fab Labs, and Maker Spaces, and with core subjects. We will share guides and platforms that bring together teams for organization and collaboration.</td>
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<td>STEM+Ag Career Pathway Curriculum and Activities</td>
<td>Melissa Huppert, Minnesota State Engineering Center of Excellence &amp; Judy Barka, Minnesota State Agricultural Center of Excellence</td>
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<td>The Minnesota State Engineering and Agricultural Centers of Excellence are excited to share their newly released and FREE curriculum STEM+Ag Career Pathways for 6th-8th and 9th-12th grade. Utilizing the Experiential Learning Model, the STEM+Ag Career Pathways Curriculum focuses on exploring student interest in STEM within the context of careers in agricultural industries. This curriculum is appropriate for in and out of the classroom and is a great fit for science teachers, CTE teachers, and youth-serving organizations.</td>
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