

**27th  
Annual**

## **SD STEM Ed Conference**

**South Dakota Council of Teachers of Mathematics  
South Dakota Science Teachers' Association**

**February 7, 8, & 9, 2019  
Crossroads Hotel-Huron Event Center  
Huron, SD**

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Graduate Credit is available through DWU-Mitchell.

Next year's conference will be **February 6, 7, & 8, 2020.**

# Featured Speakers



**BANQUET SPEAKER — - Dr. Kristopher J. Childs** is a National Content Specialist with Houghton Mifflin Harcourt. He has vast experience at the K-12 and post-secondary levels in teaching and leadership positions. His experiences have afforded him the opportunity to gain hands-on practical experiences in a variety of educational settings working with diverse student populations. Dr. Childs has been recognized by faculty, staff, and students as a visionary and collaborative leader.

He will fire us up in our Opening Session Friday morning in Prairie A & B and is our Banquet Speaker Friday evening. He is also doing two sessions Saturday morning at 8:00 in Dakota F and 10:00 in Dakota E.

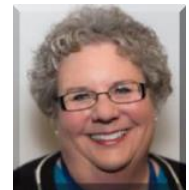
## OTHER FEATURED SPEAKERS

**Sara Van Der Werf** is a nationally board-certified teacher who taught secondary mathematics for Minneapolis Public Schools for more than 25 years. Additionally, Sara led the professional development, curriculum writing and strategic planning for K-12 mathematics. Sara frequently speaks at the state and national levels, including keynoting conferences and leading professional development on a variety of topics. Sara is active in the national mathematics community via twitter, @saravdwerf, and her blog, saravanderwerf.com. Sara's sessions are in Dakota E on Friday at 8:30 & 3:30 and then Saturday at 8:00.



**Sara Byre's** focus at South Dakota Manufacturing & Technology Solutions is marketing. She is responsible for maintaining the company's social media platforms, promoting events, and building client relationships. In this role, she is also responsible for managing the "What's So Cool about Manufacturing?" student video contest. Sara's Friday sessions start at 8:30 in Dakota B, 1:10 in Dakota E & 2:10 in Dakota B; Saturday in Dakota B at 9:00 & 1:40.

**Kim Soper** is a professional development specialist with the University of Nebraska Medical Center. She hosts teacher trainings, develops high quality, culturally relevant science and math content for students and teachers, and leads and develops science camps, workshops, and science festivals across Nebraska and South Dakota. Kim's sessions start in Dakota A on Friday at 11:20, 2:10 & 3:30; Saturday at 10 & 12:40.



**Mollie Gabrielson** is the Instruction and Fidelity Manager at the US Math Recovery Council®. Throughout her 18 years in education, she has assumed a variety of educational positions. She holds a M.S. in Curriculum and Instruction from BHSU and holds a Reading Specialist Endorsement from the USF. Ms. Gabrielson is passionate about empowering teachers to understand how children make sense of mathematics and how to move each child forward in their mathematical understanding. Working with Mollie is 21-year veteran educator

**Mike Busch.** In his current role as an Outreach and Training Manager, Mike actively works with districts to arrange for and implement professional development opportunities that empower teachers to improve mathematics teaching and learning for all students. Their Friday sessions are in Dakota F starting at 8:30, 10:30, 1:10, & 3:30; and on Saturday, their session is in Dakota E starting at 1:40



# 2019 SD STEM Ed Conference

South Dakota Council of Teachers of Mathematics  
South Dakota Science Teachers' Association

The meeting rooms for all sessions are in  
**The Crossroads Hotel/Huron Events Center**

## Program

### Thursday, February 7, 2019

7:00 PM - 9:00 PM Evening Sessions (See Program)

### Friday, February 8, 2019

7:00 AM - 4:20 PM Registration Open Pre-Function Area

8:00 AM - 5:00 PM Exhibits Open Pre-Function Area

8:00 AM - 8:30 AM Opening Session & Keynote Prairie A & B

8:30 AM - 11:20 AM Morning Sessions (See Program)

11:20 AM - 11:50 AM Networking, Exhibitor & Poster Session Exhibitor Hallway

11:50 AM - 12:50 PM Friday Luncheon Prairie A, B, C  
*(cost included in the registration fee)*

12:50 PM - 1:10 PM Networking, Exhibitors & Poster Session Exhibitor Hallway

1:10 PM - 4:20 PM Afternoon Sessions (See Program)

4:30 PM SDCTM Business Meeting Dakota C  
SDSTA Business Meeting Dakota G

5:30 PM - 6:30 PM Social Hour Pre-Function Area  
Sponsored by SD STEM Ed & Vendors

6:30 PM Friday Evening Banquet Prairie A, B, C  
(Cost is \$25)

### Saturday, February 9, 2019

7:00 AM - 11:20 AM Registration Open Pre-Function Area

7:00 AM - 8:00 AM Breakfast Meeting Salon

Presidential Awardees (Past & Present)

8:00 AM - 11:30 AM Morning Sessions (See Program)

11:30 AM - 12:30 PM Saturday Luncheon Prairie A, B, C  
*(cost included in the registration fee)*

12:40 PM - 4:15 PM Afternoon Sessions (See Program)

4:30 PM Joint SDCTM & SDSTA Boardroom  
Executive Board Meeting

**SD STEM Ed Conference 2019 Planner**

| <b>Thursday, Feb. 7, 2019</b>   |  |   |
|---|--|---|
|   | First Choice   | Second Choice                                       |
| 7:00 PM   | Math Pot Luck Prairie B  | Science Showcase Prairie C                          |
| <b>Friday, Feb. 8, 2019</b>   |  |   |
| Remember to visit the exhibits in the Lobby and Hallways of the Crossroads Hotel. |  |   |
|   | First Choice   | Second Choice                                       |
| 8:00 AM   | Session #: KEYNOTE Reimagining the STEM Experience<br>Location: Prairie A, B<br>Title: Dr. Kristopher J. Childs, Houghton Mifflin Harcourt K-12 Math & Science | Are You Teaching Content That Matters?              |
| 8:30 AM   | Session #:<br>Location:<br>Title:  | Session #:<br>Location:<br>Title:                   |
| 9:30 AM   | Session #:<br>Location:<br>Title:  | Session #:<br>Location:<br>Title:                   |
| 10:30 AM  | Session #:<br>Location:<br>Title:  | Session #:<br>Location:<br>Title:                   |
| 11:50-12:50   | <b>Friday Noon Luncheon in Crossroads Hotel – Prairie A, B, C</b>  |   |
| 12:50-1:10  | <b>Exhibitor Networking: Exhibitor and Poster Session</b>  |   |
| 1:10 PM   | Session #:<br>Location:<br>Title:  | Session #:<br>Location:<br>Title:                   |
| 2:10 PM   | Session #:<br>Location:<br>Title:  | Session #:<br>Location:<br>Title:                   |
| 3:00 PM   | <b>Exhibitor Networking: Exhibitor and Poster Session</b>  |   |
| 3:30 PM   | Session #:<br>Location:<br>Title:  | Session #:<br>Location:<br>Title:                   |
| 4:30 PM   | SDCTM BUSINESS MEETING in Dakota E<br>SDSTA BUSINESS MEETING in Dakota A   |   |
| 5:30  | Social hour Sponsored by ? ? ? ?   |   |
| 7 PM  | Friday Night Banquet in Prairie Ballrooms A, B, C<br>(Banquet Tickets Required-Cost is \$25)   | Can STEM Be Used to Make this World a Better Place? |

| <b>Saturday, Feb. 9, 2019</b> |   |  |
|-------------------------------|---|--|
|                               | First Choice  | Second Choice                          |
| 8:00 AM                       | Session #:<br>Location:<br>Title:                                   | Session #:<br>Location:<br>Title:      |
| 9:00 AM                       | Session #:<br>Location:<br>Title:                                   | Session #:<br>Location:<br>Title:      |
| 10:00 AM                      | Session #:<br>Location:<br>Title:                                   | Session #:<br>Location:<br>Title:      |
| 10:50 AM                      | <b>Exhibitor Networking: Exhibitor and Poster Session</b>           |  |
| 11:30-12:30                   | <b>Saturday Noon Luncheon in Crossroads Hotel – Prairie A, B, C</b> |  |
| 12:40 PM                      | Session #:<br>Location:<br>Title:                                   | Session #:<br>Location:<br>Title:      |
| 1:40 PM                       | Session #:<br>Location:<br>Title:                                   | Session #:<br>Location:<br>Title:      |
| 2:40 PM                       | Session #:<br>Location:<br>Title:                                   | Session #:<br>Location:<br>Title:      |
| 3:30-4:15                     | Wrap-up and Reflect – Science in Dakota A                           | Wrap-up and Reflect – Math in Dakota G |
| 4:30 PM                       | SDCTM & SDSTA JOINT BOARD MEETING IN THE BOARDROOM                  |  |

Next Year's Conference will be February 6, 7, & 8, 2020

## Conference Kick Off Thursday, 7:00 – 9:00

### T102 Math Pot Luck SDCTM

*Prairie B  
Math*

Network with other math teachers! Share your favorite activities and lessons! Swap teaching ideas! Sharing math teaching ideas will be the focus of this session. Bring 25 copies of your favorite activity to share. Leave with ideas from other great teachers. **Pizza will be provided for those who attend!**

### T103 Science Showcase SDSTA

*Prairie C  
Science*

In celebration of the 50th year of the Periodic Table, bring an activity to share with colleagues that relates to elements, chemistry, or the Periodic Table. (Feel free to get creative describing this link - everything can connect to this ordered version of the elements). Share your lesson with a link on social media, send to [officers@sdsta.org](mailto:officers@sdsta.org) to post to the page, or bring copies to share. **Pizza will be provided for those who attend!!**



## Opening Session & Keynote Friday, 8:00-8:30 AM

### Reimagining the STEM Experience:

#### Are You Teaching Content That Matters?

*Prairie A, B*

Featured Speaker Dr. Kristopher J. Childs,  
Houghton Mifflin Harcourt *K-12 Math & Science*

It is time to innovatively change student's STEM experience. Participants will develop an understanding of rich real-world problem-solving task selection and implementation. The focus will be on providing students with a meaningful STEM experience, building upon the skills and experiences they bring into the classroom.



## Breakout Session 1 Friday, 8:30-9:20 AM

### F103 Open Education Resources (OER)

Dr. Judy Vondruska, South Dakota State University

*Prairie C  
STEM*

This session will provide general background information on open-educational resources including what constitutes OER, sites to locate resources, and an overview of research on the usage of OER. The presenter will also relate her experience in implementing OER materials in her astronomy classroom at SD State.

### F104 What is Technology? What is Engineering?

Marie Steckelberg, EdD, Steckelberg Consulting  
SteckelbergConsulting.com  
marie@steckelbergconsulting.com

*Dakota A  
Elementary Science*

Engineering and technological literacy are embedded in the SD Science Standards. We will examine familiar objects to develop a better understanding of the term “technology”. Then, you will experience the engineering design process as you take on an engineering challenge.



*Steckelberg Consulting, LLC*

- STEM, STEAM, GLOBE
- Engineering is Elementary®
- ARTsome Astronomy
- SD Science Standards Training

Marie Steckelberg, EdD • Consultant  
Marie@SteckelbergConsulting.com  
SteckelbergConsulting.com

### F105 FEATURED SESSION:

#### The Best Manufacturing Resources for Your Classroom

Sara Byre, South Dakota Manufacturing and Technology  
sdmanufacturing.com

*Dakota B  
K-12 STEM*

Look no further for advanced manufacturing curriculum and fun learning activities for your classroom! This presentation will cover the top websites educators can use for gathering free STEM lesson plans, videos, and manufacturing games to supplement learning. Learn about off-site activities including how to set up manufacturing tours and what STEM camps and events are available in SD.South Dakota.



### F106 Desmos Card Sorts and Polygraph:

#### Awesome Digital Tools for Any Classroom

Mark Kreie, Brookings High School  
markkreie.blogspot.com  
mark.kreie@k12.sd.us

*Dakota C  
K-12 Math & Science*

Come learn how Card Sorts and Polygraph activities from Desmos can help facilitate learning and generate great discussions in your classroom. Participants will learn how to access existing Card Sorts and Polygraph activities as well as how to create their own. Expect to leave the session with something to use in your classroom the following week. All Desmos tools are free. Intended for grades 5-12; bring an iPad or laptop.



## Friday, 8:30-9:20 AM

### **F107 Adventures in Chemistry (the Self-Paced Kind)**

Sabrina Henriksen, Rapid City Area Schools - RCHS  
sabrina.henriksen@k12.sd.us

*Dakota D*  
*9th-12th Science*

I went on an adventure this year and designed my chemistry class to be self-paced. I want to share my stories with you. Come join a discussion about how this is going and find out what I'm celebrating and what I'm changing.

### **F108 FEATURED SESSION:**

#### **Engaging Students in Seeing Mathematical Structure**

Sara VanDerWerf, VanDerWerf Educational Consulting  
saravanderwerf.com  
saravdw@gmail.com

*Dakota E*  
*6th-12th Math*

Students who identify mathematical structure find and use efficient strategies to solve problems. How can we help students see the structure of mathematical concepts before we name it for them? Practical strategies that engage students in noticing structure will be modeled with specific details for implementation in the secondary classroom.

### **F109 FEATURED SESSION:**

#### **Student Understanding: What Do We Really Know?**

Mike Busch, US Math Recovery Council  
Mollie Gabrielson,  
michael@mathrecovery.org

*Dakota F*  
*Elementary Math*

This session will explore video from assessment interviews with students to gain insight on the current understandings and strategies of several individual students. Session participants will watch video of students working to solve a variety of math problems. We will use our observations and knowledge to create current profiles of student understanding.

### **F110 The Balancing Act of Effective Scaffolding**

Stephanie Higdon, SD Department of Education  
stephanie.higdon@state.sd.us

*Dakota G*  
*K-12 Math*

Giving students the right amount of support during math can be a challenge at all levels, kindergarten through high school. What is the most effective way to create a culture in your class where students feel supported and are truly engaged in their learning? Come have rich discussions and engage in active learning strategies with colleagues around best practices to support students, without “telling” students how to think.

**As a member, you may attend and vote at the Friday 5:30  
Business Meeting. Science=Dak A Math=Dak E**

## Breakout Session 2

### Friday, 9:30-10:20 AM

#### **F201 Meet the Future Teachers**

Larry Browning, South Dakota State University  
Larry.Browning@sdstate.edu

*Prairie A*  
*Math & Science*

Prospective science and math teachers from all South Dakota institutions are invited to engage with practicing science and math teachers attending the conference. The goal is to provide support and encouragement for future teachers by having experienced teachers share advice, success stories, and useful strategies.

#### **F202 A National Park Summer**

Hannah Caffee, Harrisburg School District  
hannah.caffee@k12.sd.us

*Prairie B*  
*K-12 STEM*

In love with National Parks? Spend a summer as a Teacher Ranger Teacher. In this session you will hear about one TRT's experience, and start planning your own.

#### **F203 Desmos Snapshots: A New Tool to Help Facilitate Classroom Conversations**

Mark Kreie, Brookings High School  
Brody Gilbertson, SDSU Teacher Candidate  
markkreie.blogspot.com  
mark.kreie@k12.sd.us

*Prairie C*  
*6th-12th Math*

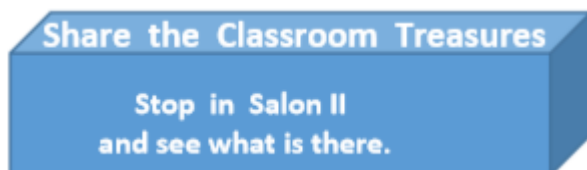
Snapshots is a new feature added to the Desmos Teacher Dashboard. Designed with the “5 Practices for Orchestrating Productive Mathematics Discussions” in mind, Snapshots provide a way for teachers to select, sequence, and connect ideas. In this session, participants will learn how to access the Snapshots tools and receive best practice tips about how to use them. All Desmos tools are free. Intended for grades 5-12; bring an iPad or laptop.

#### **F206 Trees Around the GLOBE**

Cassie Soeffing, Institute for Global Environmental Strategies  
globe.gov/web/trees-around-the-globe/overview  
cassie\_soeffing@strategies.org

*Dakota C*  
*K-12 Science*

Tree height is not just a measurement - it is a gateway to understanding many things about the environment. The structure of tree canopies has a huge effect on how ecosystems function and cycle through carbon, water, and nutrients. Used in conjunction with the GLOBE Observer App, Landcover tool, students as citizen scientists will be part of a project to create more detailed satellite-based global maps of land cover by sharing photos of their world.





**F207 Claim-Evidence-Reasoning:  
Use Inquiry to Develop Scientific  
Explanations about Phenomena**

*Dakota D  
Science*

Amber Gunner, STEMScopes  
agunner@acceleratelearning.com

Claim-Evidence-Reasoning (CER) is a way for students to explain observed phenomenon in a scientific way. This structured approach allows students to use observations and data from an investigation. Students use critical reasoning to connect the claim and evidence together. CER is an acclaimed and highly successful instructional strategy that is changing how students understand concepts and write explanations for phenomena.

**F208 Mastery Learning**

*Dakota E  
9th-12th Math*

Diedra Nissen, Kiki Nelsen, Roosevelt High School, Sioux Falls School District

How to implement a mastery learning assessment model in your classroom to increase understanding and keep students engaged year long.

**F209 Making Math Fun with Gamification**

Kevin Smith & Brandi Antonsen, *Dakota F*  
Dakota State University *K-8 Math*  
Jenna Grossenburg, Aberdeen OMT Elementary School  
kevindsmith.org/chasing-einstein  
kevin.smith@dsu.edu

Do you want your students to be excited about math and reinforce the math practice standards at the same time? We'll share info on how to do that. Chasing Einstein is a collaborative project between preservice teachers at DSU and students in 5th-7th grade classrooms. We'll tell the story and give you ideas for your own classroom.



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Lynne Jones · Action Arts and Science Program  
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ljones@washingtonpavilion.org · 605-367-7397 ext. 2374



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Valerie Shearer  
Account Manager  
[vshearer@acceleratelearning.com](mailto:vshearer@acceleratelearning.com)



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about STEM Exploration Events, group campus  
visits or STEM presentations at your school.

**SOUTHEAST TECH**

## Friday, 9:30-11:20 AM (2 hour sessions)

### F204 FEATURED SESSION:

#### **Notebook Foldables**

Kim Soper, UNMC

*Dakota A*  
*6th-8th Science*

Turn notebooks into 3-dimensional, individual, and brain-smart tools, while using classroom-tested strategies for success coupled with Dinah Zike's Foldables to challenge and intrigue diverse students. Go home with a mini-composition book constructed on-site. We will use an Earth Science theme.

### F205 TIES Resources - Teacher Institute for Evolutionary Science

Alison Bowers, Hanson School District

Bertha Vazquez, TIES - Teacher Institute for Evolutionary Science  
tieseducation.org

*Dakota B*  
*6th-12th Science*

This double-session helps teachers teach evolution with confidence. The first hour will cover materials and we provide a full unit, including exam, for you to take home. The second hour covers hands-on activities and labs to engage students in evolutionary science. Let's make evolution fun and relevant!!

### F210 Empowering Students to Make Mathematical Connections


Julie Jackson, Cathy Quinlivan, CPM

cpm.org  
juliejackson@cpm.org

*Dakota G*  
*6th-8th Math*

Participate in activities that make connections between a pattern, table, graph and rule. Help students move through the representations, while developing a deep understanding of multiple ways to solve problems and to communicate that understanding verbally and visually. Teachers will receive ideas and materials that they can use in their own classrooms.

**Visit with Conference  
Exhibitors to be qualified to  
win valuable prizes at the noon  
meals**




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Visit [CPM.ORG/cpminfo](http://CPM.ORG/cpminfo) or scan the QR code to get more information and view our conference sessions.



**MORE MATH FOR MORE PEOPLE**

## Breakout Session 3

### Friday, 10:30-11:20 AM

#### **F301 Dialogue Not Monologue - Effective Student Discourse**

*Prairie A*

Deb Wolf, Julie Dahl, Sanford Underground Research Facility - BHSU  
sanfordlab.org  
debra.wolf@bhsu.edu

*K-12 Math & Science*

Purposeful focus on increasing student talk is an effective and efficient way to ensure that student learning is visible. Research verifies that typically, teachers speak 70-80% of the time. This session focuses on “easy to use and implement” K12 strategies to increase the amount and quality of student discourse.

#### **F302 PowerUp Airplanes**

*Prairie B*

Julie Olson, Mitchell Senior High/Second Chance High School  
julie.olson@k12.sd.us

*6th-12th STEM*

Construct and fly a powered paper airplane. Learn lesson applications.

#### **F303 Robotics Team? No problem! Start a BEST Robotics Team**

*Prairie C*

Gail Jacobsma & Kelly Keller, Arlington High School  
Gail.Jacobsma@k12.sd.us

*6th-12th Math & Science*

Think your school and students would love to have robotics team but believed that you didn't know enough to start one? Have no fear! The Arlington BEST Robotics Team and their advisors Gail Jacobsma and Kelly Keller will convince you that, “Yes, YOU CAN!” The group will demonstrate & share their work and robotics in the Exhibitor Hall.

#### **F306 Tracking Mosquito Using GLOBE Observer Mosquito Habitat Mapper Tool**

*Dakota C*

Cassie Soeffing, Institute for Global Environmental Strategies  
globe.gov/web/mission-mosquito/overview  
cassie\_soeffing@strategies.org

*K-12 Science*

GLOBE Mission Mosquito's student research campaign connects students of all ages to monitor changes in the frequency, range and distribution of potential disease vector mosquitoes by reporting observations using the GLOBE Observer Mosquito Habitat Mapper mobile app (FREE download at <https://observer.globe.gov/about/get-the-app>). These data can be easily uploaded from the GLOBE database and analyzed to explore a variety of research questions examining connections between land, water, air and life in the Earth system.

### **Banquet Tickets?**

**There is a limited number of extra banquet tickets still available. Check with Sheila at the Registration Desk.**

## Friday, 10:30-11:20 AM

### **F307 Using Stellarium to Teach Astronomy Concepts**

Dr. Judy Vondruska, SDSU  
Larry Browning & Judy Vondruska, SDSU

*Dakota D*  
*9th-12th & College Science*

Stellarium is free, open-source planetarium software for your computer. It can be used to learn the constellations, understand the motions of planets/stars/moon, find deep-sky objects, travel through time and space and much more. Please download on your computer prior to the session from <http://stellarium.org/>.

### **F308 Multiplying Binomials (Scaffolding Technique for Review)**

Darrin Merrival, Pine Ridge School  
darrin.merrival@bie.edu

*Dakota E*  
*9th-12th Math*

Multiplying polynomials using the area model. I have the students engaged by telling them they have to complete one step of the problem on the board at the end. *Repeated as session 508*

### **F309 FEATURED SESSION:**

#### **Differentiation Without Going Crazy - Using Progressive Mathematization to Design and Adjust Instruction for the Elementary Mathematics Classroom**

Mollie Gabrielson & Lucinda (Petey) Maccarty, US Math Recovery Council  
mollie@mathrecovery.org

*Dakota F*  
*Elementary Math*

Classroom teachers are asked to differentiate; however, many are not given any resources or guidance in how to accomplish this task. The dimensions of progressive mathematization include the techniques of Extending the Range of Numbers, Distancing the Setting, Complexifying, and Notating, which can help teachers routinely differentiate for all students. Participants will learn what each technique requires and explore the application of these to differentiate tasks and lessons.

## Friday, 11:20-11:50 AM

### **Networking, Exhibitor, and Poster Session**

*Exhibitor Hallway*

Conference attendees have the opportunity to network and visit with Exhibitors and enter door prize drawings. Exhibitors have color coded tickets for drawings. These tickets will be given out in the exhibition hallway at the discretion of the exhibitors. Keep one half and place the other in the drawing buckets at the registration table. The more booths you visit, the better your chances to win a prize! Drawings for this session will be held during Friday lunch and you must be present to win!

**Thank You:**



**NASCO® and**



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**For donating gift certificates for the conference.**



**Lunch: *Prairie A, B, & C***  
**Friday, 11:50 AM-12:50 PM**

Come for a meal, awards, recognitions, and raffle with swag from vendors and other amazing organizations! Hosted by Presidents of SDSTA and SDCTM. Awards to be presented include Outstanding Biology Teacher, Outstanding Mathematics Teacher, Outstanding Physical Science Teacher, Daniel Swets Robotics Materials Award and Kelly Lane Earth & Space Science Grant.



**Friday, 12:50-1:10 PM**

**Networking, Exhibitors, and Poster Session**

*Exhibitor Hallway*

Conference attendees have the opportunity to network and visit with Exhibitors and enter door prize drawings. Exhibitors have color coded tickets for drawings. These tickets will be given out in the exhibition hallway at the discretion of the exhibitors. Keep one half and place the other in the drawing buckets at the registration table. The more booths you visit, the better your chances to win a prize! Drawing winners from this session will be placed on the TV screen in the exhibit area - prizes must be claimed Friday!

**Breakout Session 4**  
**Friday, 1:10-2:00 PM**

**F401 Wireless Data Sensors**

Larry Browning, Physics, South Dakota State University  
Matt Miller, Chemistry/Biochemistry, South Dakota State University  
Larry.Browning@sdstate.edu

*Prairie A*  
*9th-12th Science*

Wireless data sensors from Pocket Lab and Vernier can provide easy and accurate data for labs. Participants will have an opportunity to use this equipment and see how it can be used in classrooms. Teachers with this equipment are invited to come and share their activities.

**F402 Twenty-First Century STEM Skills Through Studying Mars**

Gail Jacobsma, Arlington Junior High  
Gail.Jacobsma@k12.sd.us

*Prairie B & C*  
*K-12 Math & Science*

Arlington 7th grade students have been learning 21st century skills and expanding their STEM horizons through the study of Mars. They would like to showcase their Giant Mars Map and VEX IQ robots from Buzz Aldrin's ShareSpace Foundation. They will be sharing their Mars base models, Mars rovers, experiments with hydroponics and engineering notebooks. Please come listen to their presentations and ask them questions!

## Friday, 1:10-2:00 PM

### **F404 Science Speed Dating**

SDSTA-SDCTM Officers, SDSTA-SDCTM  
www.sdsta.org; www.sdctm.org  
officers@sdsta.org

*Dakota A*  
*K-12 Science*

Join us for our Professional Development Speed Dating Session! We've got 50 minutes to get you as much info as possible. There will be at least six different topics (TEAMS Competition, English Tips & Tricks, STEMYSTUFF, Evolution Activities, Egg-cellent Osmosis, SD Breeding Bird Atlas); for those you are interested in, stop by their table; at the switch, you can visit another table or take your new idea and head off to another session. Come and go as you please. Sit where you like and get the information that pertains to you! Check Registration Desk for hand-out of specific information.

### **F405 Badlands Erosion and Deposition**

Ed Welsh, Brad Barker, Julianna Ellis, Badlands National Park  
nps.gov/badl/index.htm  
edward\_welsh@nps.gov

*Dakota B*  
*K-8 Science*

Join us for a brief classroom activity that helps illustrate the circumstances that shaped the badlands and the geologic history of South Dakota, along with discussion on other earth and life science oriented learning opportunities with Badlands National Park.

### **F406 SD HOSA: What is it and how to get it at your school!**

Brock Rops, SD HOSA with  
Lisa Fuccello, Brandon Valley High School and Lisa Cardillo, Harrisburg High School  
sdhosa.org  
lisa.fuccello@k12.sd.us

*Dakota C*  
*6th-12th STEM*

During this informational session, we will be covering statistics/data regarding health care professionals and student interests in South Dakota. We'll discuss what HOSA is and explain the competitive events that it offers to students. Finally, we'll discuss how to start a HOSA chapter for those wanting more information.

### **F408 FEATURED SESSION:**

#### **Teaching Mathematical Ideas vs. Tricks**

Sara VanDerWerf, VanDerWerf Educational Consulting  
saravanderwerf.com  
saravdw@gmail.com

*Dakota E*  
*Math*

Why should we be teaching mathematical concepts before practicing skills? Many of us have worked to shift our teaching towards teaching concepts first and have found it difficult to make a shift. Practical ideas of making this shift work for you and your students will be shared to make this transition successful for both teachers and students.



Friday, 1:10-2:00 PM

F409 FEATURED SESSION:

## Building Bridges...Not Walls! Moving Student Towards Flexible Computational Strategies

*Dakota F*

Mollie Gabrielson, Mike Busch, US Math Recovery Council  
mollie@mathrecovery.org

In this session, we will examine a detailed progression of counting types and explore the underlying complexities of children's counting-based strategies. Counting strategies for addition and subtraction are significant advancements for students, but it is critical that students' progress beyond counting-by-ones to other strategies that are based on 'structuring numbers'. Students need to develop much more knowledgeable ways of adding and subtracting numbers. In this session, we will explore how to support students in their development of more efficient ways to develop accuracy, flexibility, and fluency within addition and subtraction 20 and beyond.



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Valerie Shearer  
Account Manager  
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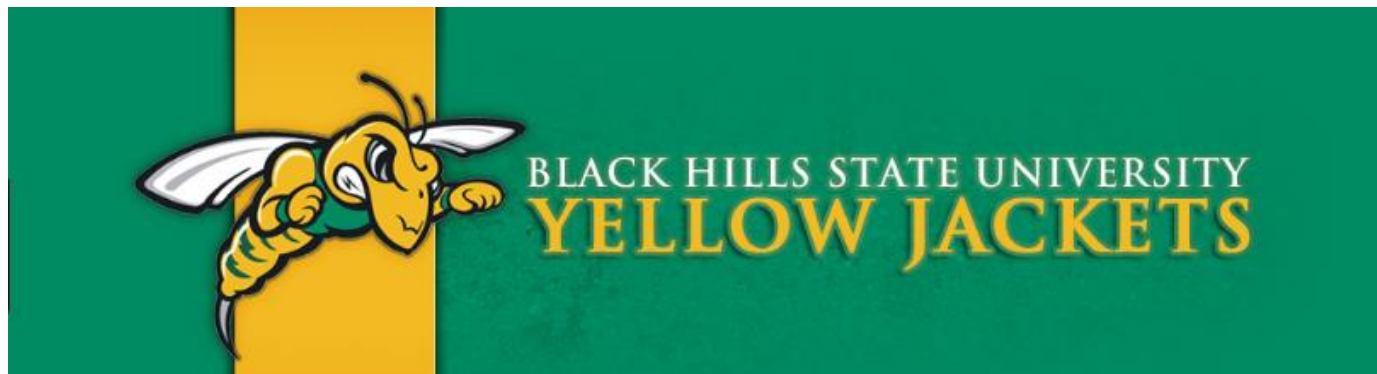
## F410 Visible Algebra

Deann Kertzman, Black Hills State University  
bhsu.edu  
deann.kertzman@bhsu.edu

*Dakota G*

*Middle School Math*

Beginning in first grade, learners solve for unknowns in various addition and subtraction settings. By third grade, learners are using a letter for unknowns in multiplication and division settings. Fourth grade adds multiplicative comparison. Why then are middle school learners often frustrated with the transition from arithmetic to algebraic thinking? This session will explore a progression of visible learning that might assist students in transitioning to algebraic reasoning. Be prepared to construct models, draw representations, and use physical models to solve algebraic situations through the lens of a learner.



## Breakout Session 5

### Friday, 2:10-3:00 PM

#### **F501 Using Crosscutting Concepts to Scaffold Student Thinking**

*Prairie A*

Julie Dahl & Deb Wolf, Sanford Underground Research Facility  
sanfordlab.org/educators  
julie.dahl@bhsu.edu

*K-12 Math & Science*

Crosscutting concepts provide students with an organizational framework for connecting knowledge from various disciplines into a coherent and scientifically based view of the world. This session will focus on strategies that utilize Crosscutting Concepts (CCCs) in the classroom to support and deepen student learning.

#### **F502 Kinesthetic Astronomy**

*Prairie B*

Dr. Judy Vondruska, SD State University

*9th-12th+ Science*

Learn how to teach basic astronomical concepts through choreographed bodily movements and positions that provide educational sensory experiences. This session will focus on modeling the astronomical meaning of the day, year, and seasons as well as the nature and timing of moons phases.

#### **F503 Designing and Implementing DGE Tasks That Engage Students in Productive Struggle**

*Prairie C*

Ashley Jairam, University of South Dakota  
ashley.jairam@usd.edu

*6th-12th Math*

Teachers can engage students in productive struggle by designing and implementing tasks that create uncertainty. This session will explore characteristics of dynamic geometry tasks that create uncertainty and engage students in struggle. This session will also explore what teachers can do to help students resolve those uncertainties, making struggle productive.

#### **F504 FEATURED SESSION:**

##### **Science Words=Winning Words for Success**

*Dakota A*

Kim Soper

*K-12 Science*

Do your students struggle with some basic assessment terms and what they are to do on written assessments? Learn a strategy to connect academic science vocabulary to being successful for the future.

#### **F505 FEATURED SESSION:**

##### **What's So Cool About Manufacturing? A Career Exploration Contest**

*Dakota B*

Sara Byre, South Dakota Manufacturing and Technology

*6th-8th STEM*

The "What's So Cool About Manufacturing?" contest is designed to expose, educate and excite middle school students about careers in manufacturing. Over the course of a semester, students will take a field trip to a local manufacturer to film, edit and market to their peers why they think manufacturing is cool. Schools will compete against other schools from across the state to create the best two-minute clip answering the question: "What's so cool about manufacturing?" The goal is to promote STEM education and increase regional awareness about different careers in the industry in a fun and engaging way. Schools that participate will receive free filming equipment and accessories.

Friday, 2:10-3:00 PM

**F506 "Makey Makey" circuits for grades 3-6**

*Dakota C*

Benjamin Benson, Sanford Research  
sanfordresearch.org/education  
SanfordOutreach@sanfordhealth.org

Visit The Sanford PROMISE team to design and build circuits using a Makey-Makey board. This session will also help you to learn about the circuit building supplies available through the lending library at housed at Sanford Research.

The Sanford PROMISE  
inspiring the next generation of scientists

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sanfordresearch.org/education

**F508 Multiplying Binomials (Scaffolding technique for review)**

*Dakota E*

Darrin Merrival, Pine Ridge School  
darrin.merrival@bie.edu

Multiplying polynomials using the area model. I have the students engaged by telling them they have to complete one step of the problem on the board at the end. . *Repeat of 308*

**F509 Co-Teaching Math: It's Best for our Students!**

*Dakota F*

Beth Kaltsulas & Kacie Johnson, Yankton Middle School

*K-8 Math*

This session will share many math activities and technology that are currently used in a math “co-teach” classroom. A general math educator and a SPED teacher create a fun, innovative, and effective learning environment for their students. Join us and pick up a new idea or two to enhance your math instruction.

Friday, 3:00-3:30 PM

**Networking, Exhibitor, and Poster Session**

*Exhibitor Hallway*

Conference attendees have the opportunity to network and visit with Exhibitors and enter door prize drawings. Exhibitors have color coded tickets for drawings. These tickets will be given out in the exhibition hallway at the discretion of the exhibitors. Keep one half and place the other in the drawing buckets at the registration table. The more booths you visit, the better your chances to win a prize! Drawing winners from this session will be placed on the TV screen in the exhibit area - prizes must be claimed Friday!

## Breakout Session 6 Friday, 3:30-4:20 PM

### **F601 SD AAPT Annual Meeting & Photo Contest**

James Stearns, Aberdeen School District  
Larry Browning & Judy Vondruska, SDSU  
SDAAPT.SDSTA.org

*Prairie A  
9<sup>th</sup>-12<sup>th</sup> & College Science*

This is the annual meeting of the South Dakota Section of the American Association of Physics Teachers (SD AAPT). During the meeting, the group will share experiences, classroom activities, and seek answers to questions and problems. Everyone is welcome to attend & bring their physics & physical science questions. Final voting on Physics Photo Contest.

### **F602 Discussions with Higher Ed**

Dan Van Peurse, SD Board of Regents and BOR Institutions

*Prairie B  
9<sup>th</sup>-12<sup>th</sup> Math*

At this session members of higher ed will be present to discuss new initiatives such as Math Pathways and the future direction of math placement. Also, they will be happy to discuss dual credit courses and other topics of interest.

### **F603 DIVE-in Engineering and the Engineering Design Process**

Amber Gunner, STEMScopes  
agunner@acceleratelearning.com

*Prairie C  
Science*

*DIVE-in Engineering* is taking the Maker Movement by storm. Developed by STEMScopes in partnership with New York Hall of Science, it is driven by natural curiosity and creativity. *DIVE-in Engineering* offers practical and inquiry-based experiences that inspires student ingenuity. Join us as we showcase a new hands-on solution, which could be the motivation for students to pursue careers in engineering fields.

### **F604 FEATURED SESSION:**

#### **Birds Should be on Everyone's STEM**

Kim Soper

*Dakota A  
Elementary STEM*

Come get ideas on how birds can be used as a vehicle to teach most everything! Cultural inclusion and language included.

### **F605 Phenomenal Soil and Water**

Anne Lewis, South Dakota Discovery Center  
Marie Steckelberg, EdD, Steckelberg Consulting  
www.sd-discovery.org      annelewis@sd-discovery.org

*Dakota B  
K-8 Science*

Soil and water offer fascinating, rich opportunities for phenomena anchored learning. Explore how to integrate this phenomena into your science teaching. Hands-on, experiential, and fun!



**South Dakota Discovery Center**  
*Your hands-on science playground*

## Friday, 3:30-4:20 PM

### **F606 South Dakota EPSCoR Mini-Unit Summer Program**

Justin Lovrien & Lisa Fucello, Brandon Valley High School  
justin.lovrien@k12.sd.us

*Dakota C*  
*6th-12th Science*

Introduce teachers to a summer opportunity, the SD EPSCoR Science Three Dimensional Mini-Unit program. We will introduce two sample lessons, one covering ESS standards on plate tectonics and Earth's early history and another on designing a GMO with a hands-on introduction to gel electrophoresis.

### **F608 FEATURED SESSION:**

#### **Minimizing the "Matthew Effect"**

Sara VanDerWerf, VanDerWerf Educational Consulting  
saravanderwerf.com  
saravdw@gmail.com

*Dakota E*  
*Math*

The Matthew Effect is a phenomenon sometimes summarized by the adage that "the rich get richer and the poor get poorer." How do we catch-up students in our classes that are not academically ready to be there? How can we help create classrooms where all students are engaged in doing important mathematics?

### **F609 FEATURED SESSION:**

#### **From Gaps to Growth: Moving Students Towards Multiplicative Automaticity**

Mollie Gabrielson & Lucinda (Petey) Maccarty, US Math Recovery Council  
mollie@mathrecovery.org

*Dakota F*  
*Elementary Math*

Finding a balance between conceptual understanding & automaticity can be challenging! Explore strategy-based approaches that build bridges towards automaticity by prioritizing number relationships to serve as a catalyst for larger values. Intentional tasks & activities will increase the enjoyment of math, as well as mastery of multiplication facts. Together, we will explore trajectories and corresponding strategy-based approaches using a variety of tasks and activities that both increase students enjoyment of mathematics, as well as their fluency with basic facts.

### **F610 Knowledge of Domains: Inconsistent Applications of Definition to Problem-Solving Tasks**

Dr. Margaret Adams, South Georgia State College  
sgsc.edu  
margaret.adams@sgsc.edu

*Dakota G*  
*9th-12th & College Math*

Although functions and domains are among the Grade 8 Common Core Standards, distorted recollections occur in college-level mathematics. Prior function knowledge transfers inconsistently to written problem-solving tasks. Inappropriate schema construction, a theoretical model of understanding, (Richard Skemp, 1987) is proposed to explain misconceptions. Suggestions for instructional practices will be exchanged.



**Business Meetings**  
**Friday, 4:30-5:30 PM**

**SDSTA Business Meeting**  
SDSTA.org

*Dakota A*  
*Science*

All members or interested members of the SD Science Teachers Association are invited to attend this discussion about our organization and the state of Science Education in South Dakota and across the country.

**SDCTM Business Meeting**  
SDCTM.org

*Dakota E*  
*Math*

All members or interested members of the SD Council of Teachers of Mathematics are invited to attend. This is a leadership election year, all members are eligible voters.

**NETWORKING SOCIAL**

**Friday, 5:30-6:30 PM**

Make new friends and renew old friendships! Join your colleagues for pre-banquet refreshments and professional networking.

*Lobby*

**SD STEM Ed AWARDS BANQUET**  
**Friday, 6:30-9:00 PM**

**Can STEM Be Used to Make this World a Better Place?**

Featured Speaker: Dr. Kristopher J. Childs of Houghton Mifflin Harcourt

*Prairie A, B, C*

Each and every student brings a variety of prior STEM experiences and dispositions into the classroom. However, deficit views, gatekeeping assessments, and systematic barriers negatively impact student learning. Empower ALL students to participate meaningfully in making sense of STEM. *(Limited Tickets for Banquet available at the registration table on Friday or during pre-registration).*



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The Learning Company™

**Talk with**  
**Billy Pugliese & Matt Misialek**  
**at the HMH booth**



## PAEMST Breakfast Saturday, 7:00 – 8:00 AM

### Breakfast for SD PAEMST State Level Finalists and Past Awardees

Allen Hogie, SD PAEMST (Math), Allen.Hogie@k12.sd.us  
Jennifer Fowler, SD PAEMST (Science); Jennifer.Fowler@k12.sd.us  
paemst.org

*Prairie A*  
*K-12 Math & Science*



## Saturday Breakout Session 1 Saturday, 8:00-8:50 AM

### **S101 Showcase Your Teaching Practice and Win Money**

Allen Hogie, SD PAEMST (Math)  
Jennifer Fowler, SD PAEMST (Science)  
paemst.org  
Allen.Hogie@k12.sd.us; Jennifer.Fowler@k12.sd.us

*Prairie A*  
*7th-12th Math & Science*

How would you like to receive \$10,000 for showcasing your teaching practice? The Presidential Award is sponsored by the White House and the National Science Foundation. South Dakota is able to give two awards, one in mathematics and one in science. The 2019 cycle recognizes teachers of grades 7-12.

### **S102 Specialty Crops in the Classroom: Educating South Dakota's Youth through Mobile Classroom Growing Systems**

Spencer Cody, Edmunds Central School District  
echs.k12.sd.us/domain/116  
Spencer.Cody@k12.sd.us

*Prairie B*  
*K-12 STEM*

Edmunds Central has developed mobile classroom growing systems geared toward education and consumption of specialty crops not commonly consumed by many students in South Dakota. Currently, more than 50 school districts across South Dakota are participating in the program. Find out how to incorporate specialty crops in your curriculum!

### **S103 Inquiry and Writing (CER: Claim Evidence Reasoning)**

Carrie Cox, Chamberlain High School  
carrie.cox@k12.sd.us

*Prairie C*  
*K-12 Math & Science*

Start incorporating inquiry into your lesson plans. This session will include a basic introduction to inquiry and problem based learning. Also, explore how to get students to include writing in activities using CER paragraphs (Claim Evidence Reasoning). Time will be given to brainstorm an activity/problem for a lesson in your classroom and to create a CER for that topic.

Please fill out your Evaluation  
of the Conference. We want  
next year's to be even better!

Check out the Classroom Treasures  
After 3 PM,  
the Treasures become trash!

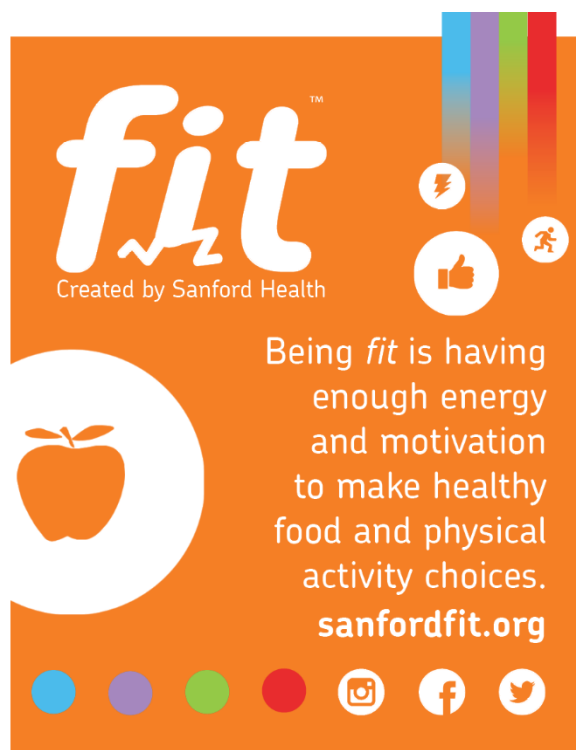
Saturday, 8:00-8:50 AM

**S104 Exploring the Kidney: STEM and Health**

*Dakota A  
K-8 Science*

Shelby Braun, *fit* by Sanford Health  
Liz McMillan, Sanford PROMISE Sanford Research  
sanfordresearch.org/education; sanfordfit.org  
SanfordOutreach@sanfordhealth.org

Explore an engaging STEM lesson that will challenge critical thinking skills and get students out of their chairs. This STEM design challenge is an investigation of the kidney and current scientific inquiry at Sanford Research that meets both science and health education standards.



**S105 Phones for Physics**

*Dakota B  
Science*

Larry Browning, Physics Department, SDSU  
Larry.Browning@sdstate.edu

Using the sensors in your smart devices provides additional ways to engage your students in lessons for light, sound, and motion. Several of the apps -- Phyphox, Physics Toolbox, Sensor Kinetics -- will be demonstrated using classroom ready activities.

**S106 Gamified Mars Learning Lab**

*Dakota C  
K-12 STEM*

Dr. Mark Geary, Dakota State University  
Mark.Geary@dsu.edu

Create a science center STEM experience based on a Mars Landing in your own school computer lab. Grant funding possibilities shared.

**S108 FEATURED SESSION:**

**The "H" Word**

*Dakota E  
Math*

Sara VanDerWerf, VanDerWerf Educational Consulting  
saravanderwerf.com  
saravdw@gmail.com

The number one question I get is "How do you do homework?". I've not answered this fully until this year. If you give homework – or if you don't - here are some best practices to consider.



**South Dakota Discovery Center**  
*Your hands-on science playground*

## Saturday, 8:00-8:50 AM

### S109 FEATURED SESSION:

#### Inspiring Change Through Rich Problem Solving Involving Fraction Operations

*Dakota F*

*Elementary Math*

Dr. Kristopher J. Childs, Houghton Mifflin Harcourt  
kristopherjchilds@gmail.com

In this session participants will explore operations involving fractions. Participants will develop a deep and flexible understanding of fractions. This understanding will allow the exploration of common challenges students and teachers encounter when understanding operations involving fractions. Examples will include real-world applications of fraction operations.

### S110 Catch - Fisheries Sustainability Game

*Dakota G*

*9th-12th Science*

Julie Olson, Mitchell Senior High/Second Chance HS  
julie.olson@k12.sd.us

Play a game of Catch to find out about sustainable fishing practices. Catch simulates individual and collective management of a generic “common pool” renewable natural resource over a 10-year period.

## Breakout Session 2 Saturday, 9:00-9:50 AM

### S201 STEM Challenge: Ongoing Engagement through Problem Solving

*Prairie A*

Alexandra Wakely, Army Educational Outreach  
Programs/NSTA  
www.ecybermission.com  
awakely@nsta.org

*6th-12th Science*

eCYBERMISSION (sponsored by the United States Army) is a free, nationwide STEM competition for students in grades 6-9. In this interactive workshop, participants will: work on and solve puzzles that can be taken to the classroom to model problem-based learning; learn through practice that failure is an important part of learning, and it needs to be a step along the path to success; learn how the online STEM competition, eCYBERMISSION gives students a chance to explore and solve problems using science and engineering and how teachers and students can participate at no cost.



**BECOME AN  
eCYBERMISSION VOLUNTEER**

eCYBERMISSION is a web-based STEM competition for 6th-9th graders sponsored by the U.S. Army Educational Outreach Program (AEOP). By joining as a volunteer, you have the luxury of participating in the mission from anywhere in the country and your main focus is to encourage students to explore the real-world applications of STEM.

**JOIN US AS:**  
CYBER GUIDES | AMBASSADORS | VIRTUAL JUDGES

TO REGISTER TODAY, VISIT: [www.ecybermission.com](http://www.ecybermission.com)

aeop ecybermission

## Saturday, 9:00-9:50 AM

### **S202 The Geo-Inquiry Process**

Michelle Bartels, Hamlin Middle School  
sites.google.com/site/bartelsscience  
michelle.bartels@k12.sd.us

*Prairie B  
Science*

Geo-Inquiry is a new integrated, project-based process that connects real-world challenges and phenomena. In this session, you will learn new strategies to help students develop critical thinking skills, ask geographic questions, collect information, visualize and analyze data, create a compelling story, and ultimately become advocates for change in their local communities.

### **S203 Organizing Homework with Google Classroom**

Susan Gilkerson, Rutland  
susan.gilkerson@k12.sd.us

*Prairie C  
6th-12th Math & Science*

Need a way to organize yourself and your students with the handouts, assignments, and tests that you give? This workshop will explain how I did that by going paperless.

### **S204 FEATURED SESSION:**

#### **Lessons Learned from the Career & Technical Academy**

Sara Byre, South Dakota Manufacturing and Technology

The Career & Technical Academy in Sioux Falls offers high school students career exploration opportunities through hands-on learning experiences. The CTE Academy focuses on workforce demands and employer needs by offering students the opportunity to test out different career fields before graduation. Some of the class offerings include: auto body repair, automotive technology, carpentry and construction, health careers, manufacturing and welding, and Project Lead The Way. The facility uses state-of-the-art equipment and project-based learning to better prepare students for a variety of post-secondary options. Learn more about CTE's student success, plans for the future and lessons learned.

*Dakota A  
K-12 STEM*



### **S205 Inquiry Based Labs -- Physics**

Larry Browning, Physics Dept., South Dakota State University  
Matt Miller, Chemistry/Biochemistry, South Dakota State University  
Larry.Browning@sdstate.edu

*Dakota B  
9th-12th Science*

An inquiry activity/lab based around physics and engineering concepts will be presented and discussed. Specifically, a project to measure R-factors for a model house (a cardboard box heated by a light bulb) will be discussed along with extensions to measure the effect of windows and what more can be investigated.

### **S206 Teaching Experiences in Research**

Darwin Daugaard, Dell Rapids Public High School

*Dakota C  
K-12 Math & Science*

This session will consist of sharing different teacher experiences in research. Come prepared to listen and share your experiences. Information will be shared on what to expect and how to find and apply to these experiences.

## Saturday, 9:00-9:50 AM

### **S208 Family Math**

Cindy Kroon, Montrose High School  
ck022.k12.sd.us/  
cindy.kroon@k12.sd.us

*Dakota E*  
*Elementary Math*

Explore a set of take-home activities designed to help families with young children discover the fun and engaging side of mathematics. Family math is not: flash cards, worksheets, or math homework. Family math is: puzzles, games, and engaging activities. Play around with math in a family-friendly environment and (hopefully) change perceptions about math.

### **S209 Concrete to Abstract - Making Connections from Grades 6th-12th**

Marcia Torgrude & Julie Jackson, CPM  
cpm.org  
marciatorgrude@cpm.org

*Dakota F*  
*6th-12th Math*

To assist students in gaining conceptual understanding of mathematics, a great deal of work is required using our classroom resources (textbooks, supplementary materials, and manipulatives) in ways for which we possibly were not trained. This session provides examples of what conceptual understanding might involve and how it progresses from sixth grade through high school.

### **S210 Exploring the Unpacked Standards**

Stephanie Higdon, SD Department of Education  
stephanie.higdon@state.sd.us

*Dakota G*  
*K-12 Math*

During the summer, teacher work groups took an in-depth look at the newly adopted state math standards. These teachers engaged in rich discussions around the meaning of the standards, best practices to teach students the standards, and created the unpacked standards documents. Join me in the exploration of the math standards and the unpacked math standards documents.

## Breakout Session 3 Saturday, 10:00-10:50 AM

### **S301 Biomedical Research: Reading and Relevancy for all Students**

Liz McMillan, Sanford PROMISE Sanford Research  
Jessica Rowell, STEMJourneys, learnmore@stemjourneys.org  
sanfordresearch.org/education  
STEMJourneys.org

*Paririe A*  
*7<sup>th</sup>-12<sup>th</sup> Science*

See how biomedical research in the field partners with the movement for adapted primary literature in middle/high school science through implementation of interactive reading passages. Using thematic virtual journeys in meeting scientists, practicing data interpretation, and experiencing science in context, any student can engage in relevant experience without being in the lab. Where will science and literacy meet in your classroom?

## Saturday, 10:00-10:50 AM

### **S302 Technology in the Classroom**

Michelle Bartels, Hamlin Middle School  
sites.google.com/site/bartelsscience  
michelle.bartels@k12.sd.us

*Prairie B  
Math & Science*

My observation is that students love to be on their computer. Why not incorporate more technology in your classroom? I will share some of the technology resources I use in my classroom that students enjoy. Please bring a device so you can try the technology out for yourself.

### **S303 Flipped Classroom with Customized Paced Learning**

Jayne Heier, Brookings High School  
jayne.heier@k12.sd.us

*Prairie C  
6th-12th Math & Science*

In 2013 I flipped my classroom to increase engagement in learning the content and as a countermeasure to reach students with chronic absences. I now use an LMS and added a customized pace component. In my session I will share my successes, failures and what I have learned along the way.

### **S304 FEATURED SESSION:**

#### **Ethnobotany: Plants Used by Plains Indians and Prairie Pioneers**

Kim Soper

*Dakota A  
K-8th Science*

Help students learn to identify fifteen common plants found in Nebraska and South Dakota. Cross curricular ideas and cultural inclusions discussed. Each participant will receive a booklet to take home as well a mini tree guide.

### **S305 Inquiry Based Labs - Chemistry**

Matt Miller, Chemistry/Biochemistry, South Dakota State University  
Larry Browning, Physics, South Dakota State University  
Matt.Miller@sdstate.edu

*Dakota B  
9th-12th Science*

An inquiry activity/lab based around chemistry and technology concepts will be presented and discussed. This is a follow-up to the physics/engineering session but with an emphasis on chemistry concepts.

### **S306 OneNote Class Notebook in High School Mathematics**

Gail Jacobsma, Arlington  
Gail.Jacobsma@k12.sd.us

*Dakota C  
6th-12th Math & Science*

OneNote Class Notebook has allowed my classroom to be virtually paperless. Homework (Yes, handwritten math homework!) is digital, automatically saved and turn in. Tired of wasting time at the copier or having the it jam? Copies can be distributed to all students in seconds.



## Saturday, 10:00-10:50 AM

### **S308** FEATURED SESSION:

#### **Making Student Thinking Visible**

Sara VanDerWerf, VanDerWerf Educational Consulting  
[saravanderwerf.com](http://saravanderwerf.com)  
[saravdw@gmail.com](mailto:saravdw@gmail.com)

*Dakota E  
Math*

Connecting the mathematics we teach in grades six through twelve mathematics with a visual representation is critical for many students to make sense of mathematical concepts. What are the most effective representations to use with secondary students? How do you listen to students and make their thinking visual using these models/representations?

### **S309** FEATURED SESSION:

#### **Fractions: The Struggle is Real**

Mollie Gabrielson, US Math Recovery Council  
[mollie@mathrecovery.org](mailto:mollie@mathrecovery.org)

*Dakota F  
Elementary Math*

Fractions are the foundation for a series of important secondary math concepts, yet the struggle with teaching fractions is real! Participants will engage in rigorous tasks designed to elicit sense making related to fraction concepts as learners first and then observe students engaging in the same tasks. It's time to put the fear of fractions away! The ways students build and work with units in whole number contexts influences the way they coordinate units in fraction contexts. Participants will explore how to negate these whole number misconceptions by engaging in rigorous tasks that will develop strong mental actions of whole numbers and move students on the pathway towards success with fractional units!

### **S310** Tech Toys in the Classroom

Mark Iverson, Watertown School District  
[mark.a.iverson@k12.sd.us](mailto:mark.a.iverson@k12.sd.us)

*Dakota G  
STEM*

Try 3D printing, laser engraving, flying a drone or coding a robot for yourself! You'll see how FUN it is while learning so much at the same time. If you don't already have a 3D printer or laser engraver or any tech toys in your classroom, this is great opportunity to learn how to expand your STE(A)M, CTE, FabLab or MakerSpace programs. If you're already a pro, visit to share your experiences with other educators!

## Saturday, 10:50-11:30 AM

### **Final Networking, Exhibitor, and Poster Session**

*Exhibitor Hallway*

Conference attendees have the opportunity to network and visit with Exhibitors and enter door prize drawings. Exhibitors have color coded tickets for drawings. These tickets will be given out in the exhibition hallway at the discretion of the exhibitors. Keep one half and place the other in the drawing buckets at the registration table. The more booths you visit, the better your chances to win a prize! Drawings for this session will be held during Saturday lunch and you must be present to win!

**Lunch**  
**Saturday, 11:30 AM-12:30 PM**

*Prairie A, B, C*

Hosted by SDCTM and STSTA Presidents (Allen Hogie and Mark Iverson. Come for a meal, networking with new friends, awards, recognitions, and raffle with swag from vendors and other amazing organizations! Sanford PROMISE Ambassadors awarded and 2019+ SDCTM Leadership Announced.

**Breakout Session 4**  
**Saturday, 12:40-1:30 PM**

**S403 Top 20 in and out of the classroom**

Molly Ring, Brandon Valley School District  
ringmath.weebly.com  
molly.ring@k12.sd.us

*Prairie C*  
*K-12 Math & Science*

How I use the strategies from "Top 20 Teachers" to improve relationships with students, parents, and fellow teachers.

**S404 Science, Art and Storytelling: A GREAT Collision!**

Marie Steckelberg, EdD, Steckelberg Consulting  
SteckelbergConsulting.com  
marie@steckelbergconsulting.com

*Dakota A*  
*K-12 Science*

The “collision” of art, science and storytelling is not a fad; it is an ancient practice. Bring your curiosity and explore your creativity as we discover how this ancient practice can be used in the classroom – at all levels!

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Marie@SteckelbergConsulting.com  
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**S408 FEATURED SESSION:**

**Math Literature and Vocabulary**

Kim Soper

*Dakota E*  
*K-12 Math*

Get some ideas for literature connections, make a math concept Foldable vocabulary booklet and take home a template for your students. A drawing will be held for 3 sets of math vocabulary cards.

**S409 What if...we thought of grading differently?**

Carla Diede, Harrisburg South Middle School  
carla.diede@k12.sd.us

*Dakota F*  
*6th-12th Math*

One point for the answer, two points for work, ... does this sound familiar? Join the discussion on how to grade differently using success criteria (rubrics) to communicate learners' strengths and areas of improvement in math while also helping them self-reflect. Look at examples and take time to create your own.

## Saturday, 12:40-1:30 PM

### **S410 STEM-ulating Activities on Human Ecology**

Lynda Venhuizen, South Dakota State University  
Lynda.Venhuizen@sdstate.edu

*Dakota G*  
6th-8th Math & Science

Discover innovative ways to teach middle school students about human-environmental interactions, while also building STEM skills through games, problem solving, mathematical modeling, and more! Receive lesson plans in an electronic format, all matched to state standards.

## Saturday, 12:40-2:30 PM (2 Hour Sessions)

### **S405 Connecting Research to the Classroom**

Rhea Waldman, SD Discovery Center  
sd-discovery.org

*Dakota B*  
6th-12th STEM

Get your students excited about STEM by connecting them to current research. The SD EPSCoR Education Portal offers free curriculum modules for middle- and high school aligned with SD science standards, developed by teachers for teachers. The ready-made lesson plans include engaging, hands-on activities, based on research happening in SD.

### **S406 Sanford Research's PROMISE program presents... Exploration of Mitochondrial DNA**

Benjamin Benson & Liz McMillan, Sanford Research  
sanfordresearch.org/education  
SanfordOutreach@sanfordhealth.org

*Dakota C*  
9th-12th Science

The Sanford PROMISE program helps provide access to biomedical research. Join us in the exploration of mitochondrial DNA via a brief lesson on Bioinformatics (using the computer to study DNA) and discussion about students collecting and sequencing their own DNA to learn about their own haplotype (genetic origin).

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## Breakout Session 5

### Saturday, 1:40-2:30 PM

#### S501 Science Demonstrations: Bernoulli's *Prairie A*

Steven Rokusek,  
South Dakota Public Broadcasting  
sdpb.org/learn  
steven.rokusek@state.sd.us

*K-12 Science*

During this session participants will review classic science demonstrations and activities that highlight Bernoulli's Principle. Many of the demonstrations are accompanied by videos and lessons. This will be an educational and entertaining session.

#### S502 Sustainability Development Goals and Fulbright *Prairie B*

Julie Olson, Mitchell Senior High/  
Second Chance HS (alternative school)  
julie.olson@k12.sd.us

*K-12 STEM*

Learn how the sustainability development goals and Fulbright come together to make classroom instruction more meaningful. Also learn about how to apply for a trip to Japan!

#### S503 National Geographic Certified Educator *Prairie C*

Anne Lewis, South Dakota Discovery Center  
sd-discovery.org  
annelewis@sd-discovery.org

*K-12 Math & Science*

National Geographic Educator Certification is a free professional development program that recognizes pre-K through 12 formal and informal educators committed to inspiring the next generation of explorers, conservationists, and changemakers. These educators are part of a powerful movement to make the world a better place by empowering students.



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#### S504 FEATURED SESSION:

#### Workforce Initiatives to Meet Modern Manufacturing Demand *Dakota A*

Sara Byre, South Dakota Manufacturing and Technology

*6th-12th STEM*

With the nation's aging workforce and low unemployment rate, employers are looking for innovative ways to recruit the next generation of skilled workers. Join this discussion on the ways South Dakota is actively working to meet the growing demand of skilled trade workers as well as tactics other states are using to change young Americans' perceptions about modern manufacturing.



Saturday, 1:40-2:30 PM

**S508** FEATURED SESSION:

**Professional Development in Mathematics: Making it Count!**

Mollie Gabrielson, US Math Recovery Council  
mollie@mathrecovery.org

*Dakota E  
Elementary Math*

Investigate the shift in mathematics instruction to an increased focus on conceptual understanding and problem solving. Examine guiding principles to inform mathematics instruction. Provide ways to support teachers in moving their instructional practice forward in a meaningful way that includes support systems and follow up strategies to ensure deeper learning and sustained implementation. Examine how developmental mathematics begins with the child, not with the mathematics and focus on increased educator effectiveness.

**S509** **Scrap Paper Geometry** *Dakota F*

Steven Caron, Aberdeen Central H. S.  
*6th-12th Math*

Participants will be presented with hands-on activities used to discover geometric theorems.



[sdsmt.edu](http://sdsmt.edu)

**S510** **Study Team and Teaching Strategies:**

**Getting Teams to Work**

**Effectively in Class**

*Dakota G*

Marcia Torgrude & Julie Jackson, CPM

*6th-12th Math*

[cpm.org](http://cpm.org)

[marciatorgrude@cpm.org](mailto:marciatorgrude@cpm.org)



Believing that students should work in teams in math classrooms and getting them to work effectively are two different things. Come learn strategies that you can use in your classroom to help teams of students value one another and sincerely work together to solve problems! We will look at the why, when, how and what's of using teams along with specific strategies such as team roles, think-ink-pair-share, swap meet, and reciprocal teaching.

**Breakout Session 6**  
**Saturday, 2:40-3:30 PM**

**S602** **Ethics & Genetics**

Liz McMillan, Sanford PROMISE Sanford Research  
Robin Bowman, Personal Genetics Education Project  
[sanfordresearch.org/education](http://sanfordresearch.org/education)  
[pged.org](http://pged.org)  
[SanfordOutreach@sanfordhealth.org](mailto:SanfordOutreach@sanfordhealth.org)

*Prairie B  
9th-12th Science+*

Next Generation Sequencing, Direct To Consumer Genetic testing and ancestry services, CRISPR, and gene editing are just a few of the areas of genetics that may include ethical decision making in 2019 and beyond. pgEd creates lessons and resources for teachers to introduce ethical discussions in their classrooms. Learn about these lessons and other ways to engage in this NIH SEPA project.

## Saturday, 2:40-3:30 PM

### **S603 STEM Education through Renewable Energy,**

#### **The KidWind Challenge**

Chad Ronish, Hill City High School  
Steve Wegman, South Dakota Renewable Association  
kidwindchallenge.org  
chad.ronish@k12.sd.us

*Prairie C*  
*K-12 Math & Science*

The KidWind Challenge provides a great platform for your students to access STEM education by participating in the challenge, or implementing activities into your classroom. Students can explore the issues of energy conservation and energy transformation in fun hands on engineering contests!

### **S604 Aquaponics-Fish to Food**

Brian Schmuck, Menno Public School  
brian.schmuck@k12.sd.us

*Dakota A*  
*K-12 Science*

Vegetables and herbs can be grown indoors, all year long. Using PVC piping, tubes, totes, fish and plants, you can create an indoor garden without using fertilizers. Participants will be shown a model of a working aquaponics unit. Discussions will show how the units can be used in K-12.

### **S605 Demos to Spark Students' Interest**

Larry Browning, Physics Department, South Dakota State University  
Matt Miller, Chemistry/Biochemistry, South Dakota State University  
Larry.Browning@sdstate.edu

*Dakota B*  
*9th-12th Science*

We've been working on new demonstrations to engage students in the STEM process and we want to share them with you. Hopefully, the carpet will survive this year.

### **S606 Cybersecurity Education: Whose Responsibility Is It?**

Rob Honomichl, Dakota State University  
rob.honomichl@dsu.edu

*Dakota C*  
*K-12 & Admin STEM*

Your personal information is extremely valuable to cybercriminals. It is important that every student is exposed to cybersecurity education. During this session we will look how cybercriminals exploit individuals as well as provide teaching resources to help students understand computer and cyber sciences.

### **S608 New South Dakota Math Standards Unpacked**

Melissa Walther, McLaughlin School District  
melissa.walther@k12.sd.us

*Dakota E*  
*K-12 Math*

I will be presenting the new South Dakota math standards in unpacked form. I will show where to find them (I will provide a link to a shared google drive folder if they have not been shared by the state at the time of presentation) and how to use them. I will be explaining the clusters since this is different than the last unpacking.



Saturday, 2:40-3:30 PM

**S609 Trig in Context:**

**A Civil Engineering Perspective** *Dakota F*

Fenecia Foster & Beth Kassing,  
Southeast Technical Institute *6th-12th Math*  
fenecia.foster@southeasttech.edu

Are you looking for authentic trigonometry applications? In this session participants will work through a handful of civil engineering trigonometry applications that will be presented in a way that you can immediately use them in your classroom. Specific topics include surveying, statics, and wastewater.



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**admissions@southeasttech.edu** to learn  
about STEM Exploration Events, group campus  
visits or STEM presentations at your school.

**SOUTHEAST TECH**

**S610 An Introduction to FIRST: STEM**

**and Project-Based Learning** *Dakota G*

Jeremy Haugen, EmBE FIRST LEGO League *K-12 STEM*  
embe.org/program/first-lego-league *jhaugen@embe.org*

FIRST celebrates 30 years of motivating youth to explore science, engineering and math through project-based learning packed with 21st Century skills. Come find out about the four FIRST programs, their track-record of success, and discuss ideas for implementing them in classrooms and after-school programs.




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Visit [CPM.ORG/cpminfo](http://CPM.ORG/cpminfo) or scan the QR code to get more information and view our conference sessions.



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## Wrap-Up & Reflection Discussions Saturday, 3:30-4:15 PM

### **S704 Science Wrap-up and Reflect**

SDSTA

*Dakota A*

*Science*

Join SDSTA leadership and offer your feedback from the conference and recommendations for future events. Turn in your survey for a chance to win conference registration to the 2020 SD STEM Ed Conference.

### **S708 Math Wrap-up and Reflect**

SDCTM

*Dakota G*

*Math*

Join SDCTM leadership and offer your feedback from the conference and recommendations for future events. Turn in your survey for a chance to win conference registration to the 2020 SD STEM Ed Conference.

## JPDC Board Meeting Saturday, 4:30-6:30 PM

JPDC Board

*Prairie A*

SDSTA & SDCTM Officers and Conference Leadership meet to discuss current conference outcomes and strategize for upcoming event(s). If you are interested in helping to manage the conference and be part of the Joint Board, please contact SD STEM Ed Board Chair: Cindy Kroon at [Cindy.Kroon@k12.sd.us](mailto:Cindy.Kroon@k12.sd.us).

**Next Year's Conference will be  
February 6, 7, & 8, 2020  
Hope to you see there!!!**

**Representatives will be exhibiting on Friday from 8:00 AM until 5:30 PM.**

*(Most will be available on Saturday till noon.)*

**These include:**

**Army Educational Outreach Program (AEOP)**

**Black Hills State University**

**CPM Educational Program**

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**Project Lead The Way**

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**South Dakota Public Broadcasting**

**South Dakota School of Mines**

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**The Sanford PROMISE: Sanford Research**

**Washington Pavilion**

**Marcia Akeung (eCybermission)**

**Deann Kertzman & Julie Dahl**

**Julie Jackson & Bob Petersen**

**Billy Pugliese & Matt Misialek**

**Kathy Van Kley & Vic Dreier**

**Amy Baete & Shelby Braun**

**Stephanie Folk**

**Anne Lewis**

**Kim Smeenk**

**Steven Rokusek**

**Ashli Maddox**

**Fenecia Foster & Elizabeth Kassing**

**Marie Steckelberg**

**Valerie Shearer**

**Liz McMillan & Benjamin Benson**

**Lynne Jones**

**\*Name Tag Lanyards are compliments of Sanford**

THANK YOU NASCO and Carolina Biological for donating gift certificates for the conference.

South Dakota Science Teachers' Association Business Meeting  
will be held in Dakota G at 4:30 pm on Friday, February 8, 2019

SD Council of Teachers of Mathematics Business Meeting  
will be held in Dakota C at 4:30 pm on Friday, February 8, 2019

**Graduate Credit**

Conference credit will be offered through Dakota Wesleyan University. You may register for one hour of credit at the 499 or 599 level. Attendance at a sharing session is required to earn graduate credit from Dakota Wesleyan University. There will be personnel available to register you for the credit on Thursday night from 7:00 to 9:00 pm, and on Friday morning from 7:30 to 8:30 am. Check in the hotel lobby for the DWU table. A syllabus listing course requirements will be available at the time of registration. For more information, contact Dr. Ashley Digmann at (605) 995-2625.

Next year's conference will be **February 6, 7, & 8, 2020**

**The 2019 Conference Committee would like to offer a Special Thanks to . . .**

**Dakota Wesleyan University and Dr. Asheley Digmann for handling the credit.**



**All speakers** for their dedication to the future of mathematics and science education.

**All exhibitors** for their enthusiastic participation.

The **Huron Area Chamber of Commerce, The Huron Convention and Visitors Bureau** for a great deal of help and cooperation.



The **Huron Events Center & Crossroads Hotel** for their help and generous hospitality.

**All the conference participants** who make all of our efforts worthwhile and without whom there would be no conference.

**A SPECIAL THANKS GOES TO TIE FOR HELPING US WITH PROJECTORS!**

*(This year's TIE Conference is April 7-9, 2019 in Rapid City.)*

Next year's conference will be **February 6, 7, & 8, 2020.**

**The 2019 Spring STEM Ed Conference** is a joint venture of the South Dakota Science Teachers' Association (SDSTA) and the South Dakota Council of Teachers of Mathematics (SDCTM)

Note: There is a common registration form for the conferences. One form is used to register for all activities, including SDSTA and SDCTM memberships.

|  |      |             |       |               |
|--|------|-------------|-------|---------------|
| ONE-day (SDCTM or SDSTA members)<br>includes the Noon Luncheon for that day  | \$55 | Non-members | \$105 | Students \$15 |
| TWO-day (SDCTM or SDSTA members)<br>includes the Noon Luncheon for both days | \$80 | Non-members | \$130 | Students \$25 |

The Friday Night Banquet is **NOT** included in the registration fee. A ticket for the banquet may be obtained at an additional cost of **\$25**. {Registration after Jan. 20 will be considered as on-site and will cost an additional \$35}

Because of a limited printing budget, the program was available in advance at the SDCTM website [[www.sdctm.org](http://www.sdctm.org)] or SDSTA web site [[www.sdsta.org](http://www.sdsta.org)]. Printed programs were not mailed, but were distributed on site with the registration materials.

**2019 Mathematics and Science Conference  
SDSTA & SDCTM**

Please take time to respond to the following questions concerning the conference. This information will help the program committee take steps to improve future conferences. Circle one in each group:

|               |            |               |             |
|---------------|------------|---------------|-------------|
| Content Area: | Math       | Science       | Both        |
| Grade Band:   | Elementary | Middle School | High School |

Did you prefer this year's printed format or last year's two column format? {Circle one} This year - Last year

Circle which no cost-to-you items you enjoyed; or X those we could do without:

Morning: donut holes & coffee; Afternoon: popcorn; All day: pop; Other \_\_\_\_\_

What presentation or presentations did you feel were the most useful or helpful?

What made it (or them) good?

Were there any presentations that disappointed you?

Please give us your overall assessment of the conference along with any comments you would like to share.

---

Detach and fill in the following for a final prize to be sent after the conference. To register for the prize, turn in this entry along with your evaluation form.

|                       |
|-----------------------|
| _____                 |
| Name                  |
| _____                 |
| Address               |
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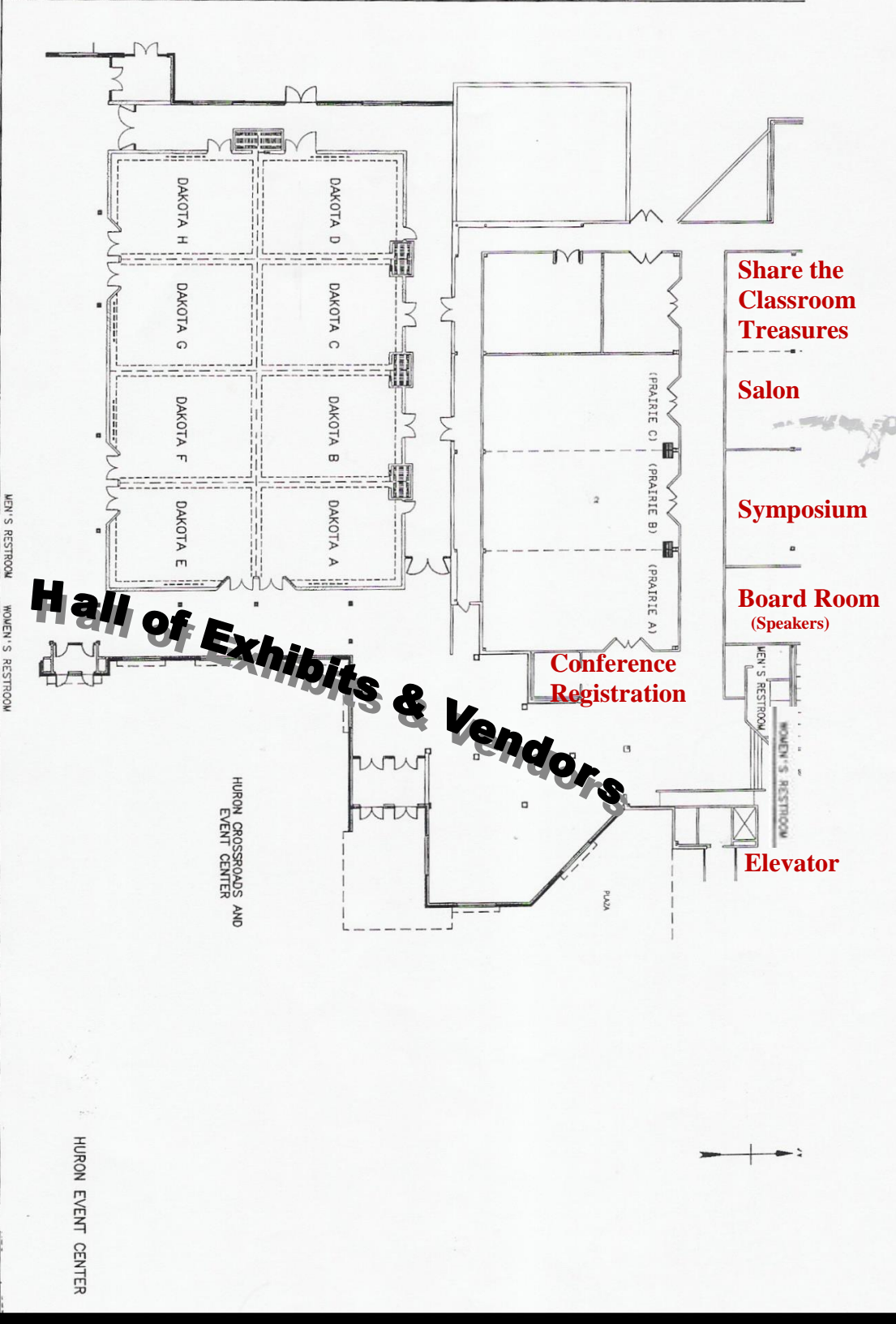
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**Hall of Exhibits & Vendors**

**Share the Classroom Treasures**

**Salon**

**Symposium**

**Board Room (Speakers)**

**Conference Registration**

**Elevator**

MEN'S RESTROOM WOMEN'S RESTROOM

MEN'S RESTROOM WOMEN'S RESTROOM

HURON CROSSROADS AND EVENT CENTER

HURON EVENT CENTER

