



Wahpe Woyaka pi

(Talking Leaf)

South Dakota Council Teachers of Mathematics Newsletter

Presidential Ponderings

Amazing! What a great conference. The SD STEM Ed conference held in February provided a professional development opportunity that rivaled many regional and national conferences. I heard once again through conversations with featured speakers Sara Van Der Werf, Kristopher Childs, and Mollie Gabrielson (who braved inclement weather and endured closed airports) that they were impressed with the variety and number of quality sessions that were offered. This impression is due to the hard work of many people behind the scenes as well as the many teacher leaders who “stepped up to the plate” by sharing a piece of their daily practice with attendees in their sessions. I would like to extend a huge thank you to all who worked behind the scenes and who put so much of their “free” time into making this year’s SD STEM Ed conference a success. It really takes a great TEAM of people to make this event an incredible professional development opportunity for mathematics and science teachers in South Dakota. A special thank you goes to Cindy Kroon, our conference coordinator, and Sheila McQuade, our conference registrar for taking care of the many of details and logistics for us.



As you prepare to attend next year’s conference what are you planning to share with others? Our conference hosts sessions that are created and designed by teachers just like you for other teachers. Many speakers share lessons and activities that engage their students. Never think your ideas are too small or insignificant. I remember attending for the very first time as a beginning teacher and I walked away from the conference with many ideas to try out in my own classroom. Some of them I still use today! You will never find a friendlier group of people to share your time, talent and passion for teaching with. Once again, please consider submitting a speaker proposal in the fall and sharing your gifts with others. The dates for next year’s conference are February 6-8, 2020. Speaking of preparing for next year, we welcome your input about the conference. Are there topics of interest that you would like to see included in the programming? Is there an engaging speaker that you would like to see invited to South Dakota as a featured speaker? One of my duties as President has been to invite featured speakers to our conference who can fill a need or address topics of special interest to our membership. If you are traveling to San Diego, CA for the NCTM Annual Conference (or somewhere else) and come across a topic or presenter that would be a good fit for our conference, please feel free to contact me or any one of SDCTM’s officers or liaisons. We welcome your suggestions.

This year was an election year for SDCTM. Our new officers are: Crystal McMachen (President), Sheila McQuade (President-Elect), Dan Van Peurseem (Vice-President), Jay Berglund (Treasurer), Amy Schander (Secretary), and Mark Kreie (NCTM Liaison). If you have an interest in becoming more active or have a desire to expand your leadership skills by becoming an officer in SDCTM, the next election will take place in 2021. If you would like more information please contact Crystal McMachen (Crystal.McMachen@k12.sd.us) or Sheila McQuade (smcquade2@sfcss.org).

If you are looking for a great professional learning opportunity, please consider attending the SDCTM 2019 Summer Symposium entitled “Taking Action: Implementing Effective Mathematics Teaching Practices” on Wednesday, July 10, 2019 in Mitchell, SD on the campus of Dakota Wesleyan University. More information is provided in this newsletter, but it promises to be another great opportunity to enhance one’s teaching practice.

As my SDCTM Presidential term comes to an end, I want to thank you for all you do in providing a quality mathematics education for each of your students. Best wishes for continued success in the classroom and for a great finish to your school year!

Allen Hogie

SPRING 2018-2019

Wahpe Woyaka pi

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Calendar Notes:

- 2019 Summer Symposium
July 10, 2019
- PAEMST Nominations
Due April 1, 2019
- PAEMST Applications
Due May 1, 2019



Musings from Crystal

I think Spring is finally here! I have a feeling that I am not alone in saying that I never thought this winter was going to end. The bad weather and snow days really messed with my lesson planning!

Now that it is spring, I am already looking at my calendar for the summer. The SDCTM Summer Symposium is going to be held July 10th in Mitchell, SD on the campus of Dakota Wesleyan University. This year it is titled “Taking Action: Implementing Effective Mathematics Teaching Practices.” Sharon Rendon will be presenting and if you don’t know Sharon, she is a wealth of knowledge in the field of mathematics teaching. Sharon works for CPM and is the Regional Director for NCSM (National Council for Supervisors of Mathematics). She is an engaging presenter and I can guarantee that this Symposium will be worth the drive! If you are interested, please get registered!

I also want to bring your attention to a free resource for the middle level grades. MATHCOUNTS has different programs that you can use with your students. There is a video challenge, the competition series, and a math club. I have coached teams for the competition series for many years. It is a great way to get students to problem solve and attack unfamiliar problems. This year I tried the video challenge. All the resources were free for the video challenge and it was easy for my students to do. Both competitions are over for this year, but I encourage you to look into these programs for next year. Visit mathcounts.org to learn more or if you have questions, please feel free to reach out to me and I can help guide you in getting started!

I am hoping this end of your school year is a good one. Until next time...

Crystal McMachen
SDCTM President-Elect
Crystal.McMachen@k12.sd.us



“The SDCTM Summer Symposium is... titled “Taking Action: Implementing Effective Mathematics Teaching Practices.””

Our Programs



A national middle school mathematics competition that builds problem solving skills and fosters achievement through four levels of fun, in-person “bee” style contests.

[LEARN MORE](#)



A national middle school mathematics enrichment program that gives educators the resources and guidance needed to run math clubs in schools and other groups.

[LEARN MORE](#)



A national middle school contest that blends math, creativity, art and technology and challenges students to produce a video solving a math problem in a real-world setting.

[LEARN MORE](#)



K-5 Corner

Spring greetings! As a mom of a five year old, I try to sneak learning and practice in wherever I can. My daughter loves to play games, especially cards. For this edition of the newsletter, I wanted to share a game focusing on number sense and number identification. It is a very simple game widely known as garbage. This is a favorite at our house. If your child/student can identify numbers, they can play this game.

Garbage

How to Play:

If playing is 1-2 players you only need 1 deck of cards. 3-4 players, you might want two decks. If you want to take all of the face cards out for younger players, you can, or use digit cards 1-10. We play jacks and queens – you lose your turn, kings are wild.

1. Dealer deals each player 10 cards
2. All other cards are put into a stack in the middle.
3. Cards are lined up like a ten frame.
4. The first player starts by taking a card off the stack. They then replace that card in the correct spot according to the tens frame. For example, if they pull a 6, they will put it in the 6th spot on their tens frame and use the flipped card to fill in another spot on their frame if they can. They will do this until they can't replace anymore of their tens frame spots and discard the last one into a stack.
5. The next player can either draw a new card or pick up the one discarded.
6. This continues with each player until the first player that completes their tens frame wins.
7. Collect cards, shuffle, repeat. If you want, the winner can remove a spot from their ten frame – if they won one round, they would remove a card from the ten spot, the second time they win, they would remove the nine and ten spot and so on. If you want to focus on keeping that ten frame whole, continue to play with all ten spots.



Beginning of game,
drawing an 8



Placing the 8,
uncovering a 3



Placing the 3,
uncovering a 3,
turn ended.



“As a mom of a five year old, I try to sneak learning and practice in wherever I can.”

Lindsey Tellinghuisen
SDCTM Elementary Liaison
Lindsey.Tellinghuisen@k12.sd.us



6-8 Highlights

Mathematics and Marching: Keep to the beat

When spring arrives (whenever that may be), I always get the question, “can we do our assignment outside?”. Being a teacher that values their math education, being outside usually does not lead to more learning. However last year I discovered a way where it could!

Teaching my eighth graders translations on a coordinate plane can be “kind of boring”, or so I was told. It wasn’t until I had a conversation with my Band teacher that I learned there was this great free website called <http://micromarching.com/>. On this site students create their own marching routine using transformations.

I was able to teach my kids the transformations on graph paper and then they got to string them together into a fun online routine. Better yet, when the sun shines, I challenge students to go out and perform some of their routines. Each “director” was tasked with communicating via translation notation to each person where they should go. It is a great way to be outside and work on translations!

Note: I used a set of 4 bed sheets with spray painted lines to create a coordinate plane for the students to use.

Molly Ring
SDCTM Middle School Liaison
Molly.Ring@k12.sd.us



“On this site, students create their own marching routine using transformations.”





9-12 Spotlight

Quadratics with Catapults

As math teachers, we are always working hard to teach content while including applications. One fun way to do this with quadratics is to use projectile motion of catapults. We take a couple days out of our quadratic unit to complete this project which requires students apply a variety of math skills to real-world data.

The motion of any object thrown, kicked, shot, launched through the air can be described by the following quadratic equation:

$$h = h_0 + v_0t - 16t^2$$

h = height at any time, t , in feet
 h_0 = initial height, in feet
 v_0 = initial upward velocity, in feet per second
 t = time, in seconds

In this project, we launch foam balls from a catapult and use distance and time measurements to create an equation for height as a function of time. With that equation, we can predict the height of the ball at any time. Our objective is to use this information to help us hit a target with our catapult. To complete this project students must be able to:

- 1) do unit conversions to convert height and distance to feet
- 2) setup and solve a linear equation to solve for v_0
- 3) find the vertex of a parabola
- 4) solve a quadratic equation using the quadratic formula
- 5) graph a quadratic equation by finding points.

To make this work, you will need some supplies. There are lots of places to be creative, but here is what I use.

- AirStrike Catapult (about \$12) – Can make it work with just one, but best to have a spare.
- 100 ft measuring tape (could use much shorter)
- Rulers
- Yard sticks
- Timers or phones used as timers
- Something for a target. I use a paper box.

Interested in giving it a try? I am happy to share years of experience. Just send me an email.

Jennifer Haar
 SDCTM High School Liaison
 Jennifer.Haar@k12.sd.us

(Jennifer's activity follows on page 6.)



“...we are always working hard to teach content while including applications.”



Quadratics with Catapults

Initial Data Collection

	Launch 1	Launch 2	Launch 3	Launch Data Used
Height Ball is Released From Launcher (h_0)				
Distance Ball Travelled				
Time ball is in the air				
Maximum Height (Estimate)				

1. Insert initial height into the projectile motion equation. $h = h_0 + v_0t - 16t^2$
2. Add time the ball is in the air to the equation from part 1 and calculate to find initial velocity.
3. Use initial height and initial velocity to write the equation describing height as a function of time for your ball launch.
4. Find the axis of symmetry of your ball launch using your $\frac{-b}{2a}$ and your equation from part 3.
5. Use your axis of symmetry to find the height and time of the maximum point of your ball.
6. Use your equation from part 3 and the quadratic formula to calculate the two times the ball will be at the height of the target.
7. Use the formula $v_h = \frac{d}{t}$ to calculate the horizontal velocity of the ball. (Unlike the vertical velocity, which changes due to gravity, the horizontal velocity is essentially constant.)
8. Use the horizontal velocity from part 7, the time from part 6, and the equation $v_h = \frac{d}{t}$ to calculate the distance you should position the catapult from the target. (Which of the two times from part 6 should you use if you want the ball to fall down onto the target?)
9. Draw a graph of the height of your ball as a function of time. Label both the x and y axis. (x -axis is time measured in seconds. y -axis is height measured in ft.)
There are 5 points you should know for sure from your calculations. Mark those 5 points accurately on the graph. Sketch in the parabola that connects those points.
Initial height. (0 ,)
Landing time. (, 0)
The two times the ball will be at height of target. (,) and (,)
Max height. (,)

10. Analysis of results

Was your team able to hit the target by adjusting the catapult location based on your calculations?

If not, what do you think caused your prediction to be unsuccessful? Be specific. Were your calculations incorrect? Did your calculations make simplifying assumptions that were not valid? Was there a problem with the equipment?

What could be improved about this project next year? Be specific. Should we make the challenge harder? Easier? Should we add elements to the project? Should we leave elements out? Should we work as a whole class? Individually?



Higher Ed Viewpoint

I send you greetings from your fellow colleagues in the BOR institutions across the state. As I write this article we are enjoying much better weather but it was not without the drawbacks of recent flooding for many located along the various watersheds. I trust that none of you suffered any loss of human life due to the flooding that has taken place and anything that was lost can be replaced, even though it may not be easy and often times painful.

We just finished Pi-Day and I am sure many of you celebrated it your own way in classes that day. I know at USD we served a total of 33 pies to students, faculty, and staff in the student center that day. I also know SDSU was active on social media with all their celebrations. I trust that at a minimum, you all enjoy a good piece of pie!

In my last update I discussed that we were working through our common courses in the BOR system to make sure our campuses have the same pre-requisites for our common courses. I am happy to report that this task is now complete and it should have the end-result that your students will have the ability to take and transfer courses at any of the 6 BOR institutions rather seamlessly.

Another update that we mentioned at SDCTM, if you joined us in Huron, was about a graduate certificate in math that we are going to start offering in the fall. To make a long story short, if you want to be certified to teach dual credit courses in the system, you essentially need 18 graduate hours of math. For those interested in doing so, we designed two separate graduate certificates of 9 hours each in order for you to obtain this certification. The six BOR institutions will take turns offering different courses that could be used for this certification. The courses will be made available either online, or some distance delivery mode (ie DDN) in order to make it feasible for you to take these courses. The proposal is currently at the BOR level but we suspect it should make it through the system in time for the fall delivery date. Once fully approved, we will be sending out the specifics via Sheila so you are all aware of the opportunity.

It is hard to believe that we are only looking at two more months until graduation. I trust you all have a great end of the school year and can have an opportunity to enjoy some summer of relaxation, reflection, and maybe even take part in some professional development of your choosing

Sincerely,

SDCTM Vice President & Liaison to Higher Education

Share the Wealth

South Dakota Teachers are some of the most creative, dedicated professionals. Whenever I have the opportunity to visit with our teachers, I always hear of a project or lesson idea that I could use in my classroom. I invite you to share your wealth of ideas with our membership. Please consider submitting a favorite idea, lesson, activity... for publication in our newsletter.

Send submissions to:

Sheila McQuade, SDCTM Newsletter editor (smcquade2@sfcss.org).



“...your students will have the ability to take and transfer courses at any of the 6 BOR institutions rather seamlessly.”





A Word from Stephanie

Greetings,

Between the weather forecast for the next couple weeks, and seeing a robin yesterday morning, I have decided spring has finally decided to join South Dakota. I look forward to warmer temperatures and nicer roads as I travel to different events throughout the state. Many schools have started the last quarter, which means summer vacation is just around the corner, and more professional learning workshops are quickly approaching. In this newsletter, I wanted to share some upcoming opportunities for professional growth, and some specific workshops the Department of Education is planning.

The Mathematics Content standards will be fully implemented in the fall of this year. The content specialist team is discussing the best ways to support both administrators and teachers in becoming more familiar with these new standards. In addition to workshops on the new South Dakota Mathematics Content Standards, our team is developing workshops to support educators in utilizing the unpacked cluster documents I wrote about in detail in the last newsletter. The workshops will develop an understanding of the changes made to the standards, in addition to best practices in the utilization of standards and unpacked documents when developing lesson plans. Please watch for specific dates for these workshops on the DOE Math Listserv. If you are not receiving these emails, you can send an email to listmanager@k12.sd.us, do not include a subject, and for the message write: *Subscribe DOEMath*. As always encourage colleagues to also sign up for the DOE Math Listserv.

Two other opportunities for professional growth to watch for this spring are the South Dakota Math/South Dakota Science leadership cohort, and the South Dakota Mentoring Program. Having the opportunity to be involved in both programs, I can say, with confidence, they are excellent ways to extend yourself as an educator. The SD Math/SD Sci leadership group will meet four times during the 2019-2020 school year. During these meetings science and math educators have in-depth discussions around topics including, but not limited to, challenges that face math and science education at the class, school, district, state and national level, equity in math and science education, and leading impactful changes in math and science education. Please watch for application information for this excellent leadership opportunity on the DOE Math and Science Listservs. The SD Mentoring Program is a wonderful way to have a lasting impact on a first-year teacher in South Dakota. As a mentor, you will attend both a face-to-face Mentoring Seminar and a mentor/teacher meet and greet this summer, where you will be paired with a new teacher to mentor for two years. In June of each of the years you are a mentor you also participate in the Mentoring Summer Academy with your new teacher, a two-day conference filled with excellent professional learning workshops. Please watch for more information regarding this program and note that applications for new mentors are due May 1.

I look forward to meeting more of you throughout the summer at one or more professional learning opportunities!

Have an excellent end to your school year,

Stephanie Higdon



*“...send an email to listmanager@k12.sd.us do not include a subject, and for the message write: *Subscribe DOE Math.*”*

*PD Opportunities include:
Standards Workshops,
SD Math/Science
Leadership Cohort,
SD Mentoring Program*



Mark's Thoughts

New Feature in Desmos Activity Builder

If you use Desmos Activities in your classroom (found at <https://teacher.desmos.com/>) and are interested in customizing or creating your own activities, Desmos Activity Builder (<https://teacher.desmos.com/activitybuilder>) is where to begin. Those who have played around with the Activity Builder feature will be happy to hear about a recently released feature. Teachers can now copy a screen from a different activity and paste it into their own custom activity.

For more details about this new feature, please check out the Desmos Blog at <https://blog.desmos.com/articles/friday-fave-for-march-15/>.

As always, if you ever have any questions regarding NCTM or Desmos, please feel free to contact me at Mark.Kreie@k12.sd.us. Have a great New Year!

Mark Kreie
NCTM Representative
Mark.Kreie@k12.sd.us



2019 Daktronics Math Teacher of the Year

Every year, Daktronics recognizes an educator who is excelling in the field of mathematics. This year's recipient of the Daktronics Outstanding Mathematics Teacher Award is Mrs. Katie Keppen of the Harrisburg School District. Keppen has been a math teacher for 15 years and is a leader in implementing customized learning into her classroom. This allows her students to have an individualized learning experience throughout their mathematics education. Keppen meets with each student to set goals that work with their distinct needs and allow them to master the class content. "It's my favorite aspect of teaching," Keppen said. "Getting to work with the kids and figure out how they best learn and what lights a fire in their brain. We figure out together what makes them want to learn and discover new things."

Keppen strives for excellence every day as she interacts with students and faculty at Harrisburg High School. "We set high expectations for the students," Keppen explained. "As teachers, we always look for new and better ways to do things. You spend a lot of hours, early mornings and late afternoons, to be as involved as you can. I keep learning and growing myself, so I can model that ideal."

continued





2019 Daktronics Math Teacher of the Year - *continued*

Dr. Kevin Lein, the former principal of Harrisburg High School, commented on Keppen's exceptional dedication to her students and profession. "Mrs. Keppen utilizes superior organizational skills, relevant and higher-level assessment, and a contemporary approach to each lesson," Lein said. "She is a credit to the teaching and mathematics profession. The marriage of skill, intelligence, passion, and genuine interest in her students is truly remarkable and exemplary."

Keppen finds inspiration from her students' success. Feedback from parents and students makes an impact on her and pushes her to always strive for excellence. Zach Schulte, a former student of Keppen's, discussed his experience in her classroom. "Her teaching style helped prepare me for the class structure and content of college mathematics courses," Schulte explained. "Mrs. Keppen held students accountable for work and gave them all the necessary tools to succeed, regardless of their career choice. She is an adaptive, knowledgeable, and compassionate teacher who seeks nothing more than to see her students succeed."

Keppen's dedication to her students is obvious to everyone she encounters. "In the long run, kids are inspired by a sincere person who accepts them for where they are mathematically, as well as where they are as a person, and then works with them to reach their potential," Keppen said.

The Daktronics Outstanding Mathematics Teacher Award is given by the South Dakota Council of Teachers of Mathematics. The recipient of the award receives an engraved plaque and a \$1,000 award to assist in their teaching efforts with new equipment or in attending a mathematics conference or workshop. The winner is announced at the annual SDCTM/SDSTA Annual Professional Development Conference.

Leah Brink (HR, Personnel, SD Corporate) commented on the importance of good educators in the field of mathematics. "During middle and high school, it's critical to have excellent educators to keep students engaged and compelled by the study of mathematics," Brink said. "Math skills can be applicable to nearly every occupation and field, and mathematics is a universal language, which means it's globally relevant." Brink goes on to explain why Daktronics makes it a priority to invest in the future of STEM, "Much of the Daktronics' workforce resides in South Dakota, which is a low-population state with historically low unemployment. In order to have the skilled workforce we need in the future, we should continue to promote and invest in STEM educational initiatives, like the Outstanding Mathematics Teacher."

Keppen plans on using the award to invest in new technology for her classroom, such as an iPad Pro, to be able to do new and innovative interactive learning activities with her students. She would like to give credit to everyone who has allowed and encouraged her to impact so many students and would like to thank Daktronics for sponsoring the award and for giving recognition to educators.

"In the long run, kids are inspired by a sincere person who accepts them for where they are mathematically, as well as where they are as a person, and then works with them to reach their potential."



2019 Distinguished Service Award

Each year, SDCTM recognizes the service to Mathematics education in general and SDCTM in specific by one of its members. It is always a surprise to the recipient and to keep it a surprise, many members are “in the dark” as well. When Allen Hogue, SDCTM President presented the award, he gave some background about the the recipient in a series of clues.

- a lifetime resident of the Midwest.
- has earned degrees in three different states.
- has inspired many students to pursue careers that resonate with their passion for mathematics.
- is a leader in mathematics education and a super role model.
- believes that relationships matter.
- likes teaching topics developed and expanded upon by the likes of Leibniz, Newton, Descartes, Reimann, Euler and Gauss.
- is a gifted mathematician whose work has been published.
- has been a SDCTM Executive Board member since 2011 and writes a quarterly newsletter article.
- interested in hoppy that is believed to be a form of psychotherapy.
- believes that body armor is a veil, suit and gloves.
- loves the birds and the BEES.
- is USD’s Mathematical Sciences Department Chair.

Our 2019 Distinguished Service recipient is Dan Van Peursem,



2019 Friend of Mathematics

Each year, SDCTM recognizes a person, group or entity that has benefited SDCTM and the work that we do to serve Math teachers around the state. It is generally a surprise to the recipient(s). When Allen Hogue, SDCTM President presented the award, he gave some background about this year’s recipient in a series of clues.

- loves to read.
- is a good listener.
- is willing to go the extra mile to help any teacher.
- has positively impacted the practices of many teachers and the lives of many students.
- creates and leads fun, meaningful professional learning experiences for educators in SD.
- seeks to lift up and celebrate accomplished teaching.
- has a job that has many moving parts and has learned the fine art of “juggling” responsibilities.
- knows what “unpacking” is all about.
- has what I call Vitamin “C”. Caring, Concern, and Commitment.

Our 2019 Friend of Mathematics is Nicol Reiner.





Presidential Award for Excellence in Math and Science Teaching

At the SDCTM/SDSTA Conference banquet this year we recognized Christine Saltsman, Traci Stiegelmeier, and Kim Webber as state level finalists for the PAEMST award.

Christine Saltsman, a mathematics teacher from Gettysburg, SD has been teaching for 18 years. She currently teaches 6th-8th grade mathematics, and k-8th grade physical education. Christine graduated from Dakota Wesleyan University with a Bachelor of Arts degree in Elementary Education along with a 5-8 Middle Level endorsement in 2000. She earned her Master of Arts degree in Differentiated Instruction from Concordia University in 2017. Christine volunteers as an EMT in her community and is a member of SDCTM and NCTM.

Traci Stiegelmeier, a 3rd-5th grade mathematics teacher from Wakpala, SD has been teaching for 6 years. Traci graduated from the University of Mary with a Bachelor of Science degree in Early Childhood Education, Elementary Education, and Special Education. She earned her Master of Science degree in Curriculum and Instruction from Black Hills State University in 2018. Traci is a member of SDEA, SDCTM, and NCTM.

Kim Webber, a 2nd grade teacher from Black Hawk, SD has been teaching and performing curriculum specialist/consulting duties for 35 years. Currently, Kim is now a literacy coach in the Rapid City School District. Kim graduated from the University of Lethbridge with a Bachelors degree in Education in 1984. She completed her Masters degree in Curriculum and Instruction from the University of Alberta in 1990 and earned a Math Specialist Endorsement from the South Dakota Department of Education in 2014. Kim has been involved in writing/reviewing Smarter Balanced summative assessments and Digital Library material and has authored "Sunshine Classics" which is a reading program. She is a member of SDCTM and NCTM.



*at right:
Allen Hogie, Math
PAEMST State Coordinator
and Math Finalists
Christine Saltsman,
Traci Stiegelmeier, and
Kimberly Weber*



2020 SD STEM Ed Conference Registration Information

We would love to see you at the 2020 SD STEM Ed Conference. The conference will be February 6, 7, and 8, 2020. We will once again be in Huron, SD because the Crossroads and Huron Event Center are so very good to us and help us to keep our costs affordable with several “perks” for which we do not have to pay such as meeting rooms, suites with work space, and conference rooms to name just a few. That being said, food costs have increased and it is necessary for us to raise our rates to cover our increases. It is very helpful to us to have our paid registrations completed two weeks before the conference. The following 3-tier fee structure reflects the cost increase and our efforts to reward early registration.

An additional change in registration for 2020 is that we will no longer accept paper registration forms. ALL registrations will be on-line. You will continue to have an option to mail in a check to complete your registration.

Sheila McQuade
 SD STEM Ed Conference Treasurer & Registrar
 SMcQuade2@sfcss.org

In 2020 all registrations will be on-line. Mailing in a check for payment will still be an option.

2020 SD STEM Ed Registration rates		
Early Bird - June 1 - Dec 15		
	2 day registration	1 day registration
member	\$85.00	\$60.00
student	\$30.00	\$20.00
non-member	\$135.00	\$110.00
Pre-registration Dec 16 - Jan 24 (payment must be postmarked 1/20 or online payment COMPLETED by 1/24 or you will be "bumped" to the next tier)		
member	\$100.00	\$75.00
student	\$35.00**	\$25.00
non-member	\$150.00	\$125.00
On-site Registration		
member	\$120.00	\$95.00
student	\$65.00	\$55.00
non-member	\$170.00	\$145.00
** There is a smaller increase for students at this point because of their schedules.		
Students interested in attending may not be in contact with the content area professors before the beginning of second semester.		

Be sure to include the 2020 SD STEM Ed Conference in your budgets for next year!

EGGCELLENT FACTORING PRACTICE!

Students work in groups of 2-4 to practice general trinomial factoring, difference of squares, and perfect square factoring in an engaging seasonal format. (approximate time 20-30 minutes)

A.SSE.2 Recognize and use the structure of an expression to identify ways to rewrite it.

A.SSE.3 Choose and produce an equivalent form of an expression



1. Use a permanent marker to number the outside of a set of plastic Easter eggs 1-20.
2. Cut apart problem set (below) and place the corresponding problem into each numbered egg. Place eggs into an Easter basket or other container.
3. Students open the egg and work with their group member(s) to completely factor the expression. When finished, check solution with teacher.
4. Students reassemble and return the egg, then select another one.
5. To avoid duplication, students can use a tracking sheet to record which eggs have been used.
6. To complete the activity, each group will correctly factor ten different expressions.

Variation: Put the factored form into the eggs instead. Students practice polynomial multiplication to simplify expressions.

Student tracking sheet (1 for each group of students): Cross off each numbered egg as completed.

1 2 3 4 5 6 7 8 9 10

11 12 13 14 15 16 17 18 19 20

Expressions (cut apart and insert into eggs)

Solutions (for teacher use)

1. $a^2 + 7a + 12$

1. $(a + 3)(a + 4)$

2. $n^2 - 9n + 20$

2. $(n - 4)(n - 5)$

3. $x^2 - 7x - 18$

3. $(x - 9)(x + 2)$

4. $t^2 + 17t + 42$

4. $(t + 3)(t + 14)$

5. $a^2 + 29a + 4$

5. $(a + 4)(7a + 1)$

6. $5n^2 + 13n + 6$

6. $(5n + 3)(n + 2)$

7. $4x^2 - 5x + 7$

7. Prime

8. $4t^2 + 22t + 10$

8. $2(2t + 1)(t + 5)$

9. $2a^2 + 9a - 18$

9. $(a + 6)(2a - 3)$

10. $x^2 - 49$

10. $(x + 7)(x - 7)$

11. $a^2 - 121$

11. $(a + 11)(a - 11)$

$$12. \quad n^4 - 16 \qquad 12. (n^2 + 4)(n + 2)(n - 2)$$

$$13. \quad 16y^4 - 1 \qquad 13. (4y^2 + 1)(2y - 1)(2y + 1)$$

$$14. \quad 5a^2 - 80 \qquad 14. 5(a - 4)(a + 4)$$

$$15. \quad a^2 + 12a + 36 \qquad 15. (a + 6)^2$$

$$16. \quad 25x^2 + 60x + 36 \qquad 16. (5x + 6)^2$$

$$17. \quad 25a^2 - 40a + 16 \qquad 17. (5a - 4)^2$$

$$18. \quad 16t^2 - 56t + 49 \qquad 18. (4t - 7)^2$$

$$19. \quad n^4 - n^2 \qquad 19. n^2(n + 1)(n - 1)$$

$$20. \quad a^2 + 5a + 25 \qquad 20. \text{Prime}$$

Cindy Kroon

Cindy.Kroon@k12.sd.us

Montrose High School

South Dakota Council of Teachers of Mathematics

July 10, 2019

SDCTM 2019 Summer Symposium
Dakota Wesleyan University, Mitchell SD

Taking Action: Implementing Effective Mathematics Teaching Practices

Wednesday
July 10, 2019

Instructor: Sharon Rendon
 CPM Mathematics Director of Professional Learning, NCSM Regional Director

Cost:
SDCTM Members
\$50.00
Nonmembers
\$100.00

Registration: 8:00 am
 Session 8:30-4:00

DWU Graduate credit
 is available (+\$70)

**Registration
 deadline: May 30**

Activities will be
 applicable for grades
 4-12.

Bring your laptop or
 tablet computer.

SDCTM is an Affiliate of the National Council of Teachers of Mathematics. (www.NCTM.org)

Effective teaching matters for student learning of mathematics. Through this workshop, gain a richer understanding of the high-leverage, research-informed teaching practices identified in NCTM's *Principles to Actions*.

What is the role of facilitating student discourse? In what ways can teachers support productive struggle so students take ownership of their learning? How do the eight teaching practices form a framework to guide the daily work of teaching mathematics? The session will engage you with classroom strategies and resources to experience and see how the teaching practices can be implemented effectively across all grades.

Participants are encouraged to bring their own device to learn how to model 5 of the mathematical teaching practices using a Desmos activity.

- Location: DWU Campus Mitchell, SD
- Registration: \$50 for SDCTM members or \$100 for nonmembers.
- Questions about registration? Contact jay.berglund@k12.sd.us

Don't delay! Registration is limited to a maximum of 32 participants (first come basis) for the session. Minimum 16 participants required.

To register for the symposium:

- Complete this form and mail with payment \$50 (SDCTM member) \$100 (nonmember)
- Please send this form and check payable to SDCTM to:

Jay Berglund
 204 S. Exene ST
 Gettysburg, SD 57442

- Questions: email jay.berglund@k12.sd.us
- Not a member yet? Join now! Go to <http://www.sdctm.org/joinsdctm.htm>

DWU Graduate credit

Do not send payment for DWU credit with your registration. You will register and pay for credit (+\$70) when you arrive on campus July 10.

Name _____

E-mail address _____

Home/Summer Address _____

Home phone _____

School _____

ABOUT US

The National Science Foundation (NSF) created the first Experimental Program to Stimulate Competitive Research (EPSCoR) program in 1980. Its success led congress to expand the program and since 1990 create EPSCoR-like programs in several federal agencies, including: USDA, NIH, DoD, DoE, NASA and EPA.

Now named the Established Program to Stimulate Competitive Research, EPSCoR identifies develops, and uses a state's academic science and technology resources to support its economic growth and promote a more productive and fulfilling way of life for its citizens. EPSCoR acts on the premise that universities, their science and engineering faculty, and their students are valuable resources that can influence a state's development in the 21st century. To achieve this goal, NSF provides lasting improvements to the state's academic research infrastructure that increase its national research and development competitiveness.

Research

- EPSCoR recognizes that universities are valuable resources. Their science and engineering programs, as well as faculty and students, are major assets to the state. Currently, SD EPSCoR supports facilities, faculty, students, and equipment at South Dakota Universities.
- EPSCoR/IDeA universities, their faculty, and students are leading the way in the 21st century. These researchers are needed for the nation to meet its most pressing priorities in health, cyberinfrastructure, and homeland security. A broad science and technology base is especially important in an era when different regions have unique issues involving resources, health, security, and the environment.
- Scientific and technological research cannot be limited to a few states if the nation is to maintain world leadership and reach its full potential. Along with stimulating competitive research and promoting excellence in education, EPSCoR/IDeA improves access to that high-quality education and cutting-edge research, expands economic opportunity, creates jobs, and improves the quality of life across the nation.

Economic Development

- To nurture economic development in South Dakota, SD EPSCoR partners with the SD Governor's Office of Economic Development, the SD Office of Commercialization, and the SD Board of Regents. Through these collaborations business/technology education programs are created.
- Global competition demands a highly skilled workforce, and the country's economic future depends on scientific and technological advances everywhere, not just in a few places. Through EPSCoR/IDeA, participating states and territories are building a high-quality, university-based research infrastructure, a backbone to their scientific and technological enterprises, and a strong and stable economic base into the next century.

Education

SD EPSCoR promotes and supports educators, research faculty, and programs in the areas of science, technology, engineering, and mathematics (STEM).

- Advances in science and engineering are essential for ensuring America's economic growth and national security. During the next decade, U.S. demand for scientists and engineers is expected to increase at four times the rate for all other occupations. Today's high school students overall are not performing well in math and science, and fewer of them are pursuing degrees in technical fields.
- Outreach and informal science education activities engage more than 35,000 SD residents per year.

Diversity

The SD EPSCoR diversity plan represents bold, catalytic, strategic and systemic approaches to recruiting and supporting citizens of all races, ethnicity, nationality, gender, age, economic status, and sexual orientation within STEM. With a small population, South Dakota must take advantage of all its human resources if it is to advance.

SD EPSCoR Diversity Goals and Strategies:

- Develop a mechanism for sharing successful diversity initiatives and discussing policies, progress and barriers statewide. The annual SD EPSCoR Diversity Summit will be a venue for sharing and linking promising, but currently disconnected diversity initiatives.
- Develop meaningful partnerships between state government, K-12, higher education and the private sector to strengthen STEM education for diverse audiences and to diversify STEM-related workforce. Utilizing statewide initiatives to improve instruction for underrepresented groups and those in remote regions as well as diversifying SD's STEM workforce.



Innovative Strategies to Close the Fraction Gap

I am Jim Franklin, a special education teacher from Elm Street Elementary in Rome, GA. I have taught students for over 20 years in inclusion, resource, and self-contained settings. Due to the need from my students, I have developed innovative fraction strategies and an instructional process for all students, including low vision and blind, to learn fraction standards that will improve their confidence, increase rate of mastery, and create real world connections.

Fraction strategies are equally important as to the process in which they are presented to students. Because learning fraction standards is intimidating and frustrating for many students, it is important to create a “we are all in this together” mindset in the classroom to promote collaborate learning and set student-guided goals and rewards after they master benchmarks in the process.

Benchmark Goal 1/3: Students will incorporate real world connections and demonstrate mastery of visual representations.

Mastering this benchmark is critical for all students in order for them to have the foundational skills to master Benchmarks 2/3 and 3/3. They need to be proficient in the following tasks:

1. Demonstrate the ability to accurately shade circles, squares, and triangles in fractional parts
2. Fold paper into fraction strips with increments of 12ths and 16ths
3. Add and subtract common fractions on a number line

Benchmark Goal 2/3: Students will demonstrate the ability to add and subtract fractions with mixed numbers with commonly recognized denominators (2, 3, 4, 6, 8, 12, and 16) by using manipulatives.

Mastering this benchmark is critical for students before they attempt adding and subtracting fractions with abstract denominators. Teachers often skip this step and go from Benchmark 1/3 to 3/3 too quickly, causing confusion for many students. They need to be proficient in the following objectives:

1. Compare fractions by using fraction cubes and magnetic fraction strips on a dry erase board.
2. Add and subtract common fractions numbers using manipulatives
3. Add and subtract mixed numbers with different denominators with manipulatives to check their work. Refer to the addition and subtraction problems below that can be solved with manipulatives.

Benchmark Goal 3/3: Students will add and subtract mixed numbers with common and abstract denominators.

Mastering this benchmark is important for students so that they can correctly solve math reasoning problems.

1. Teach strategies (such as using a T-Chart) to find common denominators
2. Add and subtract fractions and mixed numbers with denominators of 2, 3, 4, 6, 8, 12, and 16 and then have students use manipulatives to check their work for accuracy
3. Assign mixed numbers with abstract denominators

“Fraction strategies are equally important as the process in which they are presented to students.”



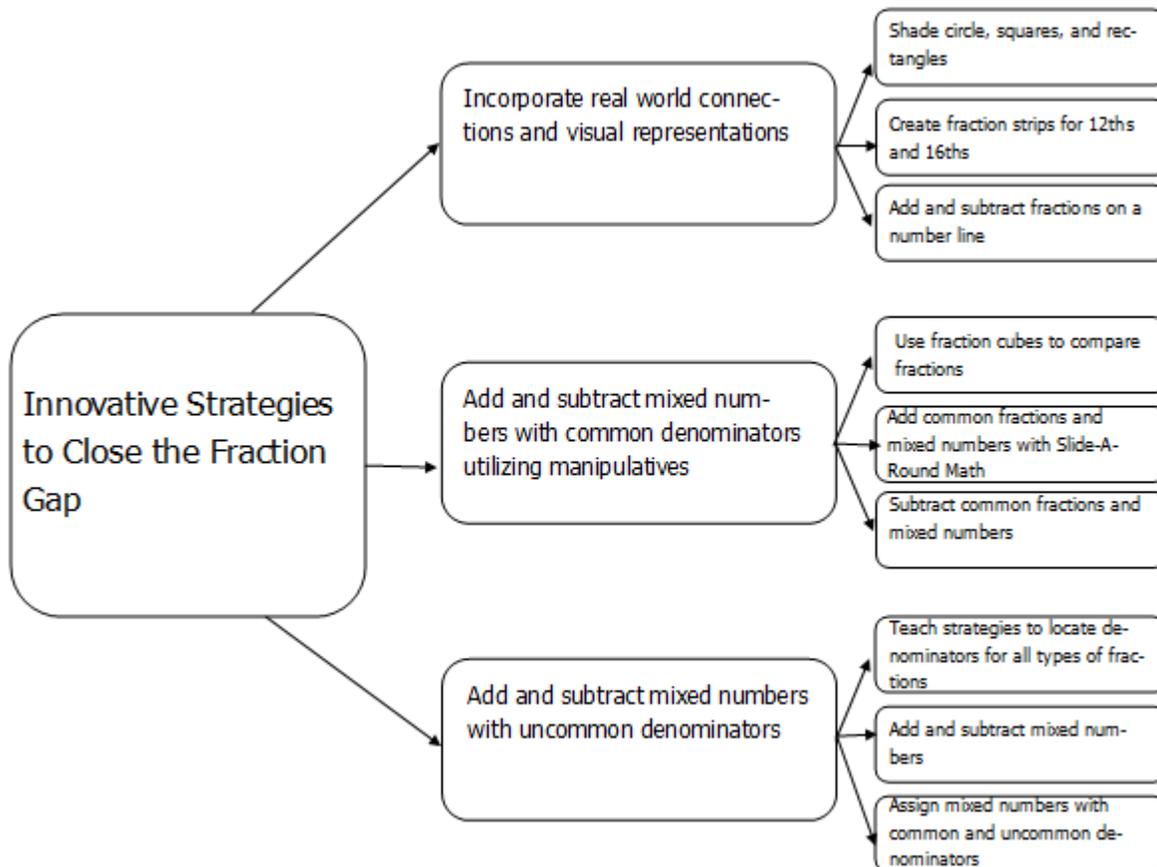
Innovative Strategies to Close the Fraction Gap *continued*

Fractions are essential standards for students to master on classroom tests as well as on standardized assessments. By providing additional strategies and visual aids to support students' instruction, they are given opportunities to strengthen the necessary foundational skills to transition from "How many parts are shaded?" to "Subtract $3\frac{7}{11} - 4\frac{1}{19}$." Traditional methods of teaching strategies are valid and must be implemented on a regular basis, but innovative strategies are necessary to reach all students and to close the fraction gap.

To view an Easter seals Indianapolis demonstration video in how to use the fractions' manipulatives effectively, please visit www.slidearoundmath.com.

Jim Franklin
Elm Street Elementary
Rome, Georgia
slide-a-round@comcast.net

"Fractions are essential standards for students to master.."





Presidential Awards Nominations

Know a Great 7-12 Mathematics or Science Teacher? Nominate him or her to receive the Presidential Teaching Award!

The PAEMST program was established in 1983 by the White House and is sponsored by the National Science Foundation. The award is the nation's highest honor for math and science (including computer science) teachers. The program identifies outstanding math and science teachers in all 50 states and four US jurisdictions.

Awardees each receive a \$10,000 award, a paid trip for two to Washington, DC to attend a week-long series of networking opportunities and recognition events, and a special citation signed by the President of the United States.

This year's cycle will recognize outstanding **secondary teachers in grades 7 - 12**. The application deadline will be **May 1, 2019**. Nominations will be accepted until March 1, 2019. You can nominate a deserving teacher by visiting www.paemst.org.

Other than this, **WHY** would someone want to complete the application process?

Three CEU's from the South Dakota Department of Education can also be earned toward certificate renewal by completing the application process. To be eligible, a PAEMST candidate must complete all components of the application process and submit a scorable application that can be sent on to the state selection committee. All applicants submitting a scorable application will earn credit, not just the state finalists whose materials will be sent on to a national selection panel.

The PAEMST application consists of three components: Administrative, Narrative, and Video. The components allow the applicant to provide evidence of deep content knowledge and exemplary pedagogical skills that result in improved student learning. After eligibility is confirmed and technical specifications are met, each application will be evaluated using the following five Dimensions of Outstanding Teaching:

- Mastery of mathematics or science content appropriate for the grade level taught.
- Use of instructional methods and strategies that are appropriate for students in the class and that support student learning.
- Effective use of student assessments to evaluate, monitor, and improve student learning.
- Reflective practice and life-long learning to improve teaching and student learning.
- Leadership in education outside the classroom.

If you have any questions, please contact:

Allen Hogie
SD PAEMST Mathematics Coordinator
Allen.Hogie@k12.sd.us
605.553.8095





THE SANFORD PROMISE

Inspiring the next generation of scientists.

2018-19 K-12 SCIENCE EXPERIENCES

The mission of the Sanford PROMISE is to increase the community's understanding of science and their awareness about the benefits of research to our society. Visit us online at: www.sanfordresearch.org/education, connect with us at 605.312.6417 or SanfordOutreach@sanfordhealth.org to learn more about these programs or to inspire us with your own ideas for connecting youth, educators, and scientists!

Visit the **Sanford PROMISE Community Lab** for a tailored, hands-on experience in the heart of Sanford's working research facility to learn what it takes to be a biomedical scientist through hands-on activities, tours, and interactions with Sanford scientists.

Middle Level Biomedical Exploration

In early March we set aside a week for large middle school groups to learn about how biomedical scientists work towards finding the *cure to cancer*.

Research Shadowing

Students age 16 and older explore a working research lab environment and learn about the qualities required for a career in biomedical research. Teachers are invited to shadow too!

PROMISE Scholars

Immersive research experience for rising high school seniors. Juniors apply in fall 2018 for summer 2019 experiences.

Science Discovery Days

In November 2018 and April 2019, we invite high school sophomores and juniors to connect with regional scientists and biomedical researchers through interactive career presentations and exhibits from area industries and universities.

Elementary Inquiries

K-6th grade students practice the research process with hands-on activities. *Science to make you sweat* (K-2 grade, October 2018); *Diabetes: Finding the Cure* (3-6 grade, December 2018); *Power-up Brain Science* (K-2 grade, January 2019); *Enabling Technologies* (3-6 grade, May 2019).

Check the website often for student and teacher workshops in summer 2019 and additional events and opportunities.

 Like Sanford Research on Facebook

 Follow @SanfordPROMISE on Twitter

SANFORD
RESEARCH



Print a copy of this form. Mail with check payable to SDCTM to:

Jay Berglund
204 S. Exene Strert
Gettysburg, SD 57442

Name _____

School Name _____

Subjects or Grades Taught _____

Addresses

Home _____

School _____

Mailing Address: _____ Home _____ School _____

Home Phone _____

School Phone _____

Fax Number _____

E-mail _____

Membership categories (Check only one)

- _____ Elementary School \$5.00
- _____ Middle School / Junior High \$20.00
- _____ High School \$20.00
- _____ Post Secondary \$20.00
- _____ Retired \$5.00
- _____ Student \$5.00
- _____ Other \$20.00

We now offer the option to use PayPal to pay your dues for a minimal processing fee of \$1.00. The processing fee will cover the processing fees incurred by SDCTM and fees charged for having checks cut by PayPal.

*Instructions can be found online at:
<http://www.sdctm.org/joinsdctm.htm>*



SDCTM Newsletter
C/o Sheila McQuade
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2019-2021

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