



# Wahpe Woyaka pi

## (T a l k i n g L e a f )

South Dakota Council Teachers of Mathematics Newsletter

## Presidential Ponderings

Hello friends and happy winter!

This is a busy time for SDCTM! We are busy preparing for our upcoming SD STEM ED conference which is held at the Huron Crossroads Hotel and Convention Center, February 6-8. Thursday night kicks off with a sharing session. This is a time where you can meet informally with South Dakota teachers and walk away with ready to use lessons, activities, games and more. We provide a pizza dinner and you provide the activities! When you come, make sure you have 25 copies to share with your fellow South Dakota teachers.

Friday and Saturday will be filled with over 100 sessions featuring speakers in math, science and STEM education. We are so excited for all the wonderful presenters who are willing to share their knowledge and expertise in teaching mathematics to students. There are so many great sessions! A couple are “5 Math Resources to Make Math Fun,” “You Khan get the Data,” and “WE ARE... NOT your traditional math class!” Sessions range from Kindergarten to Post High School.

We also have two nationally known speakers coming and braving the South Dakota winter. Sean Nank is from San Diego. He is presenting on topics such as Design Thinking in STEM classrooms and Standards Based grading. Annie Fetter is from Vermont. Annie is known for “What do you notice? What do you wonder?” I am excited because she is going to talk about Noticing and Wondering in both elementary and secondary classrooms!

New this year will be the opportunity to peruse and order NCTM books. We will have samples set up and attendees will receive a 20% discount off list price and free shipping when they order using a flyer provided at the conference. If there is an NCTM book you have been thinking about purchasing, this will be your opportunity to save a little money.

It is not too late to register for the conference. This year we have gone paperless, so you will not see the “yellow flyer” in your mailbox. Instead, we have been spreading the word through emails, our newsletter, and the DOE math and science list serve. To register, visit our website: [www.sdctm.org](http://www.sdctm.org) before January 24. If you miss the deadline, you can register after Jan 24<sup>th</sup>, but the registration fee is higher.

Don't forget to also register for the graduate credit from DWU. Check out our website for more information!

There are so many great things happening in South Dakota. Being able to connect, share ideas, and problem solve together is why I originally joined the South Dakota Council of Teachers of Mathematics. Since then I have made new friends and have grown as an educator. I hope you also find the experience rewarding. We have so many great teachers in South Dakota and I am looking forward to learning from YOU in February!

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



WINTER 2019-2020

## Wahpe Woyaka pi

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### Calendar Notes:

- *SD STEM Ed Pre-Registration ends January 24, 2020*
- *2020 SD STEM Ed Conference February 6-8, 2020*
- *2020 PAEMST Nominations Due March 1, 2020*
- *2020 PAEMST Applications Due May 1, 2020*



## Musings from Sheila

One of the things I have always had an interest in is how we learn, how our brains process information. I am often frustrated by the change in the behaviors of my students while at the same time I am intrigued by how different their learning is when compared to students 20 years ago. The brains of the students I have now have developed differently than the brains of students I once taught. “The way adolescents of today learn, play, and interact has changed more in the past 15 years than in the previous 570 since Gutenberg’s popularization of the printing press. The Internet, iPads, cell phones, Google, Twitter, Facebook, and other modern marvels unleash a virtual gusher of information to the plugged in teen brain.” (*The Digital Revolution and Adolescent Brain Evolution*, Jay N. Giedd). They seem to know how to find information quickly but do they know how to solve a problem? They can look up an answer but do they understand the why or how involved in getting to that answer?

O<sup>†</sup>Gorman became a one to one school last year when we assigned a Chromebook to each student. I know that many of you have been working in just such an environment for several years. I am resistant to using the Chromebook just for the sake of using technology but at the same time I have found some applications that have proven valuable to me and my students such as Desmos (both the online calculator as well as the bank of activities found at [www.teacher.desmos.com](http://www.teacher.desmos.com)), Kahoot, EdPuzzle, Camtasia, Quizlet and Quizlet.live. Recently, I was (re-) introduced to PearDeck. Using PearDeck, teachers can turn any slide show in to an interactive slide show. My first PearDeck enhanced slide show was one that I created specifically for reviewing the special segments in triangles (angle bisector, median, altitude and perpendicular bisector). Students need a device much like using Kahoot or Quizlet.live in class, but the difference is that a student’s response can be made by typing in an answer, placing an icon on a particular part of the slide, clicking on the correct choice, or by using the drawing tools to highlight a part of a drawing or drawing a line. You can lock the screens and then scroll through students’ answers (without their names) to discuss the slide and how each one answered/solved the problem providing students with the immediate feedback that is so valuable. I found that by “playing along” on my phone using a personal gmail account gave me an answer key to share with the students (some partial screenshots are below). It took a lot more time to prepare than what I’ve done previously, but kids responded well and several said that they liked it and found it valuable.

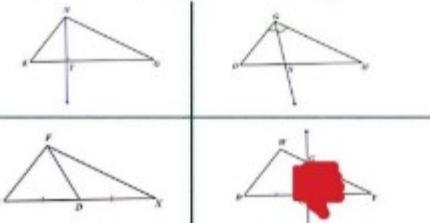
I believe the challenge for teachers is to find lessons/activities that are technology based yet still provide value in our content area. Not one of us wants to use computers or other technology just so that we can check a box on a survey indicating that we’ve used tech in our classes.

Sheila McQuade  
SDCTM President-Elect  
[SMcQuade@OGKnights.org](mailto:SMcQuade@OGKnights.org)



*“The way adolescents of today learn ... has changed more in the past 15 years than in the previous 570 ... ”*

Which of these doesn't belong?



Students, drag the word

Draw lines to match the special part of a triangle with the corresponding point of concurrency.



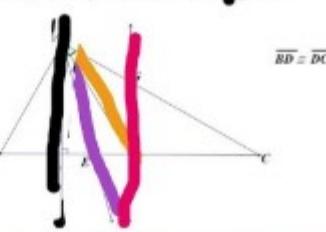
Trace the line, segment or ray in the corresponding color to identify the special parts of the triangle.

Altitude

Angle Bisector

Median

Perpendicular Bisector



Students, draw anywhere on this slide

Pear Deck - Interactive Slides



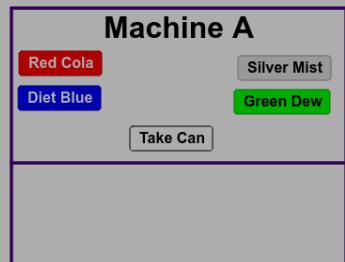
## 6-8 Highlights

Is this Vending Machine FUNCTIONing Correctly?

I was privileged enough to go to the NCTM conference in Nashville this October and found a FANTASTIC ready-made lesson to introduce functions to my 8<sup>th</sup> graders. This is roughly a 45-minute lesson to get kids to start thinking about what makes a function. Students are given several examples of functions and NON functions. Students work in small groups to figure out what makes a function a function.

This machine is a function.

This machine is NOT a function.



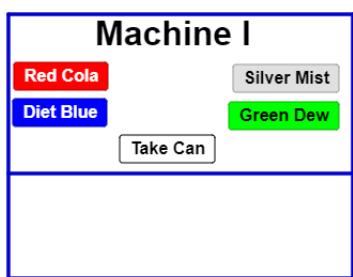
Don't forget to click Take Can each time.

Then it progresses to questions where students figure out which one is a function, and which is not.

Which machine is a function?



*“...get kids to start thinking about what makes a function a function.”*



I have included an answer key as well (see pg 4). Hope you find the gem of a lesson plan ready to use with little prep just like I did.



## Is this Vending Machine FUNCTIONing Correctly?

<https://go.uncc.edu/NCTMSD2019>

This One is a Function		This One is Not a Function	
A	Red – Red Blue – Blue Silver – Silver Green – Green	B	Red – Red Blue – Blue Silver – Random Green – Green
This One is a Function		This One is Not a Function	
C	Red – Blue Blue – Red Silver – Silver Green – Green	D	Red – Red Blue – Random Silver – Silver Green – Green
Which One is a Function			
E	Red – Red Blue – Blue Silver – Silver Green – Random	F	Red – Silver Blue – Green Silver – Red Green – Blue
Which One is a Function			
G	All Random	H	Red – Blue Blue – Silver Silver – Green Green – Red
Which One is a Function			
I	Red – 2 Silvers Blue – Green Silver – Red Green – Blue	J	Red – Red Blue – Blue & Random Silver – Silver Green – Green
Which One is a Function			
K	Red – Random Pair Blue – Blue Silver – Silver Green – Green	L	Red – Green Blue – Green Silver – Green Green – Green
Are these functions?			
M	Red – Red Blue – Red Silver – Silver Green – Silver	N	Red – Red Blue – Blue Silver – Silver Green – Green & Red



## 9-12 Spotlight

### Trigonometry Fun

In the 2<sup>nd</sup> quarter of the year, our Precalculus class moves into trigonometry. Students already know right triangle trig ratios from prior classes, but here we will expand trig relationships beyond the right triangle into the trig functions at any angle measure. The student learning objectives for this unit include the following.

- 1) I can find trig values of the special angles. (Multiples of 30°, 45°, or 0°.) I do not encourage my students to memorize these values. Instead we focus on understanding how to create these values quickly with triangles.
- 2) I can describe how the right-triangle definitions of trig functions relate to the periodic graphs of the trig functions.
- 3) I can graph accurately the trig functions.

Students achieve each of these objectives through an extended exploration that allows them to find all this information using knowledge of triangles and right-triangle trig.

#### Step 1 – Building those special right triangles.

##### 30°-60°-90° Right Triangle

Starting with just a single sheet of printer paper and using four quick folds, students create an equilateral triangle. At this point, I give them the only piece of information that I will provide throughout the process. I tell them the side length of the equilateral triangle is 2 units. Of course, I could let them measure the side lengths with a ruler and they could use that length to do the same calculations, but the math is so much easier if we choose 2 units. Notice also, that I did not choose 1. Choosing 1 would have us create the unit circle, and I really want to stay away from the unit circle. The unit circle quickly moves towards students trying to memorize a bunch of factors without understanding, and that is not our objective. With the one side length specified, students can label all side lengths and angle measures of the equilateral triangle. Then, students fold the triangle in half. Using the known side lengths and angles from the equilateral triangle, students can quickly label the angle measures and two side lengths of the new 30°-60°-90° triangle. The students may need some prompting to remember that they can use the two known side lengths and the Pythagorean Theorem to find the missing side of their right triangle. Students now have a 30°-60°-90° triangle with correct side length ratios that they have created for themselves. I encourage them to document all their work on the triangle. This triangle becomes a basic building block for the trig work to come.



*“...I really want to stay away from the unit circle. The unit circle quickly moves towards students trying to memorize a bunch of factors without understanding, and that is not our objective. ”*

		$\begin{aligned} x^2 + 1^2 &= 2^2 \\ x^2 + 1 &= 4 \\ x^2 &= 3 \\ x &= \sqrt{3} \end{aligned}$
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*continued*



## 9-12 Spotlight *continued*

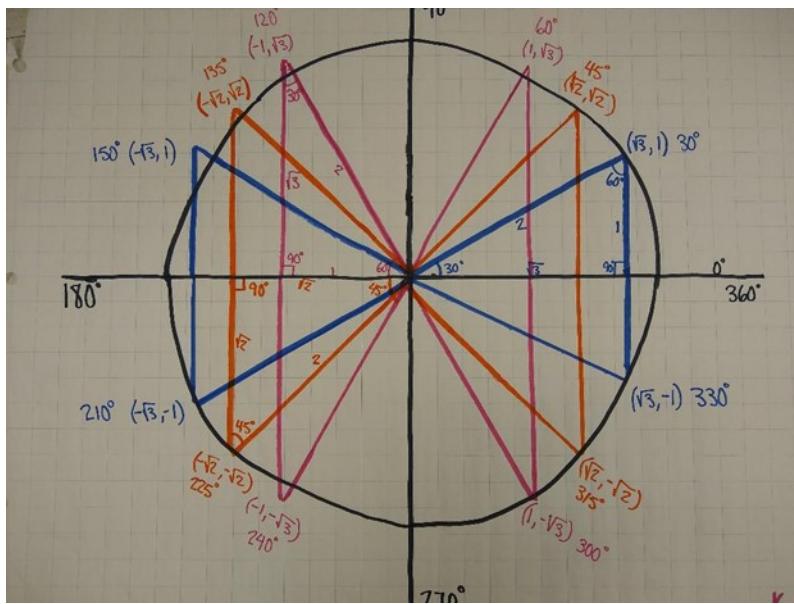
### 45°-45°-90° Right Triangle

Starting with a new piece of printer paper, students can make one fold and two quick cuts to create an isosceles right triangle with hypotenuse length matching the side length of the original equilateral triangle. Students can label all the angle measures and the length of the hypotenuse. Most students will need some prompting to see that they can use the Pythagorean Theorem to calculate the missing side length measures. Students now have a 45°-45°-90° triangle with correct side length ratios that they have created for themselves. I encourage them to document all their work on the triangle. This triangle becomes a basic building block for the trig work to come.

	$\begin{aligned} x^2 + x^2 &= 2^2 \\ 2x^2 &= 4 \\ x^2 &= 2 \\ x &= \sqrt{2} \end{aligned}$
--	--

### Step 2 - The Circle

Given a big sheet of paper, students are challenged to create a circle with a radius matching the hypotenuse of their triangles. That circle and an x and y-axis running through the circle are created using a single color. Using a new color and their 30°-60°-90° right triangles, students draw in each triangle with a reference angle of 30°. For each triangle drawn, students label the intersection between the triangle and the circle with coordinate of the point and the angle measure. Students use a new color to repeat the process for triangles with a reference angle of 60° and again for triangles with a reference angle of 45°. The result is a colorful and busy circle that helps students connect the special triangles to a circle.



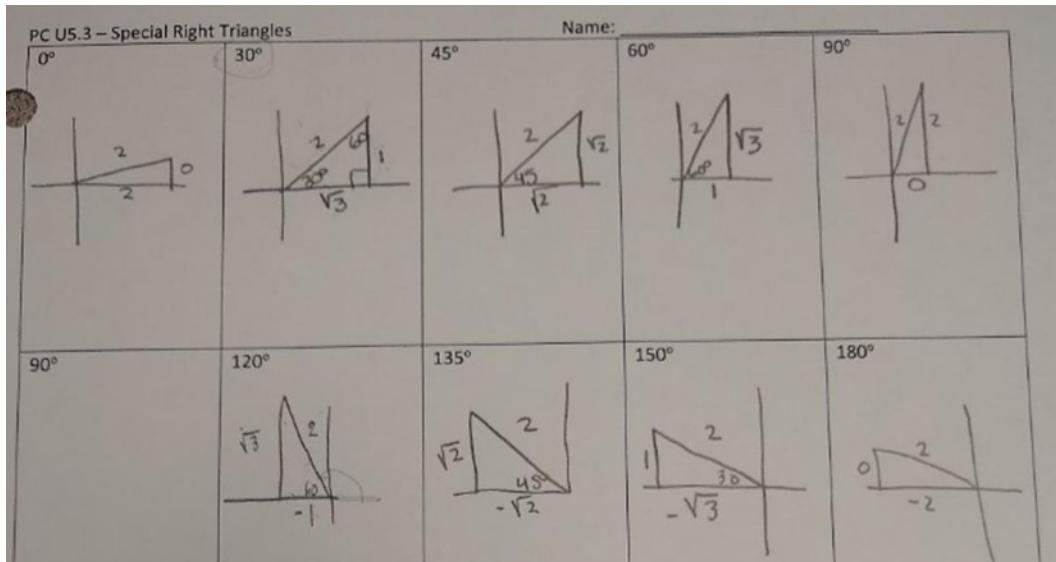
*continued*



## 9-12 Spotlight *continued*

### Step 3 – The Reference Triangles

Students are then encouraged to draw each of the triangles individually. The idea is that students can draw and label sides and angles for any triangle with a reference angle of a multiple of  $30^\circ$  or  $45^\circ$ . Students have previously explored the power of reference triangles and coterminal angles that lets one triangle expand to represent infinitely many angles.



### Step 4 – The Trig Table

Students now complete a standard trig table finding sine, cosine, and tangent for all special angles between  $0^\circ$  and  $360^\circ$  using the side length ratios of the triangles they drew in step 3. Students leave the ratios in exact value including radicals for the first trig table, but then they pick up a calculator to find decimal equivalents to help with the graph.

Table of Trigonometric Values														
$\theta$ (Deg)	$\theta$ (Rad)	Ref Angle	$\sin \theta$	$\cos \theta$	$\tan \theta$	$\csc \theta$	$\sec \theta$	$\cot \theta$						
$0^\circ$		NA	$\frac{\sqrt{0}}{2}$	$\frac{\sqrt{2}}{2}$	1	$\frac{\sqrt{0}}{2}$	0	$\frac{\sqrt{2}}{0}$	undef	$\frac{2}{2}$	1	$\frac{2}{0}$	undef	
$30^\circ$		$30^\circ$	$\frac{\sqrt{1}}{2}$	0.5	$\frac{\sqrt{3}}{2}$	0.87	$\frac{1}{\sqrt{3}}$	0.58	$\frac{2}{1}$	2	$\frac{2}{\sqrt{3}}$	1.15	$\sqrt{3}$	1.73
$45^\circ$		$45^\circ$	$\frac{\sqrt{2}}{2}$	0.71	$\frac{\sqrt{2}}{2}$	0.71	$\frac{\sqrt{2}}{\sqrt{2}}$	1	$\frac{2}{\sqrt{2}}$	1.41	$\frac{2}{\sqrt{2}}$	1.41	$\frac{\sqrt{2}}{\sqrt{2}}$	1
$60^\circ$		$60^\circ$	$\frac{\sqrt{3}}{2}$	0.87	$\frac{1}{2}$	0.5	$\frac{\sqrt{3}}{1}$	1.73	$\frac{2}{\sqrt{3}}$	1.15	$\frac{2}{1}$	2	$\frac{1}{\sqrt{3}}$	.58
$90^\circ$		NA	$\frac{\sqrt{2}}{2}$	1	$\frac{\sqrt{0}}{2}$	0	$\frac{\sqrt{2}}{0}$	X	$\frac{2}{2}$	1	$\frac{2}{0}$	undef	$\frac{0}{2}$	0
$120^\circ$		$60^\circ$	$\frac{\sqrt{3}}{2}$	0.87	$-\frac{1}{2}$	-0.5	$\frac{\sqrt{3}}{-1}$	-1.73	$\frac{2}{\sqrt{3}}$	1.15	$-\frac{2}{1}$	-2	$-\frac{1}{\sqrt{3}}$	-0.58
$135^\circ$		$45^\circ$	$\frac{\sqrt{2}}{2}$	0.71	$-\frac{\sqrt{2}}{2}$	-0.71	$-\frac{\sqrt{2}}{\sqrt{2}}$	-1	$\frac{2}{\sqrt{2}}$	1.41	$-\frac{2}{\sqrt{2}}$	-1.41	$-\frac{\sqrt{2}}{\sqrt{2}}$	-1
$150^\circ$		$30^\circ$	$\frac{\sqrt{1}}{2}$	0.5	$-\frac{\sqrt{3}}{2}$	-0.87	$-\frac{\sqrt{3}}{\sqrt{3}}$	-0.58	$\frac{2}{1}$	2	$-\frac{2}{\sqrt{3}}$	-1.15	$-\frac{\sqrt{3}}{0}$	-1.73

continued

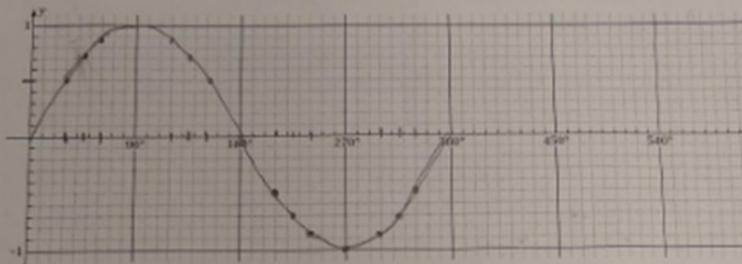


## 9-12 Spotlight *continued*

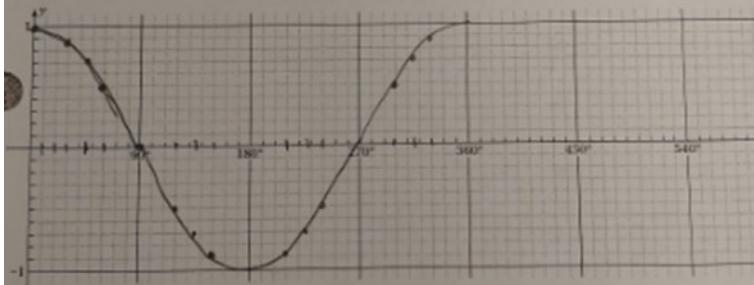
### Step 5 – The Graphs

Now students are ready to graph the trig functions without their calculator and without help from me. For each sine and cosine function, students are given a coordinate grid that runs from  $0^\circ$  to  $720^\circ$  on the horizontal axis and -1 to 1 on the vertical axis. For tangent, the coordinate grid runs from -2 to 2 in the vertical direction. For each trig function they plot the 17 points from the trig table and connect to see the function curve. At this point, students generally find a few errors on their trig table – often dealing with signs in quadrants 2 through 4. Students should also start to see how the period of sine and cosine relates to the degrees in a circle.

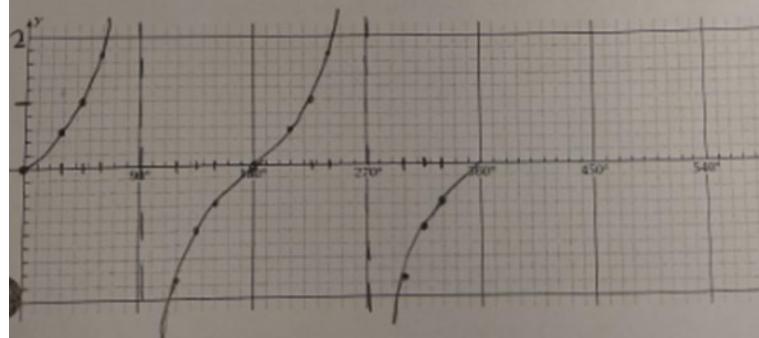
Use your trig table from section 5-3 to plot points for the graph of  $\sin x$ .



Use your trig table from section 5-3 to plot points for the graph of  $\cos x$ .



Use your trig table from section 5-3 to plot points for the graph of  $\tan x$ .



*continued*



## 9-12 Spotlight *continued*

### What to do next?

After a quick introduction to the reciprocal trig properties, students can use the same triangles drawn for this exercise to complete the trig table for secant, cosecant, and cotangent. Using coordinate grids running from -2 to 2 in the vertical direction, students can graph these new functions. It is really fun to see students create these graphs and puzzle about why they look the way they do.

What about those multiple of  $90^\circ$  angles?

Clearly it is important for students to know sine, cosine, and tangent values for  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$ ,  $270^\circ$ ,  $360^\circ$ , etc. I want my students to know these from understanding rather than from memorization. There are several ways to get to these values, and we eventually explore them all in our classroom, but for this section, we try to explore using the idea of an imaginary triangle. We all know that  $0^\circ$  does not actually make a triangle, but we could think about the limit of a triangle with a very small angle.

	$\sin 0 = \frac{0}{2} = 0$ $\cos 0 = \frac{2}{2} = 1$ $\tan 0 = \frac{0}{2} = 0$
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We could also do the same for each multiple of  $90^\circ$ . I will show  $270^\circ$  here since it is often the most challenging for students to draw.

	$\sin 270 = \frac{-2}{2} = -1$ $\cos 270 = \frac{0}{2} = 0$ $\tan 270 = \frac{-2}{0} = \text{undefined}$
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Happy Trigging!

I hope this exploration has given you a couple of ideas that you could use in your classroom. If you learn something new and useful as you work with your students on this material, please forward it on to me at [Jennifer.Haar@k12.sd.us](mailto:Jennifer.Haar@k12.sd.us).



## Higher Ed Viewpoint

Greetings once again from the BOR institutions! As I type this letter we have just completed the semester and our students are waiting to take their final exams. I trust you are all ready to close out the first half of the year as well and that you can look back to many successes in the classroom over the past few months.

I would like to inform everyone on events that will be taking place on the various campuses this spring. In that spirit, here is some shameless advertising.

- SDSU will be a host site for the AMC 10B and AMC 12B (American Mathematics Competitions sponsored by the Mathematical Association of America) on Wednesday, February 5<sup>th</sup>, 2020, from 1:30 to 4:00 PM in the SDSU Student Union Campanile Room. There will be no cost to participants. For more information or to register on or before January 2nd, please contact Dr. Jung-Han Kimn at [jung-han.kimn@sdstate.edu](mailto:jung-han.kimn@sdstate.edu)
- USD will host the 65<sup>th</sup> Annual Merten Hasse Mathematics Contest on April 4, 2020. Please go to the website for registration and further information. <https://www.usd.edu/arts-and-sciences/math/merten-hasse>
- NSU will host their annual high school math competition on April 22. For more information contact Stacy Trentham at [Stacy.Trentham@northern.edu](mailto:Stacy.Trentham@northern.edu)
- SDSMT will host the West River Math Contest on Monday, May 11. The testing categories include Algebra I, Algebra II, Geometry, Advanced Math, and Master's math topics. Students in both middle and high school can participate! Registration information can be found online <https://www.sdsmt.edu/Academics/Events-and-Outreach/WRMC/West-River-Math-Contest/>.
- The Black Hills Math Circle is a monthly enrichment mathematics program open to high school students from around The Black Hills area. Students visit the BHSU campus on Saturday mornings and do interactive (and fun!) mathematics activities, where they are encouraged to investigate new topics in a deeper and more collaborative way than they are used to. Some of the topics students have explored over the past two years have included introductory coding, the mathematics of gerrymandering and redistricting, the card game SET, and Sierpinski triangles with 3D printing. 2020 Math Circle sessions will include programming, voting methods, and more. Modest travel stipends are available to attending teachers. Visit the Black Hills Math Circle's Facebook page for more details about the group here: <https://www.facebook.com/Black-Hills-Math-Circle-320116491357575/>

There are many opportunities for you to bring your students to our campuses and I hope you can take advantage of some of them. I look forward to seeing you all in Huron at the annual math and science conference. It is coming up soon! I wish you all a much needed and deserved relaxing break with family over the holidays.

Sincerely,

SDCTM Vice President & Liaison to Higher Education  
Professor and Dept. Chair  
The University of South Dakota  
Dan.VanPeursem@usd.edu



*"There are many opportunities for you to bring your students to our campuses..." "*



## SD STEM Ed ... What to wear?

There is no real dress code for attending the conference. You may wear whatever you like during the day. Some teachers dress in professional wear for the daytime sessions, others choose to wear jeans and still others sport their school logo/mascot for the day.

Saturday is definitely a bit more casual as the majority of attendees travel home on Saturday afternoon. The SD STEM Ed Conference has dubbed Saturday, "Classy T-shirt Day". Many choose to wear their favorite Math or Science themed shirt with jeans.

Many dress up for the Friday evening banquet. Several have stated that they wished that it was advertised as a dressy occasion. Rest assured, there is not a dress code and you will not be turned away, even if you are in jeans, but many do wear dresses/suits.



## Wine Raffle to Benefit the McCann Scholarship

A scholarship in memory of long time SDCTM member and officer Diana McCann has been established for the benefit of college students preparing to become a math teacher. Rising seniors studying math education at any post secondary institution in South Dakota are eligible. The scholarship is awarded at the annual SD STEM Ed Conference.

We will once again be selling chances (3 tickets for \$5) to help fund this scholarship during the conference.

All other donations to the McCann Scholarship can be sent to:

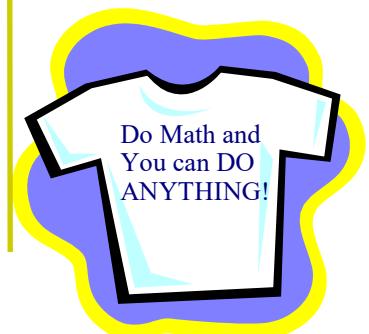
Security State Bank  
1600 Main Street  
Tyndall SD 57066

*One hundred percent of all donations will be used to fund the scholarship.*



## Classy T-Shirt Day

When you pack for the conference, don't forget your favorite Nerdy Classy T-shirt! Again this year, we will all be sporting them on Saturday as we embrace our Math and Science Nerdiness!





## A Word from Stephanie

Greetings,

Happy New Year! I am in disbelief that 2019 has come to an end and we are starting the year 2020. I feel like it was just last year that we transitioned from 1999 to 2000, and every news story discussed Y2K. In the fall newsletter, I discussed looking forward to a slower pace for the fall season. Unfortunately, life did not slow, and I had five trips in five weeks, fortunately, I got to meet amazing people and engage in wonderful work while traveling.

The first trip was to Nashville, Tennessee to attend the NCTM Regional Mathematics Conference. I am grateful that I was able to attend this conference with six secondary math teachers from across the state. This conference was an excellent opportunity to meet math educators from across the United States, listen to and learn from some amazing speakers, including Dr. Tim Konold. I encourage you to attend the SD STEM Ed conference, where many of the South Dakota teachers who attended will share what they learned in workshop sessions, and how they are implementing this new learning in their classrooms and schools. My travel escapade ended with a trip to Minneapolis to work with the State Network of Educators on the Smarter Balanced Digital Library. I appreciate opportunities like these to collaborate with the Department of Education Assessment team, and a wonderful team of teachers from South Dakota and other Smarter Balanced Assessment states. If you have not used the [Digital Library resources](#), I strongly encourage you to invest some time to review these resources. The Playlist resources in the Digital Library especially valuable. These resources are aligned to the standards and provide a range of tasks for students above standard, at or near the standard and below the standard. It was a great experience to help develop these resources that have such a positive impact on student learning.

A new year means a new goal. In 2020 I hope to find ways to stay more connected. I am so happy to have met so many of you and strive to meet many more math educators from throughout the state. My challenge for you is to be more intentional about connecting with math educators as well. Please take a few moments to post on discussion boards, read and respond to a twitter post or check in with a math educator who you haven't talked to in a while.

I stated in the fall newsletter that I would like to start a webinar series. After meeting and connecting with teachers this fall, this goal is even more important. Continue to watch for updates as this plan continues to take shape.

I hope you have a wonderful winter, stay warm and safe. As always, please contact me if you have any questions or needs.

Stephanie Higdon  
Math Specialist  
SD Division of Learning & Instruction  
Stephanie.Higdon@state.sd.us



*"My challenge for you is to be more intentional about connecting with math educators ..."*



## Mark's Thoughts

### Native American Cultural Activities

At the NCTM regional conference in Nashville, I attended a session titled “Native American – Based Mathematics Materials for the Classroom”. Dr. Charles Funkhouser shared the resources that he helped develop through a NSF-sponsored partnership between California State University Fullerton and Turtle Mountain Community College.

The resources include a set of 18 lessons. Each lesson connects Native American culture to a different mathematical topic. The lessons have been developed and piloted in consultation with Tribes throughout the West. The lessons are classroom ready and free for everyone to use. A few examples of the lessons include the Geometry of Arrowheads and Symmetry found in Beadwork.

You can learn more about this project and access the lesson and resources at <http://mathfaculty.fullerton.edu/cfunkhouser/>. The lessons can be found under the “lessons” tab located on the left toolbar.

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



*“Each lesson connects Native American culture to a different mathematical topic.”*



## SDCTM “Gear”

I have been approached many times about my “Long Live Math” shirt and where one can get one. Last year, we had some at the conference, but unfortunately, we ran out. Luckily, I have a connection to someone who likes to make t-shirts. Therefore, she can make more! So... now SDCTM has an online t-shirt shop through Etsy. Money from the sales of these math shirts goes to SDCTM. The link to the SDCTM shirts is: [https://www.etsy.com/shop/blackhillsprintwear/?section\\_id=26958602](https://www.etsy.com/shop/blackhillsprintwear/?section_id=26958602).

Not only is there the “Long Live Math” shirt, there are other math shirts, SDCTM baseball shirts, and polos. Check it out!

Crystal McMachen  
SDCTM President





## Presidential Awards for Excellence in Mathematics and Science

**Know a Great K-6<sup>th</sup> Grade 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 technology, engineering, and 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 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 elementary teachers in grades K - 6. The application deadline will be May 1, 2020. Nominations will be accepted until March 1, 2020. You can nominate a deserving teacher by visiting [www.paemst.org](http://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 are attending the SD STEM Ed conference and would like to know more about the program, attend the **"Showcase Your Teaching Practice and Win Money"** **PAEMST**) session which will be held during the 8:00 am time slot in Dakota A on Saturday. I hope to see you there!

If you have any questions, please contact:

Allen Hogie  
SD PAEMST Mathematics Coordinator  
[Allen.Hogie@k12.sd.us](mailto:Allen.Hogie@k12.sd.us) 605.553.8095



*"The award is the nation's highest honor for math and science (including technology, engineering, and computer science) teachers."*



## 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. ALL registrations must be completed on-line. Once you have registered, you will receive an invoice. Payment options include mailing a check with a copy of the invoice, paying on-line with a credit card, or paying on-line with PayPal.

To register, complete the Google form at:  
<https://forms.gle/xKeY5H551rnsvniX8>

Sheila McQuade  
SD STEM Ed Conference Treasurer  
SMcQuade@OGKnights.org

*Be sure to register and pay for your registration by 1/24/2020 in order to be eligible for the Pre-registration rates . (Complete on-line payment by 1/24/2020 or postmark a check by 1/20/2020).*

## 2020 SD STEM Ed Conference Booklet QR Code

Published conference booklets will NOT be available at the conference. We have noticed that fewer attendees use one, most prefer the copies they have downloaded and marked up ahead of time or the Schedule at Glance pages we print. The SAG/s will still be printed but the conference booklet will not be. The QR code at right will be posted through the conference as well as printed on your registration envelope. You can use it now (and later) to access the online conference booklet.



## Classroom Treasures

Did the spring cleaning bug bite you this year? I have been purging and tossing/giving away excess in my classroom as well as in my home for the past 6 months. Is your closet full of stuff that you no longer use, but it's too good to throw away? A big success every year, “Share the Classroom Treasures” returns. Plan to bring your excess, good, working equipment or resource materials to the conference. We will be providing a room for you to drop off and give away your things so that other South Dakota teachers with a need can take them to use.

(Although it may feel like yours, make sure that it is. If it's marked "School Property", please leave it in school.)





## Math Fail?

4:08 46° ⚡ 92%

google.com/search?q=sdstate

≡ Google J

sdstate football

ALL IMAGES NEWS SHOPPING VIDEOS MAP

Sports >

South Dakota State Jackrabbits football  
3rd in Missouri Valley

GAMES NEWS STANDINGS PLAYERS

FCS · Today Final

7 - 38   
Northern Iowa SD State  
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SDAKST	0	21	-4	21	38

SD State Sat, 11/23 1:00 PM  
 South Dakota

All times are in Mountain Time Feedback

Submitted by Cindy Kroon,  
Montrose School District  
Cindy.Kroon@k12.sd.us



“The Goehring/Veitz Leadership Scholarship” has been established to encourage new teachers of math and science to become professionally involved on the state level. The scholarship, which is good for a free one or two day registration at the SD STEM Ed Conference (hosted by SDCTM and SDSTA), is available to any teacher who meets each of the following criteria:

- Is a K-12 teacher of math or science who is in the first year of teaching in SD
- Is a member of SDCTM and/or SDSTA. Applicants must pay their own dues to the chosen organization.

The application process is simple. Fill out the attached form, have it signed by the building principal, and upload a pdf copy when you complete your conference registration online at:  
<https://forms.gle/nB5bxikUExzZHDvP7>

Contact Sheila at [SMcQuade@OGKnights](mailto:SMcQuade@OGKnights) with any questions.

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**APPLICATION  
“GOEHRING/VGKTZ LEADERSHIP SCHOLARSHIP”**

Name:

School District:

Teaching Assignment:

Membership Information:

I am already a member of SDCTM SDSTA (Circle one or both)

I am joining SDCTM and/or SDSTA (Circle one or both)

I am enclosing a check for

\$5.00 for Elementary Math and/or \$5.00 for Elementary Science

\$20.00 for MS/HS Math and/or \$20.00 for MS/HS Science

(Name) \_\_\_\_\_ is in his/her first year of teaching in SD at \_\_\_\_\_ School District during the \_\_\_\_\_ school year and is thus eligible for ‘The Goehring/Veitz Leadership Scholarship.’

Signed: \_\_\_\_\_, Building Principal



2301 Research Park Way  
Brookings, SD • 57006  
605.688.6231  
[www.sdepscor.org](http://www.sdepscor.org)

## 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.



## 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](http://www.sanfordresearch.org/education), connect with us at 605.312.6417 or [SanfordOutreach@sanfordhealth.org](mailto: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-6<sup>th</sup> 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.**



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

**Jay Berglund  
204 S. Exene Street  
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  
OGHS  
3201 S. Kiwanis Ave  
Sioux Falls, SD 57105

## 2019-2021 SDCTM Executive Board Members

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