

The 6 1/2 Bridges of Harrisburg:

Technology

Connections

Equity

State Standards

Multiple Representations

Common Core Standards

Assessment

*Make
the
Connection*

*Pennsylvania Council of Teachers of Mathematics
61st Annual Conference
October 18-19, 2012
Radisson Hotel
Camp Hill, PA*

Dear Math Friends,

On behalf of the Pennsylvania Council of Teachers of Mathematics, I would like to welcome you to the 2012 Conference. The Annual Conference is the “big event” for PCTM and I am glad that you have chosen to be part of this exciting conference.

I would like to take this opportunity to thank our 2012 conference committee led by the very capable Rose Mary Zbiek, Penn State University Park, as General Chair. I would also like to acknowledge the other members of Team 2012 who are listed in this program. Thank you for your work on this project. You made this conference happen. There have been many other individuals that have worked behind the scenes to make this conference happen (and you know who you are) and I would like to give a “shout out” to all of you as well.

I would be remiss if I did not mention our speakers. Our speakers, who are primarily you, our members, make the conference happen. Without speakers, we would not have a conference and I wish to take this opportunity to thank you for participating in the conference as a speaker. If you are not speaking this year, I encourage you to consider speaking in future years since all math teachers have something to share.

I hope that all of you take this opportunity to engage or re-engage yourself in that which all of us attending have in common, teaching mathematics. Please take the time to make some new math friends or get acquainted again with math friends you have not seen for a while. Take a moment to share the wealth of knowledge you have about teaching mathematics with others during the numerous, and this year expanded, networking opportunities. This is one of the few times during the school year when you can do all of above at once at your leisure in a nice environment.

Remember that PCTM is not simply about a conference once a year. Watch our new website for information about other opportunities PCTM provides for you throughout the year and join us.

Please enjoy your stay here in the Harrisburg area and thanks for attending the 2012 conference.

Mike

Mike Long
PCTM President



Mike Long, incoming PCTM president, takes Pauline Chow, outgoing president, for a ride during the June 2012 second annual PCTM math-data day at Hersheypark.

*The 6 1/2 Bridges of Harrisburg:
Make the Connection*



Welcome!

No matter how long we have been learning and teaching mathematics, we can always make new connections for ourselves and with our students. New technology and multiple representations are tools that we can use to keep mathematics interesting, challenging, and accessible for all students. Well-articulated standards and carefully crafted assessments help us to guide our daily work and to reflect on our classroom practices and school programs.

This conference is an opportunity not only to share and explore new ideas but also to connect with old and new friends and inspiring colleagues. To you and to everyone whose presence is the heart and soul of this meeting, thank you for being here...and thank you for being you!

Rose Mary Zlick
General Chairperson

On behalf of the Pennsylvania Council of Leaders of Mathematics, it is my pleasure to welcome you to the 2012 PCLM conference within a conference.

The challenges facing mathematics educators in 2012-13 are huge and must be addressed with creativity, zeal and perseverance. As we transition to the PA Common Core and the Keystone Exams, it is critically important that we collaborate as professionals. All of us in PCLM wish you the best professional development experience at both conferences.

Jim Bohan
President, PCLM



61st Annual PCTM Meeting Committee Chairs

General Chair:	Rose Mary Zbiek, rmz101@psu.edu
Program:	Phil Boehmer, pboehmer@raiderweb.org Ray Shearer, rshearer@raiderweb.org
Registration:	Marian Avery, mavery@gvgsd.org
Commercial Exhibits:	Terry Baylor, twbaylor@comcast.net Johnathan Hocker, johnhocker8@gmail.com
Webpage:	Jason Silverman, js657@drexel.edu
Meals and Banquet:	Jane Dalton, daltonjjj@comcast.net Sue Davis, sdavis@ldsd.org
Signs:	Deb McKee, dmckee@ldsd.org

Conference Events

Wednesday, October 17

Registration: 5:30 p.m. - 9:00 p.m., Conference Center lobby
PCTM Board Meeting, time 6:00 p.m. - 8:30 p.m., Veranda Room
Pennsylvania Council of Leaders of Mathematics annual meeting

Thursday, October 18

Registration: 6:30 a.m. - 4:00 p.m., Conference Center lobby
Exhibits: 7:30 a.m. - 5:15 p.m., Grand Ballroom
Conference Sessions and Workshops: 8:30 a.m. - 4:00 p.m.
Pre-Service Teacher Day: 8:00 a.m. - 4:00 p.m., Governor's B
Pre-Service Teacher Day Poster Display: 3:00 p.m. - 4:00 p.m. Grand Ballroom

PCLM breakfast: 7:00 a.m. - 9:00 a.m., Veranda Room

PCLM board meeting: 9:00 a.m. - 12:00 p.m., Senate Room

****NEW**** *PCTM Networking and Awards Hour (free): 4:15 p.m. - 5:15 p.m., Grand Ballroom*

Banquet and Entertainment: 5:30 p.m. - 7:00 p.m., Governor's A & B
Pennsylvania Association of Mathematics Teacher Educators Board Meeting: 8:00 p.m. - 9:00 p.m., Senate Room

Friday, October 19

Registration: 7:00 a.m. - 10:00 a.m., Conference Center lobby

PCTM Breakfast/Business Meeting: 7:30 a.m. - 8:25 a.m., Governor's B

Exhibits: 7:30 a.m. - 1:00 p.m., Grand Ballroom

Conference Sessions and Workshops: 8:30 a.m. - 4:00 p.m.

The 35th Annual Meeting

Pennsylvania Council of Leaders of Mathematics

The Pennsylvania Council of Leaders of Mathematics (PCLM) will conduct its Thirty-Fifth Annual Conference on Wednesday and Thursday, October 17-18, 2012.

The conference will begin on Wednesday with a luncheon sponsored by McGraw Hill Education Group and end at noon on Wednesday with a PCLM Executive Board meeting. Breakfast will be sponsored by Suntex International (First in Math).

This year's conference will focus on the PA Core Standards and the changes in mathematics instruction and assessment. Speakers will be Michelle Schearer, the 2011 National Teacher of the Year; Kevin Mauro, John Weiss, and Charlie Wayne from The Pennsylvania Department of Education Offices of Instruction and Assessment; and Eric Milou from Rowan University the Eastern 2 representative for National Council of Supervisors of Mathematics.

Pre-registered current members of PCLM may attend these sponsored functions and they are encouraged to invite and pre-register another leader in mathematics education as their guest. Only members and their guests who have registered and have received admission confirmation tickets to the conference will be admitted to this conference. There will be NO onsite registration.

If additional information is needed, please contact Janie Zimmer, zimmer@rbed.us, 610-291-0500.



Leadership in Mathematics Education

Mathematics in an Era of Core Standards

Pennsylvania Council of Leaders of Mathematics

Wednesday, October 17, 2012

10:30 a.m. - 11:15 a.m. **Registration**

Keystone D & E

11:15 a.m. - 12:00 p.m. **Luncheon**

Sponsored by McGraw Hill School Education Group

12:00 p.m. - 12:45 p.m. **PCLM Meeting**

Jim Bohan, President PCLM

12:45 p.m. - 1:00 p.m. **Break**

1:00 p.m. - 2:00 p.m. **How Leaders Can Energize All Teachers and Students to Maximize Performances**

Michelle Schearer, 2011 National Teacher of the Year, Frederick Public Schools, Maryland

2:05 p.m. - 3:20 p.m. **Current Status of the PA Core Standards and Assessments. What's in Our Future?**

Facilitator: Jane Wilburne, Penn State Harrisburg. Panel: Kevin Mauro, Mathematics Education Advisor, Bureau of Teaching; John Weiss and Charlie Wayne, Bureau of Assessment and Accountability, Pennsylvania Department of Education and Learning, PA Department of Education

3:20 p.m. - 3:40 p.m. **Break**

3:40 p.m. - 5:00 p.m. **Powerful Resources on the Core Standards Provided by NCSM for Leaders in Mathematics**

Eric Milou, Rowan University, NCSM, Eastern 2 Rep

Thursday, October 18, 2012

7:00 a.m. - 9:00 a.m. **Breakfast**

Veranda

Sponsored by Suntex International (First in Math)

7:30 a.m. - 9:00 a.m. **Exemplar Problems for CCSS and PA Core Standards**

9:15 a.m. **PCLM Board meeting**

Senate

Pre-Service Teacher Day
Thursday, October 18

8:30 a.m.	Welcome Featured Speaker: Dr. Miriam Leiva	Governor's B
9:30 a.m. - 12:00 p.m.	Attend sessions of your choice (see program book)	
12:30 p.m.	Lunch	State Room
1:00 p.m. - 3:00 p.m.	Continue to attend sessions of your choice.	
3:00 p.m. - 4:00 p.m.	Student Poster Showcase	Grand Ballroom

2012 PCTM Awards

New Attendee Award
Tom Scheeler

Outstanding Contribution to Mathematics Education
Mary Louise Metz

Distinguished Service
Judy Werner

New Teacher Award
Troy Morris

Past President
Oiyin Pauline Chow

Hall of Fame
Carolyn Marchetti

Commercial Exhibitors

ALEXS Corporation

Bedford, Freeman & Worth Publishers / W.H. Freeman

Carnegie Learning

Casio America, Inc

Castle Learning, Inc

CPM Educational Program

D & H Distributors

First in Math Online Program

Hands-On Equations - Borenson and Associates, Inc

Houghton Mifflin Harcourt / Holt McDougal Publishing Co.

McGraw-Hill School Education Group

Neufeld Learning Systems, Inc

Peoples Education, Inc

Scholastic Education, Inc

Texas Instruments

The Math Forum @ Drexel

Triumph Learning

Visit the Grand Ballroom!

Keynote Speakers



Gail Burrill, Michigan State University

Gail Burrill was a secondary teacher and department chair in suburban Milwaukee, Wisconsin for more than 28 years. She is currently a Mathematics Specialist in the Program for Mathematics Education at Michigan State University. She served as President of NCTM and as Director of the Mathematical Sciences Education Board. She co-directs the Institute for Advanced Study's International Seminar and the Secondary School Teachers Program component of the Park City Mathematics Institute. She is an instructor for Teachers Teaching with Technology and a senior mathematics advisor to Texas Instruments Education Technology.



Miriam Leiva, UNC Charlotte

Miriam Leiva has taught mathematics at all levels throughout more than 35 years and is the B. Cone Distinguished Professor of Mathematics Emerita at the University of North Carolina Charlotte. She is the Founding President of TODOS: Mathematics for ALL—a national organization committed to equity in mathematics education for all students. Dr. Leiva has made presentations nationally and internationally and has published in journals and books. She edited and co-authored eleven NCTM books for teachers and is senior author for Houghton Mifflin Harcourt math textbooks. Her work focuses on making mathematics content accessible through best practices for all students.



Padmanabhan Seshaiyer, George Mason University

Dr. Seshaiyer is a tenured Professor of Mathematical Sciences and director of COMPLETE (Center for Outreach in Mathematics Professional Learning and Educational Technology) at George Mason University in Fairfax, Virginia. During the last decade, Dr. Seshaiyer initiated and directed a variety of educational programs including graduate and undergraduate research, K-12 outreach, teacher professional development, and STEM enrichment programs to foster the interest of students and teachers in mathematics at all levels. During this time he received multiple grants, including funding from the National Science Foundation and the National Institutes of Health.

Thursday, October 18

PCTM Sessions and Workshops

ES - elementary school	MS - middle school	HS - high school
C - college	GI - general interest	
Shaded regions - extended time workshops		Dotted Line - time change

- 1 8:30 a.m. - 9:45 a.m. workshop ES Governor's A
Speaker: Bill Tobin, Muhlenberg School District
How Constructivist Are You?
What does a teacher need to know and be able to do in order to operate a constructivist classroom? Immerse yourself in a variety of activities designed to help children construct mathematical relationships.
- 2 8:30 a.m. - 9:30 a.m. MS Keystone A
Speaker: Kim Johnson, Pennsylvania State University
Tasks that Elicit Proportional Reasoning
Using Lobato and Ellis' (2010) Developing Essential Understanding of Ratios, Proportions, and Proportional Reasoning for Teaching Mathematics in Grades 6-8, we will explore various mathematical tasks that can be used to help elicit shifts in students' proportional reasoning.
- 3 8:30 a.m. - 9:30 a.m. MS Keystone B
Speaker: Mary Lou Metz, Indiana University of PA
Implementing the Core Math Tools into the Middle School Classroom
You will be introduced to Core Math Tools from NCTM, a FREE downloadable set of interactive software tools for algebra, geometry, and statistics. Focus will be on middle school mathematics.
- 4 8:30 a.m. - 9:30 a.m. HS Keystone C
Speaker: Doyt Jones, Texas Instruments
Effective use of Technology Implementing the Common Core Standards in Mathematics
The Common Core State Standards for Mathematics (CCSSM) call for the use of appropriate technology. Experience how Nspire technology seamlessly integrates into classroom instruction. Participants will receive an examination copy of the Nspire technology.

Thursday

- 5 8:30 a.m. - 9:30 a.m. GI Keystone D
 Speaker: Tenille Cannon, The Pennsylvania State University
When am I ever going to use this? Connecting Collegiate and Secondary Mathematics
Just as secondary students wonder when they will use mathematics, we as mathematics teachers wonder when we will use collegiate mathematics to teach secondary mathematics. This session explores possible connections.
- 6 8:30 a.m. - 9:45 a.m. HS Keystone E
 Speaker: Charlene Keen, Dauphin County Technical School
Transforming Quadrilaterals and Their Changing Diagonals
Participants make two models that demonstrate relationships occurring when quadrilaterals transform from parallelogram to rectangle or rhombus to square.
- 7 8:30 a.m. - 9:30 a.m. GI State
 Speaker: Katherine Remillard, Saint Francis University
7 Billion
Within the last year world population surpassed 7 billion. This session will provide a pedagogical framework and specific activities for exploring this significant event in the mathematics classroom.
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- 8 10:00 a.m. - 11:15 a.m. workshop MS Governor's A
 Speaker: Janet Adams, Penn State Worthington Scranton
Making Polyhedron Models
The benefits of making polyhedra will be discussed. Participants will make a sample and return with instructions for their classes. Try your hand!
- 9 10:00 a.m. - 11:15 a.m. workshop ES Governor's B
 Speaker: Francis Hannick, Minnesota State Univ., Mankato
Hands-On Experience with Numerous Activities for the Elementary Math Curriculum
Participants will work together to experience a wide variety of activities. A booklet of 45 activities and ideas for others will be provided.

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Thursday

- 10** 10:00 a.m. - 11:00 a.m. ES Keystone A
Speaker: Megan Stotz, Lehigh University
ABC's and 123's: Using Literature to Teach Mathematics
K-2 educators will analyze text, connect mathematical reasoning, and problem solving activities with books. Discover the teaching process needed to help students comprehend the math–literature connection.
- 11** 10:00 a.m. - 11:00 a.m. MS Keystone B
Speaker: Janet Walker, Indiana University of Pennsylvania
Microscopic Mathematics
This session will introduce the QX-5 digital microscope and explore various middle school mathematical content using the microscope.
- 12** 10:00 a.m. - 11:00 a.m. HS Keystone C
Speakers: Ben Freeburn, The Pennsylvania State University
Duane Graysay, The Pennsylvania State University
Using Multiple Representations to Support Student Reasoning in the Classroom
Join us for an exploration of algebra and pre-calculus topics when seen through multiple representations. Be prepared to do some mathematics and share some ideas of your own.

- 13** 10:00 a.m. - 11:00 a.m. GI Keystone D
Keynote Speaker: Gail Burrill, Michigan State University



**Connecting the CCSS
Mathematics Content and
Practice Standards: The Role of
Interactive Dynamic Technology**

Interactive Dynamic Technology provides unique opportunities to engage students in mathematics in ways that address the standards: making sense of problems, reasoning about mathematical concepts, making and justifying conjectures.

Thursday

- 14** 10:00 a.m. - 11:15 a.m. workshop HS Keystone E
Speaker: Nina Girard, University of Pittsburgh at Johnstown
Bridging the Isles: Inverses, Logarithms, and Exponentials
Participate in discovery and hands-on activities emphasizing conceptual understanding of inverse, logarithmic, and exponential functions! Problem-solving applications are aligned with eligible content for performance on the Algebra II Keystone Exam.
- 15** 10:00 a.m. - 11:00 a.m. GI State
Speaker: Younhee Lee, The Pennsylvania State University
Use of College Mathematics Knowledge for Teaching School Mathematics
We will talk about how the knowledge of college mathematics can enrich mathematics learning by looking at several classroom scenarios, such as the use of a well-defined function, equivalence class, group, and isomorphism.
- 16** 10:00 a.m. - 11:00 a.m. HS Veranda
Speaker: Andrew Benzing, Strath Haven High School
A Transformative View of Transformations
Multiple representations of absolute value will be considered with the TI Nspire in order to develop a deep understanding of the transformation of all functions. A transformative experience awaits you.
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- 17** 11:15 a.m. - 12:15 p.m. MS Keystone A
Speaker: Nicole Adams, Penn State
Don't Be Square
The objective of this presentation is to introduce fun and interactive ways for making geometry class an over the top experience for middle school and early high school students.
- 18** 11:15 a.m. - 12:15 p.m. MS Keystone B
Speaker: Daniel Friess, Commonwealth Connections Academy
Riddles and Algebra: The Grammar of Arithmetic
Language-minded students may have trouble connecting to algebra, but this presentation is designed to show that grammar and algebra are extremely similar.

Remember to spend some time visiting the vendors.
Enjoy lunch at the bistro located inside the conference Grand Ballroom.

- 19** 11:15 a.m. - 12:15 p.m. HS Keystone C
 Speaker: Daniel Ilaria, West Chester University
Removing Barriers to Reasoning and Sense Making in the High School Mathematics
This session will examine common “shortcuts” that misrepresent mathematics and limit students’ ability to reason and make sense of mathematical concepts.
- 20** 11:15 a.m. - 12:15 p.m. GI Keystone D
 Speaker: Ken Sullins, Mansfield University (retired)
Filling a Mathematical Tool Box
Get your mathematical tools together and help your students fill their mathematical tool box for: Applications, Connections, Development, and Concepts. We’ll discuss some of the tools.
- 21** 11:15 a.m. - 12:15 p.m. GI State
 Speaker: Tetyana Berezovski, St. Joseph’s University
Concept of Area: From Problem Solving to Proof
Over seventy percent (70%) of Grade 6-12 students failed the NAEP items (2009-2011) related to concept of area. This concept is the main focus of this session. Participants will explore a variety of area problems in manual and virtual environments.
- 22** 11:15 a.m. - 12:15 p.m. GI Veranda
 Speaker: Michael Ladick, Allegheny Intermediate Unit
Alternative Education: Version 2.0
Teach the roughest children? Come see examples of differentiated instruction that is project based and used in a juvenile detention center for adjudicated youth. Common Core friendly and NOW handouts available.
-
- 23** 11:30 a.m. - 12:45 p.m. workshop MS Governor’s A
 Speaker: Mary Ann Matras, East Stroudsburg University
Proportion: Ratio = Ratio
Ratio and proportion are foundation topics in middle school mathematics. Join us to explore some lab experiences that demonstrate important ratio and proportion concepts.

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- 24 11:30 a.m. - 12:45 p.m. workshop GI Governor's B
 Speaker: Gail Burrill, Michigan State University
Rethinking Fractions: Implications for Teaching and Learning Algebra
The Common Core State Standards develops fractions using a number line and unit fractions. Supported by interactive dynamic technology, this approach holds promise for addressing many student misconceptions in learning algebra.
- 25 11:30 a.m. - 12:45 p.m. workshop HS Keystone E
 Speakers: Duane Graysay, Penn State University
 Monica J. Smith
 Jeanne K. Shimizu
 Glen Blume
Engaging Students in Common Core Mathematical Practices: Possibilities of Teaching for Generalizing and Justifying
Participants will explore ways to engage students in repeated reasoning, developing arguments, and attending to structure. Several approaches to generalizing the sums of angles of convex polygons will be considered.
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- 26 12:30 p.m. - 1:30 p.m. ES Keystone A
 Speakers: Robert Coffman, Penn State Harrisburg
 with Four Pre-Service Teachers
Connecting Poetry with Mathematics: Using Poetry as a Bridge to Mathematical Understanding in the Elementary Classroom
Penn State Harrisburg Elementary Education Candidates and their instructor share strategies and materials they use to integrate Poetry by Shel Silverstein and other poets in the elementary mathematics classroom.
- 27 12:30 p.m. - 1:30 p.m. MS Keystone B
 Speaker: Edel Reilly, Indiana University of Pennsylvania
Building Bridges to All Students: Differentiated Instruction Strategies
Participants will be shown a variety of strategies that can be used to differentiate instruction for elementary/middle level students. Sample lessons will be shared.

28 12:30 p.m. - 1:30 p.m. HS Keystone C

Speaker: Fernanda Bonafini, Penn State University
Heather Ervin, Penn State University

How b depends on a : A Free and Interactive Game for the Study of Real Functions

This activity can be used to enhance instruction and allows teachers and students to explore real functions through visual representations of selected points on the same number line.

29 12:30 p.m. - 1:30 p.m. GI Keystone D

Speaker: Andrew Benzing, Strath Haven High School

Teaching with the iPad...Are There More Pros or Cons?

Come and see how teaching with the iPad has transformed what happens in the classroom. Top apps shared as well as the pitfalls from using this revolutionary platform. Come learn!

30 12:30 p.m. - 1:30 p.m. GI Veranda

Speakers: Robert McGee, Cabrini College
Carol Serotta, Cabrini College
Kathleen Acker, American University

Connecting Algebra, Geometry, Number Theory and the History of Mathematics

The learning of modern mathematics can only be enriched by studying the historical background of these topics. In this talk we will consider the interconnections among these topics.

31 1:00 p.m. - 2:15 p.m. workshop MS Governor's A

Speakers: Robert Jesberg, Independent Consultant
Janie Zimmer, Research-Based Education

Students Don't Understand Math Vocabulary! What Can a Teacher Do?

Join this hands-on exploration of math vocabulary. Learn a six-step strategy providing a research-based routine. Once your students have the language of mathematics in place, understanding is sure to follow.

"In times of change, learners inherit the earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists."

Eric Hoffer

- 32 1:00 p.m. - 2:15 p.m. workshop HS Governor's B
 Speaker: Kelly Brent, Carlisle High School
Activities to Maximize Student Engagement
I have found that these activities not only get the entire class engaged, but also get students to a deeper level of understanding of the concepts.
- 33 1:00 p.m. - 2:15 p.m. workshop HS Keystone E
 Speaker: Marian Avery, Great Valley High School
Use Manipulatives to Differentiate Instruction
Cognitively demanding tasks will utilize manipulatives to help students visualize concepts such as factoring polynomials, completing the square, geometric growth patterns, and linear functions using recursive and explicit formula.
-
- 34 1:45 p.m. - 2:45 p.m. HS Keystone A
 Speaker: Gina Foletta, Northern Kentucky University
Building Geometry and Common Core Mathematical Practices Connections with Technology
Dynamic geometry environments (DGE) help students explore mathematics while generalizing and reasoning. I will offer examples that address CCSS for Mathematics for geometry and mathematical practices through constructing viable arguments.
- 35 1:45 p.m. - 2:45 p.m. MS Keystone B
 Speakers: Debbie Gochenaur, Shippensburg University
 Andrew Geesaman, Shippensburg University
Bridging the Gap: High Impact Techniques for Students with Asperger's
Connecting manifestations of Asperger's Syndrome in the classroom: choosing and executing strategies, explaining/showing work, and high impact classroom techniques will enable students with Asperger's to succeed with little teacher preparation time.
- 36 1:45 p.m. - 2:45 p.m. HS Keystone C
 Speaker: Jason Van Billiard, Cairn University
Functions: Connecting Graphical, Numerical, Analytic, and Verbal Representations
Participants will explore linear, quadratic, exponential, and trigonometric functions from multiple perspectives. Direct applications to lesson plans will be developed by participants during this session.

- 37 1:45 p.m. - 2:45 p.m. MS Keystone D
 Keynote Speaker: Padmanabhan Seshaiyer, COMPLETE Center,
 George Mason University,
 with Jennifer Suh, George Mason University



Effective Approaches to Problem Solving to Engage and Enhance Student Learning

We will share how inquiry based learning, critical thinking strategies, open-ended exploration, technology and multiple problem solving approaches can engage and enhance student learning.

- 38 1:45 p.m. - 2:45 p.m. GI State
 Speaker: Peter Skoner, Saint Francis University
Statistics Poster Competition: Fun and Learning for Your K-12 Students

Have your class participate in this fun learning experience. Students from grades K-12 can work in groups or individually to develop and submit poster displays that summarize data, provide different points of view, and answer questions about the data. They can win cash prizes and you will be recognized also.

- 39 1:45 p.m. - 2:45 p.m. GI Veranda
 Speaker: Mike Reiners
Musical Intervals and Mathematical Means

Perception of musical pitch is widely understood as a subjective way to make sense of sound wave frequencies. Lesser known, but incredibly mathematically beautiful, are the numerical relationships between certain pairs of pitches. Discover applications of the arithmetic, geometric, and harmonic means that can be used to build entire musical scales.

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- 40 2:45 p.m. - 3:45 p.m. MS Governor's A
 Speakers: Sararose Lynch, Westminster College
 Jeremy Lynch, Slippery Rock University

Let's Give Them Something To Talk About

This session will describe the I-THINK problem solving framework. Participants will solve a problem using I-THINK and learn about other classroom practices that promote mathematical discourse for upper elementary and middle school students.

- 41 2:45 p.m. - 4:00 p.m. workshop HS Governor's B
 Speaker: Max Ray, The Math Forum @ Drexel
Crime Scene Investigation: Using Technology to Make and Test Conjectures About Similarity

The Common Core builds the concept of similarity through dilation, and then transitions to proof. We will use technology to launch this transition and conjecture about how dilation and measurement relate.

- 42 2:45 p.m. - 4:00 p.m. workshop HS Keystone E
 Speakers: Andrew Benzing, Strath Haven High School
 Dina Dormer, Strath Haven High School
Nspire and STEM...What a Combination

Come and participate in ready to use TI Nspire activities that have been classroom tested in our algebra and chemistry classrooms. New users are welcome to participate in Monday ready activities.

- 43 3:00 p.m. - 4:00 p.m. ES Keystone A
 Speakers: Lois Dieterly, Muhlenberg School District
 Wendy Hromiak, Muhlenberg School District

Problem Solving: Get a Big Bang for your Buck!

Learn to incorporate Common Core Mathematical Practices and more through the use of problem solving. Increase student engagement by utilizing a "math congress" approach which can include collaboration, presentation, justification, and critique.

- 44 3:00 p.m. - 4:00 p.m. MS Keystone B
 Speakers: Kim Creasy, Slippery Rock University
 Judy Werner, Slippery Rock University

The Walking Purchase and The Story of Measurement Terminology

This sessions will integrate social studies and mathematics. Learn about the Walking Purchase in the PA Colony as the social studies basis for teaching about land measurement and units of measurement.

Thursday

- 45 3:00 p.m. - 4:00 p.m. MS Keystone C
Speaker: Ryan Fox, Penn State-Abington

More Than Just A Numbers Game

In this presentation, participants will learn how to implement an activity based on an adaptation of a European game show. Connections to Common Core and SAS will be included.

- 46 3:00 p.m. - 4:00 p.m. GI Keystone D
Speakers: Denise Mendez, Abington School District

Mary Johnson, Copper Beech Elementary School

Get on Board the Brain Train!

A layperson's look into relevant research about the brain and how using this research in your teaching can improve learning for all students. Particular application to elementary math instruction will be made.

- 47 3:00 p.m. - 4:00 p.m. GI State
Speaker: M. Kathleen Heid, Pennsylvania State University

Engaging Prospective Secondary Mathematics Teachers in Reasoning and Proof

Incorporating reasoning and proof in secondary mathematics requires problem settings that call for conjectures. Problems presented (some technology-based) are usable in courses for prospective secondary teachers.

- 48 3:00 p.m. - 4:00 p.m. MS Veranda
Speaker: Deb Heckathorne

Intertwining CCSS with Technology in the Middle School

This session will intertwine specific examples of the 6th, 7th and 8th grade Common Core State Standards to technology integration in the middle school classroom. Technology ideas will include the Internet, Youtube, spreadsheets, graphing and scientific calculators and cameras.

4:15 p.m. - 5:15 p.m. Grand Ballroom
****NEW** Networking and Awards Hour (free)**

5:30 p.m. - 7:00 p.m. Governor's A & B
PCTM Banquet (ticket required)

Entertainment by the Lower Dauphin String Quartet: Adrian Graff, Sarah Rothermel, Jennifer Jackson and Matthew Peck; under the direction of Ms. Melody Brubaker.

8:00 p.m. - 9:00 p.m. **PAMTE Board Meeting** Senate

Friday, October 19

PCTM Sessions and Workshops

49 8:30 a.m. - 9:30 a.m. MS Governor's A

Speaker: Lynn Hughes, The Miquon School

Digging Digital Roots

We will explore hands-on activities focusing on digital roots, such as divisibility tests, number patterns, visual patterns, and modular arithmetic. Students will enjoy this series of explorations and get a lot of mental calculation practice at the same time.

50 8:30 a.m. - 9:30 a.m. ES Keystone A

Speakers: Dave Kennedy, Shippensburg University
Jeremy Eastman, Shippensburg University
Lynne Dettra, Shippensburg University

Mental Math Mayhem

Come see some elementary-level mental math techniques you've probably never seen. Why do they work? When are they most useful? Do you have your own to share?

51 8:30 a.m. - 9:30 a.m. MS Keystone B

Speaker: Diane Briars, Mathematics Education Consultant

Essential Actions to Ensure That All Your Students are Common Core State Standards-Ready

What can you do NOW to prepare all students for the CCSS Assessments? This session analyzes essential CCSS expectations and highlights effective instructional practices to prepare students for these assessments.

52 8:30 a.m. - 9:30 a.m. HS Keystone C

Speaker: Cindy Murphy, Seneca Highlands IU9

CK-12 Math Flexbooks

Learn about CK-12's FlexBooks! Flexbooks are textbooks delivered in a web-based model, available online and print formats. The content can be customized by subject and level of difficulty.

53 8:30 a.m. - 9:30 a.m. GI Keystone D

Speaker: Timothy Seiber, Cumberland Valley

iPhones, iPads and iPods are Tools to Learn Math

A graphing calculator for \$1.99. A regression app for \$0.99. Come see some AWESOME® apps. Pick-a-Path® to your favorite! See some of my favorite apps and share some of the apps you recommend to your students.

- 54 8:30 a.m. - 9:45 a.m. MS Keystone E
 Speakers: Vanessa Wimberly, TI
 Phyllis Dumond, Accel Community Programs
Infusing Technology into the Middle School Classroom with Texas Instruments and Friends
This hands-on workshop will lead you in step-by-step instructions that guide your students to a new level of mathematics and science synergy, conceptual knowledge and real-world applications.
- 55 8:30 a.m. - 9:30 a.m. HS Veranda
 Speaker: Deb Heckathorne, Casio
Intertwining CCSS with Technology in the High School
This session will intertwine specific examples of the High School Common Core State Standards to technology integration in the high school classroom. Technology ideas will include the internet, Youtube, spreadsheets, graphing calculators, cameras and GPS devices.
-
- 56 10:00 a.m. - 11:00 a.m. GI Governor's A
 Speaker: Oiyin Pauline Chow, Central Pennsylvania's
 Community College, HACC
I have an App!
The presenter will share the Complete Course Project experience and discuss the vision, purpose, design, and impact of podcasts and how to develop a complete course for iTunesU.
- 57 10:00 a.m. - 11:15 a.m. workshop HS Governor's B
 Speaker: Kathleen McKinley, School District of Lancaster
Making STEM Happen in the Classroom
Engage in activities that incorporate STEM. Make connections to CCSS and Next Generation Science. Learn strategies to motivate and engage diverse populations of learners.
- 58 10:00 a.m. - 11:00 a.m. ES Keystone A
 Speaker: Lingqi Meng, Penn State University - Berks
Elementary School Teachers' Questions Regarding Power Teaching and Common Core Standards
Elementary school teachers raise a number of questions when using power teaching model and common core standards in their daily practice. The author analyzes these questions and discusses possible solutions.

59 10:00 a.m. - 11:00 a.m. MS Keystone B
 Speaker: John Kerrigan, Professor Emeritus
 West Chester University

Powerful Strategies for Developing Algebraic Thinkers in the Middle School

This interactive presentation will demonstrate how students can gain a solid understanding of linear functions by studying: in-out boxes (as functions), then number sequences, then finite differences to find the general term, then arithmetic sequences and finally slope. Powerful applications will be explored.

60 10:00 a.m. - 11:00 a.m. HS Keystone C
 Speakers: Channa Navaratna, Indiana Univ. of Pennsylvania
 Yong S. Colen, Indiana University of Pennsylvania

Integration of Logic Circuit Boards in Teaching Truth Tables

Typically, introducing the concepts of truth tables is a difficult task. Introducing logic gates and implementing a classroom project can help students to understand the importance of truth tables and inspire them to create their own projects. The work presented introduces logic trainer boards to enhance the concepts of truth tables in mathematics courses.

61 10:00 a.m. - 11:00 a.m. GI Keystone D
 Speaker: Miriam Leiva, University of North Carolina, Charlotte



Teaching Math with Equity and the Common Core State Standards, CCSS

In this session we will address the Mathematical Practices from the Common Core State Standards, CCSS, and illustrate with classroom examples, content. We will also attend to issues of equity and differentiated instruction.

ES - elementary school MS - middle school HS - high school
 C - college GI - general interest
 shaded regions - extended time workshops

- 62 10:00 a.m. - 11:15 a.m. workshop MS Keystone E
 Speakers: Janie Zimmer, Research-Based Education
 Robert Jesberg, Independent Consultant
My Teacher Speaks and Writes in Secret Code and I Don't Know What She Is Saying.
Manipulatives are a key for students' understanding. Manipulative strategies help students understand what $2b2$, $3br$, $x+2y$ mean and demystify what students see as "code only my math teacher knows."

- 63 10:00 a.m. - 11:00 a.m. GI Veranda
 Speaker: Mike Reiners, Casio
See Math in a New Light!
Graphing calculators are a great tool in true inquiry-based learning. This session will focus on how technology can enhance teaching and student learning – not overtake it. Participants will take part in activities that will allow students to foster a deep understanding of key concepts. Discover how utilizing Natural Textbook & Color Graphical display allows for a truer mathematics-focused classroom.

- 64 11:15 a.m. - 12:15 p.m. MS Governor's A
 Speaker: Lynn Hughes, The Miquon School
Getting to Second Base
Would we do all of our math in binary if we had two fingers instead of ten? Take away several activities to involve students in learning about base two while gaining a deeper understanding of base 10: puzzles, worksheets, and an impressive mind-reading card trick.

- 65 11:15 a.m. - 12:15 p.m. C Keystone A
 Speakers: Diane Devaney, Cabrini College
 Darla Nagy, Cabrini College
Tips for Running a Math Resource Center
Attendees will learn how to: promote a center and encourage multiple visits, help faculty by suggesting activities which promote an engaged pedagogy, and manage the administrative tasks of a center.

"Arithmetic is being able to count up to twenty without taking off your shoes."

Mickey Mouse

Remember to spend some time visiting the vendors.
 Enjoy lunch at the bistro located inside the conference Grand Ballroom.

- 66 11:15 a.m. - 12:15 p.m. MS Keystone B
 Speaker: Jennifer Breneisen, Montoursville Area School District
Come Differentiate with Me

Take easy to implement strategies for differentiated instruction back to the classroom on Monday. Specifically, two differentiated lessons (using integers and solving equations) will be shared.

11:15 a.m. - 12:15 p.m. HS Keystone C

- 67 Speakers: Mike Long, Shippensburg University
 Grant Innerst, Shippensburg University

Tactile Learning: Math Fun for All

Put the math learning in their hands ... literally. Come enjoy (and do) some tactile activities that span the grade levels and infuse a little fun into your math class.

- 68 11:15 a.m. - 12:15 p.m. HS Keystone D
 Speaker: John Volk, Retired

Unspeakable Practices, Unnatural Acts II

Use familiar materials in unorthodox ways. Engage your students in a variety of subject areas, such as algebra and geometry, with free or inexpensive materials.

- 69 11:15 a.m. - 12:15 p.m. MS Veranda
 Speaker: Jane Wilburne, Penn State Harrisburg

Meaningful Formative Assessments in Mathematics

How do you know whether your students are learning what you are teaching? Several approaches to meaningful formative assessment will be shared that will help make student learning visible.

- 70 11:30 a.m. - 12:45 p.m. workshop MS Keystone E
 Speaker: Mary Geschel, Borenson and Associates, Inc.

Making Algebra Child's Play

Learn about this visual and kinesthetic system for introducing algebraic concepts to young students. By breaking the code of algebra, Hands-On Equations empowers students to work with sophisticated-looking algebraic concepts. Balancing two-step equations becomes child's play!

To hold high expectations means to engage all students in cognitively challenging tasks that are simultaneously within reach and rich enough to stretch students as far as they can go. Holding high expectations does not necessarily mean accelerating coursework or presenting material that is more difficult.

-
- 71 12:30 p.m. - 1:30 p.m. MS Governor's A
 Speaker: Margaret Stempien, IUP
Percent Problems, Intuitive Reasoning, and the Common Core Standards
Participants engage in a problem solving approach for percents that employs proportional reasoning, as well as a spatial component. We link this approach to the Common Core Standards for Mathematical Practices.
- 72 12:30 p.m. - 1:30 p.m. ES Keystone A
 Speaker: Dave Echelmeier, Green Ridge Elementary School
A Math Moodle–It's Elementary
Is it possible to utilize a Moodle in an elementary classroom during math class? Absolutely! In this session, attendees will explore how a Moodle online course environment can enrich and enhance mathematics instruction and serve as an ongoing resource.
- 73 12:30 p.m. - 1:30 p.m. MS Keystone B
 Speaker: Lingqi Meng, Penn State University - Berks
Chinese Middle School Math Teachers' Lesson Design Under the New Curriculum Reform
How did Chinese middle school teachers adopt reform ideas into their math lesson designs? The author will answer this question by analyzing thirty reform mathematics lesson designs.
- 74 12:30 p.m. - 1:30 p.m. HS Keystone C
 Speakers: Kimberly Reese, Pennridge High School
 Staci Klemmer, Pennridge High School
The Mathematics of Snowflakes: Finding Algebraic Patterns in Nature
Using fractals from nature, we will generate sequences and analyze patterns utilizing TI graphing calculators. Participants will receive classroom-ready materials that can be differentiated for algebra through calculus classes.

Although calculus can play an important role in secondary school, the ultimate goal of the K-12 mathematics curriculum should not be to get students into and through a course in calculus by twelfth grade but to have established the mathematical foundation that will enable students to pursue whatever course of study interests them when they get to college.

- 75 12:30 p.m. - 1:30 p.m. GI Keystone D
 Speakers: Ben Galluzzo, Shippensburg University
 Grant Innerst, Shippensburg University

Math: A Service Learning Experience For All

Does it matter what I eat for lunch? Where does used water go? How big is my town's street fair? Join us to explore real problems that really matter.

- 76 12:30 p.m. - 1:30 p.m. HS Veranda
 Speaker: Michael Houston, Riverside High School

TI-Nspire Basics

This session will help those who are beginners with the TI-Nspire. Haven't taken yours out of the box yet? Bring it along...!

- 77 1:00 p.m. - 2:15 p.m. workshop HS Governor's B
 Speaker: Scott Steketee, KCP Technologies (also University of Pennsylvania)

Function Dances: Using Transformations to Make Variables Vary and Functions Behave

Students' conceptions of function are disturbingly weak. By integrating transformations and functions through physical and Sketchpad-based dances, students directly control and experience function concepts. Bring a laptop if possible.

- 78 1:00 p.m. - 2:15 p.m. workshop GI Keystone E
 Speaker: Timothy Seiber, Cumberland Valley

Using Dirty Math Data

Using probeware we will walk both linear and quadratic patterns. We will watch ice melt, and collect the data to show an exponential function. Amusement park probeware data will also be shared.

- 79 1:45 p.m. - 2:45 p.m. MS Governor's A
 Speaker: Cynthia Taylor, Millersville University of Pennsylvania

Selecting Games that Enhance Mathematical Understanding

Games should have instructional purposes other than review in the mathematics classroom. Participants will play various games and engage in small group discussion around three guiding principles to consider when implementing games in the classroom.

80 1:45 p.m. - 2:45 p.m. ES Keystone A

Speaker: MW Penn, author

The Literature Connection

Forming connections deepens understanding and reinforces knowledge; capturing a child's imagination makes learning fun! Learn to provide this connection by choosing good literature and creating relevant, CCSS based math lessons.

81 1:45 p.m. - 2:45 p.m. MS Keystone B

Speaker: Lynn Columba, Lehigh University

Writing: A Tool to Promote Students' Understanding of Math

Through the powerful tool of writing, students have the opportunity to express their understanding of math concepts in their own words by synthesizing information, clarifying their thinking and combining separate ideas into a new whole.

82 1:45 p.m. - 2:45 p.m. HS Keystone C

Speakers: Yong S. Colen, Indiana University of Pennsylvania

Channa Navaratna, Indiana University of Pennsylvania

The Banzhaf and the Shapley-Shubik Power Indices and the U.S. Presidential Elections

The 2000 presidential election provides an ideal backdrop to introduce the electoral voting system, the weighted voting system, and the Banzhaf and the Shapley-Shubik Power Indices. Through investigating these concepts, students will solve authentic, real-world problems.

83 1:45 p.m. - 2:45 p.m. GI Keystone D

Speakers: Mike Long, Shippensburg University

Grant Innerst, Shippensburg University

Modeling the Common Core at an Uncommon Place: Amusement Parks

Bring the common core to life for all students at all grade levels: at the amusement park, on a roller coaster, or in class using videos! Come engage in real world data driven modeling activities that connect multiple content strands. This is sure to excite students while doing math.

Effective teachers optimize the potential of technology to develop students' understanding, stimulate their interest, and increase their proficiency in mathematics. When teachers use technology strategically, they can provide greater access to mathematics for all students.

- 84** 1:45 p.m. - 2:45 p.m. HS Veranda
 Speaker: Michael Houston, Riverside High School
CCSS and the TI-Nspire
Teachers will use the TI-Nspire and premade documents to implement the Common Core State Standards. Learn how to save time with the TI-Nspire!
-
- 85** 2:45 p.m. - 4:00 p.m. workshop ES Governor's B
 Speaker: James Preston, Slippery Rock University
Beyond Gallon Man: A Constructivist Approach to Teaching Cups, Pints, Quarts and Gallons
Attendees of this workshop will participate in and be given a constructivist lesson for teaching cups, pints, quarts and gallons in the elementary classroom.
-
- 86** 3:00 p.m. - 4:00 p.m. GI Governor's A
 Speaker: Walter Orange, University of Pittsburgh at Greensburg
Integrating the History of Mathematics into the Classroom
By integrating short segments on the history of mathematics into our lessons, we can help students to find our subject less abstract, more human, and more lively.
- 87** 3:00 p.m. - 4:00 p.m. C Keystone A
 Speaker: Janet White, Millersville University
Innovations in Teaching Mathematics in the 21st Century
For Teacher Educators or Secondary Teachers. We will discuss pedagogical changes and what pre-service teachers should know including sample projects and discussion from a graduate course on this topic.
- 88** 3:00 p.m. - 4:00 p.m. MS Keystone B
 Speakers: Larry Feldman, Indiana University of Pennsylvania
 Katie Bungo, Indiana Area School District
A perimeter and area lesson in the US, Korea, and Cyprus
We will compare children's work emanating from a lesson developed by the speakers and taught to third graders in Korea and fifth graders in Cyprus and the US.

- 89** 3:00 p.m. - 4:00 p.m. GI Keystone C
 Speaker: Jen Brewer, Texas Instruments
Professional Learning Communities
Are your PLC meetings well organized. Does any learning take place, or is more of a gripe session? Making a Professional Learning Community effective can be a challenge. Come learn about the key components that are common in successful PLC's.
- 90** 3:00 p.m. - 4:00 p.m. GI Keystone D
 Speaker: Sheri Stayton, Penn State University
Divisibility Rules and Factoring
It is easy to identify multiples of three or five, but what about seven? Learn to generate rules for any number using basic algebra. Also, learn to factor trinomials without guessing.
- 91** 3:00 p.m. - 4:00 p.m. GI Keystone E
 Speaker: Janie Zimmer, TODOS: Mathematics for All, Board Member
Mathematics for All. Exactly What Does that Mean?
Educators profess all students can learn mathematics. What does that mean? If they come prepared to class and do homework??? What can we do to ensure every student reaches high math achievement?
- 92** 3:00 p.m. - 4:00 p.m. MS Veranda
 Speaker: Doyt Jones, Texas Instruments
Nspire Your Students to New Levels of Achievement
Participants will gain an understanding of the Nspire technology, and how it supports classroom instruction. The only requirement is that the participant be willing to try this hand held technology in classroom instruction. New users are welcome.

Let's end with a smile." If half a loaf is better than none, the night has a thousand eyes, a picture is worth ten thousand words, getting there is half the fun, and Helen of Troy had the face that launched a thousand ships, then in a picture taken at night from a ship that is halfway there, how much fun would Helen be having if she were holding a full loaf?

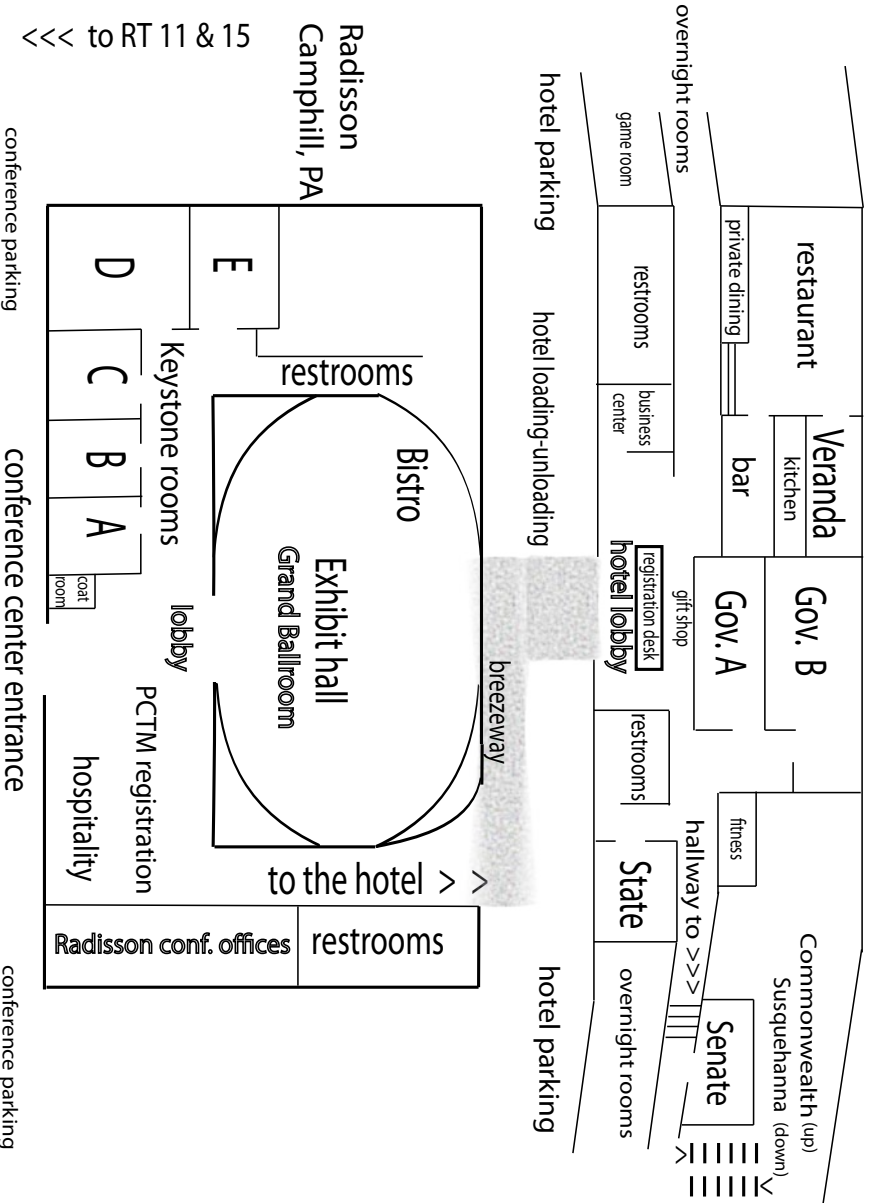
George Carlin

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Conference Planner

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Thank a volunteer.

Begin planning for November 7 - 8, 2013; at Seven Springs.

See you at Seven Springs

**Spring into Your Classroom
at SEVEN SPRINGS !**



Bring classroom ready materials back to your classroom from:

PCTM 62nd Annual Conference
November 6-8, 2013
Seven Springs Resort
Seven Springs, PA

Check www.pctm.org regularly for conference updates.

