

New Mexico STEM Symposium

Growing as a STEM Leader

June 1 and 2, 2017
Embassy Suites
Albuquerque, New Mexico



The Math and Science Bureau team at the Public Education Department (PED) would like to welcome you to the 4th annual New Mexico STEM Symposium! We are honored to once again host classroom teachers, STEM professionals, and informal educators during our state's premier STEM education event.

This year's theme is *Growing as a STEM Leader*. While you are already proven leaders within your classrooms, this year's theme is meant to encourage you to look beyond it towards opportunities available within New Mexico. The STEM Symposium will offer sessions in the following strands:

Improving STEM Instruction
Promoting Equity and Access in STEM Learning
Building Community STEM Partnerships
Teacher Leadership in STEM

Some STEM Symposium highlights include:

- Teacher Leader Panel - We will open the Symposium with a panel of current teacher leaders from our great state. They represent the Secretary of Education's Teacher Council, New Mexico State University's Mathematically Connected Communities, and the Los Alamos National Laboratory Foundation. They will share personal experiences and how these opportunities have helped them grow as professionals.
- Student keynote by New Mexico Mathematics, Engineering, Engineering, Inc. (NM MESA) students – Friday morning's general session will include two NM MESA teams. They will share their experiences with the program as they prepare to represent New Mexico at the 2017 MESA USA National Engineering Design Competition.
- Friday lunch with professional organizations – During lunch on Friday, you will have the opportunity to choose where to dine so you can learn about the professional organizations in our state. The NM Science Teachers Association, NM Council of Teachers of Mathematics, Computer Science Teachers Association, and the Environmental Education Association of NM will share their offerings to members and non-members alike and then you will have the opportunity to network with other teachers interested in these organizations' work.

Enjoy the STEM Symposium! The Math and Science Bureau's mission is to support educators in our state. Let us know how we can support you.

Best regards,

Yanira Vazquez, Director
Math and Science Bureau
New Mexico Public Education Department

The Math and Science Bureau Is Here to Help You



Yanira Vazquez, Director

yanira.vazquez@state.nm.us

Before coming to NM PED in 2014, I worked as an educator in New Mexico for 13 years as an elementary school teacher, instructional coach, and school administrator. I joined the Math and Science Bureau team as a Math Specialist in 2014 and am honored to now be the Bureau Director. I have a Master's degree from New Mexico State University in Teaching Math and Science and currently am a doctoral candidate at the University of New Mexico in Educational Leadership.



Claudia Ahlstrom, Math Assessment Specialist

claudia.ahlstrom@state.nm.us

I have served the teachers and students of New Mexico as a Math Specialist at the Math & Science Bureau since 2002. Prior to this position, I taught math at the middle school through college levels. I have a degree in math from the University of California, Berkeley and an MBA from the University of Oregon.



Marcia Barton, STEM Teacher Professional Development Specialist

marcia.barton@state.nm.us

I have been with the Math and Science Bureau since 2013. I taught secondary science for 13 years in New Mexico, am an Albert Einstein Distinguished Educator Fellow, and a National Board Certified Teacher with a Master in Science Teaching. A recipient of the 2010 Fulbright US-Japan Teacher Exchange on Education for Sustainable Development, I also participated in the Toyota International Teacher Program to the Galapagos Islands in 2008.



Shafiq Chaudhary, Math Professional Development Specialist

shafiq.chaudhary@state.nm.us

Before coming to the Math and Science Bureau in April 2017, I taught in Gallup, New Mexico as a middle school science and math teacher for seven years. I have a Bachelor's degree in Biology from the University of South Carolina and Master's degree from Western New Mexico University in Secondary Education.



New Mexico STEM Symposium

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June 1-2, 2017, Embassy Suites

TABLE OF CONTENTS

Welcome 3

Math and Science Bureau Staff 4

Thursday Schedule..... 6

Special Guests 7

Sessions At-A-Glance 8-9

Thursday Session Descriptions 10-15

Informal Science Education Night 16

Friday Schedule..... 17

Friday Session Descriptions 18-25

Hotel Room Map Back Cover

Thank You to our Vendors:

- ❖ American Chemical Society - Central New Mexico Local Section
- ❖ Amplify
- ❖ Carolina Biological Supply
- ❖ Explora Museum
- ❖ FOSS Science
- ❖ LAB-AIDS
- ❖ Lakeshore Learning
- ❖ New Mexico PBS
- ❖ MidSchoolMath
- ❖ MIND Research Institute
- ❖ Sanchez Educational Association
- ❖ STEMscopes
- ❖ Texas Instruments
- ❖ TODOS: Mathematics for ALL
- ❖ Computer Science Teachers’ Association of New Mexico
- ❖ Environmental Education Association of New Mexico
- ❖ New Mexico Council of Teachers of Mathematics
- ❖ NM PED IDEAL-NM
- ❖ NM PED Math and Science Advisory Council
- ❖ New Mexico Science Teachers’ Association
- ❖ Presidential Award for Excellence in Mathematics and Science Teaching

Conference Facilitation Managed by:





New Mexico STEM Symposium

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June 1-2, 2017, Embassy Suites

Wednesday, May 31, 2017

4:30 p.m. – 6:00 p.m. Early Registration

Thursday, June 1, 2017

7:30 a.m. – 8:30 a.m. Registration

8:30 a.m. – 10:00 a.m. **Welcome:** Yanira Vazquez, Director,
Math and Science Bureau, NM PED

Special Guests: Hanna Skandera, Secretary of Education
Teacher Leader Panel

10:00 a.m. – 10:15 a.m. Break/Transition to Sessions

10:15 a.m. – 11:30 a.m. Session I

11:30 a.m. – 1:10 p.m. Lunch On Your Own

1:10 p.m. – 2:25 p.m. Session II

2:25 p.m. – 2:40 p.m. Transition to Sessions

2:40 p.m. – 3:55 p.m. Session III

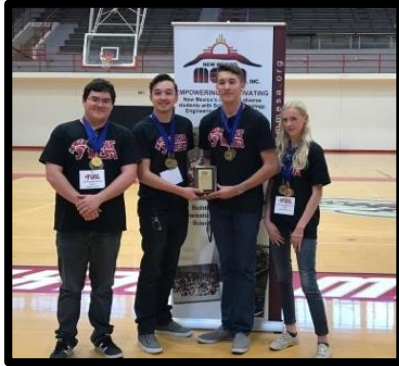
4:30 p.m. – 6:00 p.m. Informal Science – ¡Explora! Museum and New Mexico
Museum of Natural History and Science

1:10 p.m. – 3:55 p.m.
Sessions

NOTE: If you are eligible for travel reimbursement, please *remember to sign in each day*. Checks will be ready at the end of the conference on Friday after 3:30 p.m. Submit required paperwork by 10:00 a.m. on June 2, 2017.

Teachers must attend the entire Symposium to receive the travel reimbursement.

SPECIAL GUESTS



Adriana Darrow, Adrian Luna, Antoni Varela, David Velez and Advisor Mr. David Jaramillo - Deming High School MESA Team

Alfredo Sepulveda, Kevin Ramos, Luis Jimenez and Advisor Rina Viramontes - Chaparral Middle School MESA Team



New Mexico MESA is a year-round, multi-year, science, technology, engineering, and math (STEM) initiative that works with school districts and higher education institutions to improve NM student STEM performance; increase NM college STEM enrollment; and provide hands-on STEM competitions. Student teams from Chaparral Middle School and Deming High School won our State Competitions in their respective divisions in March, 2017. They will be representing NM MESA at the 2017 MESA USA National Engineering Design Competition on June 20-23 in Philadelphia, Pennsylvania.

Students were tasked with The Prosthetic Arm Challenge 2.1, which involves the development of a low-cost prosthetic device with integrated computer science components to complete a set of predefined tasks. Student teams created a prosthetic arm/hand with a microprocessor attached and, through computer programming, had the prosthetic arm/hand complete a series of tasks. In addition to the physical performance component, teams also had to write a technical paper, create an academic poster, conduct an oral presentation, and design for efficiency by keeping the cost of the prosthetic arm/hand under \$80.

Thursday Sessions

ROOM	Thurs., SESSION I 10:15 to 11:30 A.M.	Thurs., SESSION II 1:10 to 2:25 P.M.	Thurs., SESSION III 2:40 to 3:55 P.M.	Thurs., Evening 4:30 to 6:00 P.M.
Sierra I	9. Teach Astronomy with Space Engine	15. Hands-On Volcanoes: Activities For You Classroom		INFORMAL SCIENCE EDUCATION NIGHT at iExplora! Museum and The New Mexico Museum of Natural History and Science 4:30 p.m. — 6:30 p.m.
Sierra II	1. Intro to Citizen Science through GLOBE	17. In-Depth with GLOBE Data Collection and Data Visualization		
Sierra III	3. Creating a Collaborative Learning Environment	13. STEAM Up with Essential Elements and You Be the Chemist Challenge		
Ocotillo I	8. How to Use Collaboration and Productive Discussion in the Content Areas	19. The Power of Partnerships and Community Connections	24. Introduction to the NGSS – Taming the Fear Factor	
Ocotillo II	5. Project-Based Learning by Immersion	14. Number and Operations in Base Ten: Developing a Solid Conceptual Foundation for Place Value		
Sandia I	4. How do Children Learn Mathematics?	16. Building Computational Thinkers in Science		
Sandia II	7. A Room with a View (Tube)			
Sandia III	11. Literacy and STEM: The Perfect Complement			
Sandia IV	2. Increasing Student Engagement and Productive Classroom Discussions	23. Using Number Talks to Build Math Fluency and Flexibility in the Secondary Classroom	28. New Mexico Climate Champions	
Sandia V	10. Integrating Fractions and Measurement	22. Equity and Excellence: Fractions on the Number Line for ALL	26. Number Talks in the Elementary Classroom	
Sandia VI		20. PARCC: Examining Resources Available	25. Inquirer- Presenter-Scribe	
Sandia VII	6. (SC)2 and Touch Grids: Bridging STEM Barriers	21. Go With The Flow	27. Vertical Progression Professional Development Math	
Sandia VIII	12. Full STEAM Ahead with NM Agriculture in the Classroom!	18. Alien Autopsy – Fake Bodies, Real Science	29. Scrub Club: STEAM-H Strong!	

Friday Sessions

ROOM	Fri., SESSION IV 9:15 to 10:30 A.M.	Fri., SESSION V 10:45 to 12:00 P.M.	Fri., SESSION VI 1:45 to 2:30 P.M.	Fri., SESSION VII 2:45 to 3:30 P.M.
Sierra I	38. Hands-On Volcanoes: Activities For Your Classroom		51. LANL and K–8 STEM Education	57. Productive Struggle and Peaceful Interaction in Math
Sierra II	33. Wet and Wild Science – Using GLOBE Protocols to Describe Water Quality	43. Discourse Done through Math Practices	44. NM PED Teacher and Family Outreach	66. Everyone Can Code
Sierra III	35. What's the Problem: Exploring the Mysteries of Math Mistakes		46. Argumentation Made Easy!	60. Introduction to FREE Online PD Courses
Ocotillo I	32. Using Number Talks to Build Math Fluency and Flexibility in the Secondary Classroom	42. Teaching NGSS Engineering Design Through Media	52. TODOS: Mathematics for ALL: Math Equity For Every Student	64. LEGO® MINDSTORMS® Robotics
Ocotillo II	39. The Missing 'M' in STEM: A Math Circles & Modeling Approach		47. Breaking Chocolate: Engaging Science and Engineering Concepts	62. Brain Hackers Online
Sandia I	36. Increasing Academic Language In The Inquiry Classroom		45. Jump On It! Kinesthetic Math Activities and Games	59. Integration of STEM Career Awareness in a Geology Class
Sandia II	31. Energy in a New Mexico Ecosystem		50. Leonardo da Vinci was a STEAM Pioneer	58. NM DOT STEM Outreach Program
Sandia III			55. Are You STEM Ready? Hands-on STEM K-5 science – Let's Go!	63. Convection Currents & Plate Motions
Sandia IV				56. Invention Conventions
Sandia V				65. Exploring Key Ideas Across the Number & Operations in Base Ten Standard
Sandia VI	30. Making Making Meaningful – STEM Lab Design	41. Introduction to the NGSS – Taming the Fear Factor	54. Encouraging a Path to STEM	
Sandia VII	34. Fractals are SMART–Science, Math and Art!		49. From the Museum Into Your Hands	
Sandia VIII	37. STEAM PBL: Using STEM + Art Project-based Learning for Multicultural Educational Engagement		53. Investigate Natural Selection	61. STEM Teachers as New Teacher Mentors
Agave		40. Convivial Calculus	48. Supercomputing Challenge	

Session Descriptions

Session I, Thursday, June 1, 2017 10:15 a.m. – 11:30 a.m. (75 minutes)

1. ***Introduction to Citizen Science through Global Observations to Benefit the Environment (GLOBE)***

Tracy Ostrom and Christy Wall, GLOBE Mission Earth

GLOBE is an incredible resource for students to participate in authentic scientific data collection and develop scientific thinking and inquiry skills. Experience the GLOBE student protocols for Atmosphere sponsored by NASA. All teachers are welcome and to become an official GLOBE teacher, please participate in all 3 GLOBE sessions.

6 – 12; Science; Improving STEM Instruction

Sierra II

2. ***Increasing Student Engagement and Productive Classroom Discussions by Teaching Your Students to Ask Their Own Questions***

Danielle Gothie and Gwen Perea Warniment, Los Alamos National Laboratory Foundation

Having students generate their own questions increases their ability to deepen their individual understanding of core content. This workshop will help teachers shift classroom discussions from teacher directed to student directed.

K – 12; Science, Engineering, Math; Improving STEM Instruction

Sandia IV

3. ***Creating a Collaborative Learning Environment using Science and Technology***

Delara Sharma and Felicia Maestas, Santa Fe Public Schools

Learn practical tools and strategies that enable students to work together in the classroom and experience a collaborative learning environment that leads to enhanced meaning making of science concepts.

K – 8; Science, Technology; Improving STEM Instruction

Sierra III

4. ***How do Children Learn Mathematics? Using Developmental Stages to Guide Understanding***

Jana Ward and Filicity Valle, Collaborating for Outstanding Readiness in Education (CORE), New Mexico State University (NMSU)

In this interactive and hands-on session, we explore ways children learn mathematics, reflect on common practices, and learn how simple instructional tweaks can scaffold or scale-up understanding for students.

K – 5; Math; Improving STEM Instruction

Sandia I

5. ***Project-Based Learning by Immersion***

Krystal Irby, Albuquerque Public Schools

Experience the entry into student-driven inquiry, a key component in the shift to Project-Based Learning (PBL). What does an authentic, relevant, collaborative, and reflective project look like? Come find out, and leave with new tools for PBL!

6 – 12; Science, Technology, Math; Improving STEM Instruction

Ocotillo II

Session I, Thursday, June 1, 2017
10:15 a.m. – 11:30 a.m. (75 minutes)

6. *The System for Conceptualizing Spatial Concepts (SC)² and Touch Grids: Bridging STEM Barriers*
Jeff Killebrew, New Mexico School for the Blind and Visually Impaired

Louis Braille Touch of Genius Prize instructional tools (SC)² and Touch Grids facilitate STEM literacy by helping students, particularly those with visual impairments, utilize the language and layout of equational and graphical processes.

K – 12; Science, Math; Promoting Equity and Access in STEM

Sandia VII

7. *A Room with a View (Tube) ~ Teaching Hands-on, Minds-on Mathematics*
Karla Gade, Albuquerque Public Schools

Engage in a hands-on "view-tube" activity that investigates direct and inverse variation relationships through data collection and analysis. Experience mathematics concepts through alternate approaches while working as a part of a team.

6 – 12; Math; Improving STEM Instruction

Sandia II

8. *How to Use Collaboration and Productive Discussion in the Content Area Class*
Kirsi Laine and Mayra Valtierrez, New Mexico Public Education Department (NM PED) Bilingual Multicultural Education Bureau

This session observes teaching through a culturally and linguistically responsive lens and emphasizes the bridging of academic gaps for English learners and culturally and linguistically diverse learners by fostering collaboration while holding high expectations.

3 – 8; Math; Promoting Equity and Access in STEM

Ocotillo I

9. *Teach Astronomy with Space Engine – Free Planetarium Software that Amazes Everyone Who Uses It*
Mel Strong, melstrong.org

In this hands-on session participants learn how to navigate the universe in 3D using the controls to view stars, cruise through galaxies, investigate planets, fly through nebulae and much more. Bring a flash drive and get the program for free.

6 – 12; Science; Improving STEM Instruction

Sierra I

10. *Integrating Fractions and Measurement: Making Fractions Come Alive through Measurement.*
Patricia Carden and Wanda Bulger-Tamez, Mathematically Connected Communities, NMSU

This session engages you in activities that can be taken directly to the grade 3–5 classroom to build fraction number sense through practical measurement applications including linear measurement and volume/capacity.

3–5; Math; Improving STEM Instruction

Sandia V

Session I, Thursday, June 1, 2017
10:15 a.m. – 11:30 a.m. (75 minutes)

11. *Literacy and STEM: The Perfect Complement*

Tara Henderson and Explora's Early Childhood Educator Team, ¡Explora! Museum

Using simple everyday objects and materials, delight, engage, and develop a strong appetite for learning in children. This fun, thought provoking workshop of science activities you can use in your classrooms integrates literature and math.

K – 2; Science, Math; Improving STEM Instruction

Sandia III

12. *Full STEAM Ahead with New Mexico Agriculture in the Classroom!*

Traci Curry and Cheryl Butterfield, New Mexico Agriculture in the Classroom

Implement agricultural activities into your curriculum with these free classroom presentations, lessons, hands-on activities, teacher workshops and trainings, and connections to your area experts.

K – 12; Science, Technology, Engineering, Math; Building Community STEM Partnerships

Sandia VIII

Session II, Thursday, June 1, 2017
1:10 p.m. – 3:55 p.m. (150 minutes)

13. *STEAM Up with Essential Elements and You Be the Chemist Challenge*

Danielle Kusmak, Tularosa Municipal Schools; and Mike Murray, You Be the Chemist Challenge

Receive a Chemical Education Foundation giveaway bag that includes a flash drive with 50+ Activity Guide experiments. The activities use household materials, are easy to do, and can be done in any space.

K – 8; Science; Improving STEM Instruction

Sierra III

14. *Number and Operations in Base Ten: Developing a Solid Conceptual Foundation for Place Value*

Megan Kidwell and Lisa Matthews, Mathematically Connected Communities, NMSU

What does it mean to "fluently add and subtract within 100 using strategies based on place value"? Explore a research-based learning trajectory for place value understanding, and activities that support making sense of place value concepts.

K – 2; Math; Improving STEM Instruction

Ocotillo II

15. *Hands-on Volcanoes: Activities for Your Classroom.*

Mel Strong, melstrong.org

Learn about the fascinating volcanic features of New Mexico and some hands-on, cross-cutting activities regarding volcanoes. These activities may incorporate math, reading, graphing, and physics. Bring a flash drive for free materials.

6 – 12; Science; Improving STEM Instruction

Sierra I

**Session II, Thursday, June 1, 2017
1:10 p.m. – 3:55 p.m. (150 minutes)**

16. *Building Computational Thinkers in Science*

Melody Hagaman, Project Growing Up Thinking Scientifically (GUTS)

Experience computational thinking through hands-on activities from Project GUTS, NM Supercomputing Challenge, and UNM Computer Science for All. Explore resources combining Web 2.0 collaboration tools and computational thinking. BYOD (laptops preferred...some will be provided).

6 – 12; Science, Technology; Improving STEM Instruction

Sandia I

17. *In-Depth with GLOBE Data Collection and Data Visualization*

Tracy Ostrom and Christy Wall, GLOBE Mission Earth

Take a deep dive into GLOBE by learning the soil collection (pedosphere) protocols and inputting data into the site. Practice using the data visualization tools available on the GLOBE site. All teachers are welcome, and to become an official GLOBE teacher, please participate in all 3 GLOBE sessions.

6 – 12; Science; Improving STEM Instruction

Sierra II

**Session II, Thursday, June 1, 2017
1:10 p.m. – 2:25 p.m. (75 minutes)**

18. *Alien Autopsy – Fake Bodies, Real Science*

Dave Dooling, New Mexico Museum of Space History

Visit space station Antaeus and dissect *Tortilla volante* (gr. 4–12) and *Oceanus ericius* (gr. K–3) from the deep ocean of Europa. Our activity uses ersatz creatures to teach the basics of astrobiology and terrestrial life sciences.

K – 12; Science, Technology, Engineering; Improving STEM Instruction

Sandia VIII

19. *The Power of Partnerships and Community Connections...Making Them, Taking Care of Them, & Celebrating Them*

Karen Kinsman, UNM STEM-H Center for Outreach, Research, & Education

Develop an understanding of the power of partnerships and community connections that can support student learning. Begin developing your own strategies for building partnerships and collaborations within your communities.

K – 12; Science, Technology, Engineering, Math; Building Community STEM Partnerships

Ocotillo I

20. *PARCC: Examining the Resources Available to Strengthen our Curriculum and Instruction*

Ronda Davis, New Mexico Council of Teachers of Mathematics (NMCTM)

We explore available resources that provide valuable tools to help all learners move forward, and reflect on how adjustments to curricula, instruction, and assessments inform our next steps.

3 – 12; Math; Improving STEM Instruction

NMCTM Session

Sandia VI

**Session II, Thursday, June 1, 2017
1:10 p.m. – 2:25 p.m. (75 minutes)**

21. *Go With The Flow: Unit Design with Momentum and Intention*

Sharyn Gray and Heather Herd, Turquoise Trail Charter School

While a strong, research-based curriculum is the backbone of an effective mathematics class, how can you CRAFT your teaching sequence with intention, creativity, and focus? We share strategies to maximize efficiency in lesson planning.

3 – 12; Math; Improving STEM Instruction

Sandia VII

22. *Equity and Excellence: Fractions on the Number Line for ALL Students*

Susie Hakansson, TODOS: Mathematics for ALL

We focus on increasing teachers' conceptual understanding of fractions on the number line to design student learning experiences. Best practices to support English learners are included. Have fun learning with others about fraction sense!

3 – 8; Math; Promoting Equity and Access in STEM

Sandia V

23. *Using Number Talks to Build Math Fluency and Flexibility in the Secondary Classroom*

**Zachary Leonard, Los Alamos National Laboratory Math and Science Academy; Regina Watson and
Kathe Kanim, Mathematically Connected Communities, NMSU**

Number Talks can help develop students' number fluency, flexible thinking, and mathematical mindsets. Number Talks is a great way to promote mathematical connections across strategies that promote academic language.

6 – 12; Math; Improving STEM Instruction

Sandia IV

**Session III, Thursday, June 1, 2017
2:40 p.m. – 3:55 p.m. (75 minutes)**

24. *Introduction to the Next Generation Science Standards (NGSS) – Taming the Fear Factor*

Ellen Loehman and Debra Thrall, New Mexico Science Teachers Association (NMSTA)

We provide a basic overview of what the Next Generation Science Standards are and are not and show you how to read them. Our goal is to demonstrate that sometimes change is a good thing.

K – 12; Science; Improving STEM Instruction

NMSTA Session

Ocotillo I

25. *Inquirer-Presenter-Scribe*

Jonathan Haack, New Mexico Council of Teachers of Mathematics (NMCTM)

Inquirer-Presenter-Scribe is a seminar-based approach to math instruction for the middle or end of a unit. Small groups of students, each with different roles, work collectively on math problems, and then engage in a whole group seminar.

6 – 12; Math; Improving STEM Instruction

NMCTM Session

Sandia VI

**Session III, Thursday, June 1, 2017
2:40 p.m. – 3:55 p.m. (75 minutes)**

26. *Number Talks in the Elementary Classroom*

Zaira Falliner and Jana Ward, Collaborating for Outstanding Readiness in Education (CORE), NMSU

In this session, participants will learn how to implement number talks, from planning, to procedures, to drawing out student thinking.

K – 5; Math; Promoting Equity and Access in STEM

Sandia V

27. *Vertical Progression Professional Development Math Content Module (MCM) Videos for Grade 3–8 Teachers of Mathematics*

Lorenzo Gonzales, Los Alamos National Laboratory Math and Science Academy; and Mara Herrera, San Felipe Elementary School

We illustrate the use of the free Math Content Module (MCM) videos aligned to the New Mexico Common Core Standards showing the vertical progression through problem-solving activities, student work, and the online MCMs.

3 – 8; Math; Improving STEM Instruction

Sandia VII

28. *New Mexico Climate Champions: Students Learn and Take Action to Mitigate Climate Change Effects on New Mexico Water and Energy Resources*

Stephanie Bestelmeyer and Libby Grace, Asombro Institute for Science Education

Hear about an opportunity (with funding) to help students design and implement their own action projects to mitigate climate change. Learn new, hands-on activities developed by the Asombro Institute about NM energy and water issues.

6 – 12; Science; Building Community STEM Partnerships

Sandia IV

29. *Scrub Club: STEAM-H Strong!*

Stephanie Gurulé-Leyba, Scrub Club

Learn how you can incorporate STEM and literacy hands-on, project-based and applied learning with real world relevance and community partnerships by developing a summer STEAM-H enrichment program for grade 4–8 students.

3 – 12; Science, Technology, Engineering, Math; Improving STEM Instruction

Sandia VIII

JOIN US THURSDAY EVENING FOR A SPECIAL EVENT!

4:30 p.m. - 6:00 p.m. Thursday is Informal Science Education Night

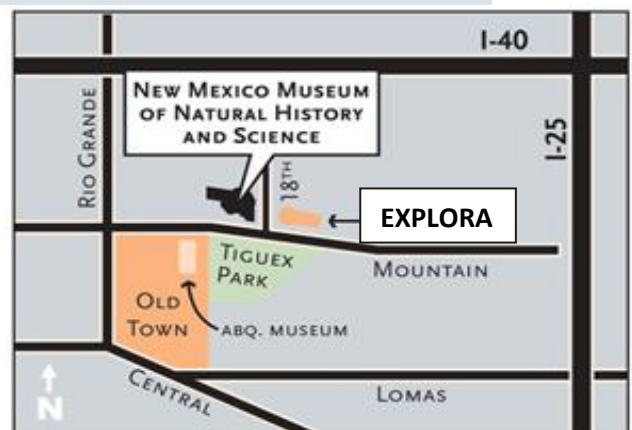
iExplora! Museum and
The New Mexico Museum of Natural History and Science will be open to
you and your family.



Ideas You Can Touch
Ideas que puedes tocar



iExplora! and the Museum of Natural History and Science is providing **free admission** on Thursday, June 1, 2017 from 4:30 p.m.–6:00 p.m. to STEM Symposium participants and their families. Wear your conference badge for admission.





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Friday, June 2, 2017

8:00 a.m. – 9:00 a.m.	Welcome: Yanira Vazquez, Director, Math and Science Bureau, NM PED
	Special Guests: Chaparral Middle School and Deming High School, NM MESA Teams
9:00 a.m. – 9:15 a.m.	Transition to Sessions
9:15 a.m. – 10:30 a.m.	Session IV
10:30 a.m. – 10:45 a.m.	Transition to Sessions
10:45 a.m. – 12:00 p.m.	Session V
	Professional Organization Lunch Learn about the work and offerings for New Mexico teachers of one of four professional organizations (<i>Sandia Ballroom</i>)
12:00 p.m. – 1:30 p.m.	
1:30 p.m. – 1:45 p.m.	Transition to Sessions
1:45 p.m. – 2:30 p.m.	Session VI
2:30 p.m. – 2:45 p.m.	Transition to Sessions
2:45 p.m. – 3:30 p.m.	Session VII
3:30 p.m. – 4:00 p.m.	Travel Reimbursement Processing

9:15 a.m. – 12:00 p.m.
Sessions

NOTE: If you are eligible for travel reimbursement, please *remember to sign in each day*. Checks will be ready at the end of the conference on Friday after 3:30 p.m. Submit required paperwork by 10:00 a.m. on June 2, 2017.

Teachers must attend the entire Symposium to receive the travel reimbursement.

Session IV, Friday, June 2, 2017
9:15 a.m. – 10:30 p.m. (75 minutes)

30. *Making Making Meaningful – STEM Lab Design Charrette*
Allison Brody, ;Explora! Museum

Want OR have a STEM Lab at your school? How can we design and utilize STEM Labs to best serve student and educator needs? We need your passion, experience, and knowledge. Join us to develop rubrics of good practice.

K – 12; Science, Technology, Engineering, Math; Improving STEM Instruction

Sandia VI

31. *Energy in a New Mexico Ecosystem*
Tish Morris and Karen Herzenberg, The Bosque Education Guide

Using local plants and animals, engage your students in the foundational concepts of understanding the sources of energy in an ecosystem, and how each organism gets the energy it needs to survive and thrive.

3 – 8; Science; Improving STEM Instruction

Sandia II

32. *Using Number Talks to Build Math Fluency and Flexibility in the Secondary Classroom*
**Zachary Leonard, Los Alamos National Laboratory Math and Science Academy; Regina Watson and
Kathe Kanim, Mathematically Connected Communities**

Number Talks can help develop students' number fluency, flexible thinking, and mathematical mindsets. Number Talks is a great way to promote mathematical connections across strategies that promote academic language.

6 – 12; Math; Improving STEM Instruction

Ocotillo I

33. *Wet and Wild Science – Using GLOBE Protocols to Describe Water Quality*
Christy Wall, GLOBE Mission Earth

Participants practice the GLOBE Hydrosphere student protocols by measuring the conductivity, dissolved oxygen, temperature, transparency, and pH of water. A brief overview of how to submit data to GLOBE is included. All teachers are welcome, and to become an official GLOBE teacher, please participate in all 3 GLOBE sessions.

6 – 12; Science; Improving STEM Instruction

Sierra II

Session IV, Friday, June 2, 2017
9:15 a.m. – 12:00 p.m. (150 minutes short course)

34. *Fractals are SMART – Science, Math and Art! New Ways to Teach Core Concepts in Math and Science Using Fractals.*

Emma Eckert and Jonathan Wolfe, Fractal Foundation

Looking for innovative ways to teach core concepts in math and science? The infinite beauty of fractals can help promote early interest in math, science, and art. Learn how to make art using algebra! Fractals are SMART—Science, Math, and Art!
K – 8; Science, Math; Improving STEM Instruction

Sandia VII

35. *What's the Problem: Exploring the Mysteries of Math Mistakes*

Beth Gudbrandsen, NM PED

Gain tools to recognize the processing problems undermining students' math success, strategies to address those underlying problems, and the opportunity to continue to collaborate in developing strategies beyond this workshop. Participants are required to bring a laptop.

3–5; Math; Improving STEM Instruction

Sierra III

36. *Increasing Academic Language Through Student Discourse and Science Note-Booking in the Inquiry Classroom*

David Call, Doris Rivera, and Dave Forester, Los Alamos National Laboratory Foundation

Experience an inquiry science lesson cycle showing the teacher moves that help support language development through student discourse and meaningful writing, demonstrating how the deliberate integration of literacy into STEM subjects directly supports student language development.

K – 8; Science; Improving STEM Instruction

Sandia I

37. *STEAM PBL: Using STEM + Art Project-Based Learning to Empower Multicultural Educational Engagement*

Kim Scheerer, NM MESA; and Michaela Shirley, Indigenous Design & Planning Institute

Hands-on activities include equity and inclusion techniques; collecting and interpreting STEM data; collaboratively designing, building, and sharing a mini-STEM project; and using Native American cultural experiences as a case study.

6 – 12; Science, Technology, Engineering, Math; Promoting Equity and Access in STEM

Sandia VIII

38. *Hands-on Volcanoes: Activities for Your Classroom.*

Mel Strong, melstrong.org

Learn about the fascinating volcanic features of New Mexico and some hands-on, cross-cutting activities regarding volcanoes. These activities may incorporate math, reading, graphing, and physics. Bring a flash drive for free materials.

6 – 12; Science; Improving STEM Instruction

Sierra I

Session IV, Friday, June 2, 2017
9:15 a.m. – 12:00 p.m. (150 minutes short course)

39. *The Missing 'M' in STEM: A Math Circles & Modeling Approach*

James Taylor and Nicholas Bennett, Math Circles Collaborative of New Mexico

This is a hands-on workshop (all software used is either free or free versions exist), with a highly collaborative angle. Mathematical Circles takes mathematical discoveries and extends them using computer modeling tools.

6 – 12; Technology, Math; Improving STEM Instruction

Ocotillo II

Session V, Friday, June 2, 2017
10:45 a.m. – 12:00 p.m. (75 minutes)

40. *Convivial (Fun) Calculus: Hands-on and Hands-free Activities*

Anna Burns and Reba Kennedy, New Mexico Council of Teachers of Mathematics (NMCTM)

While Calculus can be challenging, it can also be fun! Come join us for some hands-on activities in Calculus concepts. There will be constructions you create, songs, games, and puzzles to use in your classroom.

9–12; Math; Improving STEM Instruction

NMCTM Session

Agave

41. *Introduction to the Next Generation Science Standards (NGSS) – Taming the Fear Factor*

Ellen Loehman and Debra Thrall, New Mexico Science Teachers Association (NMSTA)

We provide a basic overview of what the Next Generation Science Standards are and are not and show you how to read them. Our goal is to demonstrate that sometimes change is a good thing.

K – 12; Science; Improving STEM Instruction

NMSTA Session

Sandia VI

42. *Teaching Next Generation Science Standards (NGSS) Engineering Design Through Media*

Laurel Wyckoff and Rose M Poston, New Mexico Public Broadcasting Service (PBS)

Teaching NGSS Engineering Design Through Media is a collection of free resources that deepen teachers' understanding of the Next Generation Science Standards and bring engineering alive for elementary, middle, and high school students.

K – 12; Science, Engineering; Improving STEM Instruction

Ocotillo I

43. *Discourse Done Through Math Practices*

Patricia Carden, Mathematically Connected Communities, NMSU

Experience firsthand what discourse is and how to support this type of learning in your classroom through the Mathematical Practices. Participants will walk away with practical activities that can be used with students the next day.

3 – 12; Math; Improving STEM Instruction

Sierra II

**Session VI, Friday, June 2, 2017
1:45 p.m. – 2:30 p.m. (45 minutes)**

44. *NM PED Teacher and Family Outreach*

Alicia Duran, NM PED Strategic Outreach Teacher Liaison; and Gloria Ruiz, NM PED Strategic Outreach Family Engagement Coordinator

This informative session will provide insight into the PED's recently launched teacher and family programs. Learn about innovative opportunities for teachers to engage with state-level leaders and other educators across the state regarding PED areas of focus, and our teacher-leader programs and resources for families to support their students.

K – 12; Science, Technology, Engineering, Math; Teacher Leadership in STEM

Sierra II

45. *Jump On It! Kinesthetic Math Activities and Games*

Amber Waugh-Reed, Albuquerque Public Schools

Jump On It! Stimulate and enhance brain function, and sensory engagement by adding movement to lessons to increase learning. Use song and dance, and everyday games and activities to get everyone's blood pumping.

3–5; Math; Improving STEM Instruction

Sandia I

46. *Claims, Evidence, and Reasoning –Argumentation Made Easy!*

Deborah Linscomb, Carolina Biological; and Carla Burns, Ruidoso Schools

Should middle school students learn to argue? Participate in lessons modeling how claims, evidence, and reasoning can be used with your students to develop argumentation skills that lead to making scientific explanations based on evidence.

6–8; Science, Engineering; Improving STEM Instruction

Sierra III

47. *Breaking Chocolate: Engaging Science and Engineering Concepts*

Hy Tran, Sandia National Laboratories; and Turtle Haste, Albuquerque Public Schools

Why (and how) does chocolate break? Design an experimental apparatus to break chocolate, perform an experiment, and collect and analyze data. In addition to engineering design, we will explore ways of presenting variables versus controls.

3 – 8; Science, Technology, Engineering, Math; Improving STEM Instruction

Ocotillo II

48. *Supercomputing Challenge*

Josephine Kilde, Supercomputing Challenge

Learn about the Supercomputing Challenge, a program encompassing the school year in which teams of elementary through high school students use mathematical or computational models to demonstrate their science projects.

3 – 12; Science, Technology, Engineering, Math; Improving STEM Instruction

Agave

**Session VI, Friday, June 2, 2017
1:45 p.m. – 2:30 p.m. (45 minutes)**

**49. *New Mexico Museum of Natural History & Science... From the Museum Into Your Hands*
Kelly White and Mike Sanchez, New Mexico Museum of Natural History and Science**

Through hands-on discovery participants explore materials, resources, and opportunities the New Mexico Museum of Natural History and Science offers teachers, including classroom-based programs and educator loaner kits.

K – 12; Science; Improving STEM Instruction

Sandia VII

**50. *Leonardo da Vinci was a STEAM Pioneer*
Susan Watson, Bloomfield School District**

Leonardo da Vinci is a prime example of how Art can be included in STEM, becoming STEAM. We will look at different ways Art enhances STEM and create an artistic project that improves the way we look at STEM subjects.

K – 12; Science, Math; Promoting Equity and Access in STEM

Sandia II

**51. *Los Alamos National Laboratory (LANL) and K–8 STEM Education*
Monica Martinez-Archuleta and Janelle Vigil-Maestas, Los Alamos National Laboratory Community Partnerships Office**

Learn about the unique opportunities teachers in Sandoval, Rio Arriba, Taos, Los Alamos, Santa Fe, and San Miguel counties have to partner with LANL and support students through participation in LANL STEM programs.

3 – 8; Science, Technology, Engineering; Building Community STEM Partnerships

Sierra I

**52. *TODOS: Mathematics for ALL with NMCTM –Working Together to Promote Math Equity for Every Student*
Tori Gilpin, NMCTM; and Rocio Benedicto, TODOS: Mathematics for ALL**

TODOS: Mathematics for ALL and NMCTM collaborate to offer strategies that address the mathematical learning of our diverse student population, and help teachers address the needs of all learners.

K – 12; Math; Promoting Equity and Access in STEM

NMCTM Session

Ocotillo I

**53. *Investigate Natural Selection and Practice STEM Skills with HHMI BioInteractive*
Jennifer Bricken, Howard Hughes Medical Institute (HHMI)**

Want to incorporate more real-world science examples and authentic data in your math class? Come learn about natural selection in Galapagos finches using free HHMI BioInteractive resources to facilitate understanding of natural selection.

6 – 12; Science, Math; Improving STEM Instruction

**Vendor Session*

Sandia VIII

**54. *Encouraging a Path to STEM*
Pareesa Shirazi, Texas Instruments**

Explore the latest resources and technology available to make coding and engineering design accessible to ALL students. Get students asking questions that prompt conceptual understanding in basic programming, engineering, math, and science.

6 – 12; Science, Technology, Engineering, Math; Improving STEM Instruction

**Vendor Session*

Sandia VI

**Session VI, Friday, June 2, 2017
1:45 p.m. – 2:30 p.m. (45 minutes)**

- 55. *Are You STEM Ready? Hands-on STEM K-5 Science –Let's Go!*
Veronica Burnett, STEMscopes; and Terry Talley, Accelerate Learning**

This interactive and highly engaging session showcases an elementary STEMscopes science lesson with English and Spanish resources, and embedded English learner proficiency strategies.

K – 5; Science; Improving STEM Instruction

***Vendor Session**

Sandia III

**Session VII, Friday, June 2, 2017
2:45 p.m. – 3:30 p.m. (45 minutes)**

- 56. *Invention Conventions*
Amy Lopeman, New Mexico Science Teachers Association (NMSTA)**

Invention Convention is an alternative to Science Fair and is a project based, inquiry type lesson. The lesson steps from beginning to end, the handouts, and example boards will be shown.

6-8; Science; Improving STEM Instruction

NMSTA Session

Sandia IV

- 57. *Productive Struggle and Peaceful Interaction in Math: A Lesson from Colombia's Escuela Nueva Model*
Dave Million and Kathryn Million, Las Cruces Public Schools**

The Escuela Nueva model in Colombia develops students as democratic leaders of the schools they attend. We will explore the democratic collaboration, sample the math tasks, and connect this model to our current practices in mathematics.

K – 8; Math; Promoting Equity and Access in STEM

Sierra I

- 58. *New Mexico Department of Transportation (NM DOT) STEM Outreach Program*
David Hadwiger, New Mexico Department of Transportation (NM DOT)**

The NM DOT outreach program includes teacher training showing how students apply STEM concepts to bridge design and construction, maglevs, and road construction. This program is supported by a federal grant, with no cost to teachers or schools to participate.

6 – 12; Science, Technology, Engineering, Math; Improving STEM Instruction

Sandia II

- 59. *Effectiveness of the Integration of a STEM Career Awareness Program in a Regular Geology Class in Increasing Awareness and Knowledge of Geoscience*
Geizi Llanes-Dejka, Farmington Municipal Schools**

Experience hands-on activities and a survey used in a Geoscience STEM career awareness program to show the importance of STEM education. Learn how our schools can build community collaborations to promote STEM careers.

9-12; Science, Technology, Engineering, Math; Building Community STEM Partnerships

Sandia I

**Session VII, Friday, June 2, 2017
2:45 p.m. – 3:30 p.m. (45 minutes)**

**60. *Introduction to FREE Online Professional Development Courses Offered By the UNM STEM-H Center*
Karen Kinsman and Erin Garcia, UNM STEM-H Center for Outreach, Research, & Education**

An introduction to the UNM STEM-H courses that are specific to the support and facilitation of inquiry-based student STEM research projects...especially those that may proceed on to local, regional, state, and/or national competitions.

6 – 12; Science, Technology, Engineering, Math; Improving STEM Instruction

Sierra III

**61. *STEM Teachers as New Teacher Mentors: A Look at One Alternative Licensure Model*
Cecilia Hernandez and Jamie Baker, New Mexico State University**

Participants will discuss mentor teacher models and strategies designed to facilitate their understanding of how to best support new teacher candidates through authentic mentorship, and the unique needs of alternative licensure candidates.

6 – 12; Science, Math; Teacher Leadership in STEM

Sandia VIII

**62. *Brain Hackers Online: A Social Media Platform for Teaching Science*
Chris Forsythe, Brain Hackers Association**

This session will demonstrate how concepts proven to drive Internet traffic may be applied to create a compelling learning environment. Brain Hackers Online is a free service that will be available in the fall of 2017.

6 – 12; Science, Technology, Engineering, Math; Improving STEM Instruction

Ocotillo II

**63. *CONVECTION CURRENTS & PLATE MOTION*
Bill Gipperich, LAB-AIDS**

Investigate and model convection currents using unique LAB-AIDS®/SEPUP materials to develop an operational understanding of the relationship between water temperature and movement, and the motion of the earth's tectonic plates.

6–8; Science, Technology; Promoting Equity and Access in STEM

***Vendor Session**

Sandia III

**64. *LEGO® MINDSTORMS® Robotics – Fundamental Programming Skills - Lecture*
Danielle Kusmak and Chris Morgan, NM First Lego League**

Gain an understanding of how LEGO® MINDSTORMS® robot programming programs are constructed, and learn about the fundamental building blocks of the MINDSTORMS language (action, flow, and sensor), with concentration on action.

3 – 8; Science, Technology, Engineering, Math; Improving STEM Instruction

***Vendor Session**

Ocotillo I

**Session VII, Friday, June 2, 2017
2:45 p.m. – 3:30 p.m. (45 minutes)**

**65. *Exploring Key Ideas Across the Number and Operations in Base Ten Standard in Grades K–5*
Rick Kitchen**

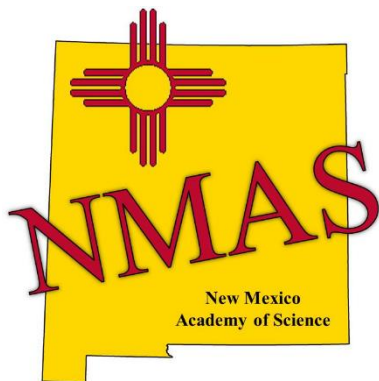
Participants have opportunities to deeply examine the development of key mathematical ideas in this CCSS-M standard. Inquiry-based instructional strategies will be modeled throughout and these strategies will be explicitly discussed.
K – 5; Math; Improving STEM Instruction

Sandia V

**66. *Everyone Can Code*
Brian Peterson, Apple Inc**

Explore curriculum for middle and high school that makes it easy to bring coding into your school. Everyone Can Code gives the power to learn, write, and teach code and the new Swift Playgrounds app includes lessons for beginning coders.
3 – 12; Science, Technology; Promoting Equity and Access in STEM
***Vendor Session**

Sierra II



New Mexico Academy of Science

Statewide Advocate & Resource For Science and Science Education www.nmas.org

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Teacher Award Program Nominations taken for deserving Science Teachers in grades 6-12

Professional Development Conference sessions for writing and presenting science research

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Summer Science Camp All expense paid camp in West Virginia for high school seniors

Annual Meeting Scientific presentations and events for the general public

Lecture Programs Expert scientific talks and discussions on social and political topics

Professional Voice White papers, opinions, and testimony to NM state government

Member, National Association of Academies of Science (NAAS)

Affiliate, American Association for the Advancement of Science (AAAS)



Presidential Awards for Excellence in Mathematics and Science Teaching

CALL FOR NOMINATIONS

Opens In Fall 2017

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) are the highest honors bestowed by the United States Government specifically for K-12 mathematics and science (including computer science) teaching. Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of science, technology, engineering, and mathematics (STEM) education. Since 1983, more than 4,700 teachers have received this prestigious honor. Up to 108 teachers are recognized each year.

Presidential Awardees receive:

- a citation signed by the President of the United States
- a trip to Washington, D.C. to attend a series of recognition events and professional development opportunities
- a \$10,000 award from the National Science Foundation



WHO CAN NOMINATE?

Anyone – principals, teachers, parents, students, or members of the general public – may nominate exceptional mathematics and science (including computer science) teachers.

NOMINATION DEADLINE
April 2018

WHO CAN APPLY?

Elementary school teachers (K- 6th grade) can apply this year. Secondary school teachers (7 - 12th grade) will be eligible to apply during a future cycle.

APPLICATION DEADLINE
May 2018



TO NOMINATE OR APPLY, VISIT:
www.paemst.org



The Division of Human Resource Development within the Directorate of Education and Human Resources at the National Science Foundation administers PAEMST on behalf of The White House Office of Science and Technology Policy.



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