

# Nebraska Summit on Math and Science Education

## Breakout Sessions

Monday, December 8, 2014

Breakout Sessions		
10:30 – 12:00	6 sessions	

1. Professional Development for teachers of mathematics
2. Authentic Science Learning Experiences
3. Sustaining a Community of Science Teachers
4. Challenges of Math and Science Teaching in Rural Communities
5. Revising the Nebraska Mathematics Standards
6. Primarily Math

Breakout Sessions		
2:30 – 4:00	7 sessions	

7. Principles to Actions – A road map for excellence in mathematics teaching
8. Reading and Writing in Science
9. Science for Diverse Learners
10. Informal Science Learning
11. Educating the Next Generation Math and Science Teachers
12. Math Coaches: Supporting Teachers as they Teach Students
13. K-12 Technology and Engineering Focused Programs
14. Math and Science in the Preschool Years - **CANCELED**

## Breakout Session Descriptions

### 1. Professional Development for Teachers of Mathematics

Moderator: Michelle Homp

The 2012 publication, *The Mathematical Education of Teachers II*, argues that “Throughout their careers, teachers need opportunities for continued professional growth in their mathematical knowledge. Satisfying the minimum requirements for initial certification to teach mathematics does not ensure that even outstanding future teachers have the knowledge of mathematics, of teaching, and of students that is possessed by successful experienced teachers.” This session will discuss the importance of high quality professional development opportunities and report on current opportunities for Nebraska mathematics teachers to obtain professional development and graduate education.

Topics to be discussed:

- The Importance and components of quality Professional Development
- The New Teacher Network
- Nebraska Mathematics Professional Development Series
- The Nebraska Math and Science Summer Institutes
- Online graduate courses for math teachers

## **2. Authentic Science Learning Experiences**

Moderator: Julie Thomas

Authentic learning emphasizes real-world, problem-based learning that causes students to look beyond textbooks and traditional resources for answers (Delisle, 1997). In Nebraska, authentic science learning experiences include in-school opportunities (where research trucks are available for check-out) and in-laboratory opportunities where high school students are able to work along scientists for an extended period of time. This session will introduce some of these authentic learning experiences encourage discussion of how we might expand these learning opportunities across the state.

**Using the Tools of the Trade: Mobile Laboratory Programs.** Presenters: Sarah Zulkoski, Outreach Coordinator for Nebraska EPSCoR; Bryan Corkle, Junior-Senior High Science Teacher, O'Neill Public Schools; and Cliff Stains, Assistant Professor, Chemistry Department, UNL.

**Using Your Summer to Discover: The Young Nebraska Scientists Program (summer research and summer camps for middle and high school students).** Presenter: Sarah Zulkoski, Outreach Coordinator for Nebraska EPSCoR.

**Promoting Science through the Food and Agriculture Research Experiences for Teachers (RET) Program.** Presenters: Jon Pedersen, Associate Dean, College of Education and Human Sciences and Tiffany Heng-Moss, Associate Dean, College of Agricultural Sciences and Natural Resources.

## **3. Sustaining a Community of Science Teachers**

Moderator: Leilani Arthurs

Historically, teachers' professional development opportunities have occurred as isolated events that are disconnected from the workplace. Now, long-term and situated professional development programs insure lasting effects on teachers' practice (e.g., Loucks-Horsley et al., 2003; Putnam & Borko, 2000). Such long-term programs can increase teachers' content knowledge and guide instructional strategies. Potentially powerful professional development models include supportive measures such as peer-coaching, collaborative action research, and case studies. This session will provide "peek encounters" with several such science programs in Nebraska and opportunity to reflect on future needs for professional development access and networking and opportunities.

**Nebraska Math and Science Partnership (MSP) Grant (KICKS and LINKS).**

Presenters: Deb Paulman, KICKS Project Director and Educational Service Unit #16 Staff Development Director, and Sheree Pandil, Science Matters State Coordinator, Educational Service Unit #3 Staff Development Consultant.

**Your Guides to the Summit: The Role of Science Organizations in Nebraska.**

Presenters: Joe Myers, President of Nebraska Association of Science Teachers (NATS); Shauna Roberson, Board Member of Nebraska Association of Science Teachers (NATS); Dan Sitzman, President of Nebraska Academy of Sciences (NAS).

**Distance-Delivered Professional Development Communities for Educators: Opportunities and Challenges to Meet Need and Busy Schedules.**

Presenter: Dave Gosselin, Chair, On-line Science for Educators Specialization, Masters of Applied Science Program, and Professor of Earth Science, University of Nebraska-Lincoln.

#### **4. Challenges of Math and Science Teaching in Rural Communities**

Moderator: Steve Swidler

This interactive session will focus on the challenges mathematics and science teachers face in rural school contexts. In the absence of large curricular and instructional infrastructures found in large cosmopolitan districts, rural teachers must cultivate local and regional resources for professional development and growth. This session will include brief presentations by distinguished math and science teachers and discussant. The audience will be invited to participate in a discussion with the teachers and Speaker of the Nebraska Legislature, addressing the question: What are priorities for cultivating and sustaining support for high quality STEM teaching in rural schools?

Session Chair: Stephen Swidler, Dept. of Teaching, Learning & Teacher Education, UNL.

Presenters: Shelby Aabrg, Scottsbluff High School and 2015 Nebraska Teacher of the Year.  
Bob Feurer, North Bend Central High School, 2011 Nebraska Teacher of the Year.  
Discussant: Greg Adams, State Senator and Speaker of the Nebraska Legislature.

#### **5. Revising the Nebraska Mathematics Standards**

Moderator: Delise Andrews

Nebraska Statute requires the state board of education to update standards for each subject area every five years. Thus the Nebraska Department of Education recently launched a revision of its math standards. While Nebraska is one of the states that has not adopted the Common Core State Standards, Nebraska's K-12 education leaders share the goals of high academic standards and producing high school graduates who are college and career ready. Are there lessons to be learned from the Common Core that should influence decisions about the Nebraska math standards? How do standards support teachers, schools and districts as they make decisions about curricula that will support teachers' efforts to strengthen K-12 mathematics education in Nebraska? This session will provide an overview of the development and adoption process for mathematics standards in Nebraska. This will be followed by a panel of teachers representing Nebraska's K-12 schools discussing what their hopes are for this process, how standards impact their work, and what it is that teachers need from the standards to enable them to best meet the needs of their students.

Presentation: The Review and Revision Process of the 2009 Nebraska Mathematics Standards  
Deb Romanek, Math Director, Nebraska Department of Education  
Panelists: Jason Vitosh, High School Teacher, Falls City Public Schools  
Julie Kreizel, Math Coordinator Grades 6-8, Lincoln Public Schools  
Matt Timm, Elementary Math Coach, Omaha Public Schools  
Member of Grades K-2 NE Standards writing team  
Lori Welch, Medicine Valley Elementary School, Grades 4-5 Math Teacher  
Member of Grades 3-5 NE Standards writing team

#### **6. Primarily Math**

Moderator: Ruth Heaton

The NebraskaMATH grant funded a professional development program designed to educate superbly prepared K-3 mathematics teachers who earn a Graduate Certificate as a K-3 Mathematics Specialist. A research initiative has studied both teacher knowledge and change together with a study of student achievement when taught by a Primarily Math graduate. The grant originally anticipated a program for 120 teachers, but demand for the program was substantial and resources were reallocated to

enable more K-3 teachers to participate. To date, 285 teachers have completed the 18-hour program and 65 more are currently taking Primarily Math courses. This session will examine the graduate program, research findings, impact from teachers' perspectives, and will discuss efforts to sustain the Primarily Math program.

Presenters: Wendy Smith, University of Nebraska – Lincoln  
Traci Kutaka, University of Nebraska – Lincoln  
Ruth Heaton, University of Nebraska – Lincoln

Panelists: Sue Braun, Lincoln Public Schools  
Kristine Ray, Lincoln Public Schools  
Jennifer Kaminski, Omaha Public Schools  
Danielle Dudo, Grand Island Public Schools

## **7. Principles to Actions – A Road Map for Excellence in Mathematics Teaching**

Moderator: Jim Lewis

The best set of standards in and of themselves cannot lead to high levels of mathematical achievement by all students. Thus NCTM has released the book *Principles to Actions: Ensuring Mathematical Success for All* to describe six guiding principles of teaching and learning and specific actions teachers and mathematics education stakeholders need to take to make mathematical success a reality for all students. This session will feature NCTM President Diane Briars and *Principles to Actions* co-author Matt Larson reflecting on key features of quality mathematics instruction, and 2015 Nebraska Teacher of the Year Shelby Aaberg providing insight to how these features are enacted from the perspective of a classroom teacher.

Presenters: Diane Briars, NCTM President  
Matt Larson, Lincoln Public Schools, NCTM President-elect  
Shelby Aaberg, Scottsbluff Public Schools, 2015 Nebraska Teacher of the Year

## **8. Reading and Writing in Science**

Moderator: Julie Thomas

Language literacy in the science classroom promotes the learning of science while promoting the skills of reading and writing. Understanding science is essential for the 21<sup>st</sup> Century; a science literate citizen will need to identify salient facts and supporting evidence from a variety of media to make informed decisions about their lives. At all levels incorporating non-fiction books to interest and encourage students' science interests can increase their reading and writing proficiency as well as science content. This session will focus on the benefits of integrating reading, writing, and science instruction.

### **Collaborative Strategies for Integrating Reading and Writing in Secondary Science Instruction.**

Presenter: Bev Devore-Wedding, High School Division Director, National Science Teachers Association (NSTA).

**Introducing Content Literacy Skills in the Primary Grades.** Presenter: Julie McGough, Second Grade Classroom Teacher and 2014 Presidential Award Finalist, Fresno, California.

**Learning to Write about Math and Science.** Presenters: Julia Roehling, Graduate Student in School Psychology and Michael Hebert, Assistant Professor of Special Education & Director of The Kit and Dick Schmoker Reading Center, University of Nebraska-Lincoln.

## **9. Science for Diverse Learners**

Moderator: Larry Scharmann

African-Americans, Hispanics, Native Americans, persons with disabilities and women are underrepresented in science, technology, engineering and mathematics. These groups comprise nearly two-thirds of the overall work force in U.S. yet they make up just one-quarter of the science and engineering workforce. This session will focus on best practices to actively include a rich and deep science experience for these diverse groups to encourage them to follow a pathway to science and engineering education and workforce.

**Embracing Diverse Science Students in Grand Island Public Schools K-12.** Presenters: Katie Ramsey, Middle School Science Coach, Grand Island Public Schools; and Robin Dexter, Associate Superintendent, Grand Island Public Schools.

**Modifying Science for Special Needs Students.** Presenter: Lynne Houtz, Associate Chair of Education, Creighton University.

**Meeting the Needs of Gifted Students in Science and Mathematics.** Presenters: John Thompson, Executive Director, Nebraska Association for the Gifted (NAG).

## **10. Informal Science Learning**

Moderator: Mark Griep

Informal science learning (in after-school clubs, zoos, and museums) serves to supplement and enhance classroom science learning. Informal science learning allows different learning styles and extends learning opportunities to non-traditional and second language learners. In this session, participants will become acquainted with several informal learning models and consider ways to expand such programs.

**Role of 4-H in Engaging Youth.** Presenter: Kathleen Lodl, Associate Dean, Nebraska Extension.

**Citizen Science.** Presenters: Emily Brown, Education Program Manager and Elizabeth Mulkerrin, Director of Education at the Henry Doorly Zoo.

**Virtual Field Trips – Why Take Them?** Presenter: Annie Mumgaard, Virtual Learning Educator, University of Nebraska State Museum.

## **11. Educating Next Generation Math and Science Teachers**

Moderator: Greg Sand

Nebraska's colleges and universities share the responsibility for educating secondary teachers of science, mathematics and computing. These teachers, in turn, are charged with educating a generation of high school graduates who must be ready to pursue college majors and careers in science, technology, engineering and mathematics. This session will highlight exemplary teacher education programs that have been supported by NSF Robert Noyce grants by faculty from UNL and

UNO and facilitate a conversation among stake-holders about what is most needed to prepare the next generation of science and mathematics teachers.

Presenters: Beth Lewis (UNL), Educating Highly-qualified Science Teachers: The MAst Program at UNL  
Janice Rech (UNO), The UNO Mathematics & Teacher Education Partnership  
Stephen Swidler (UNL), Depth Over Breadth in Learning to Teach: The MAst Program Teaching Internship  
Leen-Kiat Soh (UNL), The Need for Computer Science Teachers

## **12. Math Coaches: Supporting Teachers as they Teach Students**

Moderator: Cindy Beaman

Many school districts across the state and nation are investing in math coaches. Lincoln and Omaha Public Schools are among them. Recently Arlene Mitchell (of RMC Research Corporation) led a workshop in Omaha for math coaches and their principals to gain a better understanding of what it takes to ensure a school environment can lead to productive work by a math coach. This session will address the necessary components of successful coaching in mathematics and the challenges which may be encountered. Perspectives will be provided by Arlene Mitchell of RMC Research Corporation (coach trainer and professional development provider) and a panel that includes a primary grade math coach from LPS, and an elementary math coach and principal from OPS to talk about the issues they have encountered.

Presenters: Arlene Mitchell, Senior Research Associate, RMC Research Corporation  
Tara Zuspan, K-5 Instructional Coach, Lincoln Public Schools  
Matt Timm, Mathematics Coach, Omaha Public Schools  
Chris Pohlman, Instructional Facilitator, Omaha Public Schools

## **13. K-12 Technology and Engineering Focused Programs**

Moderator: Brad Barker

With the release of the Next Generation Science Standards (NGSS) engineering will be used as a framework to engage students in disciplinary core ideas and as an instructional point of entry to pique students' curiosity, capture their interest, and motivate their continued study. The insights gained help students recognize that the work of scientists and engineers is a creative endeavor - one that has deeply affected the world in which they live (NRC Framework, 2012, p. 218). This track will bring together technology and engineering focused initiatives that are supported through the University of Nebraska system.

Presenters: Neal Grandgenett: Educational Robotics Formal and Informal Education  
Gwen Nugent: Research Results from an Educational Robotics Program  
Sally Wei: Project Lead the Way  
Jenny Melander, Carl Nelson, Michelle Krehbiel: Wearable Technologies

## **14. Math and Science in the Preschool Years --- CANCELED**