

# Nebraska Summit on **Math and Science** EDUCATION



## Pre-Session Workshops

Sunday, December 7 | Embassy Suites Lincoln

**Social hour 8:30 p.m. - 10 p.m.:**

*After the Pre-Session Workshops, join us for a meet and greet in the Atrium/Breakfast area of the Embassy Suites. Catch up with an old friend or meet a new friend and professional colleague. We will provide light snacks (drinks can be ordered on your own at the Atrium Bar).*

## Science Sessions

### ***“Making” Sense of STEM Learning Through Community Science Workshops***

**7 p.m. – 8:30 p.m.**

**Regency Ballroom A**

*Presenter: Jerry Valadez, Ed.D., Director, Central Valley Science Project, Fresno, California*

Learn how to design a STEM learning environment that fosters creativity, innovation, and experimentation while effectively implementing State Standards, NGSS, or the scientific and engineering practices. This workshop will highlight the Sanger Community Science Workshop concept as an example of how to build a community of like-minded young people, adult mentors, and organizations to support high quality STEM learning. Participants will engage with scientific and engineering practices while tinkering, envisioning project designs, and building working models from simple materials. This workshop will serve as a resource for those involved in K-12 STEM education at all levels: teachers, informal educators, after school educators, administrators, and parent and education advocacy groups. In California, Community Science Workshops are established in high poverty, high minority communities and offer free after school drop-in programming, family science programs, summer programs, and school site programs. Professional development is also offered to help establish similar programs in both the formal and informal learning environments. The program stresses recruiting and training STEM instructors who are also role models from the community, a critical element for increasing participation by women and minorities in STEM careers.

### ***The Life Cycle of Literacy Through Science***

**7 p.m. – 8:30 p.m.**

**Alumni Room**

*Presenter: Julie V. McGough, Author, Elementary Teacher and 2014 Presidential Award Finalist in California*

Engage in questioning and plan investigations to help students understand living things while reading, writing, and participating in collaborative discussions. Engaging questions and purposeful investigations help students build understanding of science concepts. Learning about life science occurs in many elementary classrooms with simple experiences. Identify the parts of a plant or animal. What about exploring parts of the plant you cannot see? What questions will students ask when you cut open a stem to see what is inside? What about watching an animal grow and change? What observations and investigations will help students understand what happens to an animal in different stages? How can you make learning accessible on any campus through the use of mini field trips that promote observation and analytical thinking? Students will want to know more! Let their questions guide the inquiry while integrating collaborative conversations, reading of informational text, and writing. This session offers ideas to engage students through questioning and investigations of living things in a meaningful way. Help students develop a deeper understanding of the concepts being taught and a desire to engage in the next learning adventure!

*continued on reverse*

# Mathematics Sessions

## Elementary Teachers:

### ***Fluency with Fractions***

7 p.m. – 8 p.m.

Regency Ballroom B

*Presenter: Jim Lewis, Aaron Douglas Professor of Mathematics, University of Nebraska-Lincoln*

Both the Common Core State Standards and *Developing Effective Fractions Instruction for Kindergarten through 8th Grade* stress understanding fractions as numbers and the importance of using number lines when teaching fraction concepts. In this session we will discuss these ideas and how they can support developing computational fluency with fractions.

### ***Transform K-2 “Problem Performers” into “Problem Solvers”!***

8 p.m. – 9 p.m.

Regency Ballroom B

*Presenters: Susie Katt, Noyce Master Teaching Fellow and K-2 Math Coordinator, Lincoln Public Schools; Tara Zusan, Instructional Math Coach, Lincoln Public Schools*

Primary-aged children commonly rely on the “grab numbers and compute” problem solving strategy, which fails to promote mathematical reasoning and understanding. Often, instructional practices in K-2 mathematics classrooms remove the cognitive demand for young students. We’ll discuss effective instructional strategies that help K-2 students make sense of problems and persevere in solving them. Come learn how to put the thinking back into problem solving!

## Middle Level Teachers:

### ***James Tanton’s Remarkable Paper Folding***

7 p.m. – 8 p.m.

Regency Ballroom F

*Presenters: Anne Schmidt, Lincoln Public Schools, Noyce Master Teaching Fellow; Katie Soto, Grand Island Public Schools, Noyce Master Teaching Fellow*

What mathematical thinking can be found just by folding a strip of paper? Participants will discover patterns and relationships of peaks and valleys through a simple folding exercise. Participants will make conjectures and make sense of relationships developed through the folds. The topic is related to the Dragon Curve fractal.

### ***The Game and the Mathematics of the Highly Contagious SLURP Disease***

8 p.m. – 9 p.m.

Regency Ballroom F

*Presenters: Michelle Homp, Center for Science, Mathematics and Computer Education, UNL; Kat Shultis, Graduate Student, UNL Department of Mathematics*

Understanding the ways in which a disease can spread is serious business, especially in light of the recent Ebola epidemic. In this session, teachers will play a simple game that mimics the spread of an infectious illness and use mathematics to model its impact. Participants are encouraged to bring devices with spreadsheet capabilities.

## Secondary Teachers:

### ***Utilizing Technology to Coordinate Classroom Discussion and Improve Student Study Habits in Mathematics***

7 p.m. – 8 p.m.

Regency Ballroom C

*Presenter: Daniel Schaben, Arapahoe Public Schools, Noyce Master Teaching Fellow*

Having spent the last seven years in a school with a one-to-one iPad to student initiative, in this presentation Schaben will share some techniques and tools that have had the most impact in improving student learning both in and out of the classroom. Pointers on what pitfalls to avoid (for the sake of preserving sanity) will be shared. Classroom discussion strategies using the iPad will be modeled, along with some out-of-the-box math problems that require audience participation.

### ***May the Odds Be Ever in the Back of Your Textbook***

8 p.m. – 9 p.m.

Regency Ballroom C

*Presenters: Shelby Aaberg, Scottsbluff Public Schools, 2015 Nebraska Teacher of the Year; Amanda Cochran, Scottsbluff Public Schools*

Free tools like Geogebra and Desmos empower mathematics teachers to create engaging lessons for students. This presentation will explore the thought processes behind constructing engaging lessons that spark students’ curiosity and reconcile algebraic, geometric, tabular, and graphical representations. Problems and resources will be provided. Participants should bring their best ideas with them to share with others. Participants are encouraged to bring technology (laptop or tablet) but this is not required.

### ***Making Sense of Sense Making***

7 p.m. – 8 p.m.

Regency Ballroom DE

8 p.m. – 9 p.m.

Regency Ballroom DE

*Presenter: David Hartman, Ph.D., Lincoln Public Schools*

Participants will begin by looking through the eyes of children doing mathematics. (Sometimes we may forget that our middle schoolers and high schoolers are just kids—still trying to understand mathematics in ways that make sense to them.) Whether it be solving linear inequalities involving negatives, multiplying polynomials, or \_\_\_ (insert math concept here), a lack of sense making often leads to student misconceptions. Unfortunately we know these misconceptions can wreak havoc on a student for years (or a lifetime). Participants will then examine reasoning and proof and explore the fine line between actually proving something from the mathematical point of view and just making sense of it, sense enough to be making significant progress of moving down the path of deepening one’s understanding of mathematics. During this 1-hour session participants will be engaged in communicating and proving mathematics; watching short videos of students doing math and evaluating students’ proofs; listening, sharing, and collaborating about the teaching of math; and considering different perspectives of teaching and learning math.