

# February 11, 2013 - TERC Presents: Spring 2013 Conferences

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TERC researchers, curriculum developers, and professional development specialists are giving presentations and workshop sessions at several conferences this spring and summer. Look for them at the following events:

### Teachers Development Group 2013 Leadership Seminar

"Constructing Arguments in the Elementary Classroom: Including Struggling and Excelling Students in the Classroom Community"  
February 13-16, 2013  
Portland, OR

Presenter(s): **Susan Jo Russell (TERC: Cambridge, MA)**

This talk focuses on how students who struggle and students who excel with grade-level computation construct mathematical arguments. Videotaped examples illustrate teaching practices that support all students to engage with each other in this substantive mathematical work.

"Elementary Teacher and Student Learning about Generalization and Proof"  
February 13-16, 2013  
Portland, OR

Presenter(s): **Susan Jo Russell (TERC: Cambridge, MA)**, Deborah Schifter, Virginia Bastable

We describe professional development to help teachers integrate a focus on the behavior of the operations into their instruction. We report on teacher and student learning that resulted from this approach and raise the question: What are the elements, content, and structures of the professional development that might account for such learning?

### American Association for the Advancement of Science (AAAS) Annual Meeting

"Integrating Mathematics into Children's Public Library Programming: Impacts of a National Project"  
February 17, 2013  
Boston, MA

Presenter(s): **Marlene Kliman (TERC: Cambridge, MA)**

### 83rd Annual Meeting of the Eastern Sociological Society

"Understanding the Culture of STEM through the Lives of Women of Color"  
March 21-24, 2013  
Boston, MA

Presenter(s): **Maria (Mia) Ong (TERC: Cambridge, MA)**, Apriel K. Hodari (Council for Opportunity in Education), **Lily T. Ko (TERC: Cambridge, MA)**, **Rachel Kachchaf (TERC: Cambridge, MA)**

### Commission on Adult Basic Education (COABE) Annual Conference

"EMPower and GED Math Assessment Targets"  
March 24-28, 2013  
New Orleans, LA

Presenter(s): **Donna Curry (TERC: Cambridge, MA)**, **Martha Merson (TERC: Cambridge, MA)**

Students often recognize that they are visual learners. They wake up when materials mix visuals and text. Yet to align teaching to the Common Core and GED Assessment Targets teachers need to pay attention to the structure of number and the mathematical properties. While most of us learned the distributive property, for example, in a numerical, text-based way, presenters show you how you can bring life to these key ideas with visual models and number puzzles. The presenters will demonstrate how teachers can exploit this foundation for algebraic problem solving. Participants in this interactive workshop receive sample handouts from newly developed and piloted materials.

"Math Education for Adults Meets Environmental Organizing"  
March 25, 2013  
1:45-3:45 p.m.  
New Orleans, LA

Presenter(s): **Ethan Contini-Field (TERC: Cambridge, MA)**

How can you make basic math and science topics come alive for your students? Make it a part of a compelling community story. This session showcases a new set of resources from the Statistics for Action project of the Adult Numeracy Center at TERC. These resources highlight the ABE- and GED-level numeracy skills that communities need for an environmental justice campaign – like challenging a proposed coal-fired power plant, assessing risks from contaminated groundwater, or cleaning up an industrial site for use as a public park. Parts per million, percents, ratios, and data quickly become more engaging –and more memorable –when a community's health and future is on the line.

## National Association for Research in Science Teaching (NARST) Annual Conference

"Attending to the Intellectual Repertoires of Diverse Teachers and Students in Teacher Learning Paper: Getting to the Root: Assessing Teachers' Understandings of Classroom Discourse in a Practice-Based Inquiry Seminar"

April 6-9, 2013

Rio Grande, Puerto Rico

Presenter(s): **Eli Tucker-Raymond (TERC: Cambridge, MA), Ann Rosebery (TERC: Cambridge, MA), Beth Warren (TERC: Cambridge, MA)**

In this paper, we present findings regarding the design, content and effectiveness of a transcript-based interview developed for the purpose of assessing what urban elementary teachers learned about students' sense-making repertoires and classroom practice through their participation in a 10-session course focused on learning in and from everyday practice. The larger research project, Practice-Based Inquiry (PBI), is developing and investigating a model of teacher professional learning for early career teachers grounded in inquiry into everyday practice (Ball and Cohen, 1999; Lewis, Perry and Murata, 2006; Rosebery and Warren, 2008; Sherin and van Es, 2009). The purpose of the course was to engage early career teachers in practice-based classroom inquiry so that they are better able to make connections between the scientific subject matter they teach and the extensive and varied intellectual resources of their students, largely from underrepresented groups (e.g., Warren et al., 2001). The interview, used as a pre/post- assessment of the seminar, was designed to engage participants in interpreting a) the scientific ideas and sense-making of students and b) teaching practices they saw in a video and transcript excerpt from the classroom of a teacher experienced in expansive classroom discussion.

"From "Sharing Out" to "Working Through Ideas:" Helping Teachers Make the Transition to More Academically Productive Science Talk"

April 6-9, 2013

Rio Grande, Puerto Rico

Presenter(s): **Annette Sassi (TERC: Cambridge, MA), Anushree Bopardikar (TERC: Cambridge, MA), Sara Michaels (TERC: Cambridge, MA)**

This paper reports on the research findings from the Talk Science project, an NSF-funded project focused on supporting the development of students' science reasoning through discussion. Talk Science is a web-based teacher professional development program linked with the Inquiry Project Curriculum for Grade 3-5 (also funded by NSF, and also web-based). The central goal of the Talk Science project is to cultivate teachers' capacity to orchestrate more academically productive science discussions. Teachers deepen their understanding of important science concepts through study of scientist video cases; they develop a vision of the role of discussion in science meaning making through video cases of discussions taking place in other classrooms that reveal the focus, structure, and purpose of science discussions; and they develop nine strategies that support productive talk and off load some of the complexity and challenges of leading discussions.

"Girls Energy Conservation Corps: Study of a Girl Scout Program Focused on Energy Conservation"

April 6-9, 2013

Rio Grande, Puerto Rico

Presenter(s): **Gilly Puttick (TERC: Cambridge, MA)**

GECCo harnesses the power of social norms by asking girls to set group goals and share their conservation efforts (Nolan et al. 2008). Not only are GECCo activities fun and engaging, but they also support changes in attitude and behavior through experiential and analytic learning (Guiney and Oberhauser, 2009). In addition, opportunities for involvement in actions that make a difference nurture conservation skills and attitudes in the face of a pressing global problem (Leis 2005, Chawla 2007, Thogersen and Olander 2003). This paper reports some results from this research and development project funded by the National Science Foundation. The goal of the project was to integrate engaging online and real world activities that involved girls in learning about climate change and their role in it, in saving energy, in using new media creatively to educate peers about energy conservation, and in understanding the importance of collective goals and action to address climate change. The paper focuses on how our iterative design process was informed by formative evaluation data, and discusses a research study on the effectiveness of social norm messaging in extending the impact of the program.

"Strengthening from the Outside In: Promoting Success for Women of Color in Physics"

April 6-9, 2013

Rio Grande, Puerto Rico

Presenter(s): **Apriel K. Hodari (Council for Opportunity in Education), Rachel Kachchaf (TERC: Cambridge, MA), Lily T. Ko (TERC: Cambridge, MA), Maria (Mia) Ong (TERC: Cambridge, MA)**

We examine themes in the life stories of women of color in physics, astronomy and astrophysics. These themes are drawn from a larger NSF-funded project, Beyond the Double Bind: Women of Color in STEM, which analyzes the experiences of women of color across multiple STEM disciplines. Here, we analyze a subset of the data that focuses on 10 interviews and 41 extant texts (about 23 women in varied life stages). Framed by intersectionality theory and employing narrative analysis, this study critically analyzes the intersection of gender and race as it affects women of color's experiences in science. This paper presents two of the many emergent themes found in our data: activism and school/work-life balance. Findings show that, in addition to very busy work schedules, women of color are continually involved in multiple forms of activism and outreach activities centered on diversifying the STEM climate. Women also commented on the crucial aspect of balancing school/work and life, and shared ways they prioritize and manage their time. These findings add to the knowledge base about strategies for retaining women of color—widely considered to be an untapped source of domestic talent that could fill the country's scientific workforce needs.

"Designing Technology-Intensive Science, Technology, Math, and Engineering Professional Development: Insights from NSF's ITEST Projects"

April 9, 2013

10:15-11:15 a.m.

Rio Grande, Puerto Rico

Presenter(s): **Carla McAuliffe (TERC: Cambridge, MA), Caroline Parker (Education Development Center: Newton, MA), Cathlyn Styliniski (University of Maryland Center for Environmental Science)**

## National Science Teachers Association (NSTA) Annual Conference

NEW! An Astronomy Textbook Written Specifically for High School Students  
April 11, 2013  
3:30-4:30 p.m.  
San Antonio, TX

Presenter(s): Gary Curtis (Dublin Jerome High School: Dublin, OH)

Developed by the education experts at TERC, Investigating Astronomy is the first comprehensive, yearlong astronomy curriculum designed specifically for high school students. Most astronomy books used in high school classes are text heavy and have been originally developed and written for college courses. Investigating Astronomy engages students with a dynamic, active learning approach, and allows them to explore all the major topics in astronomy while conducting hands-on/minds-on investigations.

"Teaching Climate and Energy: The CLEAN Collection of Peer-Reviewed Climate and Energy Learning Resources"  
April 12, 2013  
9:30-10:30 a.m.  
San Antonio, TX

Presenter(s): **Tamara Ledley (TERC: Cambridge, MA)**, Anne Gold (University of Colorado: Boulder, CO), Susan Buhr (University of Colorado: Boulder, CO)

The CLEAN collection of climate and energy learning resources helps you teach with confidence. See materials, teaching tips, and standard alignments at [cleanet.org](http://cleanet.org).

"Leveling Up"  
April 13, 2013  
8:00-9:00 a.m.  
San Antonio, TX

Presenter(s): **James Larsen (TERC: Cambridge, MA)**, **Barbara MacEachern (TERC: Cambridge, MA)**

What happens when game mechanics = the laws of nature? You get Leveling Up, a set of free, publically available games that are based on standards-based high school science and developed by professional game designers together with educators from TERC. Participants will get engaged with the game play and need to learn the science to succeed. These games are developed for wireless tablets and phones.

#### **National Council for Supervisors of Mathematics (NCSM) Annual Conference**

"Constructing Arguments in the Elementary Classroom: Including Struggling and Excelling Students in the Classroom Community"  
April 15, 2013  
Denver, CO

Presenter(s): **Susan Jo Russell (TERC: Cambridge, MA)**

This talk focuses on how students who struggle and students who excel with grade-level computation construct mathematical arguments. Videotaped examples illustrate teaching practices that support all students to engage with each other in this substantive mathematical work.

"Informal Opportunities for Assessment in K-5 Classrooms"  
April 15, 2013  
12:15 p.m.  
Denver, CO

Presenter(s): **Arusha Hollister (TERC: Cambridge, MA)**, **Megan Murray (TERC: Cambridge, MA)**

Through video of K-5 teachers working with individuals and small groups we will consider how these moments are assessment opportunities. What questions do teachers ask? What do they look and listen for in students' responses? How can teachers create regular opportunities for these assessments? How do they inform their teaching?

"Supporting English Language Learners in Mathematics Class"  
April 15, 2013  
4:00 p.m.  
Denver, CO

Presenter(s): **Judy Storeygard (TERC: Cambridge, MA)**, Lisa Nguyen (Boston Public Schools: Boston, MA)

"Elementary Teacher and Student Learning about Generalization and Proof"  
April 17, 2013  
Denver, CO

Presenter(s): **Susan Jo Russell (TERC: Cambridge, MA)**, Deborah Schifter, Virginia Bastable

"Using Technology to Support Struggling Learners in Inclusive Mathematics Classrooms"  
April 17, 2013  
8:45 a.m.  
Denver, CO

Presenter(s): **Judy Storeygard (TERC: Cambridge, MA)**, Zachary Champagne (Duval County Public Schools: Jacksonville, FL)

#### **National Council for Teachers of Mathematics (NCTM) Research Pre-Session**

"Bringing Variable Notation to the Forefront of Early Mathematics Education"

April 15, 2013

5:30-6:45 p.m.

Denver, CO

Presenter(s): Barbara Brizuela (Tufts University: Medford, MA), **Maria Blanton (TERC: Cambridge, MA)**, **Angela Gardiner (TERC: Cambridge, MA)**, Katie Sawrey (Tufts University: Medford, MA), Brian Gravel (Tufts University: Medford, MA), Ashley Newman-Owens (Tufts University: Medford, MA)

"Fourth Grade Students' Abilities to Write Algebraic Expressions and Equations After a Year of Early Algebra"

April 16, 2013

4:45-6:00 p.m.

Denver, CO

Presenter(s): Isil Isler (The University of Wisconsin: Madison, WI), **Maria Blanton (TERC: Cambridge, MA)**, **Angela Gardiner (TERC: Cambridge, MA)**, Eric Knuth (The University of Wisconsin: Madison, WI), Ana Stephens (The University of Wisconsin: Madison, WI)

"Analyzing Learning Trajectories in Grades K-2 Children's Understanding of Functions"

April 17, 2013

3:00-4:30 p.m.

Denver, CO

Presenter(s): **Maria Blanton (TERC: Cambridge, MA)**, **Angela Gardiner (TERC: Cambridge, MA)**, Barbara Brizuela (Tufts University: Medford, MA), Katie Sawrey (Tufts University: Medford, MA), Brian Gravel (Tufts University: Medford, MA), Ashley Newman-Owens (Tufts University: Medford, MA)

### **National Council for Teachers of Mathematics (NCTM) Annual Meeting and Exposition**

"How Classroom Discussion Promotes Functional Thinking in Grades K-2"

April 19, 2013

9:30-10:30 a.m.

Denver, CO

Presenter(s): **Angela Gardiner (TERC: Cambridge, MA)**, **Maria Blanton (TERC: Cambridge, MA)**, Barbara Brizuela (Tufts University: Medford, MA)

All students have important things to say, but how do we get them to share their thoughts? Engaging students in meaningful discussion creates a student-driven classroom fostering deeper functional thinking. Participants will explore functional thinking activities and questioning techniques that enable peer discussion via inquiry-based questioning.

"Creating Mathematical Tasks to Support Children's Early Algebraic Thinking"

April 19, 2013

1:00-2:00 p.m.

Denver, CO

Presenter(s): **Timothy Marum (TERC: Cambridge, MA)**, **Maria Blanton (TERC: Cambridge, MA)**, **Angela Gardiner (TERC: Cambridge, MA)**,

Not all curricula are created equally. Thus, knowing how to create tasks that build the algebraic habits-of-mind students need is a crucial step towards developing children's algebraic thinking. Participants will learn how to transform curricular-style problems into powerful early algebraic tasks that harness Common Core's Mathematical Practices.

"Developing Children's Algebraic Thinking through Problem-Based Function Tasks"

April 19, 2013

2:00-3:00 p.m.

Denver, CO

Presenter(s): **Maria Blanton (TERC: Cambridge, MA)**, **Angela Gardiner (TERC: Cambridge, MA)**, Barbara Brizuela (Tufts University: Medford, MA)

Functional thinking is a critical domain by which children can develop algebra understanding and engage in the Common Core Mathematical Practices. Knowing characteristics of tasks that can effect this is essential. Participants will examine the components of a research-based instructional sequence designed to develop children's functional thinking.

"Names in the Neighborhood: Names and Identity as a Math Springboard"

April 17-April 20, 2013

Denver, CO

Presenter(s): **Marlene Kliman (TERC: Cambridge, MA)**, **Nuria Jaumot-Pascual (TERC: Cambridge, MA)**

### **American Educational Research Association (AERA) Annual Meeting**

"Embedding Mathematics in Public Children's Library Programs"

April 27-May 1, 2013

San Francisco, CA

Presenter: **Marlene Kliman (TERC: Cambridge, MA)**, **Nuria Jaumot-Pascual (TERC: Cambridge, MA)**

"Working toward Social Justice in Technologically Rich Settings: Lessons from NSF's ITEST Program Paper 'Learning, Teaching, Leading, and Organizing: Youth-Led Activities for Social Change'"

April 27-May 1, 2013

San Francisco, CA

Presenter(s): **Eli Tucker-Raymond (TERC: Cambridge, MA)**, Maisha Moses (The Young People's Project), Chad Milner (The Young People's Project)

The purpose of this paper is to describe and explain how an out of school math literacy and social change organization uses a near-peer structure of learning, teaching, leading, and organizing in a program in which college and high school students lead middle school students through the creation of video games about mathematics topics. Results from our program show that adults, college, high school, and middle school students—through learning, teaching, leading, and organizing—helped to create spaces that cultivated an interest, value, and need for mathematics and computational literacies beyond the informal learning space. In this way, participants developed identities as achievers, teachers, and leaders, and positive attitudes toward mathematics and computer programming.

"Women of Color in the Physical Sciences: How Intersections of Race, Gender, and Class Affect Activism and Aspirations"

April 27-May 1, 2013  
San Francisco, CA

Presenter: **Maria (Mia) Ong (TERC: Cambridge, MA), Lily T. Ko (TERC: Cambridge, MA), Rachel Kachchaf (TERC: Cambridge, MA),** Apriel K. Hodari (Council for Opportunity in Education)

This paper discusses two themes – activism and work-life balance – from the life stories of women of color in physics, astronomy and astrophysics. Drawing from a larger project and embedded in a framework of interactional theory, we share findings from 10 interviews and 41 extant texts to contribute a critical analysis of how intersections of gender, race, and class affect identity, achievement and overall educational and career experiences and goals in the physical sciences. This research will add to the knowledge base about strategies for retaining women of color—widely considered an untapped source of domestic talent that could fill the country's scientific workforce needs.

#### **NCTM Wisconsin Math Council Annual Conference**

"Functions as a Context for Proof and Reasoning"

May 2-3, 2013  
Green Lake, WI

Presenter(s): **Maria Blanton (TERC: Cambridge, MA)**

This session examines algebraic thinking as a context for proof and reasoning. Through a focus on functional thinking, participants will solve tasks and explore student work and teacher practice to build strategies for nurturing children's proof and reasoning.

#### **River Rally 2013**

"Helping Communities Understand Risk"

May 18, 2013  
3:30 p.m.  
St. Louis, MO

Presenter(s): **Ethan Contini-Field (TERC: Cambridge, MA)**

After getting a stack of water test results, a concerned mother asked, "Does arsenic in the pond behind my house mean... my kids will get cancer?" It's a good question, but one with no simple answer. This workshop will provide you with resources, skills, and short activities you can use to help community members talk through the many factors that contribute to environmental risk: Toxicity, concentrations, exposure pathways, possible health effects, and more.