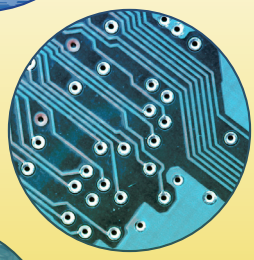
Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching


# SIXTEENTH ANNUAL MEETING

June 29 - July 1, 2010




# STEM Education Excellence

*for a*

# 21st Century Workforce

## HIGHLIGHTS

## Background Information and History

In 1991, tremendous science education reform activities were underway across Texas and the nation. Changes necessitated that teachers provide science instruction in fields for which they were not prepared. Dr. Kamil A. Jbeily, then at the Texas Education Agency, initiated a series of regional meetings across the state to explore ways to create support systems of professional development for Texas science teachers. The meetings included representatives from education service centers, colleges and universities, school districts, business and industry, and institutions of informal education. The goal was to create regional partnerships built on collaboration and cost-sharing that provided science teachers with relevant, sustained, high-intensity professional development. These P-16 partnerships, with federal funding from the Dwight D. Eisenhower Science Professional Development Program, developed into the statewide network that is now the Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching.

On March 2, 1996, with the reorganization of the Texas Education Agency, the statewide administrative office of the Texas Regional Collaboratives (TRC) was moved under a TEA-UT partnership agreement to the Science Education Center, now the Center for Science and Mathematics Education at The University of Texas at Austin. The program has enjoyed support from a wide range of partners including the U.S. Department of Education Eisenhower Grants Program, the Texas Education Agency, the National Science Foundation, and a number of corporate supporters including AT&T Foundation, Shell, the Toyota USA Foundation, The Cynthia and George Mitchell Foundation, El Paso Corporation, and others. In addition, over fifty business and community partners support activities of the Collaboratives at the regional level.

In March 2006, through a historic $1.0 Million gift from Shell, two Louisiana Regional Collaboratives prototypes modeled after the TRC, commenced their activities in the service of Louisiana science teachers. In July 2006, the TRC launched a new initiative supported by Math and Science Partnerships funding through the Texas Education Agency to provide high quality professional development to mathematics teachers across Texas. After a competitive process, grants were awarded to 20 Regional Collaboratives for Excellence in Mathematics Teaching.

To date, the Texas Regional Collaboratives have served over 30,000 science and mathematics teachers, who share their knowledge with other teachers at the district, regional, and state levels. The long-range goal of the Regional Collaboratives is to continuously (1) enhance the quality of science and mathematics teaching in Texas through Professional Development Academies and inter-regional collaboration; (2) increase the number of qualified science and mathematics educators by building the leadership capacity of teachers to mentor and serve a larger number of teachers; and (3) improve accountability of the system by evaluating the impact of the professional development on teachers' knowledge and skills, their performance in the classroom, and on student achievement.

The Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching program has received commendations from the U.S. Department of Education, policy makers, state legislators, and business partners. The Program was inducted into the Texas Science Hall of Fame on January 17, 2000, and was recognized by the Governor, the Senate, and House of Representatives on January 16, 2001 for distinguished achievements and contributions to supporting education reform.

*TRC is funded by a variety of state, federal, and corporate partners, and is supported by The University of Texas at Austin.*

# Top Texas STEM Teachers Gather for Texas Regional Collaboratives Conference

Successful partnerships, innovative instructional techniques, and exceptional teachers were celebrated at the Sixteenth Annual Meeting of the Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching (TRC), which was held in Austin June 29-July 1. The highly anticipated event drew over 700 attendees, including state policy makers, science and mathematics teachers, TRC project directors, representatives from institutions of higher education, corporate partners, and scientists.

This year's conference theme was "**STEM Education Excellence for a 21st Century Workforce**." As TRC founder and executive director Dr. Kamil A. Jbeily stated, the event was designed to encourage TRC members to renew their commitment to forging strong relationships with education, state and corporate partners in order to produce a highly skilled 21st Century workforce.


**Kamil A. Jbeily, Ph.D.**
*Executive Director*
Texas Regional Collaboratives

"Achieving excellence in science, technology, engineering, and mathematics (STEM) education is a national priority declared by President Obama and outlined in the White House Education Agenda. We at the TRC are excited to join forces with federal and state education leaders, corporate partners, and thousands of teachers and educators to help Texas and the nation achieve that goal. Our economic competitiveness, standard of living, and national security depend on our collective commitment to inspire and equip our students to pursue and excel in science and technology related careers."

The TRC Annual Meeting includes three days packed with general sessions, breakout sessions and panel discussions presented by top educators and scientists. Teachers and project directors who attend the conference have an opportunity to absorb a wealth of new information as well as network with colleagues.

A sampling of this year's outstanding presentations included "How Children Learn: Brain Research and Inquiry-Based Science," "The Science-Literacy Connection," "It Isn't Your Momma's Science Class," and "Fostering Algebraic Thinking in the Middle Grades." The sessions not only communicated the latest in research-based content but also served as demonstrations of highly effective pedagogical strategies.

"The teachers come to share their local programs, and in telling their stories, infect other Collaboratives with their ideas and enthusiasm. I think everyone leaves feeling truly appreciated, and it's a privilege to be able to host this event and treat those who attend as the special science and mathematics educators they are!" says Dr. Mary Hobbs, TRC's Coordinator for Science Initiatives.

The highlight of this year's conference was an evening dinner, reception and exhibition, during which a showcase of outstanding and interactive STEM lessons was displayed for all attendees to enjoy.

During the dinner and reception, winners of several prestigious science and mathematics teaching and mentoring excellence awards were announced. Award recipients for the 2010 conference included:

**Ellen White**, Harlandale ISD—*Toyota USA Foundation Science Mentoring Excellence Award;* **Rhonda Stone**, De Kalb ISD—*Toyota USA Foundation Mathematics Mentoring Excellence Award;* **April Ghionzoli**, Brownsville ISD—*AT&T Foundation Mathematics Teaching Excellence Award;* **James Bergman**, Amarillo ISD—*AT&T Foundation Science Mentoring Excellence Award;* **Leann Spears**, Era ISD—*Shell Science Teaching Excellence Award;* **Margaret Eddy**, Aldine ISD—*Shell Science Mentoring Excellence Award;* **Sandra Elms**, Ector County ISD—*El Paso Corporation Science Teaching Excellence Award;* **Orlando Montalvo**, Sharyland ISD—*El Paso Corporation Science Teaching Excellence Award;* **Heather Makare**, Taylor ISD—*UT Center for Science and Mathematics Education Mathematics Mentoring Excellence Award;* **Ross Ann Hill**, Idalou ISD—*The Cynthia and George Mitchell Foundation Science Teaching Excellence Award.*

"These winners exemplify excellence," said Jbeily, "and I want to tell you that I am so inspired by them – by everyone here. We gather each year to learn from one another, network, engage our policy makers and corporate partners, and highlight our successful strategies, and I hope that you look forward to this conference as much as I do."

"This is all about making great things happen in more places. We know good things are happening in islands around the state. The challenge is to make sure that every teacher has the advantages and resources to be the best that he or she can be. The best way to do that is to provide sustained, excellent professional development – that is the Texas Regional Collaboratives' mission."

This year, conference attendees were honored by a keynote address from Texas House Representative Mark Strama, who is a long-time supporter of the TRC and chair of the House's Technology, Economic Development, and Workforce Committee.

"Given the resources that we now have," said Strama, who focused his talk on the plethora of solutions that technology offers to the education system, "what can we do about the one-to-many instructional model? Technology is what will enable us to transform that model."

"Software easily has the capacity to do diagnostic assessments of students to see where they are academically, teach them exactly what they need at that point and advance them to the next level only when they're ready and have mastered the necessary foundational skills. Software can do all of that. That would be transformational, and it's not out of reach."


**The Honorable Mark Strama**
*Representative, District 50*
Texas House of Representatives

Norma V. Cantú, chair of the College of Education's Department of Curriculum and Instruction; Anne Vexler, manager of math and science partnerships at the Texas Education Agency; and Renée Flores, executive director for external affairs at AT&T also delivered comments during the reception.

"The quality of the teacher standing in front of the class is the single most important factor in affecting student success," said Vexler. "It's clear that somebody's doing something right, when it comes to STEM education, and I think it's you. Texas can truly celebrate the quality of the teachers here in this room – I think our students are really lucky to have you all."

**Keith Mitchell, Ph.D.**

As a closing to the reception and dinner, Jbeily announced that the winner of the TRC's Distinguished Service Award was Dr. Keith Mitchell, the Collaboratives' technology coordinator. The Distinguished Service Award is the highest honor bestowed by the TRC, and Mitchell was chosen as this year's honoree because of his transformation of the TRC's use of technology, taking it from "archaic" to exemplary.

"Thanks to Keith Mitchell," said Jbeily, "we have an incredible website and a thriving online community. He has such creative, effective ways of connecting people and making maximum and practical use of technology. He is retiring August 31, but his legacy will last far, far into the future."

The Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching is an award-winning statewide network of sixty five P-16 partnerships that provide sustained and high intensity professional development to P-12 science and mathematics teachers. The work and contributions of the TRC are made possible by the exemplary partnerships that it has with the Texas Education Agency and many corporate and foundation partners who have invested in its operations and services for many years. In addition to the Texas Education Agency, generous supporters include Shell, AT&T, El Paso Corporation, Toyota USA Foundation, The Cynthia and George Mitchell Foundation, and the National Science Foundation.

The TRC was founded in 1991 at the Texas Education Agency. In 1996, the Program was moved to the Center for Science and Mathematics Education at The University of Texas at Austin's College of Education. Since its inception, over 19 years ago, the TRC has served over two million students statewide through the improved instruction and performance of participating teachers. It has developed the leadership capacity of over 30,000 science and mathematics teachers through high-quality, sustained professional development. Many of these teacher leaders are serving other teachers and playing leadership roles at the campus, district, and state levels. Currently, the TRC has partners and participants in all 254 Texas counties.

**Norma V. Cantú**
*Chair, Curriculum and Instruction*
*College of Education*
The University of Texas at Austin

**Anne Vexler**
*Manager, Math and Science Partnerships*
*School Readiness and Partnerships*
Texas Education Agency

**Renée Flores**
*Executive Director, External Affairs*
AT&T - Texas

The organization was inducted into the Texas Science Hall of Fame and has received commendations from the U.S. Department of Education, Texas governor and legislature, business partners, and many community and education leaders for distinguished achievements and contributions in support of education reform.

"I have long recognized the importance of science, technology, engineering and math research and education programs," said U.S. Senator John Cornyn in a letter welcoming the participants to Austin. "As home to some of the world's leading technology companies, Texas is committed to educating the next generation of talented professionals skilled in math, science and engineering. I applaud the TRC and offer my sincere gratitude for your efforts to ensure that our education system will be able to meet the challenges of the 21st Century and beyond."

*Press Release by Kay Randall*
*Office of the Vice President for Public Affairs*
*The University of Texas at Austin*

For more information about the TRC's 2010 conference, to access conference photos and to learn more about the TRC's history, events, resources, participants and accomplishments, please visit **www.thetrc.org**.

# JUNE 29 SHOWCASE, RECEPTION, AND DINNER PROGRAM

## Evening Program

### SHOWCASE AND RECEPTION
5:30 - 7:00 p.m. - Rio Grande A

### DINNER
7:00 p.m. - Grand Ballroom

### INTRODUCTION
**Kamil A. Jbeily, Ph.D.**
*Executive Director, Texas Regional Collaboratives*
The University of Texas at Austin

### WELCOME
**Norma V. Cantú**
*Chair, Curriculum and Instruction*
*College of Education*
The University of Texas at Austin

### GREETINGS AND REMARKS
**Anne Vexler**
*Manager, Math and Science Partnerships*
*School Readiness and Partnerships*
Texas Education Agency

**Renée Flores**
*Executive Director, External Affairs*
AT&T - Texas

### KEYNOTE SPEAKER
**The Honorable Mark Strama**
*Chair, Technology, Economic Development, and Workforce Committee*
Texas House of Representatives

### TRC 2010 Distinguished Service Award

TRC MATH PROJECT DIRECTORS

**Dr. David Mills**, *Louisiana Tech University,*
**Dr. Joseph Meyinsse**, *Southern University and A&M College*, **Dr. Jbeily**, **Dr. Brenda Nixon**, *Louisiana State University*

# SIXTEENTH ANNUAL MEETING HIGHLIGHTS

**Mark Strama**, *Representative, District 50, Texas House of Representative,* **Stef Paramoure**, *Instructional Team member, ESC Region XIII*

Stef has been selected to receive the prestigious Presidential Award for Excellence in Mathematics and Science Teaching!

## *Showcase and Exhibits*

**Karen Labat**, *Social Investment Manager, Education and Arts, Shell Oil Company*, **Dr. Debbie Junk**, *Coordinator for Mathematics Initiatives, TRC,* **Marsha Willis**, *Professional Development Coordinator, TRC*

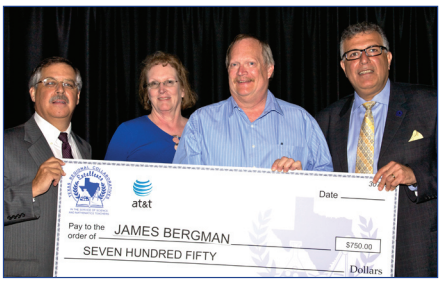
**Dr. Jbeily, Chris Jones**, *Communications and Community Relations Manager, El Paso Corporation*, and **Jesus Soto**, *Operation Services, El Paso Corporation*

TRC SCIENCE PROJECT DIRECTORS

# TEACHING/MENTORING EXCELLENCE AWARDS

## AT&T Foundation

### Science Mentoring Excellence Award




**James Bergman**
Palo Duro HS, Amarillo ISD
Region 16 Science Collaborative/Amarillo

### Math Teaching Excellence Award


**April Ghionzoli**
Hudson ES, Brownsville ISD
UT Brownsville Regional Mathematics Collaborative/Brownsville

THE UNIVERSITY OF TEXAS AT AUSTIN

WHAT STARTS HERE CHANGES THE WORLD

## Center for Science and Mathematics Education

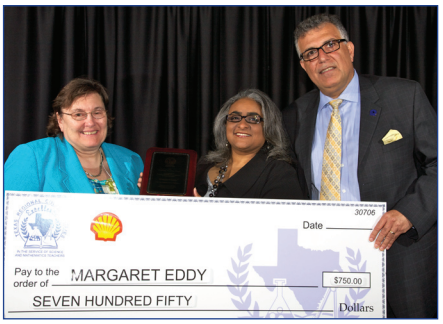
### Math Mentoring Excellence Award

**Heather Makare**
T.H. Johnson ES, Taylor ISD
Region 13 Mathematics Collaborative/Austin

## Shell Science Teaching Excellence Award


**Leann Spears**
Era ES, Era ISD
NCTC Regional Science Collaborative/Gainesville

### Shell Science Mentoring Excellence Award




**Margaret Eddy**
Carter, Carroll, Stovall Academies, Aldine ISD
Aldine ISD Regional Science Collaborative/Houston

*"Mentoring is a brain to pick, an ear to listen, and a push in the right direction."*

John Crosby

*"A teacher affects eternity: he can never tell where his influence stops."*

Henry Adams

## El Paso Corporation

### Science Teaching Excellence Award

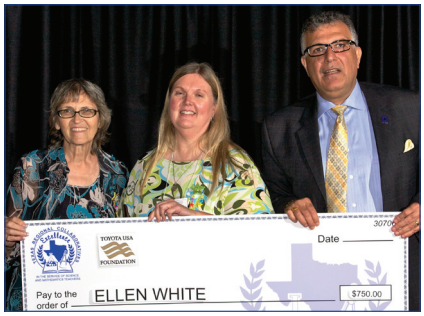

**Sandra Elms**
Blackshear Magnet ES, Ector County ISD
Region 18 Science Collaborative/Midland

### Science Teaching Excellence Award


**Orlando Montalvo**
B. L. Gray Junior HS, Sharyland ISD
Region 1 Science Collaborative/Edinburg

## Toyota USA Foundation

### Science Mentoring Excellence Award




**Ellen White**
Vestal ES, Harlandale ISD
OLLU Regional Science Collaborative/San Antonio

### Math Mentoring Excellence Award


**Rhonda Stone**
De Kalb MS, De Kalb ISD
Region 8 Mathematics Collaborative/Mount Pleasant

## The Cynthia and George Mitchell Foundation

### Science Teaching Excellence Award


**Ross Ann Hill**
Idalou MS, Idalou ISD
Region 17 Science Collaborative/Lubbock

*"Nine-tenths of education is encouragement."*

Anatole France

*"It is the supreme art of the teacher to awaken joy in creative expression and knowledge."*

Albert Einstein

## The Science-Literacy Connection

**Michael Klentschy**
*Science Consultant*

This presentation focused on the science-literacy connection and how it has been successfully used to close achievement gaps, assist English language learners in connecting to the core curriculum, and use classroom talk and writing as important components of inquiry. Relationships between literacy skills such as comprehension and inquiry were highlighted along with classroom tested best practices for the use of science notebooks.

**Dr. Carol Fletcher**, *Assistant Director/R&D Coordinator,* TRC, and **Michael Klentschy**

## How Children Learn: Brain Research and Inquiry-based Science

**Kenneth Wesson**
*Educational Consultant, Neuroscience, and Vice President,* International and Western Divisions, Delta Education/School Specialty Science, San Jose, CA

If it's your job to develop the mind, shouldn't you know how the brain works? While there is no profession more noble than educating young minds to their fullest developmental potential, preschool to university-level faculty members seldom receive any professional preparation on "how the brain works." Just as modern medicine produced more successful outcomes once it became more grounded in biological science, a scientifically supported framework that integrates brain science in instructional procedures will increasingly influence successful educational practices. Factual information increases rapidly and is quickly outdated, but the reliable principles of neuroscience will survive all tests of time. This presentation highlighted those principles in the contemporary context of education.

**Kenneth Wesson**, and **Dr. Mary Hobbs**, *Coordinator for Science Initiatives,* TRC

## The Other Lessons: What Students Keep For Life

**Michael Starbird, Ph.D.**
*Professor of Mathematics and University Distinguished Teaching Professor*
The University of Texas at Austin

"Education is what survives when what has been learned has been forgotten."-B.F. Skinner. The vast majority of our students soon forget most of the details they learn in classes–sometimes, in fact, before the final. Let's design our courses and curricula so that what survives in our students, after they forget, clearly improves their lives.

**Dr. Michael Starbird**, and **Dr. Debbie Junk**, *Coordinator for Mathematics Initiatives*, TRC

# Preparing Students For Their Future, Not Our Past

Many of the careers our students will be pursuing don't even exist today. Are we doing what is necessary to prepare our students for their future rather than our past? What are some of the emerging fields of which teachers need to be aware? What are the post-secondary routes to certification or degrees for entry into these fields? What are the skills students need to successfully compete for jobs in these areas? How can PreK-12 educators prepare students for these fields? All these questions were addressed in these interactive panel discussions with experts in these fields.

## Green Tech Careers Panel

**(l to r) Moderator Carol Fletcher, Ph.D., Panelists Stacy Dukes-Rhone,** *Executive Director,* BiGAustin, **Hector Aguilar, Ph.D.,** *Executive Dean, Continuing Education,* Austin Community College District**, Cliff Zintgraff,** *CEO*, DaVinci Minds

## Digital/Creative Media Careers Panel

**(l to r) Moderator Keith Mitchell, Ph.D.,** *Coordinator for Technology Initiatives,* Texas Regional Collaboratives. **Panelists Tim McLaughlin,** *Associate Professor and Department Head, Department of Visualization,* Texas A&M University, **Stephan Samuelson**, *President & CEO* , Twist Education, **Spencer Zuzolo,** *President,* 3D Squared, **Leslie Miller, Ph.D.,** *Executive Director,* Rice University Center for Technology in Teaching and Learning

# 2010 NITA BETH CAMP LEGACY AWARD

### The Nita Beth Camp Legacy Award was presented to Susan Smith

*"I am humbled and grateful to have received this award. Nita Beth was a shining light no matter where or when you saw her. The Texas Regional Collaboratives is that shining light in professional development that has made my 17 years at Region 16 ESC possible."*

***Susan Smith**, Project Director*
*Region 16 Science Collaborative, Amarillo*

### The Story of Nita Beth Camp

**Nita Beth Camp**
**(1940 - 2007)**

In 1985, doctors told Nita Beth Camp her life was over. Facing such a grim outlook, it would have been easy for the longtime science teacher to give in to the breast cancer that had invaded her body. But Nita Beth had other plans.

"A lot of people think cancer is a death sentence, but I think it's a life sentence because you live every day to the fullest," Camp said from her office at the Region 7 Education Service Center in Kilgore.

"My doctor said I am a medical anomaly. I should not be alive. All of the studies say I should not have lived this long," Camp said. "God has a plan for me, and I'm supposed to be here. I take my chemo and come on to work every day," she said. "If you've got something else to think about, like coming to your job, that puts your illness at the back of your mind."

These quotes embody the attitude and optimism that characterized Nita Beth Camp, founder and former Project Director of the Region 7 Collaborative for Excellence in Science Teaching in Kilgore, Texas. For over 21 years after her diagnosis with cancer and with her passing, Nita Beth Camp continues to be an inspiration for thousands of Texas educators and teachers. With great respect and admiration to her memory, the Texas Regional Collaboratives dedicates the Nita Beth Camp Legacy Award.

(l to r) **Dr. Carol Fletcher, Jan Lindsey, Dr. Kamil A. Jbeily**

**TUESDAY, JUNE 29 - LUNCH PROGRAM**

**INTRODUCTION**
**Kamil A. Jbeily, Ph.D.**, *Executive Director, TRC*

**GREETINGS FROM THE TEXAS EDUCATION AGENCY**
**Jan Lindsey**
*Senior Director, State Initiatives*

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**Teaching and Mentoring Excellence Awards**
*(Winners featured on Pages 6 and 7)*

HICKORY DICKORY DOCK:
THE PENDULUM RUNS THE CLOCK

**A. NASA Education: Explore, Discover, and Understand**
**Lisa Brown**, *NASA Aerospace Education Services Project.*
NASA's Aerospace Education Services Project (AESP) is the longest running K-12 effort in NASA's education history. AESP utilizes NASA's many educational assets to aid formal and informal U.S. education communities in promoting science, technology, engineering, and math. With a strong emphasis on professional development, the project customizes educator workshops and courses, classroom demonstrations, parent programs, and classroom resources to meet the needs of the participants. The ultimate goal is to attract and retain students in science, math, and related disciplines that are vital to the U.S. space program.

**B. Formative Assessment Doesn't Have to Be Boring!**
**Kelley Andrews**, *Richardson ISD;* **Susan Brown**, *Garland ISD*
This presentation gave participants many great ideas that can be incorporated into their classroom as soon as they return to school. We incorporated Paige Keeley's ideas from some of her books, as well as presented ideas we have developed in our own classrooms. Technology was also incorporated into this fast-paced class.

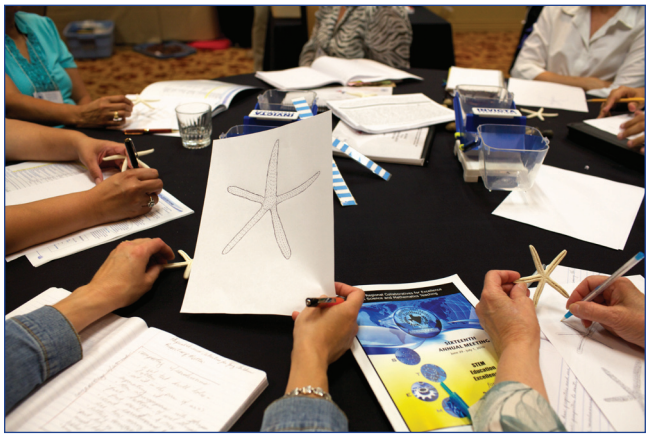
**C. Basic Electricity: Build Your Own Motor**
**James Bergman**, *Amarillo ISD;* **Arthur Schneider**, *Amarillo College*
Participants built a simple, inexpensive motor. Materials were provided. Technology resources were explored through media.

**D. 5E Instructional Model – What Does it Look Like in the Math Classroom?**
**Shane Wright**, *ESC Region 8;* **Rhonda Stone**, *De Kalb ISD*
In this session, participants explored the components of the 5E Instructional Model lesson cycle through the lens of teacher and student behaviors. Special emphasis was given to the ENGAGE and EXPLORE phases of the lesson cycle. Participants had the opportunity to have professional dialogue regarding instructional practices after viewing and reflecting on video of 5E lessons being taught in actual classrooms.

**E. A Natural Approach to Conquering Test Anxiety**
**Marianne Garcia**, *Lockhart ISD*
We've all had students who know the material in class, answer our questions, but then on the test, they fail miserably. In this workshop participants learned several natural approaches to stress and test anxiety, which will allow their students to be successful on their tests and the TAKS test. Participants received a CD with two relaxation activities to take home.

**F. Design-Based Science and Math**
**Joules Webb**, *ESC Region 20;* **Stephanie Brierty**, *ESC Region 13*
The term "technology" as described in the national science standards, implies the design, engineering, and the technological issues related to conceiving, building, maintaining and disposing of the useful objects and/or processes in the human-built world. Participants learned how to integrate Design/Engineering/Technology materials and exercises into the teaching of mathematics and science through hands-on, inquiry-based activities. STEM career connection resources/ideas were also shared.

**G. Measuring the Age of the Universe From Your Own Classroom**
**Carl Pennypacker** and **Stephanie Morgado**, *University of California, Berkeley*
Using the metacognitive benefits of hands-on education and the integration of math and science, this lesson used simple kinematics to explore cosmological red shift, star death, and how the Hubble Law is a natural result of the expansion of the universe. Ultimately, using this new knowledge, students will measure the age of the universe by looking at Type Ia supernovae data connected from the Sloan Digital Sky Survey, and analyze it with image processing software (SalsaJ).



PHYSICAL SCIENCE ACTIVITIES
FOR YOUNG CHILDREN

BASIC ELECTRICITY:
BUILD YOUR OWN MOTOR

VAK (VISUAL, AUDITORY, KINESTHETIC):
IMPLEMENTING ALL THREE LEARNING STYLES
IN YOUR DAILY LESSON

**H. Hickory Dickory Dock: The Pendulum Runs the Clock**
**Debbie Yarger** and **Suzanne Puckett**, *Fort Worth ISD*
Using literature combined with physical science, participants investigated the working of pendulums.

**I. Elementary Math Boot Camp**
**Michael Sweet**, *Pharr-San Juan-Alamo ISD;* **Jayne Rhodes**, *San Perlita ISD*
Participants engaged in an elementary math boot camp where they used foldables, played games, and made activities that they can share with their students, so that they can use at home to reinforce their learning from class.

**J. VAK (Visual, Auditory, Kinesthetic): Implementing All Three Learning Styles in Your Daily Lessons**
**Melinda Reyes**, *El Paso Bridges Academy*
The importance of using visual, auditory, and kinesthetic (VAK) techniques in every lesson was demonstrated in this session. The VAK strategies engage the brain in such a way that makes learning enjoyable. Many of our students respond more positively to visual, auditory and kinesthetic lessons. Participants learned useful techniques to keep their students engaged.

**K. Physical Science Activities for Young Children**
**Bob Williams**, *Professor Emeritus, Southern Illinois University*
Participants were engaged in hands-on activities using simple objects and some basic science tools that stretch their own science process skills, while simultaneously learning ways to extend their students' knowledge and communication skills via oral language, graphing, and journaling. The Physical Science topics of Properties of Matter and Force and Motion as well as Measurement formed the context for introducing instructional activities and assessing children's learning appropriate for Pre-K through Grade 2.

**L. The TRC Online Learning Community and Project Share**
**Keith Mitchell** and **John Solis**, *Texas Regional Collaboratives*
The TRC Online Learning Community (TOLC) is evolving in new and exciting directions. This session provided an overview of the features and functionality of the TEA Project Share infrastructure. Attendees joined into an open discussion of how the TRC community can become an active participant, and learned more about the TRC virtual meeting initiative. Participants met and gave feedback to Dr. Solis, the new TRC Coordinator for Technology Initiatives.

NASA EDUCATION:
EXPLORE, DISCOVER, AND UNDERSTAND

"SUM"MER FUN:
SCIENCE UNITES MATHEMATICALLY

FOSTERING ALGEBRAIC THINKING
IN THE MIDDLE GRADES

GEOMETRY IN CONSTRUCTION PART 1

### A. NASA Explorer Schools

**Robert LaSalvia**, *NASA Glenn Research Center, Cleveland, Ohio*
Become a NASA Explorer School! The NASA Explorer Schools (NES) Project is NASA's classroom-based gateway for middle and high school students that provide authentic learning experiences designed around NASA's unique missions while promoting student engagement in science, technology, engineering and mathematics (STEM). NES allows students to participate in NASA's mission of research and discovery through inquiry based experiences and interactions with NASA's technical workforce.

### B. Fostering Algebraic Thinking in the Middle Grades

**Courtney Bryand**, *East Central ISD*
Are you a middle school math teacher interested in better preparing your students for algebra? Do you want to pique your students' curiosity and challenge them through problem solving tasks? Participants saw students at work communicating about mathematics concepts, and took some ideas back to their own classroom. Participants received a set of problem solving tasks as well as ideas for fostering algebraic thinking through classroom structures and activities.

### C. "SUM"MER FUN: Science Unites Mathematically

**Susan Bigelow**, *Houston ISD*
Participants experienced some engaging activities geared toward students in grades 4-8 integrating the concepts of math and science. Activities focused on geometry, measurement, probability, predictions, testing hypotheses, drawing conclusions and making inferences which legitimatized dialogue and having fun while mastering TAKS skills without boring worksheets.

### D. Transparent Journaling

**Elizabeth Beardshaw**, *Allen ISD;* **Candice Favela**, *Garland ISD*
Participants took journaling to a new interactive study level to help their struggling students with journaling techniques that are not only helpful for a visual learner, but gets their kinesthetic learners actively involved by utilizing and incorporating all those old transparencies.

### E. Engaging Students in Ethical Conversations

**Tobi McMillan** and **Sarah Joy Anderson**, *ESC Region 17/Texas Tech University*
Ethics is going to be key for Texas students as they enter the 21st Century workforce. Participants joined in the ethical conversation and walked away with activities that can be used to engage students with life science content, hooking their students by giving them real world issues that draw them in and cause them to take ownership of science content by placing it in a real-life context.

### F. Geometry in Construction Part 1

**Scott Burke** and **Tom Moore**, *Thompson School District, Loveland, Colorado*
In a revolutionary approach, an academic and a Career and Technical Education (CTE) teacher teamed to design rigorous mathematics courses taught through relevant project-based CTE curriculum. Standardized test scores have increased. Gender equity and enrollment are soaring, and discipline incidents are virtually a thing of the past. Replication of this program has begun in Colorado, Texas, Washington, Illinois, California, and South Dakota. Check us out online at: www.geometryinconstruction.org.

### G. "Trolling" Through Science with Technology Applications

**Robin Dehnel** and **Jana Beth Lehman**, *San Angelo ISD*
For those of you who would rather be fishing, this session filled your tackle box with technology applications that lures your reluctant student into your net as we troll through the science TEKS.

TRANSPARENT JOURNALING

THE FOURTH R: READING, WRITING, ARITHMETIC AND ROCKETS

PLT WITH A TEXAS TWIST

### H. Empowering Teachers in Three Easy Steps

**Mary Hobbs** and **Amy Moreland**, *Texas Regional Collaboratives*
Attendees heard the results of four years of NSF-funded research on teacher empowerment as conducted by Dr. Mary Hobbs and Graduate Research Assistant, Amy Moreland. Data was collected from over 300 Texas science teachers (many TRC associated) via interviews and the Teacher Empowerment Survey online instrument. We reported on patterns we see in the data and discuss implications for teachers and those who work with them.

### I. It Isn't Your Momma's Science Class

**Sarah Kerr-Chapa**, *Northeast ISD*
This session introduced innovative ways to teach students science, and explored interactive strategies to keep students wanting more.

### J. Helping Students to Measure Up! Teaching Length in the Primary Classroom

**Jayne Rhodes**, *San Perlita ISD;* **Michael Sweet**, *Pharr-San Juan-Alamo ISD*
In the 21st Century, it is vital that our students can measure up! Follow these fun and sequential activities to help your students develop a conceptual understanding of linear measurement. Even the youngest students can grasp the big ideas of measurement with these activities. Attendees left with a CD and links to online activities.

### K. Why Won't My Students Talk About Math?

**Tracy Erbes**, *Hitchcock ISD;* **Janet Vela**, *ESC Region 4*
How do you create a positive classroom community that encourages students to talk about their mathematical thinking? Attendees explored strategies for laying the foundation for an engaging classroom where students feel safe to share and discuss their mathematical ideas.

### L. The Fourth R: Reading, Writing, Arithmetic and ROCKETS

**Mike Cable**, *Anson ISD;* **Kayla Brooks**, *Trent ISD*
Few classroom projects generate as much excitement as rockets. The STEM foundations of rocketry provide exciting opportunities for authentic hands-on, minds-on experimentation. The activities were specifically tailored to address TEKS in grades 5-8. Curriculum guide on CD and other materials were provided.

### M. PLT with a Texas Twist

**Bea Long** and **Jill Brown**, *Clear Creek ISD;* **Dee Denny**, *Pasadena ISD*
Project Learning Tree Outstanding Educators (Casey Harris, Sally Wall and Bea Long) selected 30 lessons from the PLT Pre-K–8 Activity Guide and created supplemental lessons that are unique to Texas. All of the lessons are correlated to the new 2010 Science TEKS. Participants were given a CD that contains all of the Texas Connection Lessons on PDF.

### N. TAME & The Trailblazer Mobile Exhibit

**Michael Nevels**, *Texas Alliance for Minorities in Engineering*
The TAME Trailblazer is a 40-foot exhibit trailer that houses a variety of engineering and science exhibits and travels across the state. Visitors were invited to explore the hands-on activities and exhibits. The Trailblazer is a valuable tool in raising students' enthusiasm for science and math, and reinforcing basic skills. Take-away material are accessed on the TAME website. The trailer is suitable for all ages but targets 3rd-7th graders.

(l to r) Dr. Jbeily, Norma Torres-Martinez, Dr. Everly Broadway, Dr. Kenn Heydrick

**WEDNESDAY, JUNE 30 - LUNCH PROGRAM**

**INTRODUCTION**
**Kamil A. Jbeily, Ph.D.**
*Executive Director, TRC*

**GREETINGS FROM THE TEXAS EDUCATION AGENCY**
**Norma Torres-Martinez**
*Deputy Associate Commissioner, Standards and Alignment*

**STATE OF SCIENCE AND MATH EDUCATION IN TEXAS**
**Kenn Heydrick, Ed.D.**
*Director of Science, TEA*

**Everly Broadway, Ed.D.**
*Director of Mathematics, TEA*

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**Exhibit Awards Announcement**


A NATURAL APPROACH TO CONQUERING TEST ANXIETY

**A. Making Science Accessible to All Learners**
**Kelly Mullin**, *KIPP Austin Public Schools*
A quality science education is paramount in developing students that are ready to successfully navigate the challenges of the 21st Century. This presentation examined current trends in student achievement and discussed methods for developing a science program that is accessible to all students. Response to Intervention (RTI) was explored from the perspective that successful intervention begins in the core classroom.

**B. The TRC Mid-Career STEM Teacher Recruitment Program: Bringing New STEM Teachers to Texas Classrooms**
**Janice Meyer**, *The Texas A&M University System;* **Christine Moseley** and **Kim Bilica**, *The University of Texas at San Antonio*
In this session, participants learned about the TRC's Mid-Career STEM teacher recruitment programs at The University of Texas at San Antonio and The Texas A&M University System. Attendees found out how we are bringing new STEM teachers to Texas schools!

**C. Problem Solving with Panache!**
**Patti Oefelein** and **Jamie Hester**, *San Felipe Del Rio CISD*
Draw a picture, act it out, guess and check, look for a pattern…what? We all have problem solving strategies in place. But what about those types of problems that don't lend themselves to an equation or require a different style of solution? Participants found some new ideas for teaching the more "eccentric" forms of problem solving in the elementary classroom.

**D. Cosmology and Our Universe: Why Dark Energy, and Is it Real?**
**Mary Urquhart** and **Mustapha Ishak-Boushaki**, *The University of Texas at Dallas*
UT Dallas astrophysicists discussed some of the biggest topics in modern cosmology--why we know the universe is expanding, why it appears the expansion is accelerating, and what are current ideas about dark energy? Presenters addressed the fundamental ideas of gravity, light, and redshift. Participants received CDs containing curriculum resources for explorations of the electromagnetic spectrum, dark matter, dark energy and more, including Dr. Urquhart's NASA-supported *Stars and Planets* curriculum for middle school.

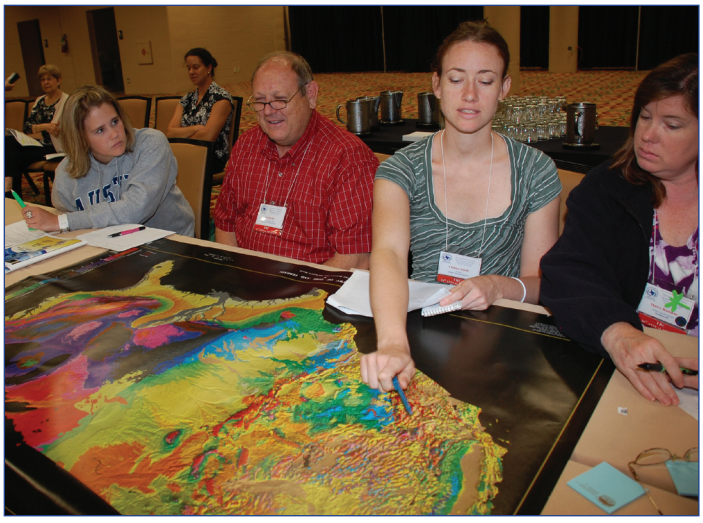
**E. Teach the Fun Way**
**Shaik Ahmed**, *Alief ISD*
Learning should be fun! Attendees explored the many middle school mathematics concepts that could be learned using just blocks. As students explore hands-on activities using these inexpensive manipulatives, they learn and retain the mathematics while they think they are playing.

**F. Geometry in Construction Part 2**
**Scott Burke** and **Tom Moore**, *Thompson School District, Loveland, Colorado*
Part 2 focused on specific hands-on activities from each respective program as examples of best practices. Additionally, participants were introduced to preliminary action planning for HOW to replicate similar programs to generate similar success.

**G. Wiki Science**
**Nikki Boutwell**, *Clint ISD*
This session targeted how teachers can integrate technology in the middle school science classroom through the use of Wikis, creating a space where students can always find the information about an assignment or lesson reducing wasted time researching. Wikis are a place where students can find peer-to-peer collaboration, interactive information, and promote mastery of concepts through information sharing.

COSMOLOGY AND OUR UNIVERSE:
WHY DARK ENERGY, AND IS IT REAL?

GEOMETRY IN CONSTRUCTION PART 2



TAPESTRY OF TIME AND TERRAIN

### H. Using Google Earth in the Science Classroom

**Becky Sinclair**, *Texas A&M University-Commerce;* **Jennifer Oramous**, *Wylie ISD*

Google Earth has multiple applications for teaching Earth Science. It is an engaging experience for all to explore many topics, such as supercontinents, plate tectonics, deep ocean imagery, other galaxies, and even more. Attendees saw how to engage your students with a wonderful resource, Google Earth.

### I. The States of Matter

**Jeanette Cubillos-Dominguez** and **Liz Keith**, *El Paso ISD*

This session included lessons on the three states of matter. These activities address the eight different intelligences in one lesson. Benefits all levels of learners from above grade level to English language learners.

### J. Engaging Math and Science Students Using Foldables

**Debbie Humphreys, Cindy Marshall** and **Susan Stehling**, *ESC Region 3*

Dinah Zike's Foldables provide students a great tool to quickly organize, display, and arrange information, making it easier for students to grasp math and science concepts as well as master skills.

### K. Taking the Fear Out of Investigation

**Carla Avila-Gray**, *Round Rock ISD*

Participants received a range of activity ideas that can help them economically, efficiently, and painlessly fulfill the student investigation recommendations from the 2010 TEKS. On their "Rediscovering Science Treasures" scavenger hunt, participants received a schoolyard map (with measurement guides), "collecting data" clues list, and graphic organizer to guide them from erosion to evaporation, past populations and adaptations towards success. Ideas for student-created hunts, collaborations, and presentations were also provided.

### L. Don't Be Left In The Dark

**April Sweet**, *Round Rock ISD*

Participants learned how to get all of the new Scientific Investigation and Reasoning into their daily classroom. This presentation incorporated Paige Keeley's strategies to identify student's misconceptions and how to turn the misconceptions into a scientific investigation. Teachers had the opportunity to explore and use science notebooks during the scientific investigation.

### M. Using Online Games to Teach Science

**Leslie Miller**, *Rice University Center for Technology in Teaching and Learning*

A growing number of adults and children play video games. Can we harness this enthusiasm for games to teach science content and process skills? The Rice University Center for Technology in Teaching and Learning has developed and tested four free online game environments that demonstrate multiple ways that online games can complement classroom instruction. In this presentation, both the underlying cognitive science and the research results were presented.

### N. Tapestry of Time and Terrain

**Stef Paramoure**, *ESC Region 13;* **Lyle Baie**, *Retired Petroleum Geologist*

An introduction to the USGS map, "A Tapestry of Time and Terrain." This digital map expresses the geologic story of mountain building, river erosion and deposition, and other events and processes that have shaped the land. It is the "most detailed and accurate portrait of the U.S. land surface, the ages of underlying rock with the addition of a fourth dimension, geologic time." Attendees learned map basics and how to get a free framed map for their school. A rolled map was given away.

ENDEAVOR 2010 MATHEMATICAL REASONING

TRANSFORMING THE CLASSROOM
WITH ENERGY

ENGAGING MATH AND SCIENCE
STUDENTS USING FOLDABLES

### A. ELPS in the Science Classroom

**Sandy Botello**, *ESC Region 20*

Attendees explored ways to increase achievement for English language learners using the English Language Proficiency Standards (ELPS) in the science classroom.

### B. The Little Mathematician and the Supersonic Mnemonic Electronic Whiteboard

**Glinda Hagood**, *Frenship ISD*

Participants discovered how to incorporate daily warm ups and lessons in an interactive format using an electronic whiteboard. They learned how to use the electronic whiteboard to spiral and differentiate math in the K-2 classroom.

### C. Suited for Spacewalking

**Jeanette Cubillos-Dominguez** and **Jonathan Valdez**, *El Paso ISD*

This presentation was an introduction of space programs and information about El Paso Astronaut Danny Olivas. Designing of mission patches, moon survival activity, moving in zero gravity and Newton's Laws. Can be integrated with math and language arts.

### D. Down to Earth Science

**Patricia Rutland**, *Stockdale ISD*

Down to Earth Science is a collection of hands-on activities to reinforce and teach the agents of weathering and erosion.

### E. Transform the Classroom with Energy

**Susan Talkmitt**, *Texas Tech University;* **Chris Howard**, *Lubbock ISD*

Participants learned how to engage students with simple, powerful activities covering energy concepts for middle school grades. Favorite activities address topics including energy transformations in living and non-living systems and encourage students to inquire as they seek patterns needed to solve simple problems.

### F. BLT-Biotechnology for Teachers: An Overview

**Marguerite Sognier**, *The University of Texas Medical Branch, Galveston*

Attendees found out how to put a biotechnology spin on their life sciences/biology classroom curricula with BLT-Biotechnology Lessons for Teachers, TEKS-aligned biotechnology content/activities.

### G. Xtreme Technology for Science Teachers

**Carolyn Schroeder**, *Texas A&M-College Station;* **Joy Sechelski**, *College Station ISD*

This session was about how to power up classrooms with interactive PowerPoint to get students motivated and involved. Attendees learned how to use PowerPoint to the Xtreme, other than just for presentations. It's a way to go "live" and increase student participation without going "wild." Participants walked away with free goodies and templates ready to share in their classroom and a head full of knowledge.

### H. Overview of the Annual Performance Report

**Todd Sherron**, *Texas Regional Collaboratives*

Attendees learned how to use the online annual performance reporting system for the MSP program. This was for new and seasoned project directors.

MAKING MATH AND SCIENCE TOTEABLE

HOW CHILDREN LEARN:
BRAIN RESEARCH AND INQUIRY-BASED SCIENCE

"SUM"MER FUN: SCIENCE UNITES MATHEMATICALLY

### I. Endeavor 2010 Mathematical Reasoning

**Christine Castellano** and **Kathleen Garcia,** *El Paso ISD;*
**Luis Carrillo** and **Dora Gurany,** *Socorro ISD*
Participants engaged in a hands-on experience of the UTEP TSTEM Center units: *Atlantis 2008 Proportional Reasoning* and *Discovery 2009 Linear Relationships*. Participants gained knowledge of proportional reasoning and linear relationships through a sampling of the units (missions).

### J. Making Math and Science Toteable

**Sara Flusche**, *North Central Texas College;* **Tracy Henry, Dee Dee Godi** and **Ashley Webb**, *Gainesville ISD*
NCTC Collaborative provided a hands-on approach to integrating science, math, and literature. Participants created their own 'Toteable' to use in the classroom.

### K. Developing Mathematical Thinkers

**Amanda White**, *Hitchcock ISD;* **Janet Vela**, *ESC Region 4*
How do you get primary students engaged in real mathematical communication? How do you get primary students engaged in real mathematical problem solving? Attendees explored strategies for creating a classroom focused on rich mathematical problem solving and communication.

### L. A "T" that Works for STEM Education: Best Practices Meets Integration

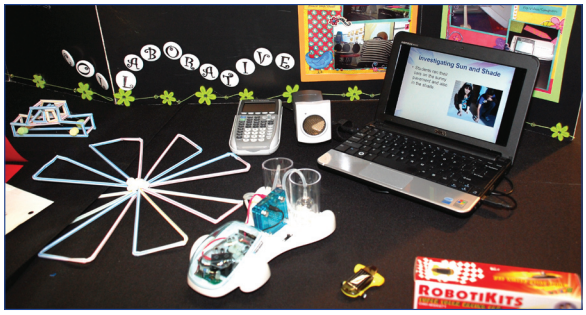
**Shawn Schlueter**, *ESC Region 14*
Effective teaching strategies have been rigorously researched culminating in Robert Marzano's "Nine," but what should they look like in a technology-integrated classroom? Attendees explored 21st Century learning resources geared for the STEM environment and related to best practices.

### M. iPods in the Classroom

**Roxanne Hammonds**, *Southwest ISD*
What place do iPods have in the classroom? Our classrooms are filled with digital natives. Participants learned how to engage students with the tools they use and are interested in today, and received a list of Apps that are useful in the classroom as well as a demonstration of some of the most popular education applications. Participants brought their iPod Touch or iPhone to download Apps instantly.

### N. Journaling Manipulatives

**Angie King**, *Robinson ISD*
Participants received hands-on manipulatives to help students collect, record, and analyze information in science journals.



WHAT IS IT REALLY LIKE
TO LIVE AND WORK IN SPACE?


DEVELOPING A SENSE OF PLACE

NASA EXPLORER SCHOOLS PILOT PROJECT:
WHAT DETERMINES A PLANET'S CLIMATE?

### A. Fun with Force and Motion

**Jana Beth Lehman** and **Robin Dehnel**, *San Angelo ISD*
In this presentation, simple, inexpensive toys were used to help students make a connection to the laws of force and motion. Attendees also compared how toys work on Earth vs. Space.

### B. The Greedy Triangle Gets Composed

**Brooke Borer**, *Northside ISD;* **Loretta Segura**, *Southwest ISD;* **Jill Meyer,** *Judson ISD;* **Esmeralda Guedea**, *Edgewood ISD;* **Graciela Garcia**, *Archdiocese of San Antonio*
The Marilyn Burns book, *The Greedy Triangle*, was used as a springboard to engage participants in composing polygons from triangles. Following two simple rules, participants were challenged to compose as many triangles, quadrilaterals, pentagons, and hexagons as possible. Each polygon was documented in a notebook image using a simple-to-teach technique.

### C. Overview of Texas Education Agency's Educator and Student Policy Initiatives Special Projects

**Felice Trirogoff**, *Texas Education Agency*
TEA's Division of Educator and Student Policy Initiatives highlighted several of their current projects: a professional development video that showed districts and campuses' use of educational technology to improve student achievement; Texas Steps Up, an opportunity for local education agencies to invest their State Fiscal Stabilization Funds in education reform and ways to improve student achievement; Texas' teacher loan forgiveness program, and the Focus Forward conference, an opportunity for superintendents, principals, teachers and educator preparation programs to share best practices around emerging issues in the classroom.

### D. Geometry in a Box

**Angela Pearson**, *Copperas Cove ISD*
Think inside the box! Attendees had an opportunity to create a project that covers Objective 3 of the TEKS. The project worked as an introduction to Objective 3 overall, a journal as they went through Objective 3, and a quick informal assessment of how well their students grasped the concepts and content of Objective 3. This innovative approach to Objective 3 will have students excited about geometry and learning while having fun and being creative.

### E. Energy Flowing Through the Cycles

**Ross Ann Hill**, *Idalou ISD;* **Melissa Duncan**, *Frenship ISD*
Carbon, Lunar, Nitrogen, Rock and Water cycles were introduced using fun activities, games and resources to engage middle school students. Teachers were provided with presentations and hands-on activities to effectively teach Earth cycles covered in middle school. The session included active participation using board games, role-play models, songs, PowerPoints, Photo Story, and Jeopardy-type assessments. Teachers were given resources to create their own materials to use in their classrooms.

### F. Science = Greater Proficiency for English Language Learners

**Jessie Minter**, *Galveston ISD;* **Juana Larralde**, *Houston ISD*
Reach your English language learners with hands-on, project-based, sheltered approach, vocabulary-drenched science! Participants got involved in activities that showed how to be more effective in using C-scope's curriculum, and left with strategies they can use and implement now.

### G. Steering Mathematics with Integrating Technology

**Susan Allen**, *Hardin Jefferson ISD*
Attendees learned how to engage students with mimio interactive technology, and experienced mathematics in a way that energizes and captivates their students. Mimio Interactive will revolutionize the way they teach, collaborate, and even the way they think.

ENGINEERING IS ELEMENTARY:
A FUN AND EASY APPROACH TO DESIGNING ALARM CIRCUITS


THE ART OF SCIENCE

### H. Building Capacity: The Ripple Effect

**Janet Vela**, *ESC Region 4;* **Amanda White** and **Tracy Erbes**, *Hitchcock ISD*

How do we build capacity of our mathematics teacher mentors in order to create a ripple effect in the world of mathematics education? Presenters shared how two days of TRC professional development impacted two third-year teachers and how these new teachers used their TRC experiences to impact the professional growth of their teammates.

### I. Engineering is Elementary: A Fun and Easy Approach to Designing Alarm Circuits

**Liz Janish**, *Round Rock ISD*

The focus was on applying the Engineering Design process to create alarm circuits and pathways through the concepts of electricity, energy, and circuits. The session explored the "circuit language" of schematic diagram symbols and a detailed diagram of their switch connection points to create an alarm circuit.

### J. The Power of Language in Mathematics

**Leslie Koske**, *ESC Region 14*

"You heard what I said, but not what I meant!" We assume that students who can text on their phones will have the ability to understand the formal mathematical language required to read and solve math problems. Attendees were encouraged to create a vocabulary rich environment in their classroom, which scaffolds the students from clueless to competent!

### K. The Art of Science

**Lucinda Presley,** *ICEE Success*

Howard Gardner, and other national experts on 21st Century success, emphasize the importance of integrating creative thinking skills with lessons in the state standards. Attendees saw how this can be done by integrating such science TEKS as forces and motion, physical properties, energy, and sound with art and language arts, designed an inquiry-based investigation, and invented a motorized sculpture that demonstrated these science concepts. Based on successful school programs produced in partnership with MIT's PIE project.

### L. What Is it Really Like to Live and Work in Space?

**Gloria Yoder**, *Huntsville ISD;* **Michelle Cochrane**, *Magnolia ISD*

Presenters shared NASA's hands-on activities that introduced both teachers and students to the effects of living and working in space. Through these activities, students experience what it feels like to be an astronaut and learn about some of the long-term effects on the human body during long-duration spaceflight.

### M. Developing a Sense of Place

**Reynaldo Ramirez, Jr.** and **Yvette Olvera**, *The University of Texas at Brownsville;* **Irma Ramirez,** *Los Fresnos CISD*

Place-based education is usually not considered. This presentation described how the use of mapmaking with children helps to inspire a sense of place that supports their understanding of spatial relationships, which are important for the study of mathematics, science and social studies.

### N. NASA Explorer Schools Pilot Project: What Determines a Planet's Climate?

**Peggy Eddy, Ayesha Kayani, Jessica Scheller, Latarsha King** and **Arlevia Davis**, *Aldine ISD*

What makes the climate of Earth more hospitable than the climate of other planets? Students engage in investigative processes to learn how human and natural factors influence the composition of Earth's atmosphere and help regulate Earth's energy budget. Participants were engaged in a variety of hands-on activities that reflect what scientists and engineers do on a daily basis. They developed hypotheses about relationships between different variables and test those relationships.

MISCONCEPTIONS IN SCIENCE

THE STATES OF MATTER


WHY 1 IS "ONE," 2 IS "TWO," 3 IS "THREE"...?

### A. Algebraic Habits of Mind as a Response to Intervention

**Sandie Giles**, *Tyler ISD*

This presentation addressed the effects of implementing Mark Driscoll's Algebraic Habits of Mind (AHOM) as a Response to Intervention (RTI) treatment in Fourth Grade. Qualitative data on AHOM as a RTI trial were collected, and results addressing interpretations of student work, utilizing habits of mind for problem solving, and determining the effectiveness of AHOM for elementary student learning were presented.

### B. Use of Technology in the Science Classroom

**Stacy Stoll**, *Killeen ISD*

The use of technology in the classroom has become a basic need for the assessment and engagement of students. I have been using different forms of technology for over 10 years and have watched student engagement and class assessment scores rise with their use. This presentation focused on the use of technology, such as: clickers, projection cameras, computers, and electronic whiteboards in a science classroom.

### C. E-STEM

**Peggy Eddy, Ayesha Kayani, Jessica Scheller, Arlevia Davis,** and **Latarsha King**, *Aldine ISD*

E-STEM learning experiences require student to use everyday materials to design and construct solutions to engineering problems. Engineering careers associated with the problem-based experiences will be explored. The E-STEM learning experiences are TEKS based, hands-on, 5E Model lessons. Participants received a free E-STEM CD.

### D. Misconceptions in Science

**Staci Thomas**, *Texas A&M University-Texarkana;* **Ronald Carson**, *Chapel Hill ISD;* **Sheri Carson**, *Pittsburg ISD*

A misconception is not knowing you don't know! There is a wide range of misconceptions regarding scientific topics that teachers must face with each lesson. In this session, presenters discussed some general preconcepts and school-made misconceptions, and also provided suggestions to diagnose misconceptions and emphasize correct scientific thinking.

### E. Why 1 is "one," 2 is "two," 3 is "three"…?

**Patricia Johnson**, *Tyler ISD*

This presentation described an elementary mathematics lesson exploring the logic that exists in the Arabic algorithms. Students learned about the Arabic numbers and the angles that are within them. Student work and teaching suggestions were presented.

### F. Creating a Presence for Science, A School Wide Systemic Change in Science Instruction

**Martin Osae**, *Dallas ISD*

Participants learned how to bring about a systemic change in science instruction at their elementary campuses. By placing a science advocate at each grade level, working in tandem with a campus science coach or science lead teacher, a strong presence for science is created at each elementary campus. Participants also took a look at a threefold approach to teaching science to young children: 1. Developmentally Appropriate Practices (DAP), 2. The 5E Instructional Model, and 3. Questioning.

### G. Using Geogebra Software

**April Ghionzoli**, *Brownsville ISD;* **Irma Renteria,** *Weslaco ISD*

In this presentation, attendees explored Geogebra, a free and multi-platform dynamic software for all levels of education that joins geometry, algebra, tables, graphing, statistics and calculus. Participants learned ways in which to incorporate Geogebra into the classroom. This innovative software may be adapted to any grade level, and is sure to increase students' motivation and achievement.

MEET TEKS AND EXPLORE SPACE WEATHER WITH A TEXAS-BUILT SPACE MISSION

WHY WON'T MY STUDENTS TALK ABOUT MATH?


XPLORIT

### H. Meet TEKS and Explore Space Weather with a Texas-Built Space Mission

**Mary Urquhart** and **Marc Hairston**, *The University of Texas at Dallas*
Attendees learned about the layers of our atmosphere, scale in the Earth-Moon system, where space begins, and our dynamic Sun are all connected to space weather with the joint NASA/Air Force/UT Dallas CINDI project. Participants created scale models of the atmosphere, the Earth-Moon system, saw how to use air-powered paper rockets in an inexpensive rocket design competition and more. CDs with all resources, including the popular comic book in English and Spanish were provided.

### I. New Science TEKS Puzzle: Critical Vertical Pieces

**Sue Ann Decuir** and **DeAnne Arledge**, *Pflugerville ISD*
Participants examined the vertical alignment of the new TEKS by comparing hands-on investigations of several concepts in physical and earth science. Activities for each grade level illustrated how students construct learning and build on experiences from year to year.

### J. Graphic Organizers in Force and Motion Investigations

**Terry Talley**, *The University of Texas Medical Branch, Galveston;*
**Nancy Schultz**, *Texas A&M University-Galveston*
Attendees learned everything they ever wanted to know about the value of graphic organizers and writing valid conclusions, and engaged in an interactive, hands-on study of force and motion taught through the story of *Sheep in a Jeep* by Nancy Shaw.

### K. UBeats: BioMusic Curriculum for Elementary Grades

**Patricia Gray**, *Music Research Institute-University of North Carolina, Greensboro*
UBEATS: Universal BioMusic Education Achievement Tier in Science is a 3-year curriculum development project that focuses on the "science of music" for elementary grades 2 to 5. Two teams of in-service teachers comprised of science teachers and music teachers developed innovative modules for upper and lower elementary grades that conform to national science and music standards. The lessons featured inquiry-based learning that builds science-processing skills through investigations of the natural world's musicality.

### L. Music, Movement, and Math…Oh My!

**Tiffanie Garvin** and **Robin Straley**, *Frenship ISD*
Brain-based research shows that students learn and retain more information when they are up and active. Attendees participated in an engaging session and learned ways to incorporate music, movement and math strategies in middle school science and STEM lessons. Participants left with a variety of activities that maximize students' energy levels and improve their retention and retrieval of science and math information.

### M. XplorIt

**Sandra Elms** and **Charlotte Burke**, *Ector ISD*
Attendees were shown how to teach valuable observation skills, science journaling and field study tools as they venture outside with their students, how to make exploration of the outdoors a creative adventure, and how to give students the ability to generate authentic products from their experiences in the field. This was a hands-on workshop that equiped attendees in the exploration and investigation of their own eco-region.

### N. Fostering Algebra and College/Career Readiness through TEA Initiatives

**Paula Moeller**, *The University of Texas System,* and **Everly Broadway**, *Texas Education Agency*
Research suggests we examine the relationship between middle school achievement and high school outcomes. Participants in this session learned how the state is shifting its focus to support algebra readiness in middle school and college and career readiness in high school in order to raise the anticipated results on End of Course assessments in future years.

# SCIENCE AND MATHEMATICS EXHIBITS AWARDS

Galveston County Regional Science Collaborative/Galveston


Region 1 Mathematics Collaborative/
Edinburg


Region 8 Science Collaborative/
Mount Pleasant

Each winning Collaborative received a $750 cash award


North Central Texas College Regional Science and
Mathematics Collaborative/Gainesville

## STATE AND FEDERAL PARTNERS

Texas Education Agency

The University of Texas at Austin

U.S. Department of Education

National Science Foundation

## STATEWIDE CORPORATE AND FOUNDATION PARTNERS

AT&T Foundation

El Paso Corporation

**The Cynthia and George Mitchell Foundation**

Toyota USA Foundation

## PROJECT CONTRIBUTORS

Abilene Education Foundation • Advanced Micro Devices
The Bob Bullock Texas State History Museum • Central West Texas Charitable Foundation/Jack Ramsey
Community Foundation of Abilene/Bob and Maggy Morford • Dian Graves Owen Foundation
Eleanor and Robert Hoppe Endowment DA Fund • J.E. Connally/Virginia H. Boyd
Morehead-Welborn LLP • Robert Gooch • Rockwell Fund
Sam E. and Ann Barshop • Scott Taliaferro, Jr. • Sydney E. Niblo
Walter F. Johnson • William Wright Jr. • Zachry Group, Inc.

## LOUISIANA REGIONAL COLLABORATIVES PARTNERS

Louisiana State University, *Baton Rouge*
Southern University, *Baton Rouge*
Louisiana Tech University, *Ruston*
Grambling State University, *Grambling*

*I feel part of a professional community of learners that is continually seeking to improve education for both teachers and students. It is empowering to know that I have a support system of colleagues who truly strive to be the best teachers they can be and who strive to provide students with excellent opportunities to grow and develop.*

**Janelle Ranford**
*Science Teacher Mentor, Rice University*

*The TRC has allowed me to have training beyond what my district can give. My eyes are opened to new and exciting teaching styles, methods, and lessons! My TRC project director, Karen Marshall, is fantastic. She worked trying to find training for me that would enhance my teaching ability!*

**Glenda Hagood**
*Mathematics Teacher, Frenship ISD*

*After teaching for 24 years, I am continuously looking for new ideas. I feel that it keeps me up-to-date on technology and innovations in science. At the start of my career, I promised myself that I wouldn't let myself become a "stagnant" teacher—one of those people that continues to do what they have always done and not grow or enrich themselves. I am constantly looking for ways to grow and become a better teacher. I love to learn and I spread my enthusiasm for knowledge to my students. The TRC has provided me with opportunities for growth. I thank you for that.*

**Cheryl Allison**
*Science Teacher, Redwater ISD*

*The TRC meeting was fantastic and I have become a better teacher because of the collaborative. I have learned more from it in the last 5 years on how to improve my teaching than all of the other 20 years of my teaching career.*

**Wanda Kollaus**
*Science Coach, Seguin ISD*

*I have been a teacher for six years and just completed four years as a TRC member. The resources and networking provided through the collaborative have enabled me to develop into a confident, more well-rounded teacher over a relatively short time span.*

**Jena Hugon**
*Instructional Team Member, Silsbee ISD*

*It has opened a whole new world of communication with other Texas math and science teachers. It has provided me with many math workshops which have enhanced our math program at our school. We are an exemplary school this year! I contribute the support of the TRC in mathematics for helping us achieve this goal!*

**Susan Allen**
*Mathematics Teacher Mentor, Hardin-Jefferson ISD*

# PARTICIPANT FEEDBACK

*I can honestly say that if it were not for TRC, I would not be the successful science teacher I am today. I have gained great resources and a wealth of knowledge from attending workshops, and it has given me the confidence I need to be a successful science teacher to my students. I know I am making a difference in the science community by being part of TRC.*

**Roxanne Hammonds**
*Science Teacher Mentor, ESC Region 20*

*I'm about to start my 12th year as a Texas teacher, but only my 4th year as a 6th Grade science teacher. I became involved in the TRC as soon as I had my new science assignment. Without the support and knowledge of the TRC, my first year would have been a disaster, and years two and three would have probably been mediocre at best. Instead, my first year was pretty good. I kept getting more comfortable, and I feel like I'm going to rock the world next year.*

**Mike Cable**
*Science Teacher Mentor, Anson ISD*

*The training that I have received from the TRC has made a world of difference to me and my students. My school was finally rated as Exemplary because the reading and math scores finally caught up with our science scores! Science has never kept us from being rated Exemplary, and this is because of the training from the TRC that I used with my students. The TRC also makes me feel appreciated. Sometimes in the big rat race that goes on during the school year, teachers do not get much in the way of positive strokes. Going to the annual meeting helps me to feel revitalized, ready for another school year, and most of all it makes me feel like I am really making a difference.*

**Donna Brown**
*Science Teacher Mentor,*
*Burkburnett ISD*

*I now research methods much more intensely. I also seek out new ways to teach skills. I am more of a risk-taker in using new methods, even when others in my district won't try them. I also encourage my colleagues to try new methods much more than before.*

**Jayne Rhodes**
*Mathematics Teacher Mentor, San Perlita ISD*

*I was impacted early in my career as a doctoral student working in STEM education. The resources provided by the Collaborative through the Texas Rural Systemic Science Initiative allowed us to implement innovation in science curriculum development and professional development with teachers in deep East Texas and set the stage for my interest and involvement in STEM educator development through partnerships and resource sharing.*

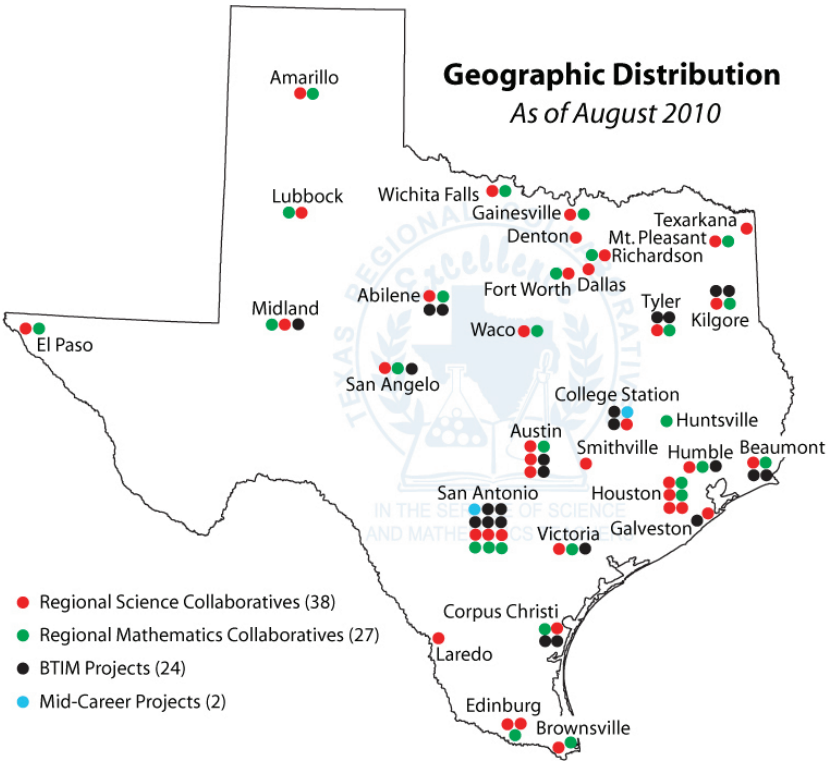
**Karen Embry Jenlink**
*Professor, Stephen F. Austin State University*

## Sixty-five Regional Collaboratives

- **Thirty-eight Science Collaboratives**
- **Twenty-seven Math Collaboratives**

Each Regional Collaborative focuses on participating teachers by:

- Enhancing their science or mathematics content knowledge,
- Improving their instructional skills, and
- Building their leadership capacity so that they can serve as a resource to improve student achievement throughout their school or district.




## Beginning Teacher Induction and Mentoring Program (BTIM)

Initiated in September 2008 with funding from the Texas Education Agency, the BTIM program is designed to increase retention of beginning science and mathematics teachers by assigning a qualified mentor teacher to each classroom teacher who has less than two years of teaching experience. Mentors provide weekly support to novice teachers through coaching, team teaching, observations, and sharing of resources.

## Mid-Career Teacher Recruitment Program

The goal of this program, implemented in September 2009 with funding from the Texas Education Agency, is to increase the number of certified science and mathematics teachers in Texas through recruitment of mid-career professionals with degrees in science, mathematics, engineering, and technology fields to teach in Texas schools. Mid-Career projects recruit, train, certify, place, and mentor those STEM professionals in high-need schools across the state.

The two Mid-Career grantees, The Texas A&M University System and UTSA Regional Collaborative, displayed at the Showcase/Exhibits and presented a workshop during the TRC Sixteenth Annual Meeting.

## Louisiana Regional Science and Mathematics Collaboratives

*Two Louisiana Regional Collaboratives are supported by the Shell-TRC Partnership:*

- Louisiana State University/Southern University Regional Collaborative
- Louisiana Tech University/Grambling State University Regional Collaborative

| REGION | MID-CAREER | BTIM* S | BTIM* M | MATH COLLABORATIVES | SCIENCE COLLABORATIVES | INSTITUTIONS |
|---|---|---|---|---|---|---|
| 1 | | | | ♦ | ♦ | Region 1 Collaborative/*Edinburg* |
| | | | | | ♦ | UT Pan American Regional Collaborative/*Edinburg* |
| | | | | ♦ | ♦ | UT Brownsville Regional Collaborative/*Brownsville* |
| | | | | | ♦ | TAMU International Regional Collaborative/*Laredo* |
| 2 | | ♦ | | ♦ | | Region 2 Collaborative/*Corpus Christi* |
| | | ♦ | | | ♦ | TAMU-CC/ESC 2 Regional Collaborative/*Corpus Christi* |
| 3 | | ♦ | | ♦ | ♦ | Region 3 Collaborative/*Victoria* |
| 4 | | | | ♦ | ♦ | Region 4 Collaborative/*Houston* |
| | | | | | ♦ | Rice University Regional Collaborative/*Houston* |
| | | ♦ | | | ♦ | Galveston County Regional Collaborative/*Galveston* |
| | | ♦ | | ♦ | ♦ | Lake Houston Regional Collaborative/*Humble* |
| | | | | ♦ | ♦ | UHCL Regional Collaborative/*Houston* |
| | | | | | ♦ | Aldine ISD Regional Collaborative/*Houston* |
| 5 | | ♦ | ♦ | ♦ | ♦ | Region 5 Science Collaborative/*Beaumont* |
| 6 | | | | ♦ | | Region 6 Collaborative/Huntsville |
| | | ♦ | | | ♦ | TAMU-College Station Regional Collaborative/*College Station* |
| | ♦ | | ♦ | | | The Texas A&M University System |
| 7 | | ♦ | ♦ | ♦ | ♦ | Region 7 Collaborative/*Kilgore* |
| | | ♦ | ♦ | ♦ | ♦ | UT Tyler Regional Collaborative/*Tyler* |
| 8 | | | | ♦ | ♦ | Region 8 Collaborative/*Mount Pleasant* |
| | | | | | ♦ | TAMU-Texarkana Regional Collaborative/*Texarkana* |
| 9 | | | | ♦ | ♦ | Region 9 Collaborative/*Wichita Falls* |
| 10 | | | | ♦ | ♦ | Region 10 Collaborative/*Richardson* |
| | | | | | ♦ | UT Dallas Regional Collaborative/*Dallas* |
| 11 | | | | ♦ | ♦ | Region 11 Collaborative/*Fort Worth* |
| | | | | ♦ | ♦ | North Central Texas College Regional Collaborative/*Gainesville* |
| | | | | | ♦ | University of North Texas Regional Collaborative/*Denton* |
| 12 | | | | ♦ | ♦ | Region 12 Collaborative/*Waco* |
| 13 | | | | ♦ | ♦ | Region 13 Collaborative/*Austin* |
| | | | | | ♦ | Capital City Regional Collaborative/*Austin* |
| | | ♦ | | | ♦ | ACC Regional Collaborative/*Austin* |
| | | | | | ♦ | UT MD Anderson Regional Collaborative/Smithville |
| | | ♦ | | | | The University of Texas at Austin - UTeach |
| 14 | | ♦ | ♦ | ♦ | ♦ | Region 14 Collaborative/*Abilene* |
| 15 | | ♦ | | ♦ | ♦ | Region 15 Collaborative/*San Angelo* |
| 16 | | | | ♦ | ♦ | Region 16 Collaborative/*Amarillo* |
| 17 | | | | ♦ | ♦ | Region 17 Collaborative/*Lubbock* |
| 18 | | ♦ | | ♦ | ♦ | Region 18 Collaborative/*Midland* |
| 19 | | | | ♦ | ♦ | Region 19 Collaborative/*El Paso* |
| 20 | | ♦ | ♦ | ♦ | ♦ | Region 20 Collaborative/*San Antonio* |
| | | ♦ | ♦ | ♦ | ♦ | OLLU Regional Collaborative/*San Antonio* |
| | ♦ | | ♦ | ♦ | ♦ | UTSA Regional Collaborative/*San Antonio* |
| | 2 | 24 | | 27 | 38 | |

*BTIM - S: Science M: Mathematics

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## Who We Are

The Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching (TRC) is an award-winning statewide network of 65 P-16 partnerships that provide sustained and high intensity professional development to P-12 teachers of science and mathematics across the state. This infrastructure of over 56 institutions of higher education collaborating with the Texas Education Agency, Education Service Centers, school districts, and business partners, has an 19-year track record of designing and implementing exemplary professional development using research-based instructional models, materials, and best practices. In addition, the TRC network includes 26 projects that focus on teacher mentoring, recruitment, and preparation.

## Our Mission

To provide Texas science and mathematics teachers with support systems of scientifically researched, sustained, and high intensity professional development and mentoring to assist them in the successful implementation of the Texas Essential Knowledge and Skills (TEKS). TRC programs equip teachers with the knowledge and skills to engage students in meaningful science and mathematics learning experiences. Activities are designed to improve students' scientific, mathematical and technological literacy, and inspire them to pursue science and engineering related careers.

## Achievements

Served over two million students across Texas through improved instruction and performance of participating teachers; developed the leadership capacity of approximately 17,000 Science Teacher Mentors (STMs) through sustained and high intensity professional development. These STMs are in turn sharing their experiences with thousands of teachers through mentoring, peer coaching, technical assistance, and workshops at the campus, district, and regional levels. In addition, approximately 1,000 Mathematics Teacher Mentors (MTMs) have received sustained and high intensity professional development sponsored by the Texas Education Agency, and supported several thousand additional math teachers with mentoring and outreach. Science and mathematics teachers in almost all of the State's 254 counties have been the beneficiaries of this extensive statewide network.

## Values

- We **serve** our teachers and students.
- We **treasure** our people.
- We **operate** with integrity.
- We **reward** our partners.
- We **contribute** to systemic reform and to the community.


**Texas Regional Collaboratives for Excellence in Science and Mathematics Teaching**

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