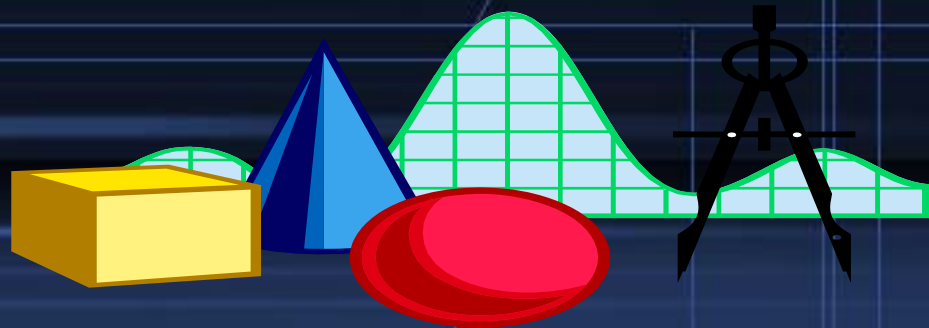


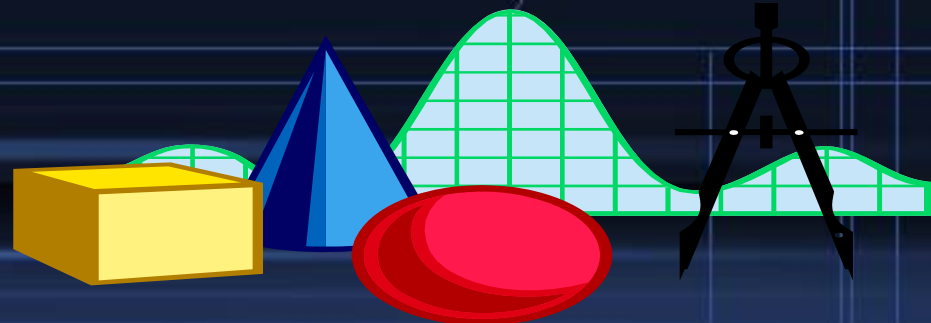
Texas Math Initiative: Professional Development Opportunities for Texas Teachers

MELL Conference
Texas State University
San Marcos, Texas
July 7, 2006



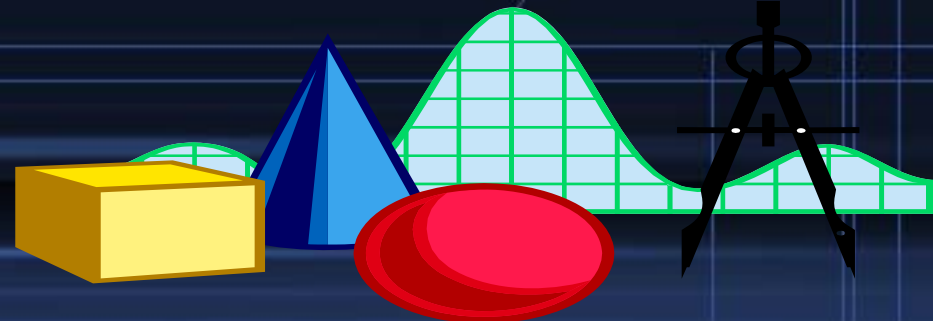
Texas Math Initiative: Professional Development Opportunities for Texas Teachers

- Kimberly Teague: Texas A&M University
- Jackie Stillisano: Texas A&M University
- Peggy Gray: Texas A&M University-Commerce
- Georgia Powers: Texas A&M University-Commerce



Overview of Texas Math Initiative

Kimberly Teague
Senior Coordinator for School/University
Initiatives



Supporting Teacher Quality

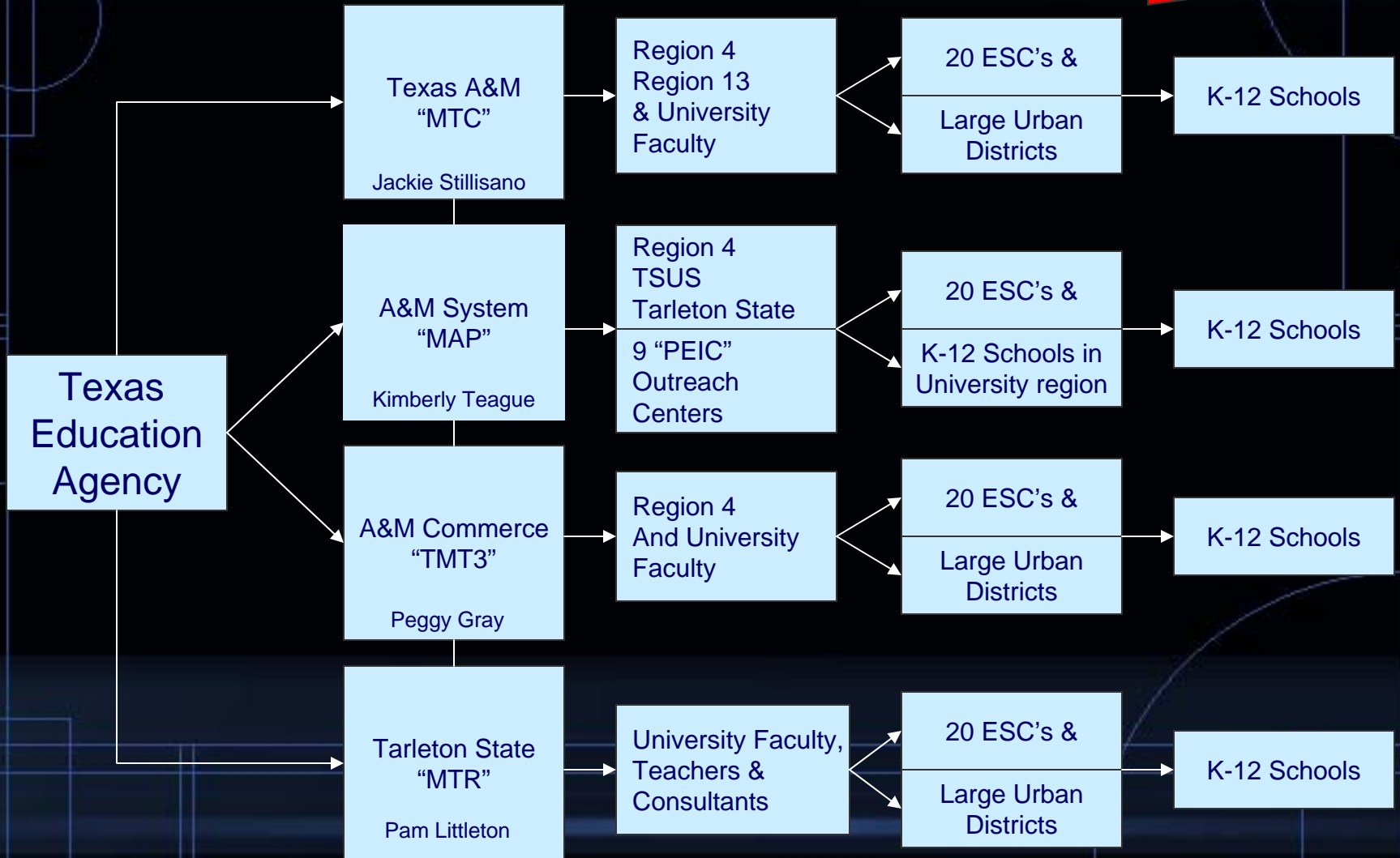
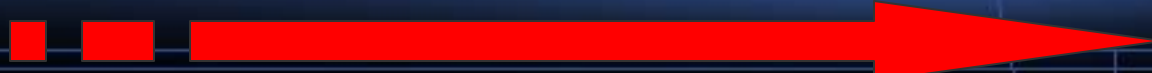
- To support NCLB, the Texas Legislature appropriated funds to TEA to be allocated for the Texas Math Initiative (There are many projects in the Initiative).
- In 2005 TEA provided funds to Texas A&M institutions to create effective professional development focused on enhancing teacher efficacy in mathematics.

Ideas Behind the Initiative

- The teacher is central to successful implementation to the TEKS. Teacher and curriculum together facilitate student learning.
- Mathematics pedagogical-content based professional development is key to enhancing teacher efficacy.
- Stakeholder involvement in creating and developing the framework is essential:
 - TEA
 - University faculty
 - Regional Service Centers
 - K-12 Administrators and Teachers
- Improved student understanding and knowledge is the ultimate goal.

Projects Roadmap

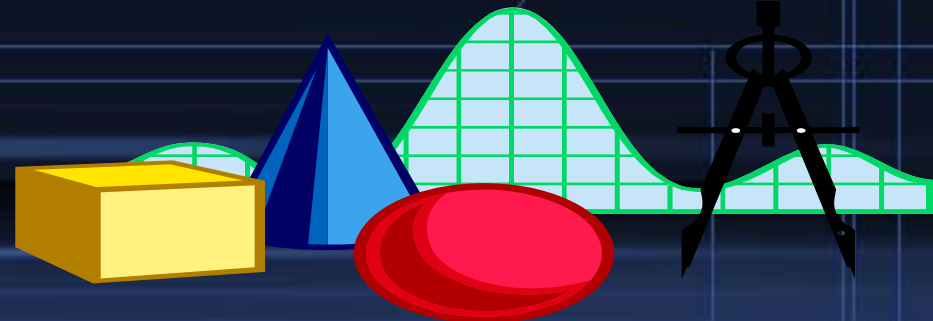
Start Here



Texas Math Initiative professional development

Texas A&M University Math TEKS Connections Project (MTC)

Jackie Stillisano
MTC Project Director



MTC Project Focus

- Professional development targeted to four audiences:
 - K-12 Mathematics Teachers
 - K-12 Administrators
 - Teacher Educators
 - Pre-service Teachers

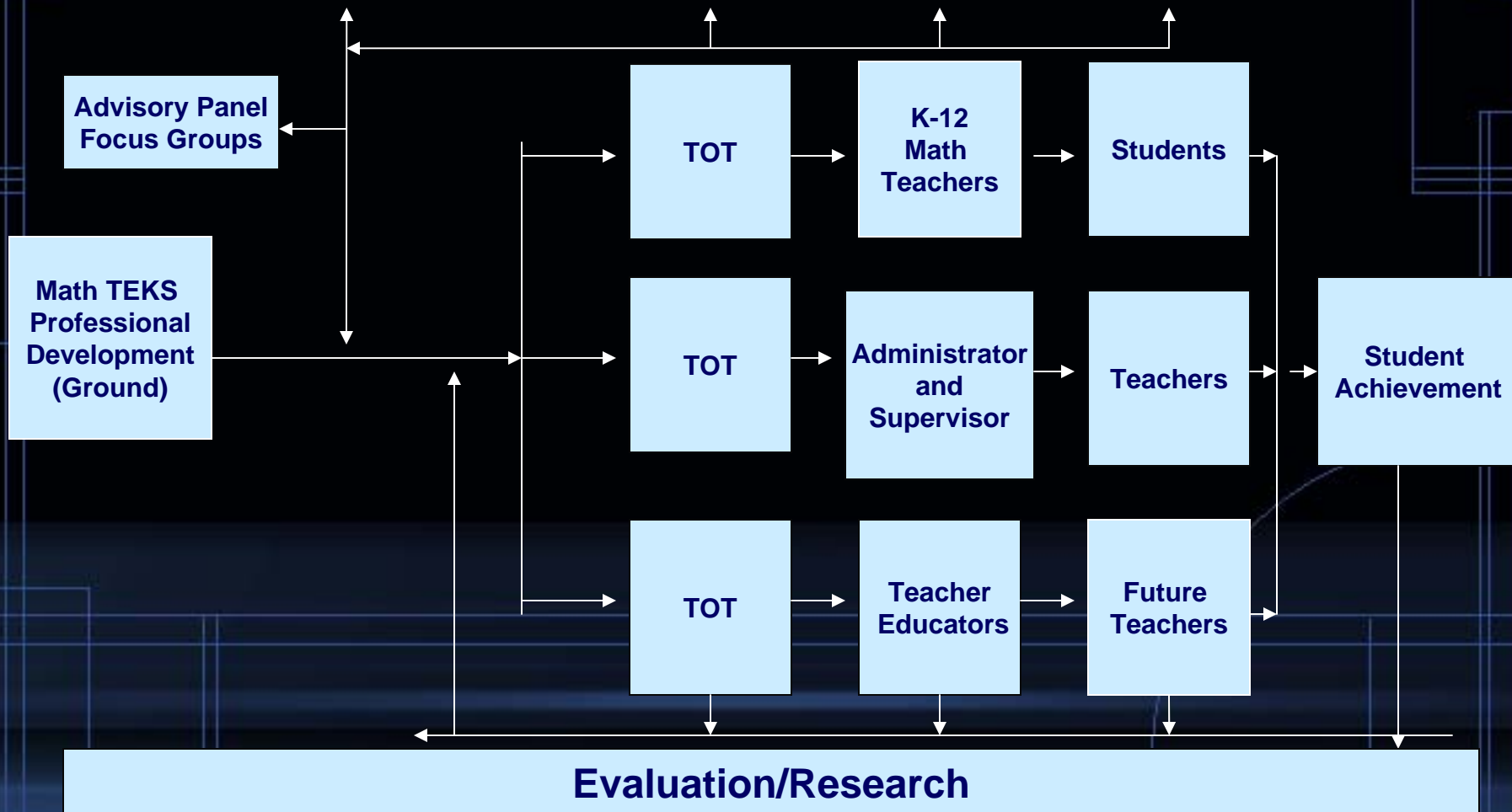
MTC Project Overview

Overall Project Goals

- Facilitate greater awareness of core instructional skills tied to math TEKS
- Facilitate greater ability to effectively instruct math students using TEKS
- Facilitate a common core core of knowledge and method between:
 - Teachers and administrators
 - K-12 and higher education teacher preparation programs

MTC Work Flow: Train the Trainer Model

Online Professional Development (CDLR)

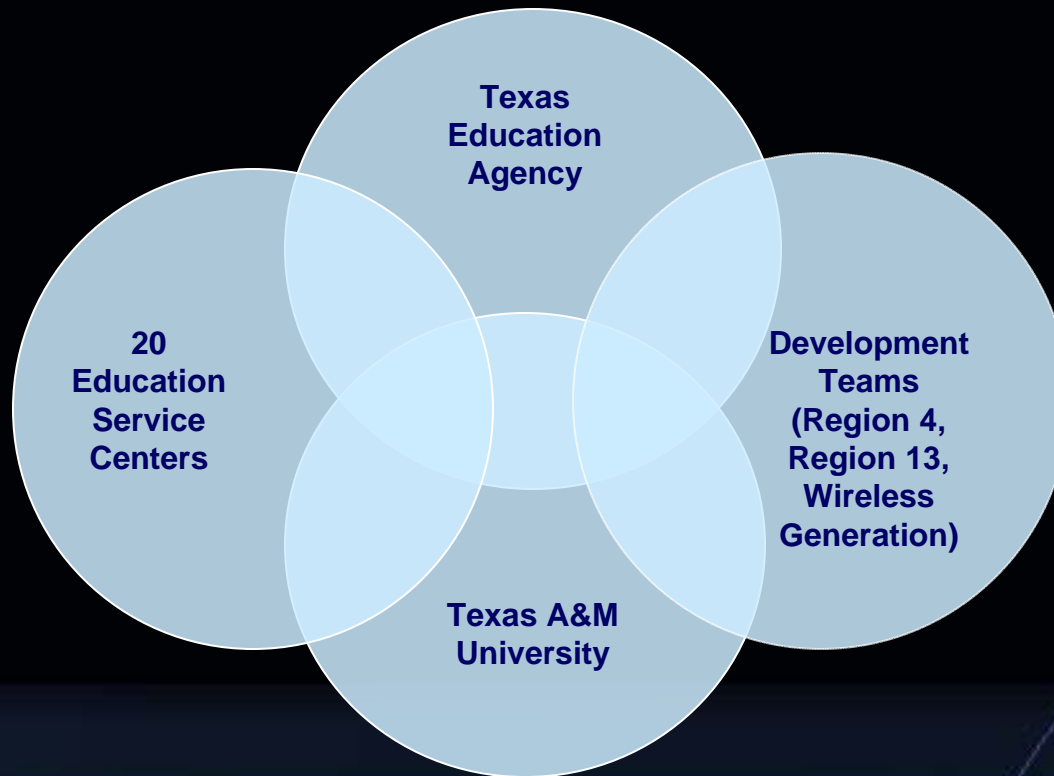


MTC Project Overview

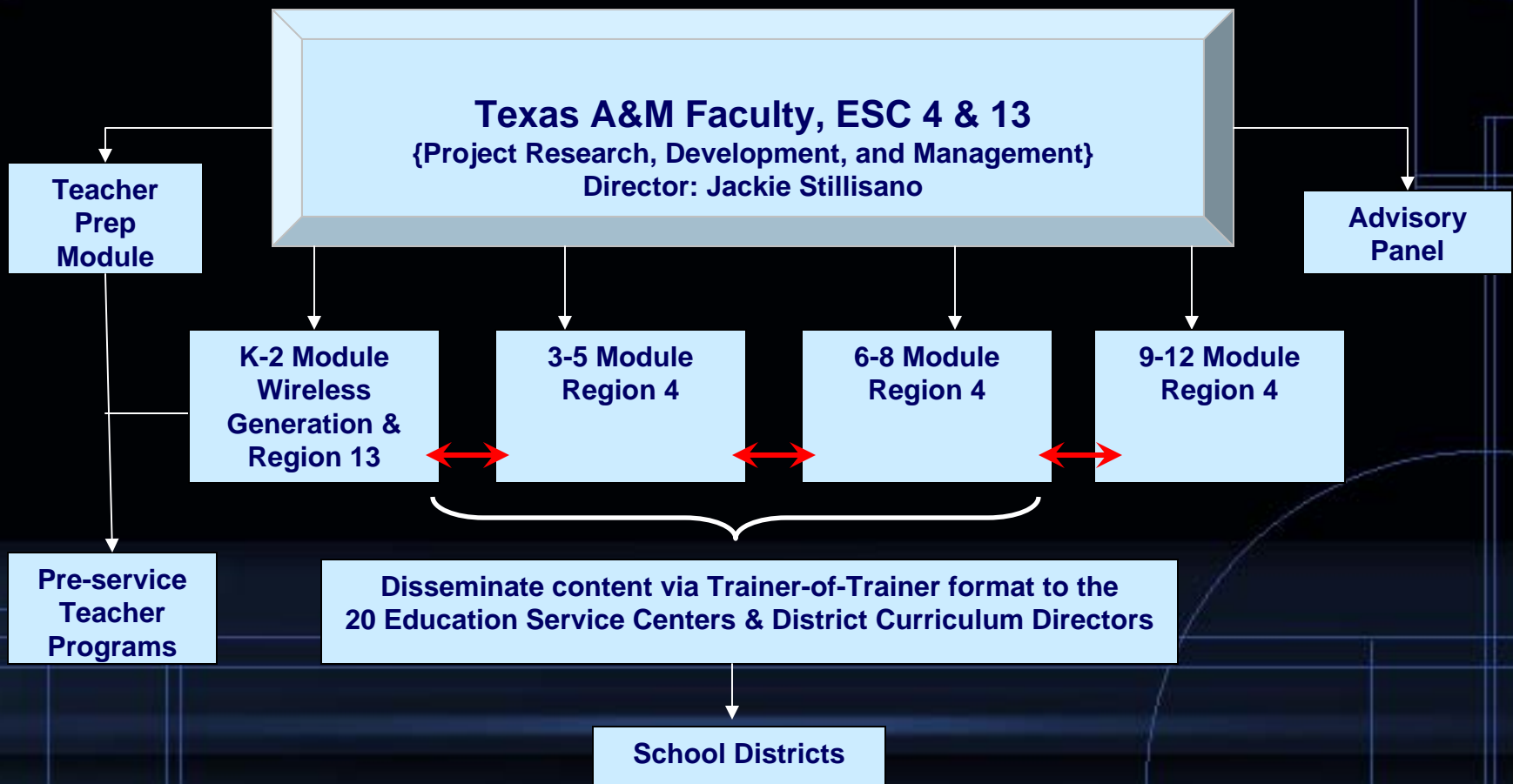
- Developed collaboratively by TAMU and ESC Regions IV & XIII
- Composed of several components, including smaller grants within the larger grant
- Integrates several cross-functional teams
- TAMU serves as fiscal agent & lead partner of MTC
- TAMU leads the external evaluation of MTC

MTC Project Overview

Collaborative Model of Inclusion and Support



Math TEKS Connections



TAMU Responsibilities

- Provide project management for MTC project
- Oversee all phases of design, development, and implementation
- Provide clarity of direction and delineate expectations for project
- Encourage a collaborative setting for project

TAMU Responsibilities (cont.)

- Manage performance
- Review, edit, and approve all materials
- Integrate research-based standards in all deliverables
- Ensure that MTC is rigorous and relevant

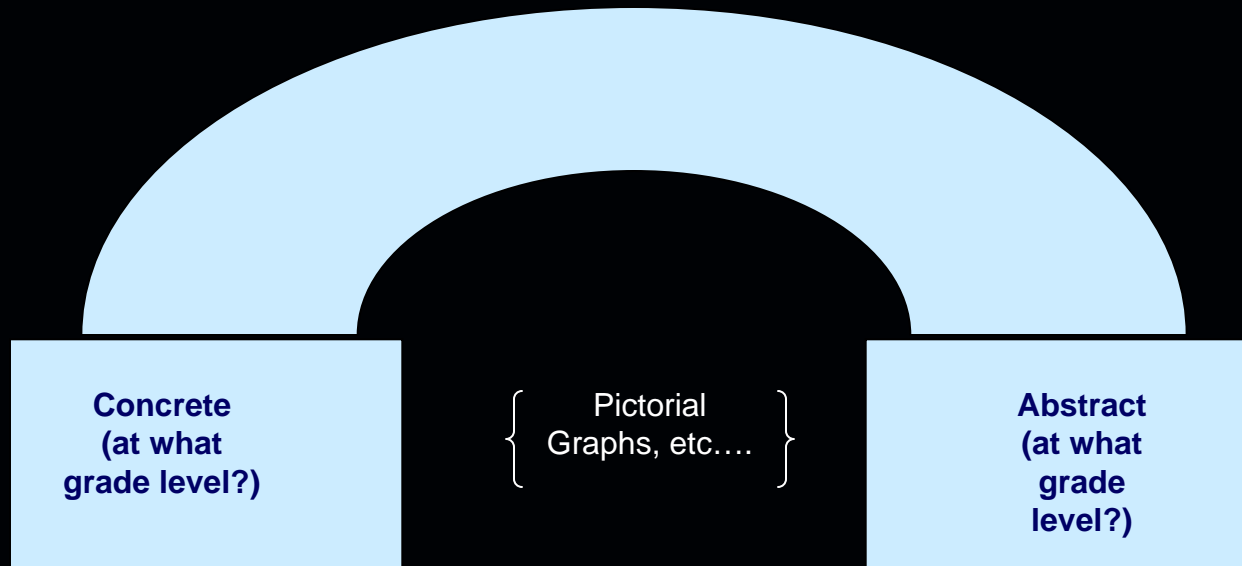
Design Team Responsibilities (Region IV, Region XIII, Wireless Generation)

- Provide content knowledge and expertise
- Identify and communicate module purpose, goals, and objectives
- Design and develop instruction and materials
- Invite and integrate feedback from Advisory Panel, focus groups, and TAMU content advisors

Design Team Responsibilities (cont.)

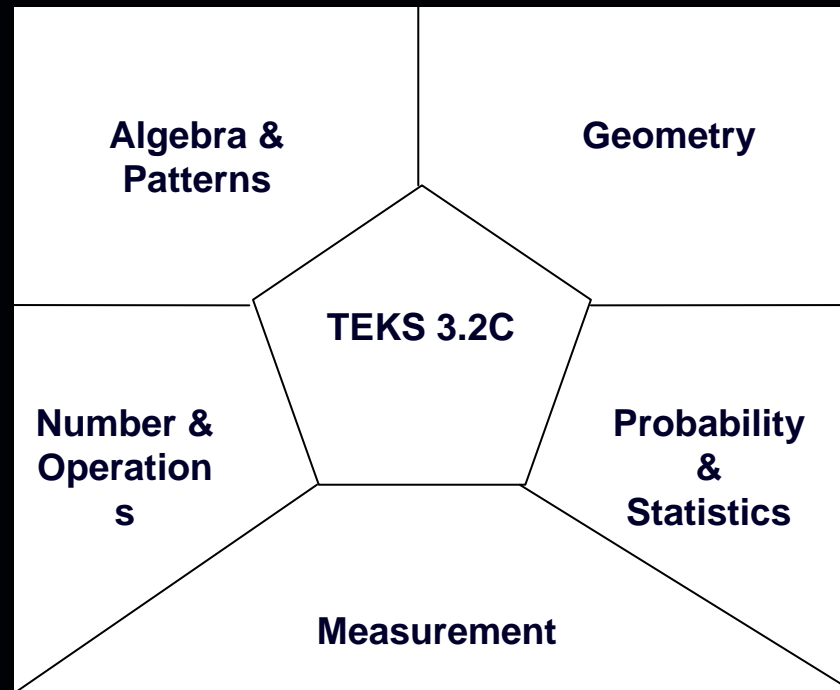
- Develop consensus prior to finalization of modules
- Facilitate focus group meetings
- Revise modules based on input from focus groups
- Deliver instruction via TOT-format
- Work with TAMU multimedia experts to provide on-line venue for MTC

Math TEKS Connections: The Big Ideas of Mathematics



Step 1: Identifying Bridges from Concrete to Abstract

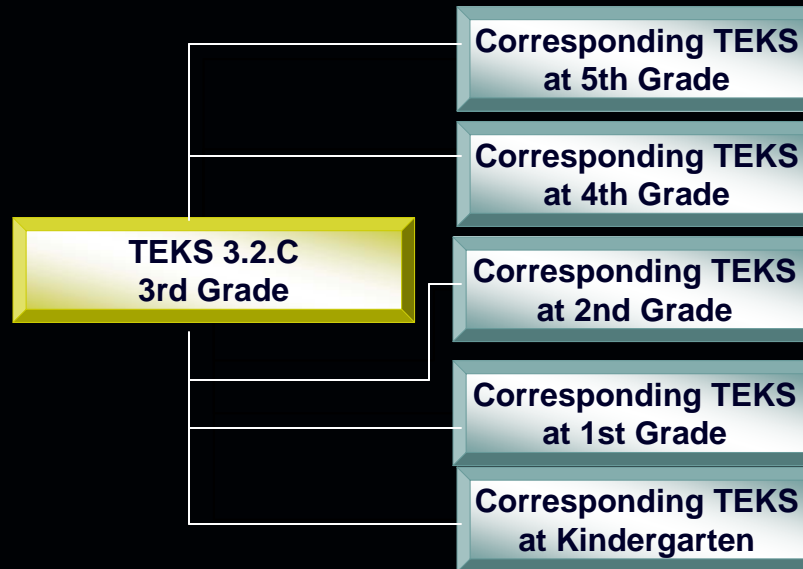
Math TEKS Connections: The Big Ideas of Mathematics



Step 2: Looking at How a TEKS Fits into
Various Strands Across a Grade Level

Math TEKS Connections

The Big Ideas of Mathematics



Step 3: Looking at Changes in a TEKS Across
Grade Levels

Math TEKS Connections

The Big Ideas of Mathematics

Connectedness of mathematical knowledge is an important understanding for teachers. “It is connections among mathematical topics, ideas, concepts, and procedures that enable teachers to portray mathematics as a unified body of knowledge rather than as isolated topics” (Ma, as cited in Hedges, Huinker, & Steinmeyer, 2004, p. 7)

MTC Project Overview

- TAMU and Regions 4 & 13 have collaborated to:
 - ✓ Recruit advisory panel members
 - ✓ Meet with the advisory panel to delineate the MTC concept
 - ✓ Review and edit framework documents
 - ✓ Refine framework documents to include essential content

MTC Project Overview

- TAMU and Regions 4 & 13 will continue to collaborate to:
 - ✓ Develop draft of professional development modules
 - ✓ Develop professional development modules
 - ✓ Review and revise drafts of each module

MTC Project Overview

- Four 2-day TOT-model professional development modules
 - K-2
 - 3-5
 - 6-8
 - 9-12
- One 3-hour administrator module
- Teacher education modules

MTC Project Overview

Training materials for each module:

1. Trainers' notes
2. Transparency masters
3. PowerPoint presentations
4. Handouts
5. Videos for training

MTC Project Overview

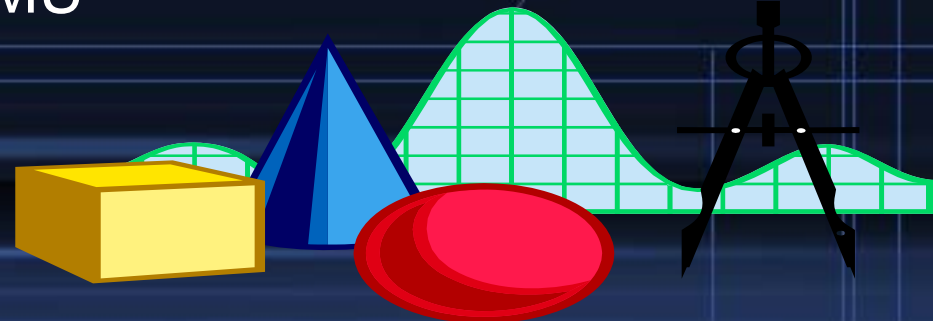
- Pilot of K-12 TOT sessions
 - December 4, 2006--December 14, 2006
 - Advisory panel members, ESC staff, University faculty
 - 4 modules presented sequentially
 - Location: Region IV in Houston
- 1st K-12 TOT session
 - Date TBD (late spring 2007)
 - ESC math specialists
 - 4 modules presented sequentially
 - Location: Region XIII in Austin

MTC Project Overview

- 2nd K-12 TOT session
 - Date TBD (late spring-early summer 2007)
 - ESC math specialists & large urban district curriculum coordinators
 - 4 modules presented sequentially
 - Location: TBD
- Online modules for teacher educators and preservice teachers
 - Spring 2007
- Online professional development modules
 - June 2007

Texas A&M University System Math Achievement Project (MAP)

Kimberly Teague
Project Manager
TAMU



Math Achievement Project

- Purpose: Multiple math projects designed to improve teacher efficacy and student math proficiency.
- Goal: To better prepare students for high school completion and post secondary education.
- Strategies:
 - Create Algebra I Training (2005);
 - Pilot the use of PDA-based math assessment tools in grades K-2;
 - Utilize the 9 TAMUS universities PEIC for public school outreach and dissemination of activities;
 - Create a Texas Math Diagnostic System e-learning CD; and,
 - Create Algebra II Training (2007)

Algebra I

- Collaborative project between Tarleton State University & Dr. Walter Stroup of UT.
- Goal: Provide educators with a working knowledge of how to design classroom lessons that encourage students critical thinking skills.
- Training via TOT held Summer 2005
- CD available upon request
- Contact: kteague@tamu.edu

Maximizing **Algebra II** Performance

- Vision: To provide tools to teachers to successfully transition instructional practices via a research-based model of instruction.
- Purpose: Incorporates hands-on, engaging experiences for all learners through a functions-based approach to Algebra II.
- Strategies: Master Trainers will receive coaching tools, debriefing tools, and questioning techniques, a notebook with all materials to turn-key, and a CD.
- This project will be an extension of concepts covered in the MTC project and will cover different function families than those covered in MTC.
- 2 two-day TOT's available Spring 2007
- E-mail Kteague@tamu.edu for questions

TMDS

- This project will develop a CD-based training module for users of the Texas Math Diagnostic Assessment System (TMDS). This module will be structured to provide training to educators in how to access, set-up, and use TMDS.
- The training module itself will be structured into chapters, with each chapter corresponding to a major function or feature of TMDS.
- Available Spring 2007

PEIC




- PEIC are former K-12 staff members who are housed at each of the nine A&M System universities under direction of the respective CoE Deans.
- Year 1 & 2: Responsibilities include implementing multiple projects on behalf of TEA:
 - Outreach and intervention rotating weekly among K-12 schools.
 - Coordination of a cadre of Academic Facilitators.
 - Implementation of Wireless Generation's mCLASS PDA-based assessment for grades K-2.
 - Facilitation of TMDS use.

A&M PEIC

Example of web-based professional development...

peichome




Connected Teacher Series: Module I

**Taking the TAKS to TASK: Comparing Grades 4th and 7th Math
TAKS Verb Use and Alignment Resources for Teachers**

Revisions Underway, check back with us, soon for updates.

1. Teacher Pre Self-test
2. Surfing across Texas: Web Resources and References
 - o Mathematics Capital
 - o Manipulative Mountains
 - o Alignment City
 - o Assessment Airport
 - o Resource Town
3. TEKS to TAKS: The Vocabulary of Measurement
 - o Vertical Alignment 3rd-8th Grades
 - o 4th Grade TAKS Verb ID
 - o 7th Grade TAKS Verb ID
 - o Measurement Match
4. Classroom Implementation
 - o Concrete / Bridging / Abstract
 - o Using Manipulatives
 - o Assessments
5. Teacher Post Self-test
6. Video Resources
7. Contributions

<http://peics.tamu.edu/>



Funded by the Texas Education Agency

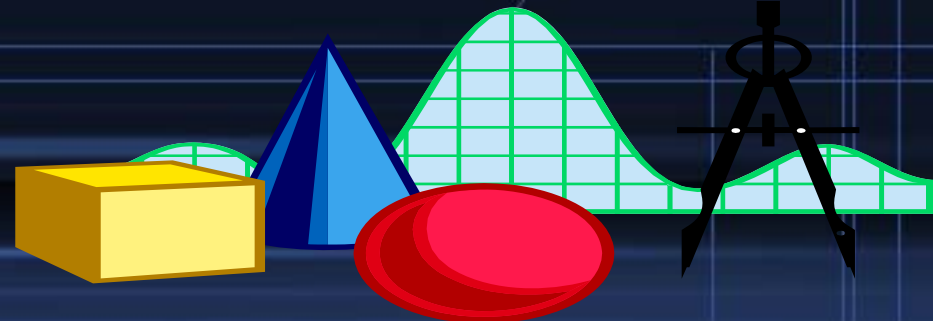
Internet

Four web-based modules available

For further information Contact: Cathy Ezrailson at cezrailson@coe.tamu.edu.

Texas A&M University- Commerce P-16 Educational Improvement Consortia (PEIC)

Peggy Gray
PEIC Director



Academic Facilitators

- Purpose of project is to compensate academic facilitators working directly with teachers in low performing schools
- P-16 Educational Improvement Consortium (PEIC) teams from nine system universities including A&M-Commerce guide and facilitate the process
- Texas A&M University-Commerce PEIC services approximately 40 campuses from 15 districts

Facilitators Paid To:

- Input data and answer technical questions concerning the programs for teachers

Facilitator Fund Uses:

- #1: Wireless Generation mClass
 - Math software developed by Wireless Generation in collaboration with Dr. Herbert Ginsberg
 - Assessment instrument for measuring math skills
 - Helps teachers acquire precise information about student progress toward learning mathematics skills

Facilitator Fund Uses:

- #2: Texas Mathematics Diagnostic System (TMDS)
 - Automates the process of creating classroom and district benchmark tests aligned to the TEKS
 - Offers continuous progress monitoring
 - Allows teachers to focus on individual student needs
 - Provides easy-to-access information and instant feedback

Facilitators Paid To:

- Assist educators and administrators in designating a TMDS point of contact for the school or district
- Discuss the steps necessary to get the district set up to use the system
- Assist the schools/districts in the enrollment process
- Monitor the schools to ensure performance

Facilitator Fund Uses:

- #3: Mathematics Cadres
 - High School Mathematics Cadre formed
 - 16 area districts represented by 16 high school math teachers
 - Meet to discuss best practices for TAKS tutoring, TAKS review, TAKS remediation, benchmark assessments, curriculum alignment, lesson planning, materials/resources selection, etc.

Facilitators Paid To:

- Share/discuss strategies with other schools/districts
- Collect research/data on best practices
- Serve as school leaders in implementing best practices for increasing student achievement in home districts

Facilitator Fund Uses:

- #4: Professional Development
 - TOT trainings including math manipulative training, instructional strategies training, technology training, TAKS data analysis training, curriculum alignment workshops, etc. are offered

Facilitators Paid For:

- Training other teachers within their districts
- Working with School Performance Coaches when they make site visits/classroom observations

Observable Changes:

- Teachers are more aware of the curriculum that needs to be taught-not just following textbooks
- Teachers are beginning to actively involve students in the learning process
- Teachers are varying their instructional strategies-not just using worksheets
- Teachers are using a variety of resources/materials including online resources and technology

Observable Changes (cont.):

- Teachers are improving their questioning skills by asking questions that require in-depth, higher-order thinking skills
- Teachers are limiting the number of problems and are teaching students to transfer knowledge from one situation to another

Teaching Mathematics TEKS Through Technology (tmt3)

Kimberly Teague for
Frank Ashley, Jo Ann Wheeler,
David Eschberger, and Eileen Faulkenberry



Teaching Math TEKS Through Technology

“tmt3”

- Developed by: Texas A&M Commerce and Education Service Center Region 4
- Purpose: Centered on effective technology, aligned to the state curriculum, that will facilitate teaching mathematics.
- Strategies: Targeted to middle and high school mathematics. Teacher lessons, student lessons, and tutorials.
 - 4 two-day Train-the-Trainer format professional development modules: Middle school, Algebra I, Geometry, and Algebra II.
 - Includes Integration of the middle school Technology Application TEKS.

tmt3

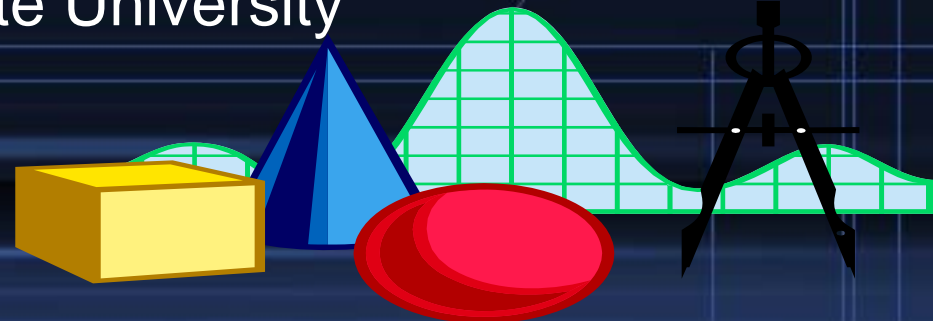
- Project Goal: Technology is seen as an instrument to explore, understand, and extend mathematics.
- Developed using the 5E (engage, explore, explain, elaborate, and evaluate) inquiry-based model to facilitate maximum participant involvement.
- Extensive technology tutorials provide step-by-step instruction specific to the activities in each module.
- Each module includes two student-ready lessons per grade level.

tmt3

- Middle School
 - Focus on statistics and probability TEKS
- Algebra I
 - Focus on linear and quadratic functions
- Geometry
 - Focus on algebraic and geometric connections and geometric structure
 - Utilize Geometer's Sketchpad, spreadsheet, graphing calculator, and TI-Interactive technologies
- Algebra II
 - Focus on quadratic functions, systems of equations, exponential functions, and rational functions

Mathematics TEKS Refinement (MTR)

Kimberly Teague for
Pam Littleton, Kathy Horak Smith,
Elizabeth Riggs, and Bowen Brawner from
Tarleton State University



Math TEKS Refinement TOT

“MTR”

- Project Director: Pam Littleton, Tarleton State University.
- Developed by: A team of mathematics faculty at Tarleton State University and classroom teachers.
- Purpose: Math TEKS were refined in 2005. This project is focused on the changes to the curriculum and provides teacher and student lessons to implement the changes.
- Goals: To increase teacher knowledge about the changes to math curriculum.

MTR Summary of Activities

- Four MTR TOT modules each 12 hours in length
 - K-2
 - 3-5
 - 6-8
 - 9-12 [Algebra I, Geometry, and Algebra II]
- If a TEKS is removed...was it removed? Moved to a different strand? Or moved to a different grade level?
- Modules piloted twice with Regional Service Centers, to be delivered in August, September, and December 2006.

MTR Grades K-5

Content pieces include:

- Numerical fluency
- Measurement
- Volume and capacity

MTR Grades 6-8

Content pieces include:

- Simple versus Compound
- Probability
- Modeling the mean, median, and mode using linking cubes
- Algebraic reasoning

MTR Grades 9-12

- Content pieces include:
 - Functions
 - Regression
 - Correlation coefficient
 - Relationship between orthographic and isometric
 - Patterns in perimeter, surface area, and volume
- All modules have an Appendix filled with student lessons at each grade level in each strand
- All materials available on CD

Contact: Pam Littleton littleton@tarleton.edu

- A BIG thank you to...

Norma Torres-Martinez and Richard Powell for their collaborative spirit and leadership!

Thank you!

References

Hedges, M, Huinker, D, & Steinmeyer, M. (2004). Unpacking division to build teachers' mathematical knowledge. *Teaching Children Mathematics*, 11(9), 478-483. Retrieved 7/6/06 from Milwaukee Mathematics Partnership website:
http://www.uwm.edu/Org/MMP/_resources/publications.htm