



Tucson Unified School District's Mathematics Plan

2006-2011

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Tucson Unified School District's Mathematics Plan 2006-2011

Mission, Vision, Values:

To increase mathematics achievement and ensure that students develop essential knowledge and skills necessary for understanding and applying mathematics concepts by improving instruction and defining quality work.

- We believe that every student must develop essential knowledge and skills necessary for understanding and applying mathematics concepts
- We believe that every educator must learn, research, and communicate what constitutes effective mathematics instruction.

Strategic Planning Goals of the Math Leadership Team:

1. The purpose of the mathematics curriculum and instruction program is to provide, revise and update curriculum documents, instruction and intervention resources, assessment tools, and other resources to assist teachers in implementing consistent standards-based instruction so that students meet grade level standards and/or attain one year's growth in mathematics.
2. The purpose of the mathematics professional learning program is to create a system-wide culture and common understanding about quality mathematics through engaging in classroom research and providing professional learning opportunities for teachers, instructional coaches and principals as learners, researchers, and communicators to improve instruction and positively impact student mathematics understanding and achievement.

TUSD Success for Children Action Plan:

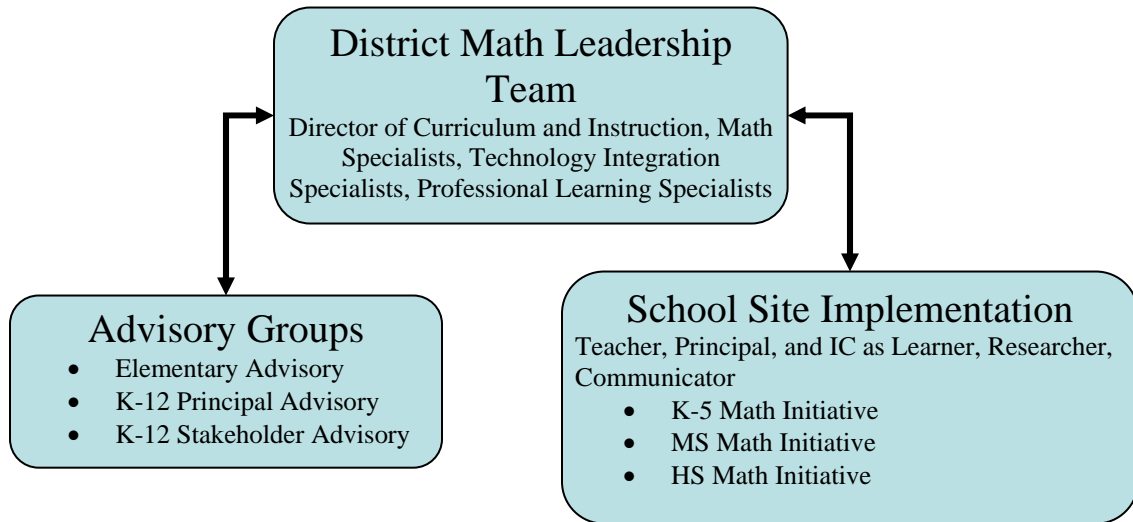
Strategic Goal for Academic Achievement

Each TUSD student will attain the skills to achieve minimum of one year's growth annually, meet or exceed promotion/graduation requirement, and become a lifelong learner in order to compete in a global society.

SMART Goals for Mathematics:

- By 2010 every student will meet or exceed state standard in reading, writing, and mathematics as measured by state assessments.
- Each year, every school will progressively increase the percentage of students meeting or exceeding the standards in reading, writing, and math, as measure by quarterly assessments.
- Each year, every student will make at least one year's growth in reading, writing, and mathematics as measure by district quarterly assessments and state or district annual assessments.

District Mathematics Team



The Role of the District Math Leadership Team:

Facilitate the implementation of the TUSD 3-5 year math plan.

Mathematics Advisory Groups:

Serve in an advisory capacity as Tucson Unified School District improves mathematics achievement through students developing essential knowledge and skills necessary for understanding mathematics.

Teachers, Principals and Instructional Coaches as Learners:

- Engage in mathematics, and identify quality instruction as it relates to mathematics.

Teachers, Principals and Instructional Coaches as Researchers:

- Research quality mathematics instruction and “rigor” at your school.
- Investigate “quality work” in mathematics at your school.

Teachers, Principals and Instructional Coaches as Communicators:

- Plan how to build common goals, common language and teacher capacity at your site and in Tucson Unified School District as a whole.
- Identify characteristics of curricula that develop essential knowledge and skills necessary for student understanding.

School Site Implementation

Site implementation is based upon a research model consisting of 3 levels

Level 1: Educators at Level 1 will develop common understanding about the structure of an effective lesson and how students learn. As learners, they will increase mathematics

content knowledge and awareness of the utility of mathematics. They will begin the research process by engaging in lesson and case study to delineate knowledge packages and identify essential mathematics skills. They will communicate the attributes of quality work.

Level 2: Educators at Level 2 will continue the research process. They will look at student work and define expectations for learner outcomes. They will articulate knowledge packages and essential mathematics skills. Advance their understanding of quality work. They will use common formative assessments on a timely basis to diagnose student needs and determine interventions. They will develop communication skills through mentoring and supporting Level 1 educators explore application of mathematics across disciplines and articulate content between grade levels and to the state mathematics standard.

Level 3: Educators at Level 3 continue the research process. In addition they will explore equity versus equality in mathematics.

Oversight, Revision, and Program Evaluation

Revisions on this TUSD 3-5 year math plan will be done bi-annually through the Math Leadership Team. Those revisions will then be shared with advisory groups and school site implementation teams annually. Revisions will be based on results from program evaluation, research, and feedback from sites. A program evaluation system will also be chosen. The system chosen to evaluate the math plan will use data and research to evaluate the effectiveness of each program implemented in the math plan.

General Timeline

2006-2007

- Formed and met with advisory groups (K-12 principals advisory, K-12 stakeholder advisory),
- Began K-5 math initiative with 8 schools (Level 1)
- Began to coordinate and integrate mathematics work across district (grants, programs), beginning of definition of quality work K-8, building coherence and alignment regarding K-12 curriculum, building a common vision of mathematics K-8
- Implemented innovative and technology driven techniques for the 9-12 classroom

2007-2008

- Add additional schools for the K-5 math initiative Level 1.
- Hire Mathematics Coaches for school site and district support
- Implement first year of Summer Boost intervention for incoming 9th graders
- Continue to coordinate and integrate mathematics work across district (grants, programs), defining quality work K-8, building coherence and alignment regarding K-12 curriculum, building a common vision of mathematics K-8
- Begin rolling implementation of standards-based mathematics curriculum K-5 for Level 1 participants

- Adoption of standards-based mathematics curriculum 6-8
- Begin Level 1 6-8 participating schools
- Revisit pacing calendar and benchmarks and align to adopted curricula
- Add innovative and technology driven instructional techniques for the 6-12 classroom
- Create district-wide infrastructure for curriculum, such as unit assessments, anchor papers, and structures for examining student work
- Create district-wide infrastructure for professional learning in mathematics, such as research schools, demonstration classrooms, and observation protocols

2008-2009

- Revise pacing calendar, benchmarks, unit assessments, anchor papers and other district infrastructure documents
- Add innovative and technology driven instructional techniques for the 6-12 classroom
- Add additional schools for the K-5 math initiative Level 1
- Begin Level 2 K-5 participating schools
- Implement Summer Boost intervention for incoming 9th graders for the second year
- Continue to coordinate and integrate mathematics work across district (grants, programs), defining quality work K-12, building coherence and alignment regarding K-12 curriculum, building a common vision of mathematics K-12
- Continue rolling implementation of standards-based mathematics curriculum K-5 for Level 1 and 2 participants
- Implement standards-based mathematics curriculum 6-8 to Level 1 participants
- Additional schools Level 1 6-8
- Begin Level 2 6-8

2009-2010

- Revise pacing calendar, benchmarks, unit assessments, anchor papers and other district infrastructure documents
- Implement innovative and technology driven instructional techniques for the K-12 classroom and provide professional development
- Add additional schools for the K-5 math initiative Level 1
- Begin Level 3 K-5 participating schools
- Third year implementation of Summer Boost intervention for incoming 9th graders
- Continue to coordinate and integrate mathematics work across district (grants, programs), defining quality work K-12, building coherence and alignment regarding K-12 curriculum, building a common vision of mathematics K-12
- Continue rolling implementation of standards-based mathematics curriculum K-5 for Level 1 and 2 participants
- Implement inquiry-based mathematics curriculum grades 6-8 to Level 1 participants
- Add additional schools to Level 1 grades 6-8
- Begin Level 2 grades 6-8

2010-2011

- Revise pacing calendar, benchmarks, unit assessments, anchor papers and other district infrastructure documents
- Add innovative and technology driven instructional techniques for the K-12 classroom
- Add additional schools for the K-5 math initiative Level 1
- Begin Level 3 K-5 participating schools
- Fourth year implementation of Summer Boost intervention for incoming 9th graders
- Continue to coordinate and integrate mathematics work across district (grants, programs), defining quality work K-8, building coherence and alignment regarding K-12 curriculum, building a common vision of mathematics K-8
- Continue rolling implementation of standards-based mathematics curriculum K-5 for Level 1, 2, and 3 participants
- Implement standards-based mathematics curriculum grades 6-8 to Level 2 participants
- Additional schools Level 1 grades 6-8
- Begin Level 3 grades 6-8

1. Curriculum- An organized plan of instruction that engages students in learning the standards, concepts, and performance objectives identified at the state and local level. A curriculum often includes scope and sequence, curriculum maps, and instructional materials alignment documents.¹

Content Statement: Curriculum is developmentally appropriate, well-articulated, aligned, and relevant across all levels as well as clear and coherent to all stakeholders to provide all students with the opportunity to be successful throughout their course work, throughout their education and beyond/ post high school.

| Objectives | Strategies | Accountability | Timeline | Responsible Party |
|--|--|--|--|--|
| <ul style="list-style-type: none"> Curriculum provides a framework for developing conceptual understanding and skill fluency through use of the process standards: Problem solving; Reasoning and proof; Connections; Communication; and Representation) Curriculum supports quality instructional practices, such as SIOP strategies, engagement strategies, differentiation of instruction, and use of models to understand mathematical concepts Curriculum is relevant, meaningful, and applied to a variety of contexts and content areas. District level curriculum documents are consistent with the curriculum Curriculum is vertically articulated from grade level to grade level, and will include aligned supplemental materials. Curriculum reflects sensitivity toward | Adoption of materials that support the development of conceptual understanding (fluency through use of the process standards | Purchase of textbooks and units | Follow Levels 1,2 and 3 for roll out for K-8 schools | Math Specialists Technology Specialists Governing Board |
| | Purchase of manipulatives that support the curriculum | Purchase and distribution of manipulatives | Follow Levels 1,2 and 3 for roll out for K-8 schools | Math Specialists Technology Specialists |
| | Purchase of supplementary teacher resource materials that support quality curriculum for example, those that implement cognitively guided instruction | Purchase and distribution of materials, | Follow Levels 1,2 and 3 for roll out for K-8 schools | Curriculum, Instruction, and Technology Integration K-1 Class size reduction Initiative |
| | Create, Complete and disseminate curriculum documents (such as pacing calendars, topic maps, scope and sequence, curriculum maps, priority number skills, and formative assessments) that identify and support the development of grade level essential understandings | Completed documents posted on the website | Spring 2007 –Fall 2007 | Math Specialists Technology Specialists K-12 math teachers Math Coaches |
| | Use technology that supports mathematics instruction: Interactive white boards, software, graphing | Purchase and distribution of materials; | Follow Levels 1,2 and 3 for roll out for K-8, 9-12 | Principals Math Specialists |

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| cultures and values different ways of thinking and solving problems | calculators, calculators | | start of 2006 | Technology Specialists |
| | Curriculum is supported by all departments, and all personnel participates in professional development | List of professional development participants | Follow Levels 1,2 and 3 for roll out for K-8, 9-12 start of 2006 | Math Specialists Technology Specialists All TUSD departments |
| | Pacing Calendar | By Level PK-10 | Revisit and revise annually | Math Specialists Technology Specialists preK-12 teachers |
| | Skills/Sub skills and Learner Outcomes | By Level PK-12 | Revisit and revise annually | Math Specialists Technology Specialists preK-12 teachers |
| | Scope and Sequence | By Level PK-12 (articulated) | Revisit and revise annually | Math Specialists, Technology Specialists preK-12 teachers, |
| | Curriculum Maps | By Level PK-12 | Revisit and revise annually | Math Specialists Technology Specialists preK-12 teachers |
| | Topic Maps | By Level PK-12 | Revisit and revise annually | Math Specialists Technology Specialists preK-12 teachers Math Coaches |
| | Common Formative Curriculum Unit Assessments | Completed assessments, collecting assessment | Revisit and revise annually | Math Specialists Technology |

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| | | data | Follow Levels 1,2 and 3 for roll out for K-8, 9-12 tentative for 2007 | Specialists preK-12 teachers Math Coaches |
| | Professional Development: Institute and three courses of study for mathematics content, instructional practice, and use of technology | List of teachers attending, coaching data, principal observations | Follow Levels 1,2 and 3 for roll out for K-8, 9-12 tentative for 2008 | Math Specialists Technology Specialists Math Coaches |
| | Implementation of adopted curriculum and use of support materials and technology | Principal observation, data from unit assessments | Follow Levels 1,2 and 3 for roll out for K-8, 9-12 tentative for 2011 | Principals Department heads Math Coaches |
| | School-site professional development examining student work on a monthly basis and identify instructional implications.(K-12) | School-selected exemplar papers for district data bank. | Follow Levels 1,2 and 3 for roll out for K-8, 9-12 start of 2007 | Principals Department heads Math Coaches |
| | Articulation meeting with K-5, 6-8, and 9-12 | Number of meetings per year Embedded during the day After school | Fall 2007 and ongoing | Principals Math Specialists Math Department Chairs Lead math teachers from K-6 |
| | Accelerated classes offered to middle school students to achieve higher levels of thinking in mathematics and meet the needs of those students exceeding current grade-level standards. | List of school course offerings | Fall 2007 | Principals Human Resources department Math Specialists Course Code Specialist |

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| | | | | 6-8 Math Teachers |
| | Research pedagogy and content of mathematics worldwide | | Fall 2007 | Principals Math Specialists Math Department Chairs Lead math teachers from K-6 |

2. Interventions- Instruction provided in response to learner needs as determined through assessment. The response may involve remediation, reinforcement, enrichment, or support.²

Content Statement: Interventions make it possible for all students to develop sound mathematical understandings (knowledge and skills – process standards)

| Objectives | Strategies | Accountability | Timeline | Responsible Party |
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| <ul style="list-style-type: none"> The first level of intervention will be provided by classroom teachers within the framework of instruction and must be focused on academic proficiency. Additional interventions must be differentiated using methods and materials that are different from the original instruction. This will also include Enrichment and Accelerated opportunities. Through on going formative and summative assessments, students requiring intervention will be identified and provided mandatory targeted, timely and flexible support. | Mandatory parental communication (ex. Phone calls, weekly/bi-monthly progress reports, online access to grades) | Parental contact log Teacher evaluation instrument | Continual throughout the school year. | Classroom Teacher and Evaluating Administrator |
| | Identify effective classroom strategies to use as models for teachers and administrators | Teacher Evaluation Instrument Mentor/Mentee program | Refer to Level 1, Level 2 and Level 3 research model | Administrators Teachers District Level Dean of Instruction (this position needs to be created) |
| | Identify and implement integrated learning systems software (e.g. PLATO, ALS A+, Success Maker) K-12 | Benchmark Assessment Standardized Testing | 2006-2011 | Math Specialists Technical Services Technology Specialist Teachers Administration |
| | TUSD Distance Learning | To be determined by Director of Distance Learning | 2006-2011 Will be reviewed for continuation in math plan 2011 | Director of Distance Learning Counselors Schools Administration |
| | AIMS Seminars for high school students | AIMS results State monitoring system Teacher recommendations | 2006-2011 | Math Specialists, Director of Curriculum and Instruction, Administrators, Math department chairs, math teachers, Instructional Coaches |
| | Summer Boost Program for incoming 9 th graders | AIMS 8 th grade placement exams Teacher recommendations | Start Summer 2007 | High School, middle school counselors, District |
| | Summer School K-12 | Benchmark Testing Current AIMS results | Continue Summer 2008 K-12 Continue summer 2007 9-12 | K-8 at site level 9-12 district wide SEAS office, counselors, summer school coordinators |

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| <ul style="list-style-type: none"> Interventions will be financially as well as philosophically supported by providing equitable access to resources such as current technology, manipulatives, and teacher training in the use of alternate instructional strategies. Intervention will be primarily preventative in nature rather than strictly remedial by utilizing frequent classroom assessment data. | Place students in an intervention class (e.g. AIMS math, Math Intervention course, offering accelerated courses, algebra support classes, HS algebra at the middle school level, and tutoring opportunities). | AIMS AIMS- DPA Benchmarks Teacher recommendation 8 th grade placement exams Standards-based grades | Ongoing | District, District Math Resource person, Administrators, Teachers, |
| | Conference time with students within the school day who need intervention | Benchmark Testing AIMS Classroom grades Teacher created Assessments District common unit assessments Number inventories | 2006-2011 | Principal, teachers, counselors, site resource personnel |
| | Classroom size reduction for high school algebra class to be no more than 25 students per teacher per class | Class size cap | 2009-2010 | District, Principal, Department chair, Counselors |
| | On-site tutoring (after school or before school) at all schools | Benchmark Testing AIMS Classroom grades Teacher created Assessments District common unit assessments Number inventories | 2009 | Transportation, District, School Site |
| | Longer class period to have more time on task (at least 60 minutes of instruction K-8) | Benchmark Testing AIMS Classroom grades Teacher created Assessments | 2008-2009 | Site Council, scheduling, administrators, teachers, |

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| | | District common unit assessments | | |
| | | Number inventories | | |
| | Development of Common Assessments by grade level K-8 (due to high school will be given by AZ Department of Education) | Results on the Common Assessments | 2008-2009 K-8, 2007-2008 9-12 | District, Department Chairs, Teachers |

3. Instructional Practices- An approach to teaching in which instruction is tailored to meet the needs of individual students. Strategies which provide a variety of ways for individual students to take in new information, assimilate it, and demonstrate what they have learned; varying teaching strategy, method, process and/or student product.³

Content Statement: Instructional practices are effective, research- based, data driven, and engage students to acquire an understanding of mathematics. Instructional practices continuously adapt to meet the needs of individual students.

| Objective | Strategies | Accountability | Timeline | Responsible Party |
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| <ul style="list-style-type: none"> • Reflect research-based pedagogy and student development • Build on background experiences (prior learning—to include culture specific— home and school). • Support high standards and expectations for students • Build student success through differentiated instruction and strategies to support multiple learning styles. • Integrate mathematical tools and technology | Identify and apply research-based instructional strategies that will extend understanding, computing, applying, reasoning, and engaging in mathematics. (SIOP, Skillful Teacher, Marzano) | Identified on TUSD math websites and associated links Dates of presentation/ training identified on PD Calendar | Fall 2007 and ongoing | Curriculum, Instruction, and Technology Integration , Class size reduction Initiative, K-1 teachers, professional learning department, Instructional coaches /department chairs, site administration A&R |
| | Implement-research-based strategies that support teaching/learning of grade level essential understandings | Lesson plans and classroom observations | Fall 2007 and ongoing | Teachers, administrators, instructional coaches |
| | Administrators and teachers need to be provided with the tools to implement Reformed Teacher Observation Protocol (RTOP) | | | District, Administrators, Instructional Coaches, teachers |
| | Identify available technological resources and how they apply at each grade level Examples include but are not limited to: PLATO, ALS A+, Success Maker ,TI-Navigator, Interactive Whiteboards, Calculators, Web Resources, Math Active, ASSET Untied streaming video resources, National Library of Virtual | District math department provides teacher training and access to technological materials at all levels Training dates provided on District PD calendar | Fall 2007 and ongoing | District math department Teachers Administrators Instructional Coaches Department Chairs |

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| | Manipulatives and other math applet sites, NCTM Illuminations, Geometer's Sketchpad | | | |
| | Create instructional plan for utilization of identified technological resources. | Instructional plan | Begin plan in Fall 2007 Implement beginning Spring 2008 | District Level – Curriculum Instruction and Technology Integration School Level – Administrators, Department Chairs/ Instructional Coaches, Teachers |
| | Distance Learning | Distance Learning will adhere to their own program evaluation protocol | Fall 2006 | Director of Distance Learning Curriculum, Instruction, and Technology Integration Math Specialists |
| | Identify and provide materials, manipulatives, etc. necessary to carry out the instruction of grade level performance objectives. | Inventory | Summer 2007 | District Level – Curriculum Instruction and Technology Integration School Level – Administrators, Department Chairs/ Instructional Coaches, Teachers |
| | Collaborate to create coherence in expectation, instructional practices and differ within and across levels. | Staff development agendas District Professional Learning Calendar | Fall 2007 and ongoing Within site, fall 2007 Across sites, fall 2008 Across levels, fall | District Level – Curriculum Instruction and Technology Integration School Level – Administrators, Department Chairs/ Instructional Coaches, Teachers |

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| | | | 2009 | |
| | Systematic in clarity of content connections, student skills, instructional models, scaffolding strategies, checking for understanding and common points of confusion (formative), language development | List course objectives and set standards Identification of quality work district-wide in mathematics Display exemplary work at school and district level | Fall 2007 and ongoing | Site level – administrators, teachers, instructional coaches District level - administration |
| | Differentiate instructional practices that address to optimize cultural differences | Intercultural proficiency training to research and identify differences in how mathematical operations are learned in different cultures. School Quality Survey Classroom Observation | Fall 2007 and ongoing | Site level – administrators, teachers, instructional coaches District level - administration |
| | Build instructional practices on students' prior knowledge base and life experiences | Classroom Lesson Plans Classroom observation | Fall 2007 and ongoing | Site level – administrators, teachers, instructional coaches |
| | Students and teachers have high standards with expectations identified in the classroom | List course objectives and set standards Identification of quality work district-wide in mathematics Display exemplary work at school and district level | Fall 2007 and ongoing | Site level – administrators, teachers, instructional coaches District level - administration |
| | Longer class period to have more time on task | | | |

4. Professional Development- Provide ongoing and extensive opportunities for teachers, staff, and parents to learn in different ways in order to acquire and internalize research-based instructional practices to support student learning.⁴

Content Statement: Professional development addresses participants as learners, researchers, and communicators of mathematics. It is on-going, valued, and results in school-wide implementation of best practices and improved student achievement.

| Objectives | Strategies | Accountability | Timeline | Responsible Party |
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| <ul style="list-style-type: none"> Participants will identify and reflect on best instructional practices and content through examination of student work, lesson study, case study, and achievement data and assessment data Professional development will focus on content and curriculum, and represent math as a coherent and connected enterprise Professional development will focus on the process standards, including reading and writing, in the math classroom. Differentiated, job specific and professional development will be required for teachers, principals, district administration, and staff. Professional development is articulated K-12 and between departments | PD for teachers, Instructional Coaches , administrators, and certified personnel in K-5, such as Mathematics Initiative workshops, Cognitively Guided Instruction (CGI) Methods, Curriculum Topic Guides, and classroom research (classroom or student case studies, student work, lesson study) | # of teachers who attend PD Sessions Accountability & Research Survey | Fall 2007 and ongoing | Curriculum, Instruction, and Technology Integration , Principal supervisors, Instructional coaches, site administration, teachers |
| | Instruct teachers about how to use curriculum, Curriculum Topic Study guides to facilitate student and teacher understanding of mathematical concepts and plan for instruction. (refer to link C) | Purchase Curriculum Topic Study Guide resource for K-12 teachers # of teachers who attend PD sessions Facilitator training of Curriculum Topic Study #s teachers using CTS as part of their professional experience in math (e.g. grade level team meetings, across grade level articulation meetings, math department meetings) | Fall 2008 | Trained facilitators Math Specialists, Technology Specialists, Math Team, Professional Learning Team, Site administrators providing the time for teachers to meet and use the materials Instructional Coaches |

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| <ul style="list-style-type: none"> departments Creation and maintenance of example mathematics research schools to promote a vision of quality mathematics education Clarify connections between SIOP, Skillful Teachers, Intercultural Proficiency and integrate key concepts during professional development trainings Creating district capacity for sustainable teacher growth and future support personnel | Principal and Central administrator lesson study sessions | List of sessions | Spring 2007 and ongoing | Math Specialists and principal supervisors |
| | Hire and support Math Coaches for school site support, district professional development, creation of district infrastructure and documents | List of coaches and duties | Fall 2007 and ongoing | Central administration, Curriculum, Instruction, and Technology Integration |
| | Support growth opportunities for mathematics coaches (e.g., Amy Morse from EDC and her work with the Boston Math Coaches) | # of sessions with outside consultant and # of participants Cases coaches write about their work | Fall 2007 and ongoing | Central administration, Curriculum, Instruction, and Technology Integration, Outside consultant (e.g., Amy Morse from Education Development Center) |
| | Instructional Coach math cadre and inquiry group to facilitate dialogue about quality mathematics instruction. | List of sessions Cases coaches write about their work | 2006 and ongoing | Curriculum, Instruction, and Technology Integration, Instructional Coaches |
| | Articulation sessions within schools, between school sites and feeder patterns (Vertical Teaming) | A&R Survey #s of sessions | Fall 2007 and ongoing | Curriculum, Instruction, and Technology Integration , Principal supervisors, Instructional coaches, site administration, teachers |
| | Revisions of Pacing Calendar, Benchmarking, and Curriculum Maps | Revised documents | Fall 2007 and ongoing | Curriculum, Instruction, and Technology Integration |
| | Creation of unit assessments, anchor papers, priority number skills, and observation protocols | Disseminated documents | Fall 2007 and ongoing | Curriculum, Instruction, and Technology Integration, Instructional Coaches, Math Specialists |
| | Create and support of research schools for lesson study | List of research schools and # of site visitors | Fall 2007 and ongoing | Curriculum, Instruction, and Technology |

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| | sites as models of quality mathematics instruction for professional development | | | Integration, Principal supervisors, Math Specialists |
| | Math and Science Partnership (MSP) Teacher Improvement through Math Instruction (TIME) | # of participants, Content Measure, RTOP, list of workshops, participant feedback | Summer 2006-September 2007 | District grant coordinators, UofA partners, A & R personnel |
| | Math and Science Partnership (MSP) Teacher Improvement through Math Instruction x2 (TIMEx2) | # of participants, Content Measure, RTOP, list of workshops, participant feedback | Summer 2007 and ongoing | District grant coordinators, Uof A partners, A & R personnel |
| | Training in Reformed Teaching Observation Protocol (RTOP) (refer to link B) | # of persons trained to use the protocol # of teachers observed using the protocol | Spring 2006 and ongoing | Curriculum, Instruction, and Technology Integration |
| | K-5 Mathematics Initiative: support for principals, teachers, and instructional coaches at target sites, including workshops, lesson studies, and roll-out adoption. | List of sessions and dates List of sites participating | Fall 2006 and ongoing | Curriculum, Instruction, and Technology Integration, Project coordinators, Math Specialists |
| | Arizona Educator Proficiency Assessment (AEPA) study groups | List of study group dates | Spring 2006 and ongoing | Math Specialists, High school math teachers |
| | Reading and Writing in the Mathematics Classroom 6-12 Workshops | List of workshop dates Number of 6-12 math teachers trained Number of principals and instructional coaches trained 6-12 | Fall 2007 and ongoing | Math Specialists Principals Instructional Coaches Teachers 6-12 Curriculum, Instruction, and Technology Integration Specialists |

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| | Texas Instruments-Navigator Study group | List of study group dates | Spring 2006-ongoing | Math Specialists Technology Specialists |
| | PLATO software training 6-12 | List of trainings and dates Number of teachers trained | Spring 2006 and ongoing | Math Specialists Technology Specialists |
| | Geometer's Sketchpad Software Training 9-12 | List of trainings and dates Number of teachers trained | Summer 2007 and ongoing | Math Specialists Technology Specialists |
| | Dynamic Classroom Assessment Training – Checking for understanding in the high school math classroom (refer to link J) | List of trainings and dates Number of 9-12 math teachers trained | Spring 2008 | Curriculum, Instruction, and Technology Integration Math Specialists |
| | Class Size Reduction Workshops for K-1 mathematics | Number of K-1 teachers trained List of trainings and dates | Spring 2006 and ongoing | Curriculum, Instruction, and Technology Integration Specialists |
| | Hold training and information sessions to support teachers in use of formative and summative assessment. | # of persons trained Teachers surveys # of sessions | Fall 2007 and ongoing | Curriculum, Instruction, and Technology Integration Specialists |
| | Required Mathematics professional development for classroom teachers to include, but not be limited to, Developing Mathematical Ideas (DMI), for principals, Lenses on Learning, for instructional and mathematics coaches, DMI, Lenses on Learning, and content focused coaching. | # of persons trained | Summer of 2007 and ongoing | Principals Instructional Coaches MSP TIMEx2 Coordinator Math Specialists Curriculum, Instruction, and Technology Integration Specialists |

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| | Create school mathematics leadership teams to identify mathematics professional development needs at the site and to support ongoing site embedded PD | # of math leadership teams in the district Names of participants at each site Lists of dates and topics of math leadership team meetings at each site | Fall 2007 and ongoing | Principals Curriculum, Instruction, and Technology Integration Specialists Math Specialists |
| | Material support for school site mathematics leadership teams including, but not limited to, purchase of <i>Relearning to Teach Arithmetic</i> series and Bridges materials | List of materials purchased Number of sites using resources | Fall 2007 and ongoing | Principals School Math Leadership Teams Curriculum, Instruction, and Technology Integration Math Specialists |
| | Develop opportunities that engage teachers in non-participating sites in lesson study, mathematics study groups, and SIC classes | Number of trainings and dates Number of teachers trained | Fall 2007 and ongoing | School Math Leadership Teams Instructional Coaches Principals Curriculum, Instruction, and Technology Integration Math Specialists |
| | 5 Day K-5 Math Institute to implement and communicate overarching goals, pedagogy (Skillful Teacher, SIOP, Marzano, Intercultural Proficiency, Effective instruction) and content which will include a strand for administrators. | Number of K-5 participants | Summer 2007 and ongoing | Math Specialists Curriculum, Instruction, and Technology Integration Specialists Principals Principal Supervisors |

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| | <p>Support for administrators in systemic school mathematics change, coaching teachers in mathematics instruction and recognizing quality mathematics instruction</p> | <p>List of events and dates</p> <p>Number of participating administrators</p> | <p>Fall 2006 and ongoing</p> | <p>Principals</p> <p>Principal Supervisors</p> <p>Math Specialists</p> <p>Curriculum, Instruction, and Technology Integration Specialists</p> |
| | <p>Ongoing grade level school site meetings to examine and evaluate student work in mathematics and articulate characteristics of quality work Identify next steps as a result of the examination, evaluation, and articulation at sites.</p> <p>2) Math coaches to facilitate quality instructional strategies, lesson studies, ELL strategies, and differentiation such as Exceptional Education, facilitate the analysis of assessments.</p> | <p>List of meetings and dates</p> <p>Number of teachers participating</p> | <p>Fall 2007 and ongoing</p> | <p>Math Specialists</p> <p>Administrators</p> <p>Department Heads at 6-12 sites</p> <p>Instructional Coaches</p> <p>Math Coaches at K-5 sites</p> <p>Teachers</p> <p>Paraprofessionals/Instructional Personnel</p> |

5. Assessment (System) - A management system containing a set of assessments that is designed to collect and evaluate data about student performance. The quality of assessments is described by using the terms “reliable”, “valid”, and “fair”.⁵

Content Statement: Assessment guides our instruction. It should reflect math topics students are required to know and demonstrate, focus on student understanding, fluency of strategies and procedures, and problem solving application.

| Objectives | Strategies | Accountability | Timeline | Responsible Party |
|--|---|--|--|--|
| <ul style="list-style-type: none"> • Formative assessments and summative tests tied to clearly articulated curriculum goals that students are required to know and demonstrate. • Common summative tests given to measure and communicate student performance. • Frequent and common formative assessments will be ongoing to inform instruction, interventions, and professional development. • Formative assessments and summative tests results are frequently examined to immediately address student needs. | Review of 1 st , 2 nd , and 3 rd quarter benchmark assessments | Number of people attending the benchmark review sessions | Summer 2007 and repeated annually or During “Back to School” session and repeated annually | Administrators Math Specialists, Technology Specialists Assessment Technology Inc K-5 cadre MS Math Rep HS Math Chairs K-12 Instructional Coaches |
| | Review pacing calendars to update what will be assessed on the benchmark assessments | Updated pacing calendars | Every Spring Semester | Administrators Math Specialists, Technology Specialists K-5 cadre MS Math Rep HS Math Chairs K-12 Instructional Coaches |
| | Maintenance of former assessment systems and substitution of new assessments as K-5 | Timeline describing crossover from former assessment systems to new assessments Number of K-5 | Follow Level 1, 2, and 3 | Administrators Math Specialists, Technology Specialists K-5 cadre |

| | | | | |
|--|--|---|---|--|
| | schools roll over into the new curriculum | sites implementing new assessments | | K-5 Instructional Coach |
| | At each school there will be an internal audit to assess alignment of curriculum with the pacing calendar | Lesson Plans Pacing Calendar Checklist | Annually | ICs (auditor) Administrators (auditor) K-12 teachers (documenting alignment in lesson plans) |
| | Develop and implement common exams for all grade levels or content areas across the district (to use as a pre and post) Administrators will be in- on the common exit exams | Staff Development agendas Exams are used- computer generated report on the percentage of teachers administrating the assessment. Professional Learning Calendar (K-5, 6-8, and 9-12 cadres will be brought together during after school, Wednesdays, or summer to develop the common exit exams.) | Algebra and Geometry Exit exams will be developed by Summer 07 11-12 exit exams Summer 08 K-8 Summer 07 Reviewed by teachers by Fall 07 Revised by Cadre by end of first semester | Math Specialists, Technology Specialists K-12 math teachers Assessment Technology Inc |
| | Implement formal and informal assessments in the classroom (e.g. questioning strategies, CPS systems, Navigators, lap dry erase boards for students) | Lesson Plans Classroom Observations Evaluation rubric | Ongoing | Technology Support Technicians at each site Teachers Math Specialists Curriculum, Instruction, and Technology Integration Specialists |

| | | | | |
|--|---|--|-------------------------|--|
| | Benchmark Assessments | Percentage of students who have taken the benchmark assessments | At least 2 times a year | Assessment Technology Inc Math Specialists, Technology Specialists Instructional Coaches Administrators K-12 Teachers |
| | AIMS, AIMS-DPA, Terra Nova (Standardized tests) | AYP AZ Learns FAME Rubric Percentage of high school students who pass it for graduation | Annually | Arizona Department of Education Accountability & Research Math Specialists, Technology Specialists Instructional Coaches Administrators 2,3,4,5,8, HS Teachers |
| | 8 th grade math placement exam | Percentage of 8 th students who have taken the exam | Annually | Assessment Technology Inc. Accountability & Research Math Specialists, Technology Specialists 8 th grade teachers |
| | Common exams at all grade levels | Percentage of students who have taken the exit exam | Annually | Assessment Technology Inc Math Specialists, Technology Specialists Administrators (overseeing that it was |

| | | | | |
|--|--|---|--|---|
| | | | | administered) K-12 Teachers |
| | Administrator observation and evaluation of teachers incorporating the strategies used for checking understanding from Skillful Teacher | Observation Notes Evaluation Rubric/Checklist | Ongoing | Math Specialists, Technology Specialists Skillful Teacher Trainers Administrators Principal Supervisors K-12 teachers (using the strategies from Skillful Teacher) |
| | Skillful Teacher Training for all grade levels Administrators will trained in how to observe and evaluate teachers using Skillful Teacher | Administrators will observe and evaluate teachers on Skillful Teacher training strategies | New teachers will be required to go through Skillful Teacher training: year 1- foundation of essential beliefs and management ; year 2- instructional strategies and review of foundation of essential beliefs Year 3- motivation and review of foundation of essential beliefs Year 4- curriculum planning and review of foundation of essential beliefs Teachers | Math Specialists, Technology Specialists Skillful Teacher Trainers Administrators Principal Supervisors K-12 teachers |

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| | | | who have not been in training will be included in year 2, 3, and 4 Or administrators will decide the level of training for the teacher | |
|--|--|--|---|--|

6. Partnerships and Collaborations

Content Statement: Partnerships and collaborations with TUSD mathematics must be accepted in terms of research-based effective strategies for the benefit of professional growth for teachers and instructional learning of students.

| Objective | Strategies | Accountability | Timeline | Responsible Party |
|--|---|---|---------------------|--|
| Develop an integrated model that connects mathematics teaching and learning to cultural, social, and linguistic contexts of Latino students | Center for the Mathematics Education of Latino/as (CEMELA) (refer to link D) | CEMELA will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the CEMELA program | Fall 2006 - ongoing | CEMELA Advisory Board CEMELA Affiliated Faculty Math Specialists Administrators |
| Increase the number of mathematic teachers grades 6-8 the interdisciplinary knowledge to ultimately improve the mathematics education of Latino students through college mathematics courses | Center for the Mathematics Education of Latino/as (CEMELA) (refer to link D) | CEMELA will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the CEMELA program | Fall 2006 - ongoing | CEMELA Advisory Board CEMELA Affiliated Faculty Math Specialists Administrators |
| Increase the number of mathematic teachers grades 3-5 the interdisciplinary knowledge to ultimately improve the mathematics education of Latino students through study group | Center for the Mathematics Education of Latino/as (CEMELA) (refer to link D) | CEMELA will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the CEMELA program | Fall 2006 - ongoing | CEMELA Advisory Board CEMELA Affiliated Faculty Math Specialists Administrators |
| Support the parents and children with the understanding of mathematics and the connections with the Latino culture | Center for the Mathematics Education of Latino/as (CEMELA) (refer to link D) | CEMELA will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the | Fall 2006 - ongoing | CEMELA Advisory Board CEMELA Affiliated Faculty Math Specialists Administrators |

| | | | | |
|--|---|---|--------------|---|
| | | CEMELA program | | |
| Increase the number of middle school teacher leaders in TUSD with a profound understanding of middle school mathematics and with the leadership skills to conduct effective professional development at their schools. | AZ Teacher Institute (ATI) (refer to link E) | The AZ Teach Institute will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the AZ Teacher Institute | 2007-2012 | Director and Assistant Directors of the UA Institute for Mathematics and Education Professional Learning Specialists Math Specialists 6-8 Administrators Participating ATI teachers |
| Create, at each site, a community of parents who: 1)Experience mathematics as a human activity; 2)Have real learning experiences with mathematics ; 3)Do mathematics with their children; Believe that their children can be successful at learning mathematics 4) Are aware of what is happening in their children's mathematics classrooms 5) Understand the connection between school mathematics and access to future careers 6) Are aware of ethnic and gender biases as they relate to expectations and success in mathematics | Math and Parent Partnerships (MAPPS) (refer to link F) | MAPPS will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the MAPPS program | 2005-ongoing | MAPPS Principal Investigators MAPPS Graduate Research Assistant MAPPS Project Director Math Specialists K-8 math teachers K-8 Administrators |

| | | | | |
|---|---|---|---------------|---|
| 7) Form partnerships with teachers and schools in supporting good mathematical learning and teaching for their children | | | | |
| Increase the number of low-income students who are prepared to enter and succeed in postsecondary education | Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) (refer to link G) | GEAR UP will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the GEAR UP program | 2006- ongoing | TUSD GEAR UP Specialists Math Specialists Teachers Administrators |
| Facilitate the emergence of new approaches to learning that draw upon a range of insights into the human brain, the functioning of human societies, and learning as a community-wide activity | The 21 st Century Learning Initiative (refer to link H) | The 21 st Century Learning Initiative will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the 21 st Century Learning Initiative | Ongoing | TUSD 21 st Century Learning Initiative Specialists Math Specialists Technology Specialists Teachers Administrators |
| Increase enthusiasm for and enhance achievement in middle school mathematics throughout the United States | Math Counts (refer to link I) | Math Counts will adhere to their own program evaluation protocol Surveys from teachers, schools, and administrators participating in the Math Counts Program | Ongoing | Southern AZ Math Counts Coordinator Math Specialists 6-8 Math teachers 6-8 Administrators |

Expected Budget Year 1

| Year | Expense | Projected Cost | Type of Budget |
|-------------|--|--|------------------------------|
| 2007-2008 | Text and Supplemental Adoption in Elementary and Middle School | \$800,000 | Soft Capital |
| 2007-2008 | Hire Mathematics Coaches for school site and district support | \$410,000 | M & O, Deseg |
| 2007-2010 | Summer Boost program for incoming freshman at each high school | \$250,000 a year | Title I, IIA, and M & O |
| 2007-2008 | Subs and compensation for articulation of curriculum materials | \$100,000 | M & O or Title IIA |
| 2007-2008 | Work towards a middle school adoption district wide | \$10,000 | M & O and Title IIA |
| 2007-2008 | Technology Tools 6-8 | \$1,000,000 | Soft Capital |
| 2007-2008 | Calculators 6-12 | \$200,000 | Soft Capital |
| 2007-2008 | Summer Math Institute | \$30,000 | Title I, IIA, IID, and M & O |
| 2007-2008 | School site professional development | \$37,500 a year | Title IIA and M & O |
| 2007-2008 | Purchase and creation of virtual classes to be used for acceleration, credit recovery and intervention | \$250,000 for the first year to purchase content | Soft Capital |

Contributors Developing the TUSD 3-5 year Math Plan

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Links to Resources and Program Information

A: Technology Plan

<http://www.tusd.k12.az.us/contents/Documents/TechPlan.pdf>

B: Reformed Teaching Observation Protocol (RTOP)

http://cresmet.asu.edu/prods/rtop_files/Training_Guide_Mar2000.pdf

C: Bibliography of Curriculum Topic Study Guides

<http://www.curriculumtopicstudy.org/resources/CTSSourceMaterial.php>

D: Center for the Mathematics Education of Latino/as

<http://math.arizona.edu/~cemela/english/index.php>

E. Arizona Teacher Institute

<http://ime.math.arizona.edu/ATI/index.html>

F. Math and Parent Partnerships

<http://mapps.math.arizona.edu/>

G. Gaining Early Awareness and Readiness for Undergraduate Programs

<http://www.ed.gov/programs/gearup/index.html>

H. The 21st Century Learning Initiative

<http://www.21learn.org/>

I. Math Counts

<http://www.mathcounts.org/>

J. Dynamic Classroom Assessment

<http://www.etacuisenaire.com/professionaldevelopment/math/dca/dynamic.jsp>

K. Process Standards

<http://standards.nctm.org/document/appendix/process.htm>

¹Arizona Department of Education, *Standards and Rubrics for School Improvement: 2005 Revised Edition*, <http://www.ade.az.gov/schooleffectiveness/STDSRUBRIC.pdf>.

²Arizona Department of Education, *Standards and Rubrics for School Improvement: 2005 Revised Edition*, <http://www.ade.az.gov/schooleffectiveness/STDSRUBRIC.pdf>.

³Arizona Department of Education, *Standards and Rubrics for School Improvement: 2005 Revised Edition*, <http://www.ade.az.gov/schooleffectiveness/STDSRUBRIC.pdf>.

⁴Arizona Department of Education, *Standards and Rubrics for School Improvement: 2005 Revised Edition*, <http://www.ade.az.gov/schooleffectiveness/STDSRUBRIC.pdf>.

⁵Arizona Department of Education, *Standards and Rubrics for School Improvement: 2005 Revised Edition*, <http://www.ade.az.gov/schooleffectiveness/STDSRUBRIC.pdf>.