

Dimension 2000

A Research Based Math Education Reform Company

Dimension 2000 is a math education reform company that consists of highly successful math teachers, instructional leaders, administrators, and technology specialists. Dr. Ed Thomas is the President of Dimension 2000. The Dimension 2000 team has developed powerful teaching strategies, student engagement activities, and instructional materials for the K-12 math classrooms. The foundation for the instructional strategies and engagement activities promoted by Dimension 2000 is based on substantial research from nationally renowned leaders in education including Harvey Silver, Richard Strong, Grant Wiggins, Doug Reeves, Robert Marzano, Larry Ainsworth, and Max Thompson. Dimension 2000's program is also based on the Principles and Standards for School Mathematics (National Council of Teachers of Mathematics- NCTM). In the last several years Dr. Thomas has planned with, taught with, presented with, and learned from Harvey Silver and Richard Strong of Silver, Strong and Associates. He has also authored texts and developed materials for Silver, Strong and Associates. Throughout his professional career (vitae attached), Dr. Thomas has interacted with Grant Wiggins, Doug Reeves, Robert Marzano, Larry Ainsworth, and Max Thompson, and has studied their works. Dr. Thomas has also presented several times for NCTM, ASCD, and SREB.

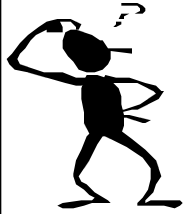
While all of the aforementioned education leaders are highly renowned, most of their research and consequent findings connect with best-teaching practices and learners in general, and are not specific to mathematics. Through the years Dr. Thomas has combined his strong understanding of mathematics and valuable experiences in countless math classrooms, with the findings of these education researchers, and developed Dimension 2000's framework for the successful teaching and learning of mathematics. The framework consists of professional development, best-practice teaching strategies, powerful student engagement activities, planning processes, assessment processes, and support materials. The components of Dimension 2000's math program is popular with teachers in hundreds of classrooms across the country.

The attached pages include:

- Links between key teachings of the education researchers, referenced above, with elements of Dimension 2000's math program ,
- Dimension 2000's Six-Factorial Model for instructional consideration,
- Dimension 2000's best-practice teaching strategies, and
- Dr. Thomas's vitae.

Education Researcher	Published Findings	Reflections in Dimension 2000's Materials and Practices
Harvey Silver and Richard Strong	<p>Students learn best in different ways, defined by four learning styles: Sensing Thinkers, Sensing Feelers, Intuitive Thinkers, and Intuitive Feelers. Teachers need to be aware of these four learning styles and plan instruction and student engagements accordingly.</p> <p>Reference: <i>The Strategic Teacher, Selecting the Right Research-Based Strategy for Every Lesson</i> Harvey Silver, Richard Strong, Matthew Perini ©2007, ASCD Publication</p>	<ul style="list-style-type: none"> • The four factorial stage of Dimension 2000's Six Factorial Teaching Model • The daily problem solving warmups found in the High Achievement Math Program for grades 3-8, and the Algebra by Style program are all balanced and tagged by learning styles (ST,SF,NT,NF).
Grant Wiggins	<p>Backward design: Identify desired results, determine acceptable evidence, plan learning experiences and instruction. Regarding desired results, develop essential questions, and identify what students will understand, know, and be able to do.</p> <p>Reference: <i>Understanding by Design</i> Jay McTighe and Grant Wiggins ©2004, ASCD Publication</p>	<ul style="list-style-type: none"> • Dimension 2000's Five Stages of Teaching and Learning Mathematics <ul style="list-style-type: none"> >Knowledge >Understanding >Proficiencies >Applications >Retention • Our planning, instruction, and assessment models are based on the Five Stages of Teaching and Learning Model
Robert Marzano	<p>While factors such as socioeconomic status and home environment cannot be changed by educators, effective instructional techniques can not only be controlled by educators, but can have a positive and significant impact on student achievement. In particular, effective instructional practices include <i>identifying similarities and differences, summarizing and note taking, reinforcing effort and recognition, homework and practice, nonlinguistic representations, cooperative learning, setting objectives and providing feedback, generating and testing hypotheses, and questions, cues, and advance organizers.</i></p> <p>Reference: <i>Classroom Instruction that Works Research-Based Strategies for Increasing Achievement</i> Robert J. Marzano, Debra J. Pickering, Jane E. Pollack ©2001, ASCD Publication</p>	<ul style="list-style-type: none"> • Dimension 2000's Best-Practice Teaching Strategies and Powerful Student Engagements apply the findings of Marzano. • Dimension 2000's math strategies and student engagements are the heart and soul of the math education reform process. • The High Achievement Guaranteed Teaching Strategies texts include detailed write-ups of the student engagement activities.

Education Researcher	Published Findings	Reflections in Dimension 2000's Materials and Practices
Doug Reeves	<p>Effective accountability must reach beyond the assessment and evaluation of students' test scores. Effective accountability must also include evaluation of adults responsible for planning, instruction, and ongoing assessment practices.</p> <p>Reference: <i>Waiting for NCLB</i> Douglas B. Reeves ©2008, <i>Educational Leadership</i>, Vol. 65 No. 6</p>	<ul style="list-style-type: none"> • Dimension 2000's consultants' presence in the classroom during scheduled classroom visits in which collaborative planning and teaching with math teachers occur.
Larry Ainsworth	<p>The need for a balanced math program: Build computational skills, deepen conceptual understanding, develop mathematical reasoning and problem solving abilities, and demonstrate understanding in a variety of assessment formats.</p> <p>Reference: <i>Five Easy Steps to a Balanced Math Program</i> Larry Ainsworth and Jan Christinson ©2000, <i>Advanced Learning Press</i></p>	<ul style="list-style-type: none"> • Elements of the High Achievement Math Program <ul style="list-style-type: none"> >Computation Challenges >Mental Math Strings >P3CR Activities >Daily Problem Solving >Math Breakdown
Max Thompson	<ul style="list-style-type: none"> • Deciding what to teach • Connecting and using the most important practices/strategies in every lesson • Helping your administration observe and understand your professional teaching practices • Finding instructional time for higher level thinking activities/lessons • Quickly assessing student learning • Differentiating instruction easily • Quickly building background knowledge and moving students from where they are • Accelerating learning • Integrating writing, reading comprehension, and higher level thinking • Focusing on key vocabulary and good vocabulary strategies <p>Reference: <i>Learning Focused Schools</i> www.learningfocused.com</p>	<ul style="list-style-type: none"> • Must Do! math engagement activities • Best-practice math strategies • Professional development for teachers and administrators • Partitioning of class time • Informal assessments • Differentiation by learning styles, and levels of difficulty • Fast track to the 90+%tile range • Read and Write Activities for Mathematics • Moving beyond the word wall: My Math Dictionary, Stand and Deliver, Mental Math Strings



SIX-FACTORIAL TEACHING AND LEARNING FRAMEWORK FOR MATHEMATICS



The Six Levels of Understanding

- B1** Knowledge
- B2** Understanding
- B3** Application
- B4** Analysis
- B5** Synthesis
- B6** Evaluation

- B1: What kind of number is π ?
- B2: Why is any non-zero number raised to the zero power = 1?
- B3: Find an example of trapezoids used in architectural design.
- B4: Which is greater? $\frac{(12-9)^2}{\sqrt{24}}$ or $\left(\sqrt{\frac{12-9}{24}}\right)^3$
- B5: Use the values $x=12$, $y=1/2$, and $z=-2$ to create an expression whose value is 20,
- B6: A student named Manny Errors committed an error as he simplified the expression $-(2-4)^2 - 4^2 + 20$ and reported the incorrect answer 32. Find Manny's error.

The Five Stages of Teaching and Learning Mathematics

- F1** Knowledge
- F2** Understanding
- F3** Proficiency
- F4** Application
- F5** Inclusion and Review

- F1: Which of the following is a fraction? A) 12 B) 5/3 C) π
- F2: Explain the meaning of the fractions 3/4, 5/3, and 1/10.
- F3: Simplify $\left(\frac{\frac{3}{4} + 1\frac{1}{2}}{4 - \frac{1}{4}}\right)^2$ without errors.
- F4: The length and width of a rectangle are $6\frac{2}{3}$ cm and $4\frac{1}{3}$ cm respectively. Find the perimeter and area of the rectangle.
- F5: As the school year progresses, inclusion occurs when skills and concepts learned in previous units are included in present and successive units of study.

The Four Learning Styles

- L1** Mastery Math Student
- L2** Interpersonal Math Student
- L3** Understanding Math Student
- L4** Self-Expressive Math Student

- L1: Use the 'Completing the Square' process to find the roots of $f(x) = 2x^2 + 8x - 7$.
- L2: Review Algebra I concepts by forming cooperative groups and playing the Fraction Alley 'Algebra Block' game.
- L3: Investigate the discriminant's role in determining the number of roots a quadratic function may have.
- L4: The FOIL method is used to multiply 2 binomials. Invent another catchy acronym that can be used to perform another task in algebra.

The Three Components of Math

- C1** Numbers, Computation, and Skills
- C2** Math Concepts
- C3** Problem Solving

- C1: Evaluate the expression $4(10-6)^2 + 20 \div 4 \cdot 5$
- C2: Explain the relationships between complementary angles and right triangles.
- C3: Jermain is 20 years older than Phil. In 5 years, Jermain will be twice Phil's age. How old are Jermain and Phil?

The Two Categories of Engagements and Tasks

- T1** Convergent
- T2** Divergent

- T1: Given a picture of the front of a house, ask students to identify the geometry in the architectural design.
- T2: Given a set of geometric shapes, ask students to incorporate those shapes into the design of an appealing home.

The One Level of Expectations

- H1** Higher Expectations

- H1: Higher expectations are evidenced by curriculum and instruction that is balanced, in regards to, and representative of all the components of Six Factorial.

Dimension 2000 Math Teaching Strategies

Command Strategy
Compare and Contrast Strategy
Concept Identification Strategy
Convergence Mastery Strategy
Cooperative Learning Strategy
Computation Challenges
Daily Problem Solving
Deductive Reasoning Strategy
Divergent Thinking Strategy
Extended Activity
Game Competition Strategy
Graduated Difficulty Strategy
Integrated Math Engagement
Knowledge by Design Strategy
Math Breakdown
Metaphorical Expression Strategy
Modeling and Experimentation Strategy
Mystery Strategy
New American Lecture Strategy
Paired Learner Model Strategy
Pattern Finding Strategy
Proceduralization Strategy
Reciprocal Learning Strategy
Stand and Deliver
Support and Refute Strategy
Task Rotation Strategy
Taxonomic Thinking Strategy

Collectively, Dimension 2000's math teaching strategies address all the components of the Six Factorial Model.

The Modeling and Experimentation Strategy, for example, addresses understanding associated with Bloom's Taxonomy, The Five Stages of Teaching and Learning, and the Four Learning Styles (Intuitive Thinker). Modeling and Experimentation is a great strategy for developing math concepts, cited in the Six Factorial Model as one of the components of mathematics. Modeling and Experimentation also reflects high expectations.

The Stand and Deliver Strategy addresses knowledge cited in the Six Factorial Model under Bloom's Taxonomy and the Five Stages of Teaching and Learning Mathematics. Stand and Deliver also addresses the Mastery Learning Style (Sensing Thinker) and promotes high expectations.

Strategies like Divergent Thinking and Metaphorical Expression address the synthesis and evaluation levels of Bloom's Taxonomy, the Self-Expressive learning style (Intuitive Feeler), convergent thinking, and high expectations.

As teachers learn and experience the best-practice teaching strategies through Dimension 2000's professional development program, they will build a strong repertoire of instructional tools vital to high achievement in mathematics.

Dr. Edward James Thomas, Jr.

Professional Vitae

January 4, 2010

Education

Ph.D.	Math Education K-12	Georgia State University	1989
Ed. Spec.	Math Education Secondary	Georgia State University	1986
Masters	Math Education Secondary	Georgia State University	1981
B.S. Ed.	Mathematics	Indiana University of Penn.	1975

Professional Employment Public Education

Cobb County Board of Education	District- C&I Math- Grades 6-12	1990 - 2005
Clayton County Board of Education	Math Division Head (MS/HS)	1977 - 1990
Henry County Board of Education	Math Teacher (HS)	1976 - 1977
Plum Boro Schools (Penna.)	Math Teacher (MS/HS)	1975 - 1976

Professional Employment College/University

Kennesaw State University	Math Instructor / Advisory Board	1995 - 2005
Georgia State University	Math Instructor	1980 - 1994
Clayton State University	Math Instructor	1988 - 1990
West Georgia	Math Education Instructor	1992

Professional Consultation

Dimension 2000	President/Math Consultant	1998 - Present
Silver, Strong, and Associates	Math Education Consultant	1994 - Present

Professional Involvement

Northwest GA P-16 Council	Co-Chair	1998 - 2001
Hands on Equations	Trainer	1996 - 2001
NCTM Conferences	Presenter	2007
GCTM Conferences	Presenter	2006
ASCD Conferences	Presenter	2007
GMSA Conferences	Presenter	2008
SREB Conferences	Presenter	2009

Published Works

Styles and Strategies for MS and HS Math (2)	Author	2010
High Achievement Math Program Grades 3-8	Author	2009
Algebra by Style	Author	2006
Achieve and Succeed High School Math Series	Author	2006
Extreme Math Makeover	Author	2007
WHAT IT IS? Math Game	Creator / Developer	2009
Fraction Alley Math Game	Creator / Developer	2006
Transformation Creation Software	Creator / Developer	2008
Math Articles (2) Professional Journals	Author	

References (Sample of schools we have recently worked with)

High Schools That Work
Professional Development for Middle Schools
Ohio North East Region
Diana Rogers, Regional Coordinator
614- 871- 9002 or 614- 668- 0686

Charles County School System
Professional Development for Middle Schools
LaPlata, Maryland
Drew Jepsky, District Coordinator
301- 934- 7391

Paulding County Schools
Assistant Superintendent
Hiram, Georgia

Huntsville City Schools
Professional Development for Middle Schools
Huntsville, Alabama
Sheila Roby, District Coordinator
256- 714- 9333