



Teaching and Learning Mathematics
K-14:

Reflecting on the Past and
Preparing for the Future

58th Annual
Western Illinois University
Mathematics Teachers Conference

Friday, March 27, 2009

Main Speakers

Opening Speaker: Keith Devlin

(aka "the Math Guy" on National Public Radio)

"Math 20-20 Vision"

By the year 2020, we are likely to have seen two major revolutions in mathematics education. Videogame technology will bring an understanding of basic mathematics to children in the affluent western societies who do not respond to current teaching methods. At the other end of the economic spectrum, cheap mobile phones will deliver instruction in basic quantitative skills to the millions in the developing world for whom the mobile phone is the only programmable computing device in the home. Both revolutions require taking a fresh look at the nature of mathematics and how it can be taught.



Dr. Devlin is Consulting Professor at the Department of Mathematics of Stanford University (<http://www.stanford.edu/~kdevlin/>) And also has a column "Devlin's Angle" on MAA: <http://www.maa.org/devlin/devangle.html>

Closing Speaker: Roger Eggleton

"The Enchantment of Mathematics"

Oh, are you a Mathematics teacher? You must be able to keep your check book balanced, and do your tax return in no time!

Well, what does it take to be a teacher of Mathematics? What does it take to be a Mathematician? How might those two vocations overlap? Where does Problem Solving fit in? What about Building Theories? Where does the Enchantment of Mathematics enter the picture?

I will try to examine and illustrate these matters in a practical way.

Dr. Eggleton is Professor of Mathematics at the Department of Mathematics at Illinois State University (<http://www.math.ilstu.edu/roger/>)



**58th Annual
Western Illinois University
Mathematics Teachers Conference
Friday, March 27, 2009**

- 8:00 – 8:30 AM** **Registration & Continental Breakfast**
Morgan Hall, First Floor
- 8:30 – 9:30 AM** **Welcome**
Keynote Address
Dr. Keith Devlin: “*Math 20-20 Vision*”
Morgan Hall 109
- 9:45-11:40 AM** **Morning Sessions**
Horrabin Hall
- 11:40 AM -1:20 PM** **Lunch and Workshop Options**
On Your Own Lunch – Campus/Downtown (Complimentary Bus)
or
Box Lunch with Pre-Registered Workshop (12:15 – 1:15 pm)
- 1:30-2:45 PM** **Afternoon Sessions**
Horrabin Hall
- 3:00 – 4:00 PM** **Closing**
Keynote Faculty Foundation Address
Dr. Roger Eggleton: “*The Enchantment of Mathematics*”
Morgan Hall 109
- 4:00 – 5:00 PM** **Alumni Reception**
Everyone is welcome to attend.
Pizza and drinks will be served.
Morgan Hall 209 (MERO)

**58th Annual Western Illinois University Mathematics Teachers Conference
Macomb, Schedule**

07:30 - 9:30 pm	Alumni House	Thursday, March 26, 2009 Reception at the Alumni House			
Friday, March 27, 2009					
8:00- 8:20 am	Morgan Hall (MG)	Registration and Continental Breakfast The West Wing of Morgan Hall, 1st Floor			
8:30- 9:30		Welcome & Keynote Address Dr. Keith Devlin "Math 20-20 Vision" Morgan Hall, 1st Floor, MG 109			
Horrabin Hall ~ Coffee - Continued Registration -					
		Grades K-4 HH 27 Dr. Mann	Grades 5-6 HH 42 Dr. Olsen	Grades 7-8 HH 43 Dr. Campbell	Grades 9-14 HH 44 Dr. Kranjc
9:45- 10:20	Horrabin Hall (HH)	Holly, Karen "Building Algebra Thinking in Grades K-4"	Genovese, Sean "Golden Math Fun"	Tribbey, Fern "Assessment FOR and OF Learning"	Blackford, Tom "The Mathematics of Poker"
10:25 - 11:00		Thompson, Bess "Singapore Math Model"	Hendricks, Barbara "Playing Around With Math"	Lewis, Tom "Neat Activities for the Math Classroom"	Dalpiaz, B.; Dalpiaz, S.; and Sheff, J. "Teaching Developmental Math with Computer "
11:05 - 11:40		Bielicke, James "Facilitating Math Concepts to Primary Learners"	Mitchell, Martha "Make Fun Count"	Donald, Karlie "Trends in Math Achievement"	Reese, Jennifer "Stepping Out of our Comfort Zones"
11:45 am - 1:20 pm	MG HH Universit y Union	Optional Lunch - Campus / Downtown - buses leave HH at 12:05; returns at 1:15 Workshop options: 12:15-1:15 Polynomiography MG 216 12:15-1:15 Geometer's Sketchpad HH 111 12:15-1:15 MSAT Career Workshop - Invitation Required - University Union			
1:30- 2:05 pm	Horrabin Hall	McCool, Jenni and Cullen, Craig "From Numerals to Intervals and Back"	Stinson, Kelly "Mathematics Manipulatives in Grades K-6"	Gustafson, Daniel "Inconvenient Critical Thinking"	Rosene, Candace "Problem Solving Percents"
2:10- 2:45 pm		Lewis, Cathie "Intervention Activities for K-4"	Mitchell, Martha "Fraction Understanding"	Felt, Kathy "Making Rtl Fit into Middle Grades Classroom"	Kranjc, Marko "The Problem of Lockers"
3:00- 4:00 pm	Morgan Hall	Closing Address - Dr. Roger Eggleton "The Enchantment of Mathematics" Morgan Hall, 1st Floor, MG 109			
4:00- 5:00 pm		Alumni Reception, MG 209 (MERO)			

Morning Sessions
9:45 – 11:40 AM
Horrabin Hall

Session Times	Grades K-4 HH 27	Grades 5-6 HH 42	Grades 7-8 HH 43	Grades 9-14 HH 44
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9:45 – 10:20 AM

Morning Sessions - Horrabin Hall

Grades K-4

Holly, Karen Chicago Public Schools, k.holly@comcast.net
"Building Algebra Thinking in Grades K - 4"

Building a strong sense of algebraic thinking in the elementary grades is essential to success in high school and beyond. Experience activities and discourse around this topic to help build that foundation with your students.

Grades 5-6

Genovese, Sean Macomb Junior High, genoveses@mcusd185.org
"Golden Math Fun"

Phi, the Golden Mean and Ratio, is one of the most peculiar and unique numbers in mathematics and art. Yet Phi, and many related mathematical concepts, can be used at an intuitive level with younger students to explore the concept of ratio, practice mental math, pencil and paper and calculator computation, drawing and construction and other skills. The Golden Rectangle and Golden Spiral can be recognized and used in art, architecture and nature. Suggested and demonstrated activities will include paper folding and compass and straight edge construction and collage.

Grades 7-8

Tribbey, Fern ICTM President, tribbeyf@gmail.com
"Is There a Difference Between Assessment FOR Learning and Assessment OF Learning?"

Description: How do we know if our students are learning what we are trying to teach? Monitoring student learning is an everyday occurrence. What does this look like in our class? When do we use assessment of learning? How do we know if our given curriculum is helping our students learn the mathematics we want them to know? How do we know if the given program materials we are using is helping us do our job? What is the student's role within our assessment practices? Come to this session to begin to learn when to use assessment FOR learning and when to use assessment OF learning.

Grades 9-14

Blackford, Tom Western Illinois University, JT-Blackford@wiu.edu
"The Mathematics of Poker: Odds, Outs and Oscillations"

The popularity of poker has rapidly grown in the last few years. Many people believe that it is just a game of luck, but in the long term, it is a game of skill. More specifically, it involves a long series of decisions, which can be made in part by computing their mathematical expectation. We will discuss the basics of probability, expectation, and odds, and how they relate to poker and other casino games.

Grades K-4

Thompson, Bess Lincoln Elementary School, Thompson@mcusd185.org
"Singapore Math Model"

Singapore Math is a collection of teaching strategies that are used in classrooms in Singapore. It places a great deal of emphasis on developing strong number sense, great mental math skills, and an intense understanding of place value. There is also a strong focus on developing students who are problem solvers by using model drawing. This visual approach helps students organize information and solve problems in a step by step sequence.

The students progress from a concrete experience to a pictorial stage and then move to the abstract level. This progression allows the children to develop a solid understanding of the concepts before they work with the abstract algorithms. The concepts are taught to mastery and will be revisited but not re-taught.

Grades 5-6

Hendricks, Barbara Western Illinois University, BB-Hendricks@wiu.edu
"Playing around with Math: Math Games and Centers"

This session will look at variety of hands-on math games and center ideas covering the concept of graphing, fractions, pre-algebra, percents, decimals, and problem solving.

Grades 7-8

Lewis, Tom Hamilton School, Moline Tlncl1227@sbcglobal.net
"Neat Activities for the Math Classroom"

I will share some extra activities I have used in my classroom that provide enrichment for my students. The activities help prepare for ISAT and promote more high-level thinking. Several of the activities have grade level specific packets that allow them to be tailored to various classroom situations.

Grades 9-14

Brian Dalpiaz, Sarah Dalpiaz and Jim Sheff Spoon River College, Brian.dalpiaz@src.edu
"Teaching Developmental Math with Computer Assisted Learning"

The number of students entering college who test into developmental mathematics is astronomical. Most of these students have very low levels of confidence in mathematics and have convinced themselves that they will never understand math or be successful in a math course. It is an unfortunate fact that most of these students will never complete a college-level math course. At Spoon River College we have developed a new strategy to help these students overcome their fears and misconceptions about mathematics, to improve their success in developmental math, and to provide a strong foundation to prepare these students for success in college-level math courses.

Spoon River College's strategy is based on the fact that students will rarely succeed in a math course unless they do the homework and do it right. Students often think that they can understand math content by watching a teacher explain it at the board, but what these students need to realize is that you learn more by doing than by watching. It is equally important that students are doing the problems correctly. A student can complete all of the homework and gain nothing if it has not been completed correctly. It is imperative that a student receive quick feedback to make sure they are doing it right.

To improve student success in developmental math at Spoon River College, we have made three fundamental changes.

1. We have increased contact time between instructors and students.
2. We have increased communication among full-time and part-time math faculty and designated a leader to provide guidance to all developmental math faculty.
3. We have incorporated the Hawkes Learning System, a computer-assisted course design in which the students complete their homework and exams on the computer.

11:05 – 11:40 AM

Morning Sessions - Horrabin Hall

Grades K-4

Bielicke, James Valley Park Elementary School, jbielicke@vpk12.mo.us
"Facilitating Math Concepts to Primary Learner"

The issues to be discussed are about the primary (K-2) math learners. The topics of the presentation are assessment, investigations, think time, spiraling and cooperative learning. They will be discussed as they pertain to the beginning foundations of a math education. Each of these topics plays a vital role in creating interest in the learner. I have a background with these issues, as I have been teaching a primary grade for eight years. Each year I try to improve on my instruction to deliver the mathematics concepts in the most effective ways I can find. I feel that the information about these topics is important, because it gives some insight into the building blocks of math education in our public schools.

Grades 5-6

Mitchell, Martha Western Illinois University, MA-Mitchell@wiu.edu
"Make Fun Count"

Make math interesting for all your students. In this session many of the NCTM content standards will be explored as we pick up straws, find squares, form a line, make rectangles, and roll dice. Prepare to “put on your thinking cap” and test your skills.

Grades 7-8

Donald, Karlie Western Illinois University, KM-Donald@wiu.edu
"Trends in Math Achievement"

Abstract: This talk will examine the mathematical achievement of 3rd through 8th grade students as measured on such instruments as the ISAT, the NAEP, and the TIMSS. Analysis of these state, national, and international assessments will include a reflection on past performance, current status, and future implications.

Grades 9-14

Reese, Jennifer Paw Paw Jr/Sr High School, jreese@2paws.net
"Stepping Out of our Comfort Zones"

This discussion is on experiences with varied levels of student motivation and abilities. It focuses on what I have done to make the classroom more conducive to learning based on the individual needs of student, (teaching in a way I was never taught and probably would not have liked). I used to leave school shaking my head, thinking, "What planet are these kids from?" Now I realize, they are from earth, and I am from somewhere else. They don't have to be as driven and interested as we were, but they can learn to appreciate the power they have in the class and have fun in math class.

Workshops 12:15 – 01:15 pm

Polynomiography Morgan Hall 216

Iraj Kalantari (I-Kalantari@wiu.edu) from Western Illinois University

Polynomiography is a powerful mathematically-inspired computer visualization medium for creativity and playful learning with numerous applications in education, math, science, art and design. Polynomiography helps bridge art and math in a unique way and has abundant artistic and educational potential, especially with respect to creativity and innovation.

<http://www.polynomiography.com>

Teacher Career Workshop University Union, Invitation required

Donna McCaw (DS-Mccaw@wiu.edu) from Western Illinois University

This year, as part of the conference, the department is hosting a math career workshop for talented high school juniors and their teachers. Twenty high school students from throughout Illinois will be selected as Mathematics Scholars As Teachers (MSAT) awardees to attend this inaugural event. This workshop will focus on attracting more top students to the mathematics teaching profession. As a teacher of mathematics, you are probably well aware of the critical need for more teachers in our field. The purpose of this workshop is to encourage bright, young minds to consider a career in teaching math.

Geometer's Sketchpad Horrabin Hall 111

Craig Cullen and Jenni McCool (cjulle@ilstu.edu) from Illinois State University

This workshop will provide teachers with samples of Geometer's Sketchpad (GSP) activities geared toward Algebra I through Calculus. Teachers will have the opportunity to work on these sample activities, as well as, work on creating their own GSP files. The presenters will also provide suggestions to help ease the frustrations that are associated with implementing the use of technology into a classroom based on their own experience. This session will be appropriate for all levels of GSP users.

Notes:

- 12:05 AM: Free buses leave Western Illinois University to downtown Macomb.
- Pre-ordered box lunches available in Morgan 209 and Horrabin Hall 7 for workshop participants.

Remember to attend the closing keynote by Dr. Roger Eggleton entitled "The Enchantment of Mathematics" at 3:00 pm in Morgan Hall 109.

Afternoon Sessions
1:30 – 2:45 PM
Horrabin Hall

Session Times	Grades K-4 HH 27	Grades 5-6 HH 42	Grades 7-8 HH 43	Grades 9-14 HH 44
1:30- 2:05 pm	McCool, Jenni, and Cullen, Craig "From Numerals to Intervals and Back"	Stinson, Kelly "Mathematics Manipulatives in Grades K-6"	Gustafson, Daniel "Inconvenient Critical Thinking"	Rosene, Candace "Problem Solving Percents"
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1:30 – 2:05 PM

Afternoon Sessions - Horrabin Hall

Grades K-4

Jenni McCool and Craig Cullen Illinois State University, jkmccoo@ilstu.edu

"From Numerals to Intervals and Back: How Young Children Think about Measuring"

This presentation will present variety of ways that young children view the parts of a ruler and misconceptions students often have regarding measuring tools. Video clips of children working with and explaining their ways of thinking about rulers will be presented. Participants in this workshop will leave with tasks that can be used to explore students' thinking about measurement, as well as, tasks that move students through more sophisticated levels of thinking about measurement concepts.

Grades 5-6

Stinson, Kelly Schuyler Industry School, kstinson@sid5.com

"Mathematics Manipulatives in Grades K - 6"

The presentation focuses on the use of mathematics manipulatives in the classroom. Research on this issue will be discussed, as well as, findings, suggestions for improvement, and better uses in the classroom. Practical activities will be presented geared towards immediate implementation into the K-6 classroom. These activities may include gallon man for measurement, money man, using tangrams to discuss properties of shapes, algebra tile use in learning multiplication facts, algebra tile use in learning the rules of operations with positive and negative integers, and math bingo games created for specific objectives as class review.

Grades 7-8

Gustafson, Daniel Western Illinois University, DJ-Gustafson@wiu.edu

"Inconvenient Critical Thinking"

Today's high school students avoid critical thought, and as a result, high school graduates are not prepared to analyze real world data and make intelligent and informed decisions. I have developed an activity rooted in past content knowledge with the intent of invoking inconvenient critical thought towards the future. The controversial central theme of the activity is one with which every student has a vested interest- climate change. My goal is to provide a turnkey activity with limitless interdisciplinary potential that helps students learn how to think critically. Using historical climate data representing the past 570 million years, students are allowed the opportunity to use their mathematical knowledge in scientific notation, percentages, graphs, estimation, and scale to analyze the data and make their own interpretations and arguments.

Grades 9-14

Rosene, Candace Western Illinois University, CE-Rosene@wiu.edu

"Problem Solving Percents"

Whether it is an extended response item or understanding density or levers, our students need to be able to work with ratios fluently. Proportional reasoning dominates mathematics and many of its applications. This talk will deal with proportional reasoning, especially percents. Most students struggle with this topic, and this talk is intended to help teachers introduce this concept. Teachers will be provided with a wide range of efficient, hands-on activities dealing with proportional reasoning. Participants will also have opportunity to explore alternative ways to work percents, pattern blocks and other manipulatives.

2:10 – 2:45 PM

Afternoon Sessions - Horrabin Hall

Grades K-4

Lewis, Cathie Hamilton School, Moline, Tlncl1227@sbcglobal.net

"Intervention Activities for Primary Mathematics"

I will share a number of activities that can be used for interventions with students in grades Kindergarten through 4. The activities address a variety of mathematical concepts and can be used with individuals or small groups of students.

Grades 5-6

Mitchell, Martha Western Illinois University, MA-Mitchell@wiu.edu

"Fraction Understanding"

Participants will examine fraction concepts through different models and word problems. They will explore different strategies for fraction operations.

Grades 7-8

Felt, Kathy Sherrard Junior High, Feltfam3@mchsi.com

"Making RtI fit into the Middle Grades Classroom"

In most schools RtI (Response to Intervention) is new to middle school/junior high math classroom. This regular session will explore some of the most effective interventions and strategies for success that have found to successfully implement RtI in the junior high mathematics classroom.

Grades 9-14

Kranjc, Marko Western Illinois University, M-Kranjc@wiu.edu

"The Problem of Lockers"

We will discuss the well-known problem of lockers, how we believe it should be presented, in what grade, and for what purpose.

**WIU University Department of Mathematics
Courses Offerings Summer 2009**

To register for classes at the Macomb or Quad Cities Campus call 309-298-5000, on-line at www.wiu.edu/stars or call the instructor.

Math 505 The Teaching of Mathematics in Middle Grades and Junior High. (3)

A study of teaching strategies and current trends in mathematics as they apply to the curriculum of the middle school and the junior high school. *Prerequisites: MATH 106 and 206 (C grade or better) or equivalent.*

Math 599 Surface Modeling

The course explores methods commonly used for representing and visualization of surfaces in 3D. We study interpolation/approximation techniques for modeling surfaces representing functions on two-dimensional domains. The techniques include interpolation/approximation using polynomials, splines, trigonometric functions. In addition to rectangular meshes we will consider triangulations of polygonal domains. The ideas are extended to approximate parametric surfaces in 3D. We will be coding the algorithms in Matlab and testing/experimenting with real data/surfaces/objects.

Graduate students from both mathematics and computer science are invited to attend.

Instructor: Victoria Baramidze (V-Baramidze@wiu.edu)

Math 699 Arranged

**Sponsors of the 58th Annual
Western Illinois University
Mathematics Teachers Conference**

We are grateful to the following sponsors for supporting this conference.

- Western Illinois University
 - College of Arts and Sciences
Department of Mathematics and Faculty Foundation
 - College of Education and Human Services
Department of Educational Leadership
- Illinois Council of Teachers of Mathematics (ICTM)
- West Central Council of Teachers of Mathematics (WCCTM)
- Hancock/McDonough Regional Office of Education #26
Gary Eddington, Superintendent
- Peoria Regional Office of Education #48
Gerald Brookhart, Superintendent
- Rock Island Regional Office of Education #49
Joseph Vermeire, Superintendent

**Next Year's Tentative Conference Date
Friday, March 26, 2010.**

Interested in being a speaker? Or suggestions for speakers?

Contact: Mathematics-Western Illinois University

Phone: (309) 298-1054 or (309) 298-2275

Email: Mathematics@wiu.edu

Website: www.wiu.edu/math