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Regional Math and Science Center  
Grand Valley State University  
328 Henry Hall  
1 Campus Drive  
Allendale MI 49401

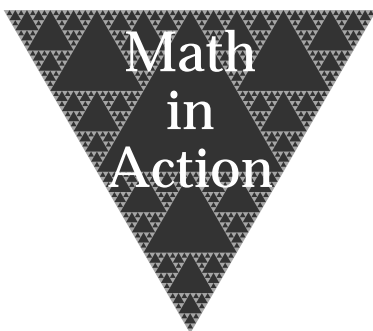
# Mathematics in Action

**“Assessment through Algebra and Number”**

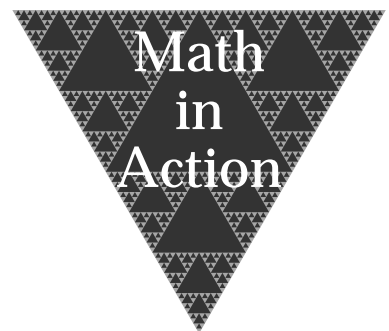
a conference for K-12 mathematics educators



Thursday, February 24, 2005



The Eberhard Center  
The Robert C. Pew Campus  
in downtown Grand Rapids  
Grand Valley State University  
Thursday, February 24, 2005  
8:40 am - 3:00 pm



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[www.gvsu.edu/math/MathInAction](http://www.gvsu.edu/math/MathInAction)

Math in Action is funded in part by: GVSU Pew Faculty Teaching and Learning Center, GVSU College of Liberal Arts and Sciences, Michigan Council of Teachers of Mathematics, and the Regional Math & Science Center (GVSU).

# Math in Action 2005 Program

## Session A: 8:40 - 9:40 am

### A1 Math Activities For All Levels

*Gail O. Sutton, Forest Hills Central High*

Are your students bored? Do you want your students to think math is fun? This session will have you immersed in math activities that can be adapted to any level of math. Even high school seniors find them to be fun! *Grades 2 - 12*

### A2 What's Your Angle?

*Gina Garza-Kling, Western Michigan University*

Truly understanding the concept of angle can be challenging. We'll use various aids, from patty paper to graphing calculators, to examine how students can develop a deeper understanding of this critical topic. *Grades 3 - 8*

### A3 Using Pictorial Growth Patterns To Promote Algebra In Elementary And Middle School Classrooms

*Esther Billings, GVSU Mathematics*

*Tarah McCarthy, Lindsey Slater, Rebecca Bergeon, GVSU Students*

Explore how pictorial growth patterns enable children (in grades kindergarten through middle school) to analyze, extend, and generalize relationships; ideas crucial for algebraic thinking. Classroom ready handouts provided. *Grades Pre-K - 8*

### A4 Using Tiles and Games To Teach Math In Grades 6 - 8

*Tracy Frank and Debi Dennis*

*College Preparatory Mathematics (CPM) Educational Program*

Participants will be actively engaged using integer tiles, playing games, and doing activities to enhance the learning of math concepts. *Grades 6 - 8*

### A5 Algebra Activities

*Kevin Dykema, Cathy McEvoy, Mattawan Middle School*

Come try out some easy to create activities to enrich your algebra classroom that your students will love. Please join in on our fun and excitement. *Grades 6 - 10*

### A6 Hands-On Math Activities From Africa

*Christy Heid, Davenport University, GRAPCEP*

*(Grand Rapids Area Pre-College Engineering Program),*

*Nancy Kingsbury, Trinity Lutheran School, Conklin*

Participate in various hands-on math activities developed for African secondary Math & Science teachers that are easily adapted to American classrooms. *Grades 7 - 12*

### A7 Proof! Finally A Logical Approach

*Chris Mikles, CPM/Director of Teacher Education*

We will begin the development of proof through the introduction of deductive reasoning by way of games. The main goal is to have students develop strategies, draw conclusions and justify their reasoning. Then we will establish three types of proof, emphasizing the need to have students critique each others' work as they look for the substance in the oral and written arguments and conclusions. *Grades 8 - 12*

### A8 Do You Know Calculus\*? (\*As Well As Elvis)

*Timothy Pennings, Hope College*

*Elvis Bogaart Wales Pennings, Welsh Corgi*

Elvis (my Welsh Corgi) and I show that he can find optimal (quickest) paths to a ball thrown in a lake. We then provide an experimental worksheet for students to determine if they can find optimal paths. *Grades 10 - 12*

## Session B: 9:50 - 10:50 am

### B1 The Crazy Universe Where Math And Art Collide

*Paul Yu, GVSU Mathematics*

This session will look at a variety of applications of art in mathematics and mathematics in art. The session will conclude with practical ways to implement projects that utilize both mathematics and art in the classroom. *Grades K - 12*

### B2 KC4 Mathematics And The GLCE's

*Ruth Moxon, Kent Intermediate School District*

The Michigan GLCE's have had a great impact on curriculum development for local districts. This session will show how KC4 Math is being revised to align with the Math GLCE's. *Grades K - 8*

### B3 Gotta Have Your POPS: Patterns-Operations-Problem-Solving Stirred In One Bowl\*

*Mary J. DeYoung, Hope College*

Participants will explore a classic problem - one that provides multiple connections to some important properties of whole numbers. *Grades 3 - 5*

### B4 Exploring An "Exemplary" Mathematics Curriculum

*Tracy Frank, Debi Dennis*

*College Preparatory Mathematics (CPM) Education Program*

Participants will explore College Preparatory Mathematics (CPM), a standards-based teacher-written curriculum that teaches basic skills from a problem solving approach. *Grades 6 - 12*

### B5 Discovering Algebra Through Data And Investigations

*Jerry Murdock, Key Curriculum Press, Algebra Author*

We will explore investigations and uses of technology that help students learn algebra, algebraic thinking, and how to use algebra. (Some use of TI-84's and CBR's) *Grades 9 - 12*

### B6 Games To Encourage Mathematical Communication

*Charlene Beckmann, GVSU Mathematics*

When do students ever get to talk about mathematics? Usually, only in their mathematics classes! This workshop will present games that you can use with students to encourage mathematical communication, and to help students think deeply about the mathematics they are learning. We will play the games using vocabulary from the Grade Level Content Expectations and Michigan Standards for grades 7 - 12. *Grades 6 - 12*

### B7 Multiplying And Dividing Polynomials Using Generic Rectangles

*Chris Mikles, CPM Educational Program*

This session will look at the area model, use algebra tiles and the generic rectangle as a basis for multiplying, factoring and then dividing polynomials. No more synthetic division. *Grades 8 - 12*

### B8 A Math Teacher Goes To Washington, Learn How You Can Too!

*David Kapolka, The National Science Foundation*

Come hear the latest news regarding the Presidential Awards Program and The Einstein Fellowship in Washington DC. The presenter is a math teacher on leave from his teaching position in Grand Rapids and working at the NSF with these two programs. Find out how you could win the Presidential Award or spend a year at NSF, NASA, or on Capitol Hill. *Grades K - 12*

## General Session and Lunch: 11:00 am - 12:40 pm

**Dr. Edward Roeber, Senior Executive Director**

**Office of Educational Assessment and Accountability, Michigan Department of Education**

Lunch and the General Session run concurrently. Participants are invited to take a lunch into the General Session to eat.

### Update On Michigan's Assessment and Accountability Programs

This session will provide an overview of Michigan's Student Assessment Programs (MEAP, MI-ACCESS, and the assessment of English Language Learners) and Accreditation/Accountability Programs (Education YES!/NCLB AYP), especially how these affect the area of Mathematics. Dr. Roeber will hold a Question-and-Answer Session following his talk.

## Session C: 12:50 - 1:50 pm

### C1 Making Math Fun For The Whole Family!

*Matt Wyneken, Pam Wells, Paul Yu, GVSU Mathematics*

We will discuss what "Family Math Night" is and why it is beneficial for children and their parents, give examples of "Family Math Night" activities, and share our experiences with "Family Math Night." *Grades Pre-K - 6*

### C2 Problem Solving For Intervention

*John Golden, GVSU Mathematics*

A report from Burton Elementary School where teachers are shifting to a problem solving approach to math to best address student learning. What are they doing? How is it going? *Grades K - 6*

## Session C (continued): 12:50 - 1:50 pm

**C3 Elementary Math Teaching Ideas and Tools**  
 (part 1 of a 2 part session - Participants **MUST** sign up for both C3 and D3.)  
*Robert A. Hahn, Retired*  
 This two-hour hands-on workshop includes: Double-nines domino sum-difference-equivalence, 3-D dodecahedron construction and use, magnetic magic squares, deciphering the Zip Code, lattice multiplication, rectangular fraction multiplication, plastic grid percentage, fraction strip division, concentric circle construction and use, soap film minimal surface area, ratios & unit analysis, and much more. *Grades 3 - 6*

**C4 Child's Play For Middle School Mathematics Students**  
*Barbara Leopard, Eastern Michigan University*  
 Appeal to the child in your middle school students by leading them toward abstract algebraic thinking using commonly available manipulatives such as pattern blocks, tangrams and color tiles. *Grades 6 - 8*

**C5 Graphing As A Connecting Thread In Algebra**  
*Virginia Head, CPM Educational Program/Regional Coordinator*  
 Graphing is an essential feature of an algebra course that brings equations to life. Participants will experience a human graph, silent board game, and a cooperative graph problem. *Grades 6 - 12*

**C6 Exploring An "Exemplary" Mathematics Curriculum**  
*Lonnie Bellman, CPM Educational Program*  
 Participants will explore College Preparatory Mathematics (CPM), an innovative, standards-based curriculum that teaches basic skills from a problem-solving approach. *Grades 6 - 12*

**C7 Beyond Middle and High School Geometry**  
*William Dickinson, GVSU Mathematics*  
 Have you ever wondered how some of the topics in geometry, covered in middle and high school, lead to college level geometry? In this workshop, participants will examine and begin to complete several activities that start with exercises based on exemplary middle and high school curricula, but lead to collegiate level topics in geometry. *Grades 8 - 12*

**C8 Algebra Tiles: Going from "Hands-On" to Concepts in Algebra I and II**  
*Susan Metzger, Grand Haven High School*  
 This session is for those participants who want to learn how to use algebra tiles to assist learning in high school algebra topics. State benchmarks and assessments will also be discussed. *Grades 8 - 12*

## Session D: 2:00 - 3:00 pm

**D1 Lesson Study, Lessons Learned, and Patterns and Symbols**  
*Gail Burrill, Michigan State University*  
 Designing, teaching, and debriefing a lesson with the help of thoughtful colleagues can help us think about how to develop reasoning and understanding of some central concepts in algebra in some very concrete and unexpected ways. *Grades PreK - 12*

**D2 Gotta Have Your POPS: Patterns-Operations-Problem-Solving Stirred In One Bowl\***  
*Mary J. DeYoung, Hope College*  
 This session repeats B3. *Grades 3 - 5*

**D3 Elementary Math Teaching Ideas and Tools**  
 (part 2 of a 2 part session. Participants **MUST** sign up for both C3 and D3.)  
*Robert A. Hahn, Retired*  
 This session is a continuation of C3. *Grades 3 - 6*

**D4 The Tortoise And The Hare: Discovering Slope**  
*Tara Maynard, Creekside Middle School*  
 Five activities help students discover the concepts of slope and y-intercept. Making charts, graphical representations, and equations all help students truly understand these concepts. Participants will receive all five lessons. *Grades 6 - 9*

**D5 Making Secondary Mathematics Visual Using Algebra Tiles**  
*Virginia Head, CPM Educational Program/Regional Coordinator*  
 You'll see how successful using manipulatives can be. Participants will be using algebra tiles for integer operations, combining like terms, distributive property, multiplication and factoring polynomials. *Grades 6 - 12*

**D6 Functions As A Unifying Thread in Algebra 2**  
*Lonnie Bellman, CPM Educational Program*  
 Participants will work with problems and activities from the CPM curriculum experiencing problem solving and understanding of graphing and functions, showing mastery over time. *Grades 10 - 12*

**D7 Stressing The Underlying Structure When Teaching College Algebra**  
*Pat Shure, University of Michigan, Ann Arbor, Mathematics*  
 The presentation will be centered on analyzing a set of problems to see how the solutions foster symbolic understanding and why this type of problem might prove valuable in teaching. *Grades 8 - 12*

**D8 Mean, Median, And....Center Of Mass. Using Mean and Median To Explore Science.**  
*Natalie Beyer, GVSU Physics*  
 We will explore how mean and median help develop a deeper understanding of the center of mass. We will discover and discuss persistent student difficulties with this topic. (Fun Manipulatives!) *Grades 6 - 13+*

### Mathematics in Action Registration Form

(One registration per form...duplicate as needed - this form is also available at [www.gvsu.edu/math/MathInAction](http://www.gvsu.edu/math/MathInAction))



<b>Name</b>		<b>Last 4 digits of Social Security Number</b>	
<b>Address</b>		<b>City</b>	<b>Zip</b>
<b>Daytime Phone ( )</b>		<b>Email address</b>	
<b>Name of School</b>		<b>School District</b>	<b>Grades Teaching Now</b>
<b>Gender</b>	<b>Ethnicity</b>		
Male ___ Female ___	African-Am ___ Asian-Am ___ Caucasian ___ Hispanic ___ Native-Am ___ Other _____		
<b>Participant Category (please select one choice from the two rows of boxes below)</b>			
Teacher <input type="checkbox"/>	Student <input type="checkbox"/>	Administrator <input type="checkbox"/> (your title) _____	School Board <input type="checkbox"/> Parent <input type="checkbox"/>
Community Member <input type="checkbox"/>	Business/Industry <input type="checkbox"/>	Legislator <input type="checkbox"/>	Other (specify) _____

**Your registration is your confirmation.**

**NOTE:** Sessions offered more than once are marked with an \*.

(Place appropriate session code in blank)			
<b>Session A:</b>		<b>Session C:</b>	
_____ 1 <sup>st</sup> Choice	_____ 2 <sup>nd</sup> Choice	_____ 1 <sup>st</sup> Choice	_____ 2 <sup>nd</sup> Choice
<b>Session B:</b>		<b>Session D:</b>	
_____ 1 <sup>st</sup> Choice	_____ 2 <sup>nd</sup> Choice	_____ 1 <sup>st</sup> Choice	_____ 2 <sup>nd</sup> Choice

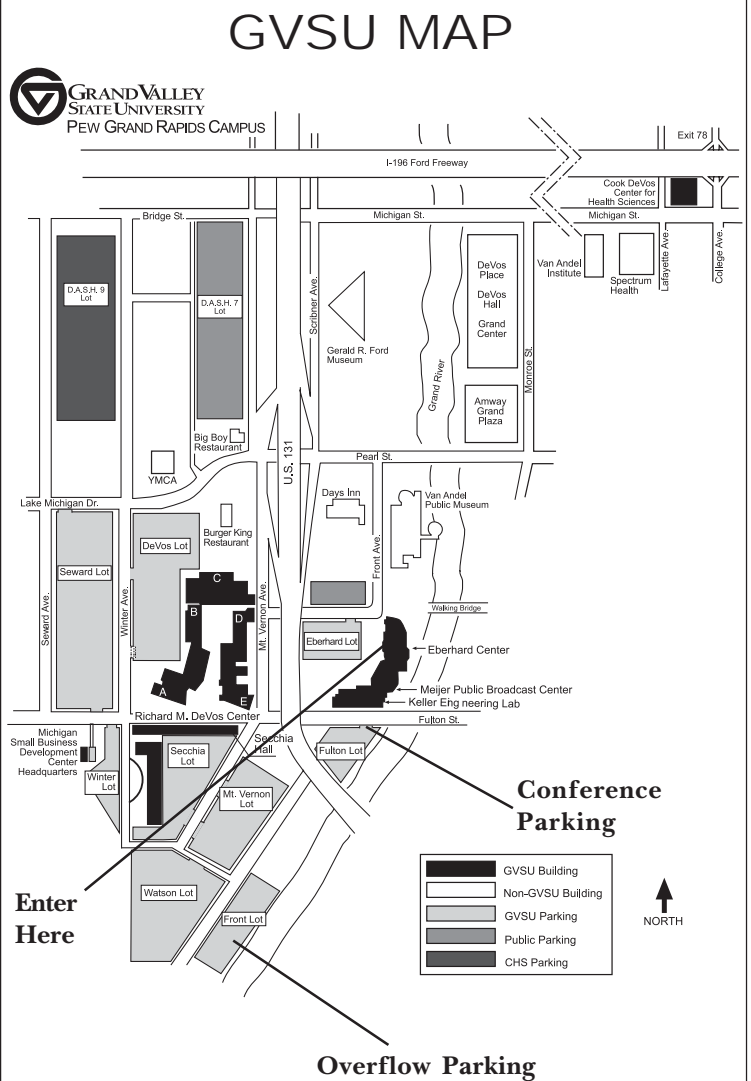
Enclose your registration fee of  
 \$22.00 per teacher/educator  
 \$7.00 per preservice teacher  
 (make checks payable to GVSU)  
 and mail this completed registration form  
 postmarked by **February 10, 2005** to:

RMSC - MIA  
 328 Henry Hall  
 Grand Valley State University  
 1 Campus Drive  
 Allendale, MI 49401

Ask your school if professional development funds are available.

# Math in Action Schedule

8:00 - 8:40 am	Registration and Refreshments Eberhard Center 2nd floor lobby
8:40 - 9:40 am	Concurrent Session A Conference Facilities, Eberhard Center
9:50 - 10:50 am	Concurrent Session B Conference Facilities, Eberhard Center
11:00 am - 12:40 pm	General Session and Lunch Eberhard Center 2nd Floor Lobby and Auditorium
12:50 - 1:50 pm	Concurrent Session C Conference Facilities, Eberhard Center
2:00 - 3:00 pm	Concurrent Session D Conference Facilities, Eberhard Center



From US-131 Northbound: Take the Pearl St. Exit, #85B. Turn left (west) onto Pearl Street (which becomes Lake Michigan Drive). Go two blocks; turn left on Winter Ave. Take Winter south to light at Fulton St. Turn left on Fulton, follow roughly two blocks under US-131 and enter the Fulton Lot on your right.

From US-131 Southbound: Take the Pearl St. Exit, #85B. Turn right (west) onto Pearl Street (which becomes Lake Michigan Drive). Go one block; turn left at first intersection on Winter Ave. Take Winter south to light at Fulton St. Turn left on Fulton, follow roughly two blocks under US-131 and enter the Fulton Lot on your right.

From I-196 East/West: Take the Ottawa Ave/Downtown Exit, #77. Follow Ottawa Ave. through downtown til it dead-ends into Fulton St. Turn right onto Fulton. Proceed roughly three blocks across the river til just before the US 131 overpass. Turn left into the Fulton Lot marked Conference Parking.

Overflow parking is available in the Front Lot noted on the map above.

January 3, 2005

Dear Educator,

You are cordially invited to attend the annual Math In Action Conference hosted by Grand Valley State University on Thursday, February 24, 2005. The conference will be held in the Eberhard Center on GVSU's Robert C. Pew Campus in downtown Grand Rapids. Registration begins at 8:00, the first session starts at 8:40, and the conference concludes at 3:00. The theme is "Assessment Through Algebra and Number: Utilizing Multiple Benchmarks".

There will be four sets of concurrent sessions addressing this theme. Each session has eight talks to select from. We are excited to have such a wide variety of speakers from Michigan elementary, middle, secondary, and post-secondary institutions, as well as speakers from the College Preparatory Mathematics Program coming from as far away as California and Texas.

We are excited to have Dr. Edward Roeber from the Michigan Department of Education to deliver a general session address, followed by a question-and-answer session, on an "Update On Michigan's Assessment and Accountability Programs."

Please join us for an invigorating day. Please tell your colleagues! Additional brochures/registration forms can be printed by visiting [www.gvsu.edu/math/MathInAction](http://www.gvsu.edu/math/MathInAction)

Sincerely,

*Marge Friar*

Marge Friar  
Co-chair, Math in Action

*David Austin*

David Austin  
Co-chair, Math in Action