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GRAND VALLEY  
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Regional Math and Science Center  
Grand Valley State University  
224 Padnos Hall  
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Allendale MI 49401

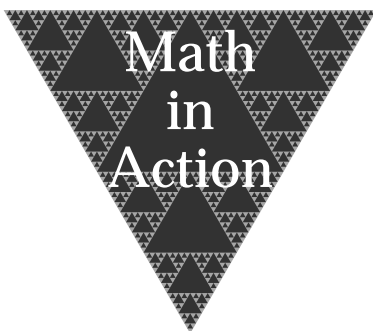
# Mathematics in Action

**"Tools for Teaching Mathematics"**

a conference for K-12 mathematics educators



Thursday, February 27, 2003



The Eberhard Center  
The Robert C. Pew Campus  
in downtown Grand Rapids  
Grand Valley State University  
Thursday, February 27, 2003  
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 Division of Science and Mathematics, MCTM, GVSU Mathematics Department, and the Regional Math & Science Center (GVSU).

# Math in Action 2003 Program

## Session A: 9:00 - 10:00 am

- A1 Math and Art - An Elementary Festival**  
*John Golden, GVSU Mathematics*  
 Three activities from the Math/Art Festival at Aberdeen Tech/Math Academy. Hands on activities, beautiful results, and great mathematics. *Grades K-5*
- A2 What in the World is a Virtual Math Trail?**  
*Brian Schad, Lawton Elementary School*  
 A computer website is utilized to ask questions (including constructed response type questions) about pictures that make up a math trail. Each picture includes a lesson plan and scoring rubric. *Grades 3-8*
- A3 Interactive Geometry Lessons Using Geometers Sketchpad**  
*Terry Faitel, Trenton Public Schools*  
 Participants will engage in activities using this geometry software that will help their students, in the classroom, strengthen their understanding of the properties of two-dimensional shapes. *Grades 4-10*
- A4 The Missing Link: Using Manipulatives to Explain Algebraic Functions**  
*Susan Metzger, Grand Haven High School*  
 Too frequently, students fail to understand how mathematics can be used to describe real life events. Participants of this workshop will learn through activities how to assist their students in gaining an understanding how algebraic functions model the real world. *Grades 8-12*

- A5 Where do We See Probability?\***  
*Tara Maynard, Creekside Middle School*  
 Many different items can be used to explore basic probability. Come see how spinners, numbered cubes, cards, coins, and a jar of jellybeans will help students grasp the idea of probability. *Grades 5-9*
- A6 Probing the Math-Science-Technology Integration Connection**  
*Cindy Ernst, Trinity Lutheran School*  
*Tim Ernst, Trinity Lutheran School*  
 Accelerate student interest and learning by doing real-world experiments that merge math and science concepts with hand-held technology. CBLs, graphing calculators, and a variety of probes will be explored. *Grades 5-10*
- A7 Using Technology: Just for the Health of It**  
*Lori Barr, Pinewood Elementary*  
 Students, using cardio heart rate monitors, learn the difference between aerobic and anaerobic exercise and benefits toward optimal health. Lifestyle fitness is encouraged as they use spreadsheets to record data over time. *Grades 6-12*
- A8 Calculator Explorations of Fractals, Medical Tests, and More**  
*David Kapolka, Forest Hills Northern High School*  
 Using function, sequence, and parametric mode, we will explore current and future terms of convergent and divergent sequences. Ever wonder how a mega dose or daily dose of medicine affects you? Explore environmental applications of convergence. We will also examine the reliability of medical, pregnancy, and diabetes tests. A rich variety of calculator tools for instruction. *Grades 10-12*

## Session B: 10:15 - 11:15 am

- B1 Origami**  
*Susan Lin, Benton Harbor Area Schools*  
 Origami will help students develop the ability to think abstractly, reason and solve problems. They will also discover and understand the relationship between geometry and congruent figures, using their logical thinking to prove it. In fact, origami is a tool for mathematical thinking. *Grades K - 12*
- B2 Using Circles and Strips to Help Students Understand Fractions**  
*Nancy Mack, GVSU Mathematics*  
 Circles and strips can help children visualize and understand fractions. Participants will use these tools as they engage in activities and explore ways to help children learn fractions with understanding. *Grades 3 - 6*
- B3 Calculators and Number Sense: Yes, They are Compatible**  
*Judy Wheeler, Berrien County Mathematics and Science Center*  
 The presenter has created programs for the TI-73/82/83 to be used in middle grades to develop number sense and logical reasoning. Each participant will receive a disk. *Grades 5 - 9*
- B4 Programming to Learn Mathematics: Robots and Turtles**  
*Kathy Burgis, Aquinas College*  
 This session will showcase two technologies suitable for high school and middle school students. Classroom activities with Lego Mindstorm® programmable robots and StarLogo dynamic systems modeling software will be shared. *Grades 7 - 12*

- B5 Where do We See Probability?\***  
*Tara Maynard, Creekside Middle School*  
 This session is a repeat of A5. *Grades 5-9*
- B6 Postal Rates: Using a Real-World Context to Explore Functions**  
*Esther Billings, GVSU Mathematics*  
*Melanie Schultz, GVSU Mathematics*  
 In this session we will share an activity that explores linear and step functions in the context of analyzing postal rate data. We will also show examples of how middle school students used models, tables, graphs, and equations to recognize, extend, and generalize patterns found in this real-world context. *Grades 6 - 8*
- B7 Geometry and Miniature Golf**  
*Marilyn Wheeler, Cityside Middle School*  
 Students showcase their geometric knowledge with books and miniature golf courses. Students will present their course - and give you a chance to try for a hole-in-one! *Grades 8-12*
- B8 Tools for Mathematically Challenged High School Students: Workplace Math**  
*Kim Pike, West Ottawa High School*  
*Norma Lamotte, West Ottawa High School*  
 This session emphasizes school-to-work transitioning for mathematically challenged secondary students using workplace tools, including micrometers, calipers, digital multimeters, trigonometric clinometers, and blood pressure cuffs. *Grades 9-12*

## Hands-on Session and Lunch: 11:30 am - 12:30 pm

## Session C: 12:45 - 1:45 pm

- C1 Cutting and Folding Paper: Activities to Develop Spatial Sense**  
*Janice Koop, Calvin College*  
 This workshop will explore activities based on folding and/or cutting a regular piece of paper. These activities help develop spatial abilities and lead to discussions of symmetry and properties of geometric shapes. *Grades 1-6*
- C2 Grade Level Performance Expectations\***  
*Bruce Budzynski, Mathematics Consultant, Michigan DOE*  
 Learn the content of and development process for the new Grade Level Performance Expectations required by the *No Child Left Behind* federal legislation. These expectations will form the basis for annual state grade level testing beginning in the 2004-2005 school year. *Grades 3 - 8*

- C3 Puzzling Pentominoes**  
*Suzanne Beute, Lowell Area Schools*  
 Puzzling Pentominoes - a problem solving approach using manipulatives and children's literature to explore the relationship between area and perimeter, ultimately leading to the discovery of their formulas for rectangles. Handouts provided. *Grades 2-4*
- C4 Developing Number and Measurement Concepts with Geoboards**  
*Judy Wheeler, Berrien County Mathematics and Science Center*  
 Geoboards are a great tool to develop rational and irrational number concepts as well as measurement concepts of area, perimeter, and slope. *Grades 5-9*

**Session C (continued): 12:45 - 1:45 pm**

**C5 How Loud Is It? How do You Spell It? And, How Much Does it Weigh?**

*Mary Richardson, GVSU Statistics*  
*Phyllis Curtiss, GVSU Statistics*  
*John Gabrosek, GVSU Statistics*

The speakers will guide participants through three interactive activities that illustrate descriptive statistics (measures of center, variability, and graphs) and hypothesis testing. Data are collected using decibel readers, Scrabble™ Express games, and digital scales. *Grades 7-12*

**C6 Problem Solving with Key Curriculum Press**

*Melissa Crag, Lamphere High School*

With the help of Key Curriculum Press's *Crossing the River With Dogs*, I have developed a problem solving course for high school students. Come check out the problems I have gathered and see how problem solving can be integrated into any high school math course. *Grades 9-12*

**C7 Using a TI-83 in the Classroom**

*Pat Pike, Battle Creek Central High School*

Look at different applications for the use of TI-83 calculators in the classroom using core Plus Curriculum. The applications could be Statistics and Probability, Linear, and Exponential. *Grades 9-10*

**C8 How Does the TI-89 Change a High School Classroom?\***

*Diane Moore, Traverse City West High School*

Now that we have become comfortable with the TI-83 plus and its equivalents we have this other calculator to deal with. How can we use the TI-89 with its symbolic manipulation capability to help students understand mathematics? How are students using it? We will use the calculator in our session to explore what it does and how we can use it appropriately in our instructional model. Our session will also use the TI-Presenter which allows your calculator to be viewed on your TV! *Grades 9-12*

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

**D1 Using Your Noodle for Mathematical Thinking**

*Tamara Arizola, SVSU Regional Mathematics and Science Center*

Participants will explore a variety of mathematical concepts, such as algebraic thinking, data analysis and geometry using pasta as a mathematical tool. All activities are interactive and will include writing/reflecting for understanding. *Grades K-6*

**D2 Grade Level Performance Expectations\***

*Bruce Budzynski, Mathematics Consultant, Michigan DOE*

This session repeats C2. *Grades 3 - 8*

**D3 Tools to Help Implement Michigan Curriculum & Prepare for the MEAP Test**

*Ann Enyart, Hastings Middle School*

You have probably heard about and seen the MI CLiMB CD-ROM, but how can it help classroom teachers? Practical and useful applications will be shown and discussed. *Grades 4 - 8*

**D4 Mathemagic Supported with TI-73/82/83, Cups and Beans**

*Judy Wheeler, Berrien County Mathematics and Science Center*

The MI CLiMB Algebra PD Module introduces the Mathemagic Activity to develop an understanding of variables to generalize arithmetic patterns. Adding "tools" to this activity both facilitates and enhances the lesson. *Grades 6-9*

**D5 Building a Better Understanding of Box-Plots**

*Pamela Wells, GVSU Mathematics*

*David Coffey, GVSU Mathematics*

Participants will engage in various activities that introduce and explore concepts associated with box-plots. These activities will include building human box-plots and using the Fathom® statistical software package. *Grades 7 - 12*

**D6 Helmets, Bones, and Sunflower Seeds**

*Mary Richardson, GVSU Statistics*

*Phyllis Curtiss, GVSU Statistics*

*John Gabrosek, GVSU Statistics*

The speakers will guide participants through three interactive activities that illustrate descriptive statistics (measure of center, variability, and graphs) and simple linear regression. Data are collected using tape measures. *Grades 7 - 12*

**D7 How Does the TI-89 Change a High School Classroom?\***

*Diane Moore, Traverse City West High School*

This session repeats C8. *Grades 9-12*



**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))

Name		Social Security Number	
Address		City	Zip
Daytime Phone ( )		Email address	
Name of School		School District	Grades Teaching Now
Gender	Ethnicity		
Male ___ Female ___	African-Am___ Asian-Am___ Caucasian___ Hispanic___ Native-Am___ Other _____		
Participant Category (please select one choice from the two rows of boxes below)			
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	_____ 1 <sup>st</sup> Choice
_____ 2 <sup>nd</sup> Choice	_____ 2 <sup>nd</sup> Choice
<b>Session B:</b>	<b>Session D:</b>
_____ 1 <sup>st</sup> Choice	_____ 1 <sup>st</sup> Choice
_____ 2 <sup>nd</sup> Choice	_____ 2 <sup>nd</sup> Choice

Enclose your registration fee of \$24.00 per teacher/educator \$12.00 per preservice teacher (make checks payable to GVSU) and mail this completed registration form postmarked by **February 14, 2003** to:

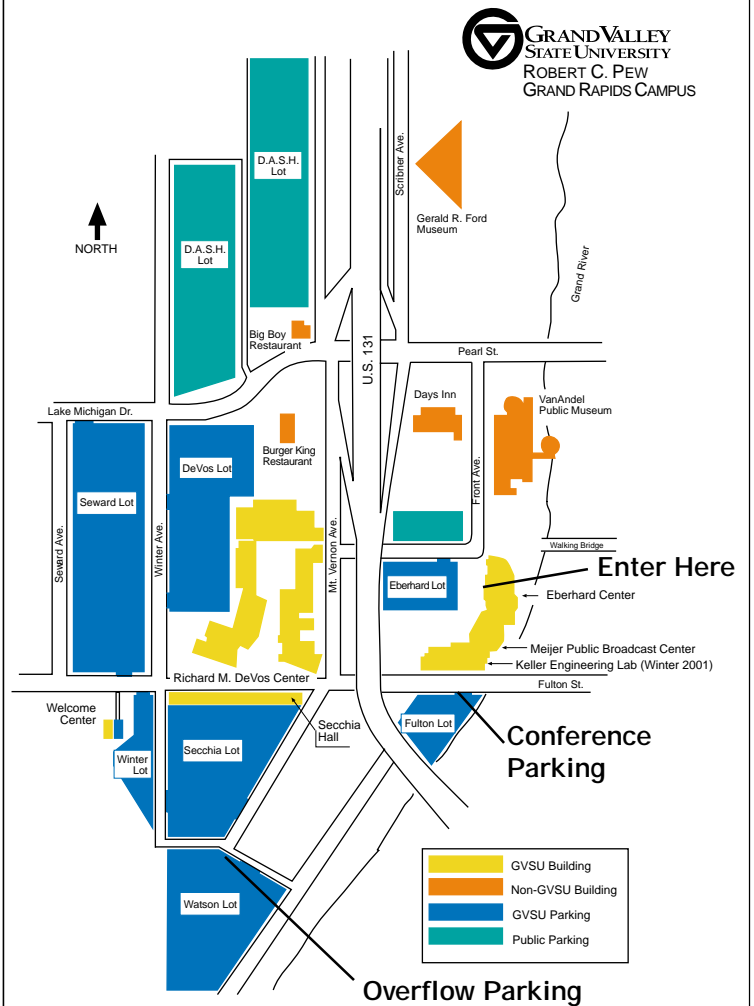
Regional Math/Science Center - MIA  
 Grand Valley State University  
 224 Padnos Hall  
 1 Campus Drive  
 Allendale, MI 49401

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 - 8:50 am	Welcoming Remarks and Important Announcements Teleconference Center, Eberhard Center
9:00 - 10:00 am	Concurrent Session A Conference Facilities, Eberhard Center
10:15 - 11:15 am	Concurrent Session B Conference Facilities, Eberhard Center
11:30 am - 12:30 pm	Hands on Sessions and Lunch Eberhard Center, 2nd Floor Lobby
12:45 - 1:45 pm	Concurrent Session C Conference Facilities, Eberhard Center
2:00 - 3:00 pm	Concurrent Session D Conference Facilities, Eberhard Center

## GVSU MAP



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 Watson Lot noted on the map above.

January 3, 2003

Dear Educator,

You are cordially invited to attend the annual Math In Action Conference hosted by Grand Valley State University on Thursday, February 27, 2003. The conference will be held in the Eberhard Center on GVSU's Robert C. Pew Campus in downtown Grand Rapids and will run from 8:40 am to 3:00 pm. The topic for this year is "The Tools for Teaching Mathematics".

There will be four sets of concurrent sessions addressing this theme. They will offer teachers the opportunity to experience a variety of interactive projects and activities that other educators have found successful. Each session will offer possibilities from across the K-12 curriculum on a host of topics; please examine the session descriptions in this program with titles and abstracts for further information.

This year instead of the usual plenary address, we are having a special hands-on session running concurrently with lunch. This event will showcase different area educators' innovative tools for teaching mathematics. A select number of concurrent session speakers have agreed to bring their "tool(s)" to a table where all participants can explore them in an informal setting. We anticipate 10-15 tables where presenters will be able to share their "tool(s)" which will give participants a chance to ask questions and learn more about the "tool(s)" being utilized.

The conference promises to be an exciting time of learning and idea-sharing centered on the mathematics classroom and we look forward to you joining us.

Sincerely,

*Nancy Alexander*

Nancy Alexander  
Co-chair, Math in Action

*William Dickinson*

William Dickinson  
Co-chair, Math in Action