

# Math in Action 2001 Program

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

**SPEAKER:** Elizabeth Difanis Phillips, Michigan State University

**TITLE OF PLENARY ADDRESS:** Developing Algebraic Reasoning Across the Grades

**ABSTRACT:** The 2000 NCTM *Principles and Standards for School Mathematics* state that: instructional programs from preK-12 should enable all students to (a) understand patterns, relations, and functions, (b) represent and analyze mathematical situations and structures using algebraic symbols, (c) use mathematical models to represent and understand quantitative relationships, and (d) analyze change in various contexts. The *Standards 2000* also suggest that students develop algebraic reasoning and understanding while pursuing solutions to interesting problems. Having students approach algebraic ideas through investigations and problems allows them to search for patterns and relationships among the variables in the data, and to find ways to generalize and represent these patterns and their reasoning in words, tables, graphs, and symbols. This talk will illustrate the underlying philosophy of algebra in the *Standards 2000* through examples of problems and student work from different grade levels.

Betty Phillips has been described as an "entertaining speaker whom teachers enjoy" who shares important ideas about the teaching and learning of algebra. Betty has taught high school math and chemistry, as well as mathematics and mathematics education courses at the collegiate level. Among her many professional accomplishments, she has been Chair and Editor of the MCTM monograph series and Chair of the NCTM Algebra Working Group. In addition, she is the author of numerous publications including two books: *Patterns and Functions for Middle Grades Teachers* and *Intermediate Algebra: Problem Solving and Applications*. Ms. Phillips also conducts workshops for teachers, gives speeches, and consults on mathematics education at the local, state, and national levels.

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

### A1 Making Music in Math Class

*Alverna Champion, GVSU Mathematics/Statistics*

*Julianne Vanden Wyngaard, GVSU Music*

Let's get busy looking for mathematical patterns in music and musical patterns in mathematics.

*Grades PreK-1*

### A2 Recursion, Fractals, and Sequences

*David Kopolka, Forest Hills Northern High School*

Explore the sequence mode operations with some unique applications from forestry to fractals including 3D models. Bring your TI-83. *Grades 9-12*

### A3 What Can We Learn From Stone Soup?

*Victoria Swenson, Cornerstone University*

We will explore the integration of mathematics and character education using children's literature, activities, simulation, and life experiences.

*Grades K-2*

### A4 "If it's positive, then it's increasing": Fostering Deep Understanding of Calculus Concepts through Writing Assignments

*Pamela Wells, GVSU Mathematics/Statistics*

We will discuss ways to use writing to help students understand important calculus concepts and to emphasize the necessity of careful mathematical reasoning and communication. Connections to the Standards will be discussed; handouts provided.

*Grades 11-12*

### A5 Update on the 2002 MEAP -- Grade 4

*Philip Babcock, State Department of Treasury*

This talk examines changes and current issues (including sample questions and assessment issues) in the new state mathematics exam (2002 MEAP). Participants may ask questions about the test.

*Grade 4*

### A6 Playing With Pascal's Triangle

*Charlene Beckmann, GVSU Mathematics/Statistics*

Pascal's Triangle is loaded with beautiful and interesting patterns. We will explore several of these and uncover relationships among Pascal's Triangle, graph theory, functions, combinatorics, and binomial expansions. *Grades 6-12*

### A7 Improving Behavior Improves Knowledge

*Mary Jones, Grand Rapids Public Schools*

*Math Curriculum Coordinator*

When students' behavior is under control, they increase their knowledge of mathematics and retain more understanding. We'll explore class management strategies for improving and modifying student behavior, especially to improve the learning of mathematics. *Grades K-12*

### A8 Probability in Grades 4-8: What are the Big Ideas?

*Kathy Burgis, Aquinas College*

Examples from several elementary and middle grades curricula (Everyday Mathematics, Connected Mathematics, and others) will be used to show how the important ideas of probability build across grade levels. *Grades 4-8*

## Session B or Lunch: 11:30 am - 12:30 pm

### B1 Authentic Assessment for a Middle Grade Patterning Task

*Gregg McMann, Oakland Schools*

Participants will analyze and complete a middle grade patterning task and determine its usefulness and alignment with the Michigan Mathematics Standards and Benchmarks. Participants will examine actual student work, discuss the development of a rubric, and analyze their own work in relation to the rubric. Next steps in teaching and assessment will also be discussed. *Grades 5-9*

### B2 Probability Games

*Janice B. Koop, Calvin College*

Children's ideas about probability, fairness, and likely events develop as the result of many experiences. Appropriate activities that use data to investigate these concepts will be shared. *Grades 3-6*

### B3 Ways to Make 10

*Dave Coffey, GVSU Mathematics/Statistics*

*Kathy Coffey, Fruitport Public Schools*

We will explore how manipulatives, research in mathematics education, and children's prior experiences (especially with patterning) can be used to aid children's understanding of the important concept of making ten. *Grades K-2*

### B4 Update on the 2002 MEAP -- Grade 8

*Philip Babcock, State Department of Treasury*

This talk examines changes and current issues (including sample questions and assessment issues) in the new state mathematics exam (2002 MEAP). Participants may ask questions about the test.

*Grade 8*

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

- C1 3D Geometry Activities and More (Part I)**  
*Marie Lusk, Forest Hills Northern High School*  
*Jim Marresse, Forest Hills Northern High School*  
 Participants will complete 3-4 hands-on geometry activities involving 3-dimensional figures. Session members will work in cooperative groups on a "Build-It" block activity, construct a 3-D mobile, and build tetrahedron kites. *Grades 9-11*
- C2 Improving Behavior Improves Knowledge**  
*Mary Jones, Grand Rapids Public Schools*  
*Math Curriculum Coordinator*  
 This session repeats A7. Please refer to A7 abstract. *Grades K-12*

- C3 Graphing Community Needs**  
*Tara Plummer, Zeeland Public Schools*  
 Our local United Way worked with middle school students in providing us with graphable information. These at-risk students analyzed agencies' data and presented their findings to the community. *Grades 6-12*
- C4 The Parabolic Project: An Advanced Algebra Lab**  
*Steve Bearss, Zeeland Public Schools*  
 Challenge: Roll a steel ball down a ramp, through the air, to land in various sized canisters. Success depends on careful measurements and a quadratic model of the form  $y = ax^2 + k$ . Participants will conduct this experiment. *Grades 9-12*

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

- D1 3D Geometry Activities and More (Part II)**  
*Marie Lusk, Forest Hills Northern High School*  
*Jim Marresse, Forest Hills Northern High School*  
 Participants will complete 3-4 hands-on geometry activities involving 3-dimensional figures. Session members will work in cooperative groups on a "Build-It" block activity, construct a 3-D mobile, and build tetrahedron kites. (Part I not required.) *Grades 9-11*
- D2 Balanced Assessment: MEAP Scores and Classroom Impact**  
*Ann Enyart, Hastings Middle School*  
 We will look at Balanced Assessment tasks and discuss preparing your students for the constructed response questions on the new MEAP test. Discussion will include practical alternative assessment suggestions. *Grades 4-8*
- D3 Activities to Assist in Understanding Transformations**  
*Susan Metzger, Grand Haven High School*  
 As noted in the Standards, transformations are to be taught not only to enhance the understanding of our physical world, but also to enrich the concepts of matrices and functions. This workshop will provide hands-on activities for teaching transformations. *Grades 7-12*

- D4 Water Play: Bottles, Graphs, and Changing Quantities**  
*Georgianna Klein, GVSU Mathematics/Statistics*  
 Why does a graph curve down? Up? Appear straight? We will use bottles, water, and measurement to explore fundamental features of graphs by connecting change in quantities to attributes of graphs. *Grades 7-12*
- D5 Developing and Constructing Factor Lattices**  
*Brian Schad, Ann Arbor Schools*  
 Factor lattices extend the concept of factors into the area of geometry. Whole number lattices will be constructed with marshmallows and toothpicks in the first, second and third dimensions. *Grades 4-8*
- D6 Update on the 2002 MEAP -- Grade 11**  
*Phillip Babcock, State Department of Treasury*  
 This talk examines changes and current issues (including sample questions and assessment issues) in the new state mathematics exam (2002 MEAP). Participants may ask questions about the test. *Grade 11*
- D7 A Probability Math Carnival**  
*Susan Walborn, Math Lab Specialist - GR Public Schools*  
 Learn how to set up and run a student-led Math Carnival based on NCTM Standard 5: Data Analysis, Statistics and Probability. *Grades K-6*



### Mathematics in Action Registration Form

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

<b>Name</b>		<b>Social Security Number</b>	
<b>Address</b>		<b>City</b>	<b>Zip</b>
<b>Daytime Phone ( )</b>		<b>Email address</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"/>	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) _____
<b>Teachers Only Fill Out Next Row</b>			
<b>Name of School</b>	<b>School District</b>		<b>Grades Teaching Now</b>

#### Your registration is your confirmation.

(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  
 \$15.00 per teacher/educator  
 \$7.00 per student  
 (make checks payable to GVSU)  
 and mail this completed registration form  
 postmarked by **February 16, 2001** to:

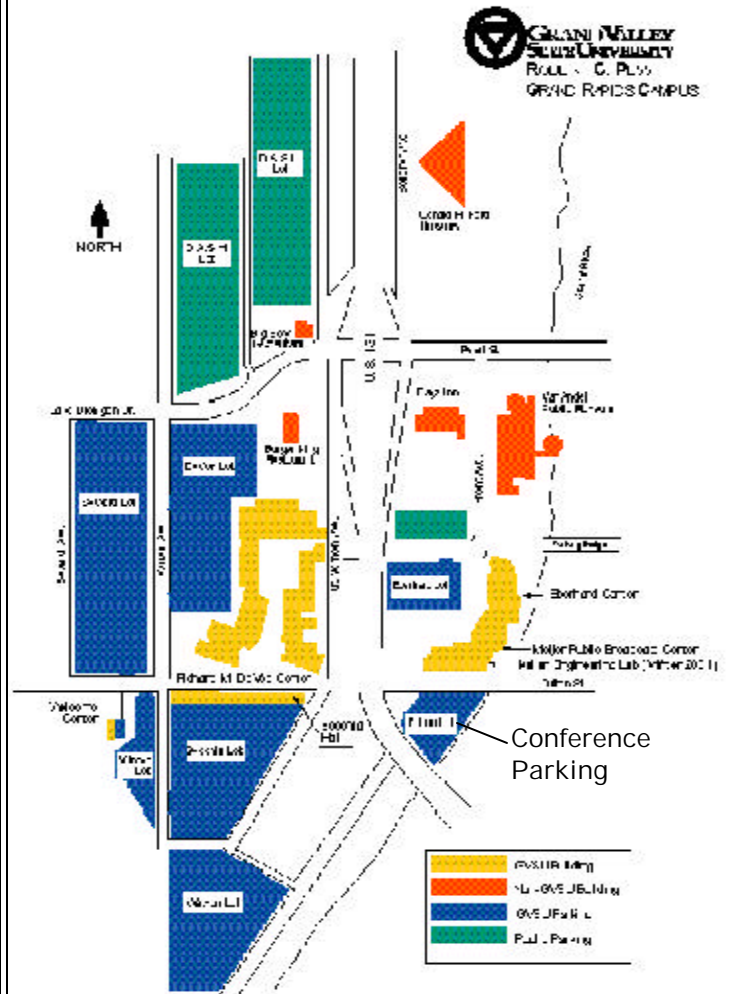
Regional Math/Science Center - MIA  
 Grand Valley State University  
 224 Padnos Hall  
 Allendale, MI 49401

Use Eisenhower or local professional development funds to cover the cost. See your school for information.

# Math in Action Schedule

8:00 am	Registration and Refreshments Eberhard Center, 2nd floor lobby
9:00 am	Plenary Address Elizabeth Phillips, Michigan State University Teleconference Center, Eberhard Center
10:15 am	Session A Conference Facilities, Eberhard Center
11:30 am	Session B or Lunch Conference Facilities, Eberhard Center
12:45 pm	Session C or Lunch Conference Facilities, Eberhard Center
2:00 pm	Session D Conference Facilities, Eberhard Center

## GVSU MAP



**From US 131 - South:** Exit at Market St. Turn left onto Market. The first light is Fulton St. Turn left onto Fulton. Proceed West on Fulton to Front St. just past the Fulton lot. Turn left on Front St. and enter the Fulton parking lot.

**From US 131 - North:** Exit at Leonard St. At light, cross Leonard and proceed South on Turner St. Next light will be at Bridge St. Cross Bridge St. and continue to head South (Turner will change into Mt. Vernon). Continue driving South on Mt. Vernon to Fulton St. At Fulton, turn left, then turn right on Front just before the Fulton lot.

**From I-96 - East & West:** Exit at Ottawa/Downtown exit. Follow Ottawa St. to Fulton St. Turn right onto Fulton. Proceed West on Fulton to Front St. just before US131. Turn left onto Front and proceed to enter the Fulton lot.

January 3, 2001

Dear Educator,

You are cordially invited to attend the annual Math In Action Conference hosted by Grand Valley State University on Thursday, March 1, 2001. The conference will be held in the Eberhard Center on GVSU's Robert C. Pew Campus in downtown Grand Rapids and will run from 9 am to 3 pm.

We are excited to have Elizabeth Difanis Phillips of Michigan State University begin the conference with a plenary address. Ms. Phillips will speak on algebraic reasoning across the K-12 curriculum and its ties to the 2000 NCTM *Standards*. With her unique combination of experience as a high school teacher, mathematics education researcher, and leader in educational reform, Betty promises to bring interesting insights and examples related to student learning.

Following the opening address, four sets of concurrent sessions will offer teachers the opportunity to experience a variety of hands-on projects and activities that other educators have found successful. Each session will offer classroom-ready ideas applicable to the K-12 curriculum, including a discussion of the 2002 MEAP. Please examine the session descriptions with titles and abstracts of the various presentations for further information.

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,

Esther Billings  
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Matthew Boelkins  
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