



Show-Me Center Newsletter

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Inside this Issue:

Show-Me Web site	2
Activity Showcase	3
Resources/Links	4
Conferences & Contact Information	5
Perspectives on Curriculum Reform	6
Have you read?	7
Parent Brochure	8

Introducing Show-Me Regional Associates

The over-arching goal of the Show-Me Project is to ensure the opportunity for every middle school student to study important mathematics within a learning environment that challenges their intellect and engages their interest. Opportunity to learn depends, in part, on a well-articulated, coherent, and rigorous curriculum and a good set of curriculum materials. Standards-based curriculum materials (*Connected Mathematics Project*, *MATH Themes*, *MathScape*, and *Mathematics in Context*) are examples of mathematically rigorous and engaging materials. Each is:

- comprehensive (multi-year and based on content outlined by NCTM);
- high quality (based on independent review by AAAS and the U.S. DoE);
- extensively field tested and revised based on pilot data;
- built on a sound instructional design that reflects how students learn;
- positively impacting student learning (confirmation by independent researchers);
- published and distributed nationally by a commercial vendor.

The Show-Me Project's primary work is to support teacher development, with standards-based curricula serving as a vehicle for professional growth and renewal. To help facilitate this work, Show-Me Center staff at the University of Missouri work with Satellite Center staff at:

University of Wisconsin – MiC Center
Michigan State University – CMP Center
Educational Development Center – MathScape Center
University of Montana – MATH Themes Center.

In addition, a core group of people with expertise in professional development and knowledge of standards-based curriculum materials serve as **Show-Me Regional Associates (SMRA)**. Geographically located around the country, SMRAs help support teachers, school district leaders, and state agency personnel explore curriculum materials and/or undertake standards-based curriculum implementation. They serve the Project in numerous ways including facilitating presentations and workshops, consulting with school districts engaged in studying, selecting, or implementing standards-based middle grades mathematics curricula, and developing materials and information needed by clients.

Please contact the Show-Me Center (showmecenter@missouri.edu) for more information about how the SMRA in your region can be of assistance to you.



Show-Me Regional Associates (from left to right): Linda Selwood (DE), Peg Bondorew (MA), Ron Preston (NC), Murrel Brewer-Hoover (WV), Sharon Stenglien (MN), Linda Tetley (MO), Bob Bates (MA), Rebecca McGraw (AZ), Nancy Mumaw (OH). Not pictured: Jenny Bay-Williams (KS), Gay Ragan (MO), and Judd Freeman (CO).

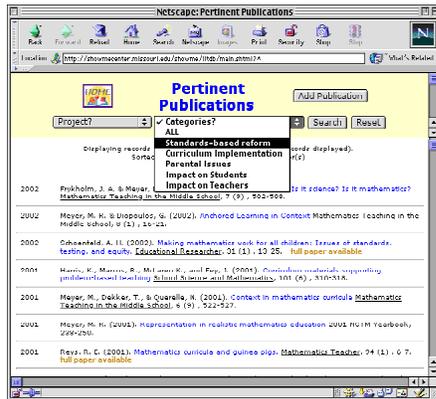
Show-Me Web site – Publications link

“A mathematics curriculum and its implementation might be judged by its results, as is the case in most fields. Good results would suggest keeping things the way they are; poor results would indicate that change of some sort is in order.”

Larry Souder, “The good old days never were” included in the *Perspectives* section.

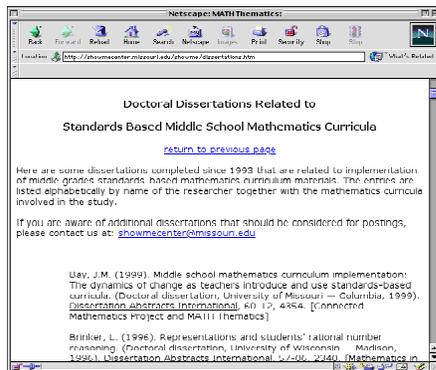
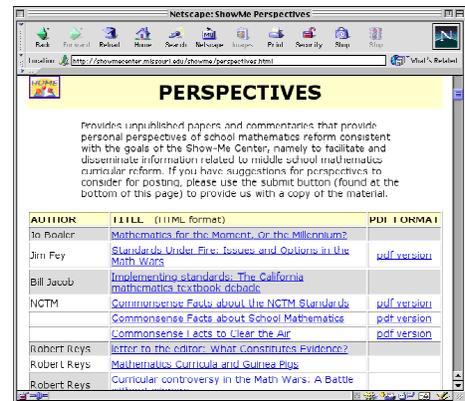
At the **Publications** link on the Show-Me Web site homepage, three kinds of print materials are highlighted: published articles, perspectives, and dissertations.

A complete reference and abstract are provided for each listing. In some cases a pdf version of the material is provided. New materials are added regularly.



The **Perspectives** link includes papers and commentaries that provide personal perspectives of school mathematics reform consistent with the goals of the Show-Me Center, namely to facilitate and disseminate information related to middle school mathematics curricular reform.

The **Published Articles** link includes a database of articles that have been published in peer-reviewed journals. The articles can be sorted by issues such as: student achievement, curriculum implementation, professional growth of teachers. Show-Me Center staff regularly review more than a dozen journals in selecting articles to be posted.



The **Dissertation** link includes a list of dissertations that address issues related to standards-based mathematics curriculum implementation. The Show-Me staff regularly reviews *Dissertations Abstracts International* (DAI) in developing this list.

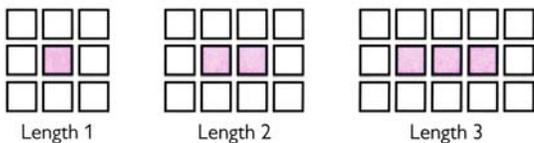
Activity Showcase

This activity comes from the *MathScape* curriculum, grade 6 unit, "Patterns in Numbers and Shapes."

In this unit students explore patterns, describe mathematical relationships orally and in writing, make tables and graphs, and begin using the algebraic language of variables and expressions. Try (on your own or with your colleagues or students) the investigations below from the 5th lesson in the unit, "Tiling Garden Beds." Prior to this lesson, students have identified, described, and generalized patterns, organized data in a table, and been introduced to the concepts of variables and expressions.

Find the Number of Tiles Investigation (excerpt)

Here are three sizes of gardens (pink area) framed with a single row of tiles:

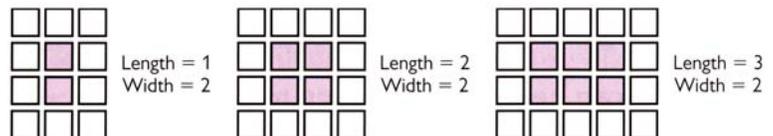


- Begin a table that shows the number of tiles for each length of garden. Use the table to write an expression that describes the number of tiles needed for a garden of any length.
- Use your expression to find how many tiles you would need to make a border around the gardens of each of these lengths.
 - 20 squares
 - 30 squares
 - 100 squares
- Tell how you would find the length of the garden if you knew only the number of tiles in the border. Test your method. How long is the garden if the following number of tiles are used for the border?
 - 68 tiles
 - 152 tiles
 - 512 tiles

In future issues of the Newsletter, activities from other standards-based curricula will be showcased.

Extend the Rule Investigation (excerpt)

Some gardens are two squares wide, and vary in length. For example:



Can you find the number of tiles needed for gardens of any length and a width of 2? Use an expression that describes your method. How many tiles do you need to make a border around each of the following gardens?

- $l=5, w=2$
- $l=10, w=2$
- $l=20, w=2$
- $l=100, w=2$

Things for Teachers to Think About

- Students often come up with different expressions for the number of tiles needed. At the end of this lesson, they write about how they can tell if their expressions are equivalent. What questions would you ask to deepen their thinking about equivalence?
- Writing expressions with two variables will be introduced in the next lesson. How might the investigations above prepare students for that challenge?

If you'd like to see more of this activity, check out the Show-Me Web site, Curriculum Showcase at:

showmecenter.missouri.edu/showme/Lesson/main.shtml



Did you know....

The National Science Foundation Mathematics and Science Partnership (MSP) program supports innovative partnership-driven projects developed to improve K-12 student achievement in mathematics and science. MSP grants focus on three inter-related goals:

- Ensuring that all students have access to challenging and advanced mathematics and science courses;

- Enhancing the quality, quantity and diversity of the K-12 mathematics and science teacher workforce; and
- Developing evidence-based outcomes that contribute to understanding how students effectively learn mathematics and science.

For more information, see:
<https://www.ehr.nsf.gov/msp/>



The Show-Me Center has a new e-mail address:

showmecenter@missouri.edu

Update your address book!



On Jan. 8, 2002, President Bush signed into law the No Child Left Behind Act of 2001 (NCLB). This new law represents his education reform plan and contains the most sweeping changes to the Elementary and Secondary Education Act (ESEA) since it was enacted in 1965. It changes the federal government's role in kindergarten-through-grade-12 education by asking America's schools to describe their success in terms of what each student accomplishes. The Act contains the President's four basic education reform principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that have been proven to work.

For more information, see the No Child Left Behind Web site at: <http://www.nclb.gov>

Send us your story

In upcoming issues of the Show-Me Newsletter we'd like to share stories of implementation of standards-based middle grades mathematics curricula. What materials are you using? What professional development was provided to teachers? How was that professional development organized and what was the focus? What advice would you give others considering implementation of standards-based curriculum materials? If you'd like to share your story, send us a brief summary via our e-mail address (showmecenter@missouri.edu). We'll contact you to set up a phone interview to develop the story.

Upcoming Show-Me Conferences

Show-Me Teacher Education Conference

January 30, 2003 Atlanta, GA

Teacher educators are encouraged to participate in this conference. Sessions will focus on preparation of middle school mathematics teachers. Resources for working with middle school mathematics teacher candidates will be explored, including use of standards-based curriculum materials. A conference agenda and registration form are available at: showmecenter.missouri.edu/AMTE

Show-Me Researchers' Workshop

May 18-21, 2003 Columbia, MO

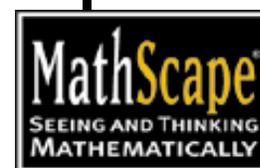
The *Researchers' Workshop* will explore methodologies and instruments for investigating the impact of standards-based middle school mathematics curricula. Financial support is available for up to 20 participants.

Application to participate is required. Priority will be given to individuals interested in engaging in research related to use of standards-based middle grades mathematics curriculum materials. Application materials are available at: showmecenter.missouri.edu/rSMResWkshp.htm

Show-Me and COMPASS Showcase

June 27-29, 2003 Chicago, IL

A joint conference showcasing NSF middle and secondary mathematics curriculum materials is being planned by the Show-Me and COMPASS staff. Participants will examine materials and discuss articulation and transition issues related to middle and high-school mathematics curriculum. The conference will take place at the Chicago Wyndham Hotel. Participation is limited to 300 people. Look for registration materials at: showmecenter.missouri.edu/showcase

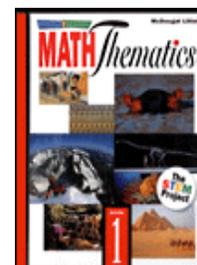


Curriculum Satellite Centers and Publishers

Curriculum	Show-Me Satellite Center	Publisher
<i>Connected Mathematics Project</i> Gr. 6-8	Betty Phillips A717 Wells Hall Michigan State University East Lansing, MI 48824 (517) 432-2870 cmp@math.msu.edu http://www.math.msu.edu/cmp	Prentice-Hall http://phschool.com/math/cmp
<i>Mathematics in Context</i> Gr. 5-8	Meg Meyer University of Wisconsin-Madison 575K Educational Sciences Bldg. Madison, WI 53706 (608) 263-1798 mrmeyer2@facstaff.wisc.edu	Holt Rinehart & Winston http://www.hrw.com
<i>MATHematics</i> Gr. 6-8	Rick Billstein Mathematics Department University of Montana Missoula, MT 59812 rickb@selway.umt.edu http://www.math.umt.edu/~stem	McDougal Littell http://classzone.com/maththem/
<i>MathScape</i> Gr. 6-8	Emily Fagan Education Development Center 55 Chapel Street Newton, MA 02458 (617) 969-7100 x3519 mathscape@edc.org http://www2.edc.org/MathscapeSTM	Glencoe McGraw-Hill http://www.math.glencoe.com/



**Connected
Mathematics
Project**





“Students left class thinking that math consisted only of dull procedures and rules to memorize.”

Perspectives on Curriculum Reform

Bring on Educational Reform

Robert E. Reys, University of Missouri

This article first appeared in The Christian Science Monitor on November 15, 2002. All rights reserved.

I am tired of hearing from doomsday educational critics who would have us abandon new ideas and return to the “good old days” - particularly in math education, where American students fall way behind the rest of the world.

Efforts to reform mathematics education are under way, but they have not reached many classrooms in the United States. While some math teachers are emphasizing thinking and problem solving, many students still experience mathematics that is dominated by memorization and drill, without any meaningful context. Reform classrooms are using technology to model and explore ideas. Students are challenged to find ways to solve problems based on what they know and understand. They have opportunities to link math to real-world problems.

While some schools are embracing reform mathematics, many others are persuaded by naysayers. But if schools continue to do more of what they’ve always done, they’ll continue to produce too many students uninterested and unmotivated to study mathematics beyond high school.

I graduated from a small Missouri high school more than 40 years ago. Although I had caring teachers, and went on to major in mathematics in college, my high school experience with mathematics was weak. Most of my peers hated math. Algorithms and tedious procedures were demonstrated with little or no explanation of why they work. Sensemaking and understanding were not a part of my experience of learning mathematics. Students left class thinking that math consisted only of dull procedures and rules to memorize.

Performances over the past 30 years on the National Assessment of Education Progress and the International Mathematics and



<http://www.csmonitor.com/>

Science Studies document that traditional mathematics curricula and methods of teaching have not been effective. However, research is emerging that shows reform mathematics is increasing student learning.

The National Council of Teachers of Mathematics, a nonprofit organization of mathematics teachers, has published a set of content standards in math called *Principles and Standards for School Mathematics* (<http://nctm.org>). Consistent with these standards, some textbooks are now integrated - topics from arithmetic, algebra, geometry, statistics, and probability are naturally connected. Integration is commonplace in countries, such as Japan, whose students excel on international mathematics tests. But most US schools are still mired in a 19th-century course sequence of Algebra I, Geometry, and Algebra II.

Throughout most of the 20th century, statistics and probability were not taught in school. Yet today, one cannot read and understand Newsweek, USA Today, or countless other news sources without being able to interpret statistical information. As a student, I used a slide rule to do some computations; today, I use a calculator. I also spent endless hours doing computations and rarely learning to estimate. Now I rarely do any tedious computations but regularly call upon estimation to decide if a calculator result is reasonable.

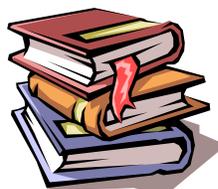
True reform would allow calculators, graphing calculators, and other readily available technological tools to help students solve equations in an instant, replacing pages of written procedures and hours of work. A mathematics curriculum should reflect what is important for the future and include advances in technology.

My college-aged son benefited from the reforms used by progressive public high school teachers and standards-based reform mathematics curricula. His classes were driven by interesting problems that teachers used to challenge students' thinking and engage them in learning mathematics. He scored at the 99th percentile on the ACT and SAT and graduated from high school with more mathematical knowledge than I learned in my first two years of college.

My grandchildren are learning from standards-based reform mathematics curricula in public elementary school. They are actively engaged in problem solving. They are developing fluency with their basic facts and also using calculators. They realize that while it is not always easy, math can be fun to learn. They typify thousands of US children who are benefiting from a mathematics education that is better than what many of their parents and grandparents experienced. Their growth underscores the fact that the problem of low achievement is not in the unconventional ways of reform math, but in too little exposure to it.

Change in the real world is inevitable, and so, too, is change in the education of students who are preparing to enter that world. Approaches such as rote memorization proved to be ineffective in the 20th century.

The good old days of mathematics never were. It's time to help our current generation of children prepare for their future and kiss the good old days goodbye for good.



Have you read....

Standards-based school mathematics curricula: What are they? What do students learn? (2002) Senk, Sharon & Thompson, Denisse (Eds.) Mahwah, NJ: Lawrence Erlbaum.

What features characterize standards-based curricula? How well do such curricula work? To answer these questions, the editors invited researchers who had investigated the implementation of 12 different standards-based mathematics curricula to describe the effects of these curricula on students' learning and achievement, and to provide evidence for any claims they made.

This volume is a valuable resource for all participants in discussions about school mathematics curricula—including teachers, school administrators, researchers, educational policy makers, and parents. The editors hope that the large body of empirical

evidence and the thoughtful discussion of educational values found in this book will enable readers to engage in informed civil discourse about the goals and methods of school mathematics curricula and related research.

"...summarizes the formative research that has gone into funded mathematics curriculum development, mostly from NSF, over the past decade or so. An account of the evidence on student learning for the various projects is sorely needed, and given the hostile 'math wars' that are now going on, we need a scholarly presentation, not more harsh rhetoric. Senk and Thompson are first rate mathematics education scholars....I feel they can present the case better than most others....Standards-Based School Mathematics Curricula is a major contribution to the literature in mathematics education."

James W. Wilson, University of Georgia

The Show-Me Center

121 Townsend Hall
UNIVERSITY OF MISSOURI-COLUMBIA
Columbia, MO 65211



PHONE:
(573) 884-2099

FAX:
(573) 882-4481

E-MAIL:
showmecenter@missouri.edu

We're on the Web!

See us at:
<http://showmecenter.missouri.edu>

PARENT BROCHURE AVAILABLE IN ENGLISH AND SPANISH

A brochure for parents describing standards-based mathematics curriculum and instruction is available in both English and Spanish on the Show-Me Web site. Strategies parents can use to help their children are offered. The brochure also includes a list of resource materials and web sites related to mathematics education. See:

showmecenter.missouri.edu/resources/parentbrochure.pdf

**Mathematics
Education
& Your Child:
What Parents Should Know**



The Show-Me Project is a National Center for Middle Grades Mathematics Curricula supported by the National Science Foundation under grant no. ESI-0137305. See <http://showmecenter.missouri.edu> for more information about the Project.

