Introducing

Math Solutions.

AK-SRESOURC Fourth Edition **STEACHING** Mathematics Marike Burns Marilyn Burns

NEW! Fourth Edition Available April 2015

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What's in **About Teaching Mathematics**, **Fourth Edition?**

Part 1 **Starting Points**

This first part of the book reflects the major overhaul of About Teaching Mathematics. Here Marilyn addresses twenty-three issues and presents her current thinking. The Starting Points are organized into six categories:

- General Pedagogical Issues
- Number and Operations: The Mathematical Cornerstone
- From Arithmetic to Problem Solving
- Assessing Understanding and Skills
- Suggestions for Classroom Instruction
- Connecting to English Language Arts Instruction

Part 3 **Teaching Arithmetic**

Focusing on the cornerstone of elementary mathematics curriculum, the ideas in this part are models for instruction that builds students' understanding, confidence, and competence in arithmetic:

- Beginning Number Concepts
- Place Value
- Addition and Subtraction
- Introducing Multiplication
- Introducing Division
- Extending Multiplication and Division
- Fractions
- Decimals
- Percents

Organized similarly to the instructional suggestions in Part 3, assessments are also included for each topic to inform instruction.

rule so it's possible to count on one, two, or three numbers. try it counting on one, two, three, or four numbers. included this two-player game in The vrote in 1975! The gar

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Part 2 **Problem-Solving Investigations**

After an introduction about how to plan problem-solving lessons, specific ideas are organized into five areas of the curriculum:

- Measurement
- Data
- Geometry
- Patterns and Algebraic Thinking
- Number and Operations

Each section includes an overview of the mathematical focus, sample whole-class lessons, additional investigations for wholeclass lessons, and independent investigations. About the Mathematics sections for some of the investigations give insights into the underlying math.

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Part 4 **Questions Teachers Ask**

Here Marilyn responds to pedagogical questions she's received from teachers over the years. She chose more than two dozen questions that reflect common themes from her archives.

a group, they should agree on the colors to use. Direct them to look for patterns on both charts. Also, tell them not to tackle 98 and 89 unless they are ready for a serious bout with addition. (Each number takes twenty-four steps with a resulting palindrome

Extension: l. Change for 21 or Change H

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Special Features

Sample Whole-Class Lessons

Detailed plans are provided for using problem-solving investigations in whole-class lessons. These instructional suggestions are offered for all the content areas in Part 2 and for all arithmetic topics in Part 3.

Sample Lesson

Palindromes

This investigation engages students in looking for numerical patterns that emerge from adding numbers in a particular way.

Materials

large 0–99 chart, 1 per student R See Reproducible R.13 Palindrome Recording Sheet, 1 per student R See Reproducible R.14

Introducing

1. Present or review concepts. A palindrome is a number that reads the same forward and backward, such as 44, 252, or 8,008. A number that is not a palindrome, such as 13, can be changed into a palindrome by using a particular procedure: You reverse the digits

NEW

About the Mathematics

Over the years, teachers have written to Marilyn asking for help with some of the investigations in About Teaching Mathematics. In these sections, Marilyn addresses the underlying mathematics for those problem-solving investigation.

Making Change

Find all the ways to make change for \$0.50. Easier version: Find all the ways to make change for a quarter. Harder version: Find all the ways to make change for \$1.00.



Using the context of money, this problem calls for making a list of all possible ways and, in that way, it's similar to Number Sums (see pages 265-266). The investigations are also similar in that both involve thinking about different addition combinations. I approached solving this investigation the same way I did for Number Sums, making a list in an orderly fashion that would exhaust all the possibilities for making change for \$0.25,

Teaching tip

NEW

Marilyn's Notes

Marilyn's personal (and dog eared) copy of the Third Edition is filled with notes, some scribbled into the margins and some on sticky notes. In this new Fourth Edition, Marilyn has reproduced many of these notes, added new ones as well, and organized them into categories to make them more useful. Look for notes titled Teaching Tip, Management Suggestion, When Observing, Vocabulary Suggestion, Literature Connection, and more.

Management Suggestion To compile students' work, I ask students to choose one of their shapes, copy it onto large geoboard dot paper, cut it out, and post it. I ask them to post only shapes that haven't already been posted. -MSB

As for Square NP, point that they ing on the

When Observing I've found that groups sometimes start by dividing up the numbers and working individually, but then shift to collaborating in a different way as they begin to notice patterns, such as about which numbers are one-step palindromes.

-MSB

Includes more than 250 math investigations!

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5 TEACHING Mathematics Marilyn Burns

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"This is a timeless, treasure of mathematical understandings... these activities, coupled with hands-on trainings, can make a tremendous difference in the mathematical understanding of elementary and early middle school teachers."

> "Gives teachers the math background necessary to listen to students as they talk and write their way

"Deep understanding of math is critical for teachers."

"A gem that helps students acquire math understanding."

> "I never liked math. I didn't really know how to teach it either. After reading this book, I feel more confident about teaching math and I actually enjoy it. I love this method of instruction and my students love it too. But be careful, after reading this one you will want the other mathsolutions.com publications!

> > - Amazon reviews, About Teaching Mathematics, Third Edition

Also from Math Solutions and Marilyn Burns

MARILYN BURNS Math Blog

Hear directly from Marilyn about her current thinking about math education and her ongoing classroom experiences and learning.

www.marilynburnsmathblog.com



About Teaching Mathematics Professional Learning 3-, 4-, or 5-day Institutes

These Math Solutions institutes help teachers change how they think about mathematics and how they teach it to their students. Tailored to districts' particular needs, teachers learn how to

- develop students abilities to think and reason;
- build students' number sense, computation, and problemsolving skills;
- organize instruction for wholeclass, small-group, and individual learning.

Institute instructors with extensive classroom experience address specific grade-level needs.

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"This course changed my thinking about math and how I teach it. This is the best math course I've ever attended. Thank you!" —Amy Seegars, Grade I Teacher