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## Marilyn Burns

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*This past January, Instructor magazine invited our online readers to send in questions to math expert Marilyn Burns. Hundreds of teachers from all over the country took the opportunity to voice their concerns about teaching math, and Marilyn thoughtfully read their queries. Here are her answers to your most frequently asked questions.*

## WITH MARILYN BURNS

**Q** *How can I help my second graders master their basic addition facts?* —Mary Donovan, South San Francisco, CA

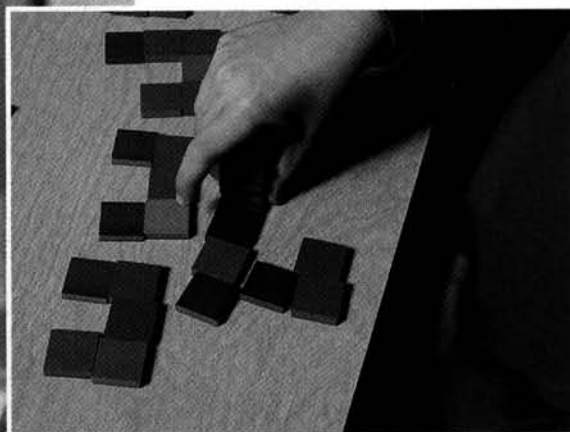
**A** It would be grand if students learned the basic addition tables just from daily practice. But, in my experience, even rigorous

attention to problem solving and calculating mentally don't do the trick. Extra attention is always needed.

One classroom strategy that has worked for me is to help children cut the table down to a manageable size. Post a chart of the addition table and ask the children, "Which are the easy ones?" Children typically respond that

it's easy to add 1 to any number. As they identify those particular combinations, cross them out. Children also often know some of the doubles— $2 + 2$ ,  $3 + 3$ ,  $4 + 4$ ,  $5 + 5$ , and  $10 + 10$ . Cross these out. Now there are fewer than 80 sums left for the children to learn.

Give the class a "hard" one to figure out, perhaps  $9 + 3$ . Talk with them about



**Q** *Rounding is very confusing for my fourth graders. Is there anything that I can do to help them?*

—Michelle Towns, Lakeside, CA

**A** Rules by themselves won't lead to understanding or developing adequate skills. It's important first for children to have many and varied experiences estimating and rounding. An idea that has worked for me is "friendly" numbers. "They're numbers that are easy to think about," I tell them. Then I ask them a variety of questions about friendly numbers:

● *What are some examples of numbers that you think are friendly?* Typically students choose 1, 5, 10, 100; older students may include 25 and 1,000. I ask them to explain the reasons for their choices. I point out that 1, 10, 100, and 1,000 are landmark numbers for our number system and have them discuss why.

● *Which do you think is friendlier, 73 or 70?* Typically students agree that 70 is easier. "You get to 70 by counting by tens," Alan told me, "but you can't get to 73 that way." I point out that the numbers that we use when counting by 10's—10, 20, 30, 40, and so on—are friendly numbers.

● *What's a friendly number that's close to 57? 113? 487?* More than one answer is possible for questions like these, so I'm sure to have students explain their reasoning for their answers.

Once children are comfortable with questions like these, address rounding directly. Write a number between 100

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their strategies. Once the children agree that 12 is the sum, tell them that they now know the answer to  $3 + 9$ . Ask children to explain why. Then explain, "When you learn one sum, you've really learned two!" Ask the children to help you find the matching pairs, and cross out all of those on the same side of the diagonal. Now there are fewer than half the sums left to memorize. Each day, spend time on one of these sums, figuring out different ways to answer it.

**Q** *We practice and practice, but some of my students still don't master the multiplication table. What can I do to help them?*

—Laura Nickels, Eldon, MI

**A** As a first step, it's essential to remember that memorizing should follow understanding. I don't ask students to memorize until after they can perform computations (even if

they are clumsy and inefficient doing so) and have had success using numbers to solve problems.

Help students who are struggling take charge of their own learning. Brainstorm with the students all the different ways they can think of to memorize a portion of the multiplication table, say the 7's. Students may come up with flash cards, writing them out, inventing a rhyme or song, practicing with a friend, or using a classroom aid or game. Ask each student to select one of these ways and devote class time for study. Then have students quiz one another.

Afterward, discuss their successes or problems, then have them choose another method to try. Also, to support their memorizing, engage students in looking for patterns in the table. Ask older students to find out if there are more even or odd products, which product occurs most often, and which numbers never appear as products.



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and 900 on the board; for example, 138. Ask: What friendly number that ends in a zero is closest to 138? What friendly number that ends in two zeros is closest to 138? These questions rephrase the typical language of rounding to the nearest 10 and 100. Continue with more examples, including larger numbers.

Talk about how “rounding” a number means “finding the friendly number that is close to your original number,” and about how “ends in a 0” relates to 10’s while “ends in two 0’s” relates to 100’s.

ful?” After I listed individual estimates on the board, each student took a handful, counted it, and put the beans in the container. We talked about why handfuls were different sizes and how an individual student might take a different number of beans on the next try.

Then, in small groups, students figured out their group’s total. I recorded the group totals on the board and then said, “Look at this information and see if you’d like to revise your estimates.” This gave students a chance to estimate the sum of the numbers on the board.



**Q** *What fun hands-on activities can I use to make learning estimation more engaging?*

—Ruthie Kinker, South Hill, VA

**A** I try to engage the class by using fun and different collections of objects for hands-on estimating. For example, I showed the class an empty container and asked, “About how many lima beans would we have in the container if each student put in a hand-

I repeated the activity over the year using cubes, toy soldiers, Legos®, and paper clips. Also, I did the same investigation with other problems:

- About how many pockets do we have altogether?
- About how many buttons do we have altogether?
- About how many books are in the class library?
- About how many letters are there altogether in our first names?

**Q** *Many of my students are confused about the value of coins and the counting of money. Do you have any activity ideas to help?*

—Linda Shriver, Canton, OH

**A** First and second grade is not only a fine time to help children learn about our monetary system, but instruction about money can also promote and develop children’s number sense.

Beginning instruction about money should focus children’s learning in three areas—the names of coins, the values of coins, and how to represent amounts of money symbolically.

For a whole class activity, give each child a penny, a nickel, and a dime. Ask them to examine each coin to find similarities and differences. Discuss their discoveries. Then ask the children coin questions, such as “Which coins have a building on the back?” and “Which coin has a picture of President Lincoln?”

Then have the children play a simple coin game. Separate the class into pairs. Give each pair a small paper lunch bag with nine coins in it—three pennies, three nickels, and three dimes. The first child calls out the name of a coin: penny, nickel, or dime. The other reaches into the lunch bag and, without peeking, tries to remove the coin named.

For a harder version of the game that also focuses on coin values, prepare a set of cards for various money values that can be made from three pennies, three nickels, and three dimes: 1¢, 5¢, 10¢, 3¢, 6¢, 12¢, 21¢, 25¢, and so on. One child chooses a card, the other reaches into the bag to remove the coins, and together they count the coins to see if they match. The children record their answers by writing the coin values on the cards or by drawing the coins they choose. ■

Marilyn Burns is the creator of Math Solutions Inservice courses, which are offered nationwide, and the author of numerous books for teachers and children. For more information visit [www.mathsolutions.com](http://www.mathsolutions.com)