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## *Why does the math that my child brings home look different from the math I remember?*

### **Yesterday — Focus on Memorization**

The mathematics you remember from years ago may have focused on memorized facts and methods for solving problems. In the past, teachers thought students were good in mathematics if they could “do math” quickly even if they didn’t understand what they were doing. Students are still being taught the same skills you learned, but they learn them with understanding.

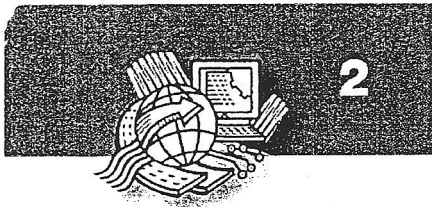
### **Today — Focus on Understanding**

Today, more emphasis is placed on thinking and understanding. No matter how well your child can do calculations, this ability is not very useful if he or she doesn’t understand them or know how or when to use particular math skills. National and international studies have shown that students have made steady improvement in math since 1990 when the National Council of Teachers of Mathematics began advocating standards-based mathematics education and learning with understanding. For example, results for the 2005 National Assessment of Educational Progress (NAEP, the Nation’s Report Card) show that 80 percent of fourth graders and 69 percent of eighth graders performed at or above the basic level in math, compared to only 50 percent and 52 percent in 1990.

### **Active Learners**

Because society has changed, the math that students need to know has also changed. Instead of worksheets filled with problems calling only for numerical calculations, your child may be bringing home problems that relate to real life, such as working with salaries and the cost of living and life expectancy, and making decisions based on comparisons. Because technology is used in so many different ways today, students need to be able to reason about problems and explain mathematics. Real learning is more than just a student listening to a teacher. Think about your own learning experiences. You probably remember those times when you actively participated in a learning activity much more than when you just listened to and watched the teacher





Yesterday's Classroom

Today's Classroom

Straight rows of desks

Groups of desks

Teachers showing students how to solve a problem while the students copied the process from the board

Students working together and discussing how to solve a problem, with guidance from teachers

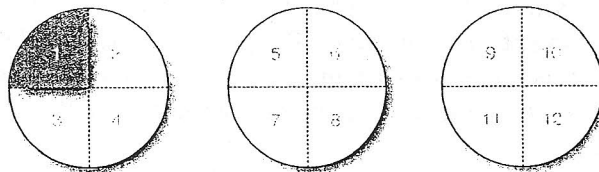
Students repeating given rules and memorizing what to do in operations on numbers

Students applying the mathematics they know to develop new skills as they examine and question solutions to problems, including real-world situations

Today's students are solving problems that they might come across in their everyday lives. They are learning many of the same skills you learned—and more. For example, think about how you might have learned to divide fractions in school. To solve  $3 \div 1/4$ , you were probably taught to “invert and multiply,” like this:  $3/1 \times 4/1 = 12/1$ . Did you understand why you were inverting or what the answer meant?

Today's students might relate this problem to a real-life situation such as the following:

*Jason has 3 pounds of hamburger and wants to make patties that weigh 1/4 of a pound apiece. How many patties can he make? They begin by drawing a model of the problem,  $3 \div 1/4$*



Suppose that each circle represents 1 (one unit, or one whole—in this case, a pound of hamburger).

The shaded slice in the first circle represents  $1/4$  (one patty).

How many one-fourths are in 3 wholes? We can see that twelve of the one-fourth pieces, four “slices” per circle, will fill all three of the circles.

Putting the problem in a real-life context helps students make a picture of it in their minds, and this can help them later in understanding why the process of inverting and multiplying works.

The goal of mathematics education today is to develop a lifelong understanding that is useful both at home and in the workplace. Whatever your child chooses to do in life, having a strong understanding of mathematics will open doors to a productive future.

