A Union of Professionals
Common Core State Standards

Dear Parents and Caregivers,

Thank you for the support you give your child in learning mathematics. This year we are teaching the new Common Core mathematics standards which guide us to more focused instruction so children can be more successful. The PTA has *Parents' Guides to Student Success* for these standards on its website: http://www.pta.org/4446.htm. These standards strive to prepare our children for the jobs of the 21st century. This is one in our series of letters intended to help you understand the work your child brings home and where we are going so that together, we can help your child become mathematically proficient. We will highlight some new language and strategies we will use to build understanding, help children make sense of numbers, and know the common methods we learned in school. This letter addresses **multiplication** in fourth grade.

What children should do well by the end of the year

In third grade students were to be fluent (fast and accurate) with all multiplications of one-digit numbers and their related divisions (e.g., 7 x 6 and 42÷7). If they do not know them yet, ask me for some strategies you can use to help your child at home. **In fourth grade children are to become fluent when adding and subtracting numbers that have sums up to 1,000,000! They will also be focusing much of their time on multiplication and division.** They will multiply 2-, 3-, and 4-digit numbers by a 1- digit number, as well as multiply two 2-digit numbers. They should easily do problems such as these correctly:

15 x 24	4 x 275	8 x 2450	20 x 24
740÷10	2320÷4	432÷6	1824÷6

New language about multiplication

There is a new expectation that students will understand that multiplications are ***comparisons of numbers.*** When they add, children compare *single* items. They think how many more is 7 than 3." They can subtract or display 7 items and 3 items to see this.

7 OOOOOOO *7has 4 more*
3 OOO

In a multiplication, students compare *groups* of items and think about **how many times as many** there are.

7 OOOOOOO

OOOOOOO
OOOOOOO
OOOOOOO
OOOOOOO
OOOOOOO

35

7 is one group of seven. 35 is 5 groups of seven.

Children are asked to "**interpret" or understand 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5.** This is new language and a new way

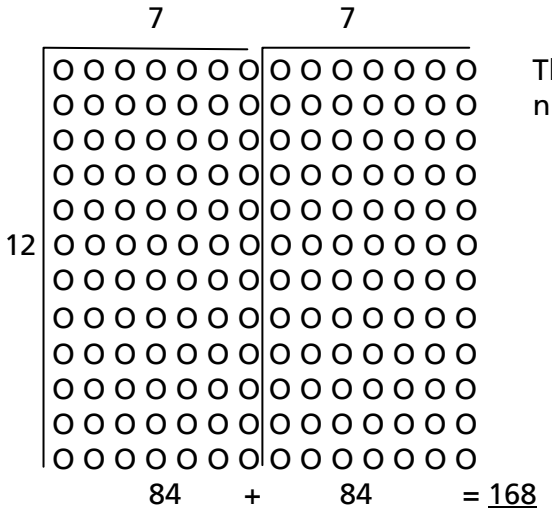
of talking about multiplication equations. If asked to write a statement such as this one mathematically–Mary has 3 times as many stickers as Duane and Duane has 12 stickers– students would write 3 x 12. They might **explain** that 3 times as many as 12 is 36 and that is the number of stickers Mary has; or say what the numbers all mean, the 3 means Mary has three times as many as Duane's 12 stickers so Mary has 36 stickers. Being able to do this prepares students to know how to solve word problems built around similar situations.

Strategies your children may use: tables, arrays, area models

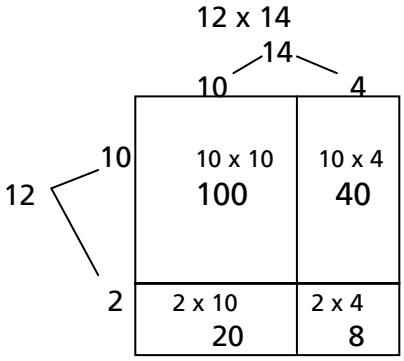
In third grade, students used tables and arrays to solve multiplication problems. In an array each group is organized in a row and the rows form a rectangular shape. Children can find how many in the array using repeated addition or by skip counting. This year we will move them to use multiplication.

> **Problem**: Sarah is making a quilt. One side will have 12 squares and the other will have 14 squares. How many squares must Sarah make?

At first students may use model this with an array. If a student knows the 12 tables, she may decide to decompose the array into two 12 x 7 arrays. They then add 84 + 84 to find that Sarah will need 168 squares.

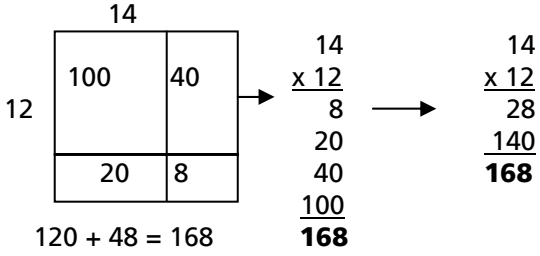


The next transition is to an **area model**. In area models numbers are usually decomposed into place values.



They multiply the split apart 14 by the split apart 12 as the boxes show. Then they add all the partial products. This is much less work than the array! These partial products transfer to what students do when using the traditional method.

Students first write each partial product. Then they keep track mentally.



These strategies are used in fourth grade to help students develop understanding of multiplication. In fifth grade the area model will be the linked to the traditional U.S. algorithm as you see above.

Using Place Value and Properties of Operations

By the end of fourth grade students will "**use place value and properties of operations**" to solve multi-digit multiplication problems. Students learn how new places are formed. Bundling or grouping 10 ones makes a ten and bundling or grouping 10 tens makes 100. They learn that when you move left one place, numbers are worth ten times as much as they were in the place to the right. They are also ten times less than they were worth if you move them one place to the right.

1, 111 is 1,000 + 100 + 10 + 1 (x10, x 10, x10) 5,555 is 5000 + 500 + 50 + 5 (÷ 10, ÷10, ÷ 10)

One way to use that knowledge is in a division like 700 ÷ 70. To get from 700 to 70, we simply move the 7 one place to right, which is equivalent to dividing it by 10. So 700 ÷ 70 = 10. We can also reason that **7**00 is a bundle of **7** tens. If 70 x 10 = 700, then 700 ÷ 70 = 10. Students also use place value when they model 4 x 18 with base-ten blocks and when they think of 4 x 18 as 4 x 10 = 40 and 4 x 8 = 32, then add the partial products 40 + 32. They also use place value when they decompose a problem by place values to create an area model.

If for 700 ÷ 70 they think "70 times what is 700," they are using the **properties** of multiplication and division. They know the relationship between multiplication and division.

Family Practice

Here are some things you can do at home.

- Create "word problems" using familiar things in the home or neighborhood.
- Ask your child to make comparisons between numbers using phrases like "times as much." For example, if a bag of sugar weighs 5 lbs. and a bag of flour weighs 20 lbs., how many times as much does the bag of flour weigh?
- Ask your child to explain what he or she learned in math class.
- Encourage your child to represent problems in different ways.

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Fourth grade teacher