Dear Parents and Caregivers,

Thank you for continually supporting your child in mathematics education. The PTA has several *Parents' Guides to Student Success*, which include the new Common Core State Standards your child is learning, on its website at www.pta.org/4446.htm. These standards strive to prepare our children for the jobs of the 21st century. You may see some unfamiliar vocabulary and strategies. This is one of a series of letters intended to help you understand where we are going so that together we can develop the necessary skills and strategies your child needs to become mathematically proficient. We will engage in "unpacking the standards" to uncover ideas to help make your child successful in mathematics.

This letter addresses **arithmetic operations and algebraic thinking** in third grade. Learning the meaning of multiplication and division will help with solving problems involving these operations. This will guide you to support your children as they deepen their mathematical understanding. Hopefully, it will also help you challenge their thinking by asking important questions to advance their learning.

Students will represent and solve problems involving multiplication. (3.OA.3)

Children need to learn multiplication and must also understand the meaning of the numbers in a multiplication problem. This understanding helps lay the foundation for children to be ready for algebra. In order for them to be fluent (do the math easily with reasonable speed and accuracy) and mathematically proficient, we need to help them develop a strong understanding of the meaning of multiplication and division of whole numbers. We will engage them in activities where they will use both operations to solve real-life problems. In third grade they will learn that multiplication involves **equal groups** and they will use **arrays** to help them understand and solve problems. We know what children commonly misunderstand and will be prepared to get them on the right track. It is crucial that students master multiplication and division now if they are to succeed later in school.

Students will explain the meaning of multiplication. (3.OA.1)

Children will be asked to multiply two whole numbers and explain what the numbers mean. For example: **5 x 7 is the total number of items in 5 <u>groups</u> with 7 <u>items</u> in each group.** Our children must think in terms of **groups of objects** rather than single/distinct objects as they did in addition and subtraction. They also learn the multiplication symbol "x" which means "groups of." Therefore 5 x 7 can be read as "5 groups of 7" or "5 times 7."

Let's look at a problem:

> **Lily has 5 bags of oranges. There are 7 oranges in each bag. How many oranges does Lily have altogether?**

Children may draw pictures to show their thinking, they may count objects, they may use repeated addition (7 + 7 + 7 + 7 + 7) or they can use multiplication. For example: 5 bags of

oranges x 7 oranges in each bag equal 35 oranges in all (5 x 7 = 35 oranges). They can also use an array, which we will discuss below. The illustration shows 5 x 7 or "5 groups of 7."

7	7	7	7	7
OOOOOOO	OOOOOOO	OOOOOOO	OOOOOOO	OOOOOOO
oranges	oranges	oranges	oranges	oranges
1st bag	2nd bag	3rd bag	4th bag	5th bag

Similarly, students can use multiplication to solve this problem: If oranges cost 5 cents each, how much does Lily have to pay for 7 apples?

Family practice: Ask your child to create other situations in real life where there would be "5 groups of 7" to find out if this standard is understood. Vary the number of groups and number in each group. Sample responses would be: 3 x 8 or 3 pencil cases with 8 pencils in each pencil case; 4 x 4 or 4 cars with 4 wheels on each car; 5 x 7 or total number of days in 5 weeks. You can have your child think about problems like these when you go shopping, put gas in

Strategies you may see your children use to solve multiplication problems before they get to the symbolic traditional algorithm.
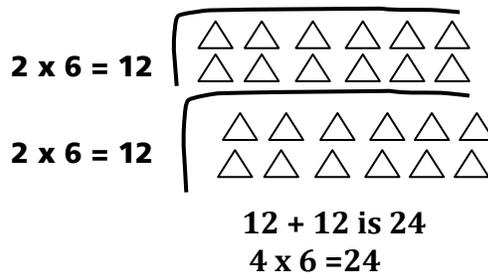
Equal size groups. Children may use yogurt container lids or make circles with yarn to show the number of groups and put equal amounts inside.

xx x x x   xx x x x   xx x x x   xx x x x   **There are 20 in 4 groups of 5.   4 x 5 =20**

Arrays. Children may lay out each group in a separate row. (This forms a rectangular shape.)

4 x 6

△ △ △ △ △ △
△ △ △ △ △ △
△ △ △ △ △ △
△ △ △ △ △ △

4 rows of 6
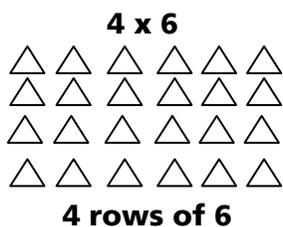
If a child knows the twos, she can decompose the array into two smaller arrays and think 2 x 6 is 12. Another 2 x 6 is 12. Then, 4 x 6 is 12 + 12 or 24.

2 x 6 = 12

△ △ △ △ △ △
△ △ △ △ △ △

2 x 6 = 12

△ △ △ △ △ △
△ △ △ △ △ △

12 + 12 is 24
4 x 6 =24

By the end of third grade, students should be fluent with products of two one-digit numbers (e.g., 7 x 6 = 42) and with the related division quotients (e.g., 42 ÷ 7 = 6).

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Third Grade Teacher