Dear Parents,

During this unit, your child will develop a conceptual understanding of decomposing multiplication problems through the use of the distributive property and the concept of area. Your child will not be required to use the properties explicitly, but will be expected to discuss the concepts and use area diagrams to support their reasoning.

In addition, your child will use area as a context to further develop multiplicative thinking. This includes solving problems involving rectangular areas by multiplying side lengths and solving for and unknown number in related multiplication and division equations.

MULTIPLICATION AND DIVISION

Students need to:

- Apply properties of operations as strategies to multiply and divide.
- If 3 x 5 x 2 can be found b 3 x 5 = 15, then 15 x 2= 30 , or by 5 x 2 = 10, then 3 x 10 = 30. (associative property of multiplication)
- Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5+2) = (8 x 5) = (8 x 2) – 40 + 16 = 56. (distributive property)

- Identify arithmetic patterns (including patterns in the addition and multiplication table) and explain them using properties of operations.

- Determine the unknown whole number in a multiplication or division equation relating three whole numbers .   For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = __ / 3, 6 x 6 = ?.

- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division. By the end of Grade 3, know from memory all products of two one-digit numbers.

- Use place value understanding to round whole numbers to the nearest 10 or 100.

- Multiply one-digit whole numbers by multiples of 10 in the range 10 – 90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.

- Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. **Assess the reasonableness of answers using mental computation and estimation strategies including rounding.**

AREA

- Relate area to the operations of multiplication and addition.

- Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b +c is the sum of a x b and a x c. Use area models to represent the distributive property in mathematical reasoning.

- Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non –overlapping rectangles, applying this technique to solve real world problems

- Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

- Multiply one-digit whole numbers by multiples of 10 in the range 10 – 90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.

- Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. **Assess the reasonableness of answers using mental computation and estimation strategies including rounding.**

KEY VOCABULARY

array: an arrangement of objects in equal columns and rows

area: the number of square units needed to cover a surface

Associative Property of Multiplication: 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2= 30 or by 5 x 2 = 10, then 3 x 10 = 30

Commutative Property of Multiplication: a property of multiplication in which the product stays the same when the order of the factors is changed (i.e., a x b = b x a)

Distributive Property of Multiplication: multiplying a number is the same as multiplying its addends by the number then adding the products

dividend: the number being divided

divisor: the number by which a dividend is being divided

factor: the numbers or terms multiplied in an expression. (a factor times a factor equals the product)

multiple: the product when numbers are multiplied together

partition: a division into or distribution in portions or shares

product: the result of multiplying one factor times another factor 8 x 8 = **64**

square unit: a unit for measuring area such as square inch, square centimeter, or square mile

quotient: the result of division 24 ÷ 3 = **8**

WAYS PARENTS CAN HELP

- Refer to the ideas described in the Unit One and Two Parent Letters. They apply to this Unit as well.

- Use grid paper to make a "floor plan" of a room in your house. Be sure to include large objects that cover a portion of the floor (ie: furniture, rugs). Determine the area of each object included in your plan.

- Measure the area of the rooms in your home to determine which rooms have the most/least area.

- Look for real world examples of area of shapes which are rectilinear (made of non-overlapping rectangles) such as a tiled floor. Help your child to see that they can find the area for each rectangle and then add the areas to get a total area of the shape.

BACKGROUND INFORMATION AND EXAMPLES FOR PARENTS

Vocabulary Resources:
Online Math Dictionary: http://www.amathsdictionaryforkids.com/dictionary.html

Multilingual Dictionary: http://www.glencoe.com/apps/eglossary/landing.php

Finding Area Using Arrays:
http://video.carrollk12.org/view/DONALDSONUSINGARRAYSTOFINDAREA

MULTIPLICATION AND DIVISION FACTS

A systematic approach for developing an understanding of the basic facts will be used. The facts will be broken up into **three sets**, progressing from more easily-learned facts called Foundation Facts to the ones that provide more challenge.

Set One	x 2, x10, x5, x1, x0 & related division facts
Set Two	x 3, x4, x6 & related division facts
Set Three	x 9, x 8, x 7 & related division facts