THIRD GRADE MATHEMATICS – Unit 1

Dear Parents,

Your child will be learning about multiplication, division, and area over the course of several units. During this unit, your child will develop an understanding of the multiple meanings of multiplication and division of whole numbers through activities and problems involving equal –sized groups, arrays, and area sized models. An understanding of the commutative property will also be developed as arrays are built to solve problems.

Your child will also solve problems to develop an understanding of the connection between multiplication and the measurement of area. He/she will recognize area as an attribute of two dimensional regions, and will measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps (a square with sides of unit length being the standard unit for measuring area). Finally, your child will understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students will connect area to multiplication.

MULTIPLICATION AND DIVISION
Students need to:

- Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. Describe a context in which a total number of objects can be expressed as 5 x 7.

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

- Apply properties of operations as strategies to multiply and divide. If 6 x 4 is known, then 4 x 6 = 24 is also known. (commutative property of multiplication)

- Interpret whole-number quotients of whole numbers. For example, interpret 56 / 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned equally into equal shares of 8 objects each. Describe a context in which a number of shares or a number of groups can be expressed as 56/8

- Use multiplication and division within 100 to solve word problems in situations involving equal groups, and arrays. Use drawings and equations with a symbol for the unknown number to represent the problem.

AREA
Students need to:

- Recognize area as an attribute of plane figures and understand concepts of area and measurement.
  a.   A square with length 1 unit, called 'a unit square", is said to have "one square unit" of area, and can be used to measure area.
  b.   A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

- Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units).

- Relate area to the operations of multiplication and addition.
  a.   Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths

MEASUREMENT
Students need to:

- Tell and write time to the nearest minute.

KEY VOCABULARY

array: an arrangement of objects in equal columns and rows

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

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)

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

- Point out objects around you, in and outside of your home, that are arranged in equal groups and arrays (rows and columns). Ask your child to use this arrangement to determine the actual or estimated total number of objects.

- When solving basic facts, ask your child to describe patterns he/she notices. After your child communicates potential patterns, have him/her use a calculator to see if the pattern continues when multiplied by factors greater than 10.

- Use a set of flash cards to play Commutative Property Memory. 1. Create a set that includes pairs of facts like- 2x5 and 5x2, 4 x 1 and 1x4, etc. 2. Lay the cards face down. 3. The first player flips over a card and says the product. 4. If correct he or she flips over another card, hoping it has the same factors in a different order. 5. If it is a pair, player one will say the product, take the pair, and go again. If it is not a match, both cards are placed face down and player two takes his turn. 6. Repeat until there are no more cards on the table. 7. The player with the most pairs wins.

- When solving word problems, have objects available for your child to help him "make sense" of the problem, and see the mathematics. Create a basket with baggies of small objects like pennies, Legos, and M and M's that can be used to create equal groups and arrays. If your child has these materials at his fingertips, he will be more likely to pull them out and use them.

- Draw large shapes on the sidewalk or a poster board. Choose a square unit that can be used to cover the shape (ie: Cheez-its, Golden Grahams). Before tiling the area, make an estimate about how many it might take to cover the shape. Determine the area of the shape.

BACKGROUND INFORMATION AND EXAMPLES FOR PARENTS

Multiplication/division word problems:
http://video.carrollk12.org/view/KRANTZBARMODEL1

http://video.carrollk12.org/view/KRANTZBARMODEL2

http://video.carrollk12.org/view/DONALDSONUSINGARRAYSTOMODELMULT

Multiplication – Arrays
http://video.carrollk12.org/view/ZELLERSARRAY

Multiplication – Double Number Line
http://video.carrollk12.org/view/ZELLERSDOUBLENUMBERLINE

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