Algebra/Geometry Institute Summer 2006
Lesson Plan II: Arrays to see Multiplication
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Grade Level: 5th

1. Teaching Objective(s)
   The students will use arrays to understand and show meaning of multiplication. To connect the area models (arrays) to the computation. That changing the order of the numbers does not change the sum.(The Commutative Property of Addition) and to change the order of factors does not change the product. (The Commutative Property of Multiplication)

2. Instructional Activities

The teacher will explain that arrays are an arrangement of things, objects, pictures, or numbers in columns or rows. A rectangular array is an arrangement of things in rows and columns. .

Teacher will ask students suppose you wanted to use a rectangular array to represent the multiplication problem 3 x 4. What would the array look like? The teacher will ask 12 students to come to the front of the room. The teacher will describe that an array of 3 rows and 4 columns is a 3 by 4 array. The teacher will arrange the students in 3 rows and 4 columns. Teacher will say that the number of things in an array is equal to the number of rows multiplied by the number of columns. This may be written as 3 x 4. Teacher may write 3 x 4 = 12 on the board.
 The teacher will then pass out activity sheet 1.

The teacher will say each row in an array has as many things in it as every other row. Every column in an array has many things in it as every other column.

Activity sheet 2 the teacher will show an arrangement with unequal rows and ask students why this is not an array

The teacher will say that rows are horizontal and can go from side to side.

That columns are vertical and can go from top to bottom Teacher will say that

that the first number described is rows and the second number is columns.

The teacher will ask students to count the number of rectangles on activity sheet 1.The teacher will tell students that you will get the same answer when adding all rows and columns as 3 x 4. That multiplication is the same as repeated addition.

Teacher will explain by changing the order of factors the product does not change. Example: 3 x 4=12 or 4 x 3 = 12. It still has 12 things in it.
This is called the Commutative Property of Multiplication. This can show the students if you forget 3 x 4=12, you can remember 4 x 3=12.
Show activity sheet 3.

The teacher will pass out counters. Each counter will represent a rectangle that in turn could represent chairs or desk that needs to be lined up in rows and columns. Students practice making a 4 by 3 array using counters. Then the students will practice by making the 3 by 4 array using different counters. Students may use activity sheet 3 for illustrations. The teacher will then explain that they have used the counters to show the Commutative Property of Multiplication. Students will continue working on activity 4 and 5 with counters to show the Commutative Property of Multiplication.

3. Materials and Resources:

America Choice (Multiplication) 2002 ed.
Mathematics Instructional Intervention Supplement 2002 ed.
Counters: At least 24 counter per student.
Activity Sheets 1-6

4. Assessment: The teacher will monitor the students as they are using their counters for arrays while walking around the room.
The students will answer activity sheet 6.

Activity Sheet 1   3 x 4

Students will add all rows and columns.
4+4+4=12
3+3+3+3=12
3 and 4 are factors and 12 is the product.
3 x 4 =12

These are not rectangular arrays.

O O O

O O O O

O O O O O

X X X XXX

X   XXX

   X

Activity Sheet 3

Example 1   4 x 3 =12

Example 2   3 x 4 =12

The Commutative Property of Multiplication says that changing the order of factors does not change the product. The order of numbers makes no difference in the product.

Activity Sheet 4   6 x 2

2 x 6

Activity Sheet 5   7 x 2

2 x 7

Activity Page 6

Question 1: How do you describe this array and what does it illustrate?

Question 2:   How do you describe this array and what does it illustrate?

Question 3: Students will draw a 3 x 5 array.

Question 4: Students will show the Commutative Property of Multiplication with a 4 x 5 array.