

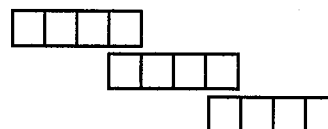
The next set of activities in this chapter will be helpful in understanding the concept of multiplication and for discovering properties of multiplication. The results may seem simple to you, but try thinking as a student just introduced to the idea.



OBJECTIVE: Use a set model for multiplication

You Will Need: Squares from Materials Card 3.4

1. As part of a classroom project to make a rug for the reading corner, three students in your class have each brought in 4 carpet squares. To model this situation, make 3 groups of 4 squares. This shows 3×4 .



How many squares are there altogether? _____

2. Use squares to represent these products and write your own story. Record.

a. $6 \times 3 =$ _____

b. $3 \times 9 =$ _____

c. $8 \times 5 =$ _____

3. Take 24 squares. Find and record four multiplication facts that can be shown about 24.

a. $__ \times __ = 24$

b. $__ \times __ = 24$

c. $__ \times __ = 24$

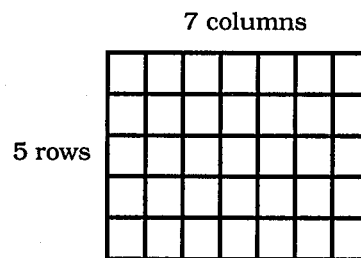
d. $__ \times __ = 24$



OBJECTIVE: Use a rectangular array approach to multiplication

You Will Need: Squares from Materials Card 3.4

1. Your class has decided to make the rug an array of squares with 5 rows and 7 columns as pictured. This represents 5×7 .



How many squares are in the array? _____

2. Make arrays of squares to represent these products. Record.

a. $2 \times 8 =$ _____

b. $6 \times 7 =$ _____

c. $4 \times 9 =$ _____



OBJECTIVE: Model properties of multiplication

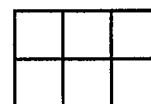
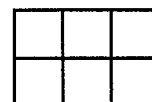
You Will Need: Squares from Materials Card 3.4

1. With the squares leftover from the large rug, your students decide to make smaller rugs for themselves. Erin makes one rug with 3 rows and 5 columns and Mark makes a rug with 5 rows and 3 columns. Illustrate this with your squares. How many squares will each student need? What do you observe about these results?

Write a general statement to explain your results.

2. One group of students decides to make 4 rugs, each 2 by 3. We will represent this as $4 \times (2 \times 3)$, where the product in parentheses represents the dimensions of the rugs. How many squares will they use altogether? _____

Record: $4 \times (2 \times 3) =$ _____



Another group decides to make 3 rugs, each 4 by 2.

This could be represented as $3 \times (4 \times 2)$ or, by commutativity, $(4 \times 2) \times 3$. How many squares will they use altogether? _____

Record: $(4 \times 2) \times 3 =$ _____

Compare the statements and their results:

$$4 \times (2 \times 3) = \text{_____} \quad (4 \times 2) \times 3 = \text{_____}$$

3. Write two multiplication equations using the numbers 2, 5, and 6, in that order.

$$\text{_____} \times (\text{_____} \times \text{_____}) = \text{_____} \quad (\text{_____} \times \text{_____}) \times \text{_____} = \text{_____}$$

What do you notice about the solution to each equation?

Write a general statement to explain your results.

4. A third group has two rug portions, one that has 2 rows and 5 columns and another with 2 rows and 3 columns. To determine how many squares they have altogether, one student suggests finding out how many are in each portion and then adding the results together. Record $(2 \times 5) + (2 \times 3) =$ _____

A second student suggests they could put the portions together to form a larger rectangular rug. How many rows are in the final rug? _____ How many columns? _____ How does the number of columns relate to the original portions that were combined?

Record: $2 \times (5 + 3) =$ _____

Compare the statements and their results:

$$(2 \times 5) + (2 \times 3) = \text{_____} \quad 2 \times (5 + 3) = \text{_____}$$

Write a general statement to explain your results.