

## Understanding Multiplication

Multiplication is just a fast way to add equal groups. “Five bags with three apples in each” is 5 groups of 3, which we write as  $5 \times 3$ .


How to read $a \times b$	Equal groups picture
$a$ groups of $b$	$a$ rows, $b$ in each row

### Key Concepts

- Multiplication is repeated addition with *equal* groups. The same number is being added over and over.
- In  $a \times b$ , the first number is the *number of groups* and the second is the *size of each group*. So  $3 \times 4$  means 3 groups of 4.
- An **array** is a rectangle of dots or boxes arranged in equal rows. The number of rows times the number of columns gives the total.
- The answer to a multiplication problem is called the *product*.


### Worked Examples

① Write a multiplication sentence for: 5 bags with 3 apples in each bag.

 The number of bags is the number of groups, so write that first: 5. The size of each group is the apples per bag, so write that second: 3. Now multiply:  $5 \times 3$ . You can think of this as adding 3 five times:  $3 + 3 + 3 + 3 + 3 = 15$ . Multiplication just gives us the same answer, faster.


 **Answer:**  $5 \times 3 = 15$

② Write  $6 + 6 + 6 + 6$  as a multiplication sentence.

 Count how many times the same number is being added. There are four 6's, so this is 4 groups of 6, which we write as  $4 \times 6$ . The product is 24. (You can double-check by counting: 6, 12, 18, 24.)

 **Answer:**  $4 \times 6 = 24$

③ An array has 2 rows and 7 columns. What is the total?

 An array is a rectangle of objects. Each row has 7 objects (because there are 7 columns), and there are 2 rows. So the total is 2 groups of 7, which is  $2 \times 7 = 14$ . You could also count down the columns: each column has 2, and there are 7 columns, so  $7 \times 2 = 14$ . Either way works!

 **Answer:** 14

### Practice Problems

Write a multiplication sentence and find the product.

1. 3 groups of 5 = \_\_\_\_\_

3.  $2 + 2 + 2 + 2 + 2 = ? \times ?$  \_\_\_\_\_

2. 4 groups of 2 = \_\_\_\_\_

4.  $7 + 7 + 7 = ? \times ?$  \_\_\_\_\_

5. Array: 4 rows, 6 columns \_\_\_\_\_

6. Array: 5 rows, 3 columns \_\_\_\_\_

7. 6 groups of 8 = \_\_\_\_\_

8. 9 groups of 2 = \_\_\_\_\_




9.  $5 + 5 + 5 + 5 = ? \times ?$  \_\_\_\_\_

10. 3 groups of 10 = \_\_\_\_\_

11. Array: 7 rows, 2 columns \_\_\_\_\_

12. 8 groups of 4 = \_\_\_\_\_

**Study Tips**

-  When you see “ $a$  groups of  $b$ ,” write  $a \times b$  in that order. The first number is always the count of groups.
-  For repeated addition, the number being added tells you the *size* of each group, and how many times it appears tells you the *number* of groups.
-  For arrays, “rows  $\times$  columns” always gives the total. Some teachers prefer “columns  $\times$  rows” — both work because the answer is the same.

**Word Problems**

1. There are 6 tables in the cafeteria. Each table has 4 chairs. How many chairs in all?

Answer: \_\_\_\_\_

2. A garden has 3 rows of flowers. Each row has 8 flowers. How many flowers altogether?

Answer: \_\_\_\_\_

**Answer Key — with Friendly Explanations****Practice Problems**

1. 3 groups of 5 =  $3 \times 5$ .

 **Answer:** 15

2. 4 groups of 2 =  $4 \times 2$ .

 **Answer:** 8

3. Five 2's added =  $5 \times 2$ .

 **Answer:**  $5 \times 2 = 10$ 

4. Three 7's added =  $3 \times 7$ .

 **Answer:**  $3 \times 7 = 21$ 

5. Array  $4 \times 6$ : 4 rows of 6.

 **Answer:** 24

6. Array  $5 \times 3$ : 5 rows of 3.

 **Answer:** 15

7. 6 groups of 8 =  $6 \times 8$ .

 **Answer:** 48

8. 9 groups of 2 =  $9 \times 2$ .

 **Answer:** 18

9. Four 5's added =  $4 \times 5$ .

 **Answer:**  $4 \times 5 = 20$ 

10. 3 groups of 10 =  $3 \times 10$ .

 **Answer:** 30

11. Array  $7 \times 2$ : 7 rows of 2.

 **Answer:** 14

12. 8 groups of 4 =  $8 \times 4$ .

 **Answer:** 32**Word Problems**

1. 6 tables of 4 chairs each:  $6 \times 4 = 24$  chairs.

 **Answer:** 24 chairs

2. 3 rows of 8 flowers each:  $3 \times 8 = 24$  flowers.

 **Answer:** 24 flowers

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