

The Relationship Between Multiplication and Division

Multiplication and division are related operations. For example, here is a set of linked multiplication and division equations:

$$8 \times 9 = 72$$

$$72 \div 9 = 8$$

$$9 \times 8 = 72$$

$$72 \div 8 = 9$$

The multiplication equations show the multiplication of two factors to equal a product. The division equations show the product (dividend) divided by one of the factors (divisor) to equal the other factor (quotient).

Some problem situations your students encounter in this unit can be solved using either multiplication or division. Consider the following problem:

I have a supply of 48 treats for my dog. If I give her 6 treats every week, how many weeks will the supply last?

The quantities in this problem are 48 treats, 6 treats per week, and a number of weeks to be determined. This problem can be written in standard notation as either multiplication or division.

$$48 \div 6 = \underline{\quad} \text{ or } \underline{\quad} \times 6 = 48$$

After the answer to the problem has been found, both division and multiplication equations can be written to show the relationship of the three quantities.

48 treats divided into groups of 6 (six treats per week) results in 8 groups (weeks).

$$48 \div 6 = 8$$

8 weeks with 6 treats per week equals 48 treats.

$$8 \times 6 = 48$$

When students solve a problem like this one, they may write either a division or multiplication equation to express the answer and its relationship to the quantities in the problem. Both notations represent the problem, depending on whether the student is thinking of the problem as division or as a multiplication problem with a missing factor. They should be able to read and interpret both of these notations, explaining what each number and symbol in the equation represents in the original problem.

See **Teacher Note 1: Algebra Connections in This Unit** for more about understanding the inverse relationship between division and multiplication.