

## KEY CONCEPT OVERVIEW

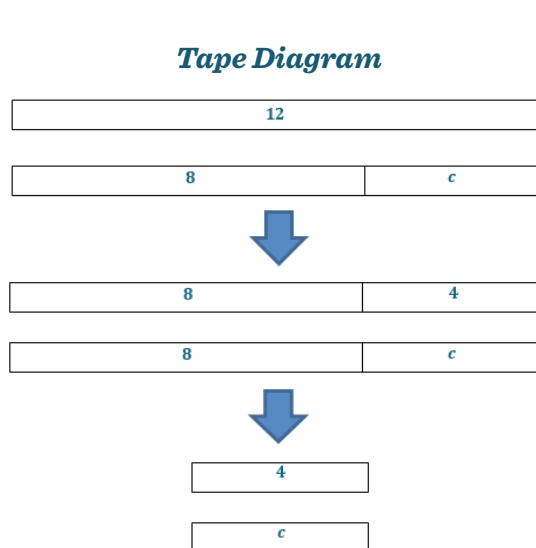
In this topic, students learn the important relationship between a number sentence and an equation as they explore the role of the number sentence in finding the **solution of an equation**. Students identify the value that makes an equation true by substituting that value for the variable and determining whether the resulting number sentence is true. Students also extend their knowledge of the equality ( $=$ ) and **inequality** symbols ( $<$ ,  $>$ ,  $\leq$ , and  $\geq$ ) and identify various values that make an inequality true or false. Finally, students use the tape diagram to solve one-step equations involving all four operations and then extend this learning to solve two-step and multi-step problems.

You can expect to see homework that asks your child to do the following:

- Replace the variable in an equation or inequality with a given value and determine whether the resulting number sentence is true or false. For example, in the inequality  $4 > 1 + g$ , if  $g$  has a value of 3, the resulting number sentence ( $4 > 1 + 3$ ) is false because 4 is equal to (not greater than) 4. If  $g$  is any number less than 3, then the inequality is true.
- State when equations and inequalities will be true and when they will be false. For example, in the equation  $36 = 9k$ , the resulting number sentence is true if  $k = 4$  because  $36 = 9(4)$ . If  $k = 3$ , then the resulting number sentence is false because  $9(3)$  does not equal 36. In fact, if  $k$  has any value other than 4, then the resulting number sentence will be false.
- Solve an equation using a tape diagram as well as algebraically. (See Sample Problem.)

## SAMPLE PROBLEM (From Lesson 26)

Solve the equation. Use a tape diagram and also solve algebraically. Use substitution (i.e., replace the variable with a value) to check your answer.



$$12 = 8 + c$$

**Algebraically**

$$12 = 8 + c$$

$$12 - 8 = 8 + c - 8$$

$$4 = c$$

**Check: Substitute 4 for  $c$  to determine whether the number sentence is true. The number sentence  $12 = 8 + 4$  is a true number sentence because solving the right side of the equation results in  $12 = 12$ , which is true. So 4 is the correct solution.**

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at [GreatMinds.org](http://GreatMinds.org).

**HOW YOU CAN HELP AT HOME**

You can help at home in many ways. Here are some tips to help you get started.

- Given the equation  $2 = \frac{h}{7}$ , determine the value of the variable  $h$  with your child. Ask him to solve this problem with a tape diagram as well as algebraically.

Tape Diagram	Algebraically																							
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Ask your child to explain how he knows that 14 is the correct answer. (The value of the variable is 14 because 14 makes the number sentence true, so it is the solution to the equation.)

- With your child, work with the inequalities  $12 > 4 + g$ ,  $27 < x - 5.5$ , and  $11 \leq k + 3$ . Take turns stating one number that could make each inequality true. After each of you has taken two turns, work with your child to think of two numbers per inequality that will make each inequality false. Encourage your child to explain why each number you identified makes the inequality true or false.

**TERMS**

**Inequality:** An inequality is a statement comparing expressions that are unequal or not strictly equal. The symbol used to compare the expressions reveals the type of inequality:  $<$  (less than),  $\leq$  (less than or equal to),  $>$  (greater than),  $\geq$  (greater than or equal to), or  $\neq$  (not equal).

**Solution of an equation:** For an equation with one variable, the solution is any number you can substitute for the variable to make a true number sentence. For example, in  $3x = 24$ , the solution of the equation is 8 because  $3(8) = 24$ .

**Truth values of a number sentence:** The truth value is either true (if the number sentence is true) or false (if the number sentence is false). A number sentence is true when it is mathematically correct. For example,  $4 \times 5 + 1 = 21$  is true because  $4 \times 5 + 1$  is equal to 21, while  $4 + 5 > 11$  is false because  $4 + 5$  is not greater than 11.