

Name _____

Understand Inequalities

Essential Question How can you use inequalities to solve problems?

UNLOCK the Problem REAL WORLD

Every morning, Bobbi's Hot Bagels makes a special claim. All bagels Bobbi's sells will be warm and less than 9 minutes old. What **inequality** can you write to represent in whole minutes how old Bobbi's bagels are?

An inequality is a number sentence that compares two unequal quantities and uses the symbols $<$, $>$, \leq , or \geq .

- What clue words tell you that this problem involves an inequality?

Write an inequality using a variable.

STEP 1 Write the inequality in words. time \longrightarrow is less than \longrightarrow 9

STEP 2 Replace *time* with the variable t . $t \longrightarrow$ less than \longrightarrow 9

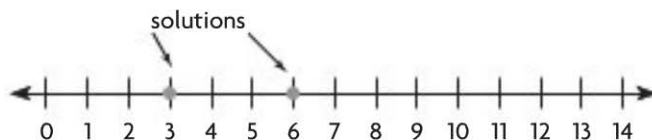
STEP 3 Replace the words *less than* with a *less than* ($<$) symbol. $t < 9$

Try This! Graph the solutions on the number line. Of 3, 6, 9, and 12, which numbers are solutions for $t < 9$?

STEP 1 In $t < 9$, replace t with 3. $t < 9$
Repeat the process for $t = 6, 9, 12$. $3 < 9 \longleftarrow$ true

STEP 2 Identify the values that make $t < 9$ true. $6 < 9 \longleftarrow$ true
True values are solutions: $t = 3, 6$. $9 < 9 \longleftarrow$ false
False values are not solutions: $t \neq 9, 12$. $12 < 9 \longleftarrow$ false

STEP 3 Graph the solutions on a number line.
Graph true values with filled circles.



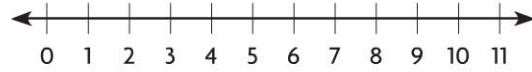
Math Talk How does the answer for the problem change if the inequality is " t is less than or equal to 9"?

Share and Show



Of 2, 5, and 8, which numbers are solutions for the inequality $x \geq 5$?
Graph the solutions on the number line.

1a. Replace x with 2. True or false?

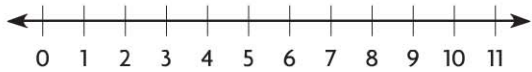


1b. Replace x with 5. True or false?

1c. Replace x with 8. True or false?

Show two solutions for the inequality on a number line.

2. $a < 6$



On Your Own

Of 7, 10, and 13, which numbers are solutions for the inequality?

3. $m > 8$

4. $b \leq 10$

5. $c < 15$

Of 0, 4, 6, and 11, which numbers are solutions for the inequality?

6. $d \geq 8$

7. $r < 1$

8. $s > 4$

Show two solutions for the inequality on a number line.

9. $n \leq 6$



10. $x > 2$



Problem Solving



11. For her birthday party, Dina wants to invite at least 8 guests but not more than 12 guests. How many guests might she have? Name all of the possibilities.
