

## Chapter 8

### Lesson 5: Inequalities

### Lesson 6: Write and Graph Inequalities

**Inequality:** is a mathematical sentence that compares quantities.

Inequalities				
Symbols	<	>	≤	≥
Words	<ul style="list-style-type: none"> <li>• is less than</li> <li>• is fewer than</li> </ul>	<ul style="list-style-type: none"> <li>• is greater than</li> <li>• is more than</li> </ul>	<ul style="list-style-type: none"> <li>• is less than or equal to</li> <li>• is at most</li> </ul>	<ul style="list-style-type: none"> <li>• is greater than or equal to</li> <li>• is at least</li> </ul>
Examples	$3 < 5$	$8 > 4$	$7 \leq 10$	$12 \geq 9$

#### EXAMPLES:

Determine which number is a solution of the inequality. (Example 1)

1.  $1 + f < 7$ ; 5, 6, 7

$1 + 5 < 7$  ✓  
 $6 < 7$  ✓  
 $1 + 6 < 7$  ✗  
 $7 < 7$  ✗  
 $1 + 7 < 7$  ✗  
 $8 < 7$  ✗

2.  $g - 3 > 4$ ; 6, 7, 8

$6 - 3 > 4$  ✗  
 $3 > 4$  ✗  
 $7 - 3 > 4$  ✗  
 $4 > 4$  ✗

$8 - 3 > 4$  ✓  
 $5 > 4$  ✓

Is the given value a solution of the inequality? (Examples 2-4)

3.  $q - 2 > 16$ ,  $q = 20$

$20 - 2 > 16$   
 $18 > 16$  ✓

4.  $t - 7 < 10$ ,  $t = 28$

$28 - 7 < 10$   
 $21 < 10$  ✗

The table shows the number of different types of roller coasters in the United States. An amusement park wants to build a new roller coaster. They will only build a roller coaster if there are less than 10 of that type in the United States. Use the inequality  $r < 10$ , where  $r$  is the number of a certain type of roller coaster, to determine which type(s) can be built. (Example 5)

Type	Number
Sit down (steel)	530
Sit down (wood)	112
Inverted	43
Flying	10
Stand up	8
Suspended	5

Stand up or  
Suspended

### Write inequalities to represent situations:

You must be over 12 years old to ride the go-karts.

Words      Your age      is over      12.

Variable      Let  $a =$  your age.

Inequality       $a >$       12

The inequality is  $a > 12$ .

You must be at least 16 years old to have a driver's license.

Words      Your age      is at least      16 years.

Variable      Let  $a =$  your age.

Inequality       $a \geq$       16

The inequality is  $a \geq 16$ .

### Graph An Inequality:

- An open dot means the number is NOT included in the graph.
- The closed dot means the number IS included in the graph.

### EXAMPLES:

