

## 2

## EXPLORE

## Writing a Situation for an Inequality

Give an example of a real-world situation that can be modeled by the inequality  $a > 3$ , where  $a$  is a whole number.

- A** First, decide what the variable represents.

The possible values of  $a$  can only be whole numbers. Underline the definition of  $a$  that best meets this description.

Let  $a$  represent the weight, in ounces, of an apple.

Let  $a$  represent the number of apples in a bag.

- B** Interpret the inequality symbol.

Can the number of apples in the bag be...	Yes/No
...fewer than 3?	
...exactly 3?	
...more than 3?	

So, the inequality  $a > 3$  can be modeled by this situation:

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## TRY THIS!

- 2a.** Give an example of a real-world situation that can be modeled by the inequality  $m \leq 120$ , where  $m$  is a positive number.

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# PRACTICE

Write an inequality to represent each situation. Then describe the solution set of the inequality.

1. At most, 15 students can be in the computer lab.

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2. For the next hour, the plane's altitude remained above 30,000 feet.

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3. The temperature of the ice in an ice rink should be no more than 26 °F.

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Give an example of a real-world situation that can be modeled by each inequality.

4.  $f \geq 20$ , where  $f$  is a whole number

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5.  $w < 8$ , where  $w$  is a positive number

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Solve each equation. Then find the solution set of the related inequality.

6.  $s + 2 = 6$

$s + 2 \geq 6$

7.  $n - 1 = 5$

$n - 1 < 5$

$s =$  \_\_\_\_\_

$s \geq$  \_\_\_\_\_

$n =$  \_\_\_\_\_

$n <$  \_\_\_\_\_

8.  $3d = 9$

$3d > 9$

9.  $t + 4 = 4$

$t + 4 \leq 4$

$d =$  \_\_\_\_\_

$d >$  \_\_\_\_\_

$t =$  \_\_\_\_\_

$t \leq$  \_\_\_\_\_

10. **Critical Thinking** The inequality  $d < 5$  represents the distance  $d$ , in miles, that Janelle walks each day. Is the inequality  $d < 5$  true when  $d = -1$ ? Explain whether a solution of  $d = -1$  makes sense in this situation.

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11. **Error Analysis** Miguel wrote the inequality  $t \leq 350$  to represent the situation "The oven temperature must be no less than 350°F." Describe the mistake that Miguel made. What is an inequality that correctly describes the situation?

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Write an inequality to represent each situation. Then describe the solution set of the inequality.

1. The temperature today will be at most 50 °F.

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2. The temperature tomorrow will be above 70 °F.

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3. There was fewer than 20 items in a bag.

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4. There must be at least 3 people on the ferry for it to cross the river.

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Give an example of a real-world situation that can be modeled by each inequality.

5.  $t \leq -2$ , where  $t$  is an integer

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6.  $j > 5$ , where  $j$  is a whole number

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7.  $y \leq 0$ , where  $y$  is a negative number

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8.  $b < \frac{1}{2}$ , where  $b$  is a rational number

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Solve each equation. Then find the solution set of the related inequality.

1.  $j - 7 = 21$        $j - 7 \geq 21$   
 $j = \underline{\hspace{2cm}}$        $j \geq \underline{\hspace{2cm}}$

2.  $3y = 66$        $3y < 66$   
 $y = \underline{\hspace{2cm}}$        $y < \underline{\hspace{2cm}}$

3.  $f + 40 = 72$        $f + 40 \leq 72$   
 $f = \underline{\hspace{2cm}}$        $f \leq \underline{\hspace{2cm}}$

4.  $\frac{p}{4} = -12$        $\frac{p}{4} > -12$   
 $p = \underline{\hspace{2cm}}$        $p > \underline{\hspace{2cm}}$

Write an inequality to represent each situation. Then describe the solution set of the inequality.

5. At least 25 people must be in line for the doors to open for the concert.

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6. The temperature of the oven should be no more than 450 °F when baking the dessert.

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