

warm-up

1) $3(-5)(-7) =$ 7.NS.2a	4) Find the area of a rectangular room (in square feet) that is 15 feet by 120 inches. 7.G.6
2) What is the sum of 52 and its additive inverse? 7.NS.1b	5) Trent bought five tickets to the movies and spent \$12.35 on snacks and drinks. Let t = the cost of one movie ticket and c = the total amount of money that Trent spent. Write an equation that could be used to determine how much money Trent spent.
3) In a survey 80 out of 100 people supported building a new library. If 450 people were asked if they supported building the library, how many would you expect to say yes?	

inequality - a mathematical sentence that states that two expressions are NOT equal

inequality symbol - symbol used to compare both sides of an inequality $<, >, \leq, \geq$

solution set - a list of values that make an inequality true $\{x, y, z \dots\}$

Algebraic Phrase	Algebraic Inequality	Examples
1. a number is less than 4.		
2. a number is more than 4.		
3. -4 is less than a number.		
4. -4 is greater than a number.		
5. Jason has at least five dollars.		
6. The highest (or most) grade you can get is a ninety-five.		

Translating inequality word phrases

Algebraic Phrase	Algebraic Inequality	Solutions
1. a number is less than 4.	$x < 4$	{3, 2, 1...}
2. a number is more than 4.	$x > 4$	{5, 6, 7...}
3. -4 is less than a number.	$-4 < x$	{-3, -4, -5...}
4. -4 is greater than a number.	$-4 > x$	{-5, -6, -7...}
5. Jason has at least five dollars.	$d \geq 5$	{5, 6, 7...}
6. The highest grade you can get is a ninety-five.	$g \leq 95$	{95, 94, 93...}

TOPIC:
Solving
Inequalities

Lesson Essential Question:

How can we model real life situations to solve an inequality?

**SOLVING
One-Step
Inequalities**
(REVIEW from
6th Grade)

EXAMPLE:

1) DRAW your RIVER (a line to separate left-side from the right-side.)

$$x + 8 < 21$$

$$3x \leq 21$$

$$\boxed{x} + 8 < 21$$

$$3x \leq 21$$

2) Perform inverse (or opposite) operation.

$$\boxed{x} + 8 < 21$$

$$\underline{-8} < \underline{-8}$$

$$\underline{3x} \leq \underline{21}$$

$$\underline{3} \quad \underline{3}$$

3) Box your final answer.

$$\boxed{x < 13}$$

$$\boxed{x \leq 7}$$

****ALWAYS CHECK****
Does my answer make sense?

DID MY ANSWER HAVE???
 ■ VARIABLE TERM ■ an INEQUALITY SIGN ■ CONSTANT

When multiplying or dividing by a negative,
switch the inequality symbol to its opposite.

EXAMPLE:

$$-3x \geq 21$$

$$\frac{-3x}{-3} \geq \frac{21}{-3}$$

$$x \leq -7$$

CHECK:

if $x = -5$

$$\begin{aligned} -3(-5) &\geq 21 \\ 15 &\geq 21 \quad \times \end{aligned}$$

if $x = -9$

$$\begin{aligned} -3(-9) &\geq 21 \\ 27 &\geq 21 \quad \checkmark \end{aligned}$$

EXAMPLE:

$$8 - x > 20$$

$$\begin{aligned} 8 - x &> 20 \\ \frac{-8}{-1} - \frac{-x}{-1} &> \frac{20}{-1} \\ -x &> -12 \end{aligned}$$

$$x < -12$$

Solution Set:

$$\{-7, -8, -9\dots\}$$

Solution Set:

$$\{-13, -14, -15\dots\}$$

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SOLVING
Two-Step
Inequalities

EXAMPLE:

1) DRAW your RIVER (a line to separate left-side from the right-side.)

$$-x + 8 > 21$$

$$\boxed{-x} + 8 > 21$$

2) Perform inverse (or opposite) operation.

$$\boxed{-x} + 8 > 21$$

$$\underline{-x} \quad \underline{+8} \quad \underline{-8} \quad \underline{-8}$$

3) Flip the symbol.

$$\underline{-x} > \underline{13}$$

$$\underline{-1} \quad \underline{-1}$$

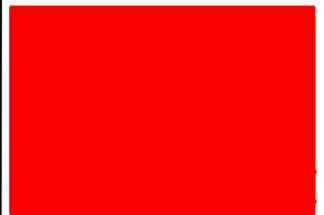
$$\boxed{x < -13}$$

4) Box your final answer.

5) Check your answer.

CHECK

(choose a possible solution)



****ALWAYS CHECK your answer. Does it make sense?**

DID MY ANSWER HAVE???

■ VARIABLE TERM ■ an INEQUALITY SIGN ■ CONSTANT

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SOLVING
Two-Step
Inequalities

EXAMPLE:

1) DRAW your RIVER (a line to separate left-side from the right-side.)

$$\begin{array}{r} -3x \geq 15 \\ 5 \\ -3x \geq 15 \\ 5 \end{array}$$

2) Perform inverse operations.

$$\begin{array}{r} 5 -3x \geq 15 5 \\ 5 \quad 5 \end{array}$$

3) Flip the symbol.

$$\begin{array}{r} -3x > 75 \\ -3 \quad -3 \end{array}$$

4) Box your final answer.

$$\boxed{x \leq -25}$$

5) Check your answer.

CHECK

(choose a possible solution)



DID MY ANSWER HAVE???

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SOLVING
Two-Step
Inequalities

EXAMPLE: $\frac{x - 3}{4} \geq 1$

1) **DRAW** your river.

$$4 \frac{x - 3}{4} \geq 1 \quad 4$$

CHECK:

2) Perform inverse operations.

$$x - 3 \geq 4$$
$$+3 \quad +3$$

3) **Box** your final answer.

$$x \geq 7$$

Solution Set:

4) Check your answer.

DID MY ANSWER HAVE???

■ VARIABLE TERM ■ an INEQUALITY SIGN ■ CONSTANT