

## Teacher Guide for the Lesson on **inequality**

**Standard:**  
7.11(A)

**Content Objective:**

We can model and solve an **inequality** and explain how operations, including multiplying or dividing by a negative, affect the solution.

**Language Objective:** Answer the following question in complete sentences using the sentence stem and the key vocabulary of the lesson:

Why do you think multiplying or dividing by a negative changes the direction of the **inequality**?

*I think multiplying or dividing by a negative changes the direction of the **inequality** because...*

**Other key vocabulary:** [equation](#)

**inequality**

INEQUALITIES	ADDING/SUBTRACTING	MULTIPLYING BY A POSITIVE	MULTIPLYING BY A NEGATIVE
$>$	① $x + 8 > 32$	① $6x < 24$	① $-2x > 14$
$<$	② $x + 8 > 32$ $-8 \quad -8$	② $\frac{x}{3} \geq 5$	② $-\frac{x}{8} \leq 12$
$\leq$	③ $x > 32$ $-8 \quad -8$	③ $\frac{6x}{6} < \frac{24}{6}$	③ $(-8) \cdot \frac{x}{8} \leq 12(-8)$
$\geq$	④ $x > 24$ ✓	④ $x \geq 5$ (3)	④ $x \leq 12(-8)$ (the signs!)
			④ $x \geq -96$ ✓

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**By studying this visual, students might:**

Notice	Wonder
<ul style="list-style-type: none"> <li>The symbols show relationships like less than or greater than</li> </ul>	<ul style="list-style-type: none"> <li>Why does multiplying or dividing by a negative change the direction?</li> </ul>
<ul style="list-style-type: none"> <li>The direction of an inequality can change depending on what you do to both sides</li> </ul>	<ul style="list-style-type: none"> <li>Does the inequality always flip with negatives?</li> </ul>
<ul style="list-style-type: none"> <li>Multiplying or dividing by a negative flips the inequality symbol</li> </ul>	<ul style="list-style-type: none"> <li>What happens if you do more than one step?</li> </ul>
<ul style="list-style-type: none"> <li>The same number is being compared on both sides in different ways</li> </ul>	<ul style="list-style-type: none"> <li>How is this different from solving an equation?</li> </ul>

<ul style="list-style-type: none"> <li>• The visual shows patterns between steps and how inequalities behave</li> </ul>	<ul style="list-style-type: none"> <li>• Can an inequality have more than one solution?</li> </ul>
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### EXTENDING THE DISCUSSION

- After randomly calling on students, if there is anything from this list that was not mentioned, then ask the class, "Did anyone notice...?"
- After students have shared what they notice, ask the class, "Did anyone wonder...?" using the suggestions above or anything else you might think is interesting or relevant to the lesson.

### Structured Conversation Prompts

OBSERVATIONAL	RELATIONAL	INFERENTIAL
<p>What is an <b>inequality</b>?</p> <p>An <b>inequality</b> is...</p>	<p>How is an <b>inequality</b> different from an <b>equation</b> ?</p> <p>An <b>inequality</b> is different from an <b>equation</b> because...</p>	<p>Why do you think multiplying or dividing by a negative changes the direction of the <b>inequality</b>?</p> <p>I think multiplying or dividing by a negative changes the direction of the <b>inequality</b> because...</p>

### Example Student Responses to the Observational Question

Low-Level	High-Level
<p>An <b>inequality</b> is when numbers are compared using symbols like .</p>	<p>An <b>inequality</b> is a comparison between two values or <b>expressions</b> using symbols like <b>less than, more than, less than or equal to, or greater than or equal to</b> to show they are not equal.</p>

## RESPONDING TO RESPONSES

Emphasize and celebrate each student's use of the key vocabulary to support a culture of "no wrong answers."

## STRUCTURING STUDENT CONVERSATIONS

Have students list observations from the visual as a warm-up, then use the Q-SSS-A process to guide small-group conversations. In the slide decks, brackets can be moved to prepare the structured conversation. In the example to the right, students will be instructed: [Q-SSS-A](#).



- To put a thumb up, then lower their hand when they are ready to answer the question
- To share with their elbow/shoulder partner, and that the student with the darkest shoe will share first
- That they will be randomly called on after the conversation

[Here is an example](#) of structuring a conversation with Q-SSS-A.

*Note: the inferential question is the same as the language objective. It is recommended that students answer the inferential question in a small-group discussion before answering it individually as the closure or exit ticket of the lesson.*

## Structured Reading

READING PURPOSE	PAT LIST	POST-READING DISCUSSION
The purpose for reading is to understand how an <b>inequality</b> represents a real world situation and shows what must be true about a value.	<ul style="list-style-type: none"> <li>• Where an inequality is used to represent a situation</li> <li>• What the inequality shows must be true about a value</li> <li>• How the situation connects to the inequality expression</li> <li>• What changes or stays the same in the inequality</li> </ul>	<p>How does the <b>inequality</b> <math>x - 15 \geq 40</math> represent Jalen's situation in the final example?</p> <p><i>The <b>inequality</b> <math>x - 15 \geq 40</math> represents Jalen's situation because...</i></p>

## STRUCTURING THE READING

Communicate the purpose of reading to the students and instruct them to make a note every time they see something on the PAT ("Pay Attention To") list. How you have students note items on the PAT list is up to you. This could include:




- Putting an asterisk in the margin
- Underlining text that supports the PAT list
- Putting a comment in the margin

Follow the reading with the post-reading discussion. Structure this discussion using the Q-SSS-A process just like the structured conversations in this lesson.

*Note: you might find the relational question is better discussed before or after the reading. This depends on whether the relational question is directly related to the reading or might make connections across units.*

## DIFFERENTIATING THE READING

You will notice that three different reading passages are provided with this lesson. Look at the shapes in the top-left of each passage to determine the grade level.

BELOW GRADE LEVEL	ON GRADE LEVEL	ABOVE GRADE LEVEL
 <i>Triangle is bottom-left</i>	 <i>Square is bottom-left</i>	 <i>Circle is bottom-left</i>

In a class with students at diverse reading level proficiencies, you can give the appropriate reading passage to different students, while having all students follow the same PAT list and post-reading discussion.