



Inequalities

Real-World Discovery Stations

Write, Graph & Solve

Grade 6 | CCSS 6.EE.B.5, 6.EE.B.6, 6.EE.B.8

6.EE.B.5

Substitution &
Checking Solutions

6.EE.B.6

Variable
Expressions

6.EE.B.8

Writing & Graphing
Inequalities

4 Discovery Stations | 20 Problems + Extensions | Anchor Charts | Answer Keys | Exit Tickets |
Easel Activity

UM Printables

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Station 1

Substitution Detective

Standard: 6.EE.B.5

In this station, you are a Substitution Detective. Your mission is to test given values in equations and inequalities to determine which ones make them true. Just as a detective tests evidence to solve a case, you will substitute values into mathematical statements and verify whether each value is a solution. This process of substitution is the foundation of solving equations and inequalities: before we can solve, we must understand what it means for a value to satisfy a mathematical statement. Work through each problem carefully, showing your substitution steps and checking your arithmetic.

Key Vocabulary

Substitution: Replacing a variable with a specific value to check if it makes a statement true

Solution: A value that makes an equation or inequality true when substituted

Equation: A mathematical statement showing two expressions are equal ($=$)

Inequality: A mathematical statement showing two expressions are not equal ($>$, $<$, $\geq$, $\leq$)

Directions: Work through all 4 problems with your group. Show all work on your recording sheet. If you finish early, try the Extension challenge. Everyone in your group should be able to explain each answer before you move on.

Station 1: Substitution Detective | Problem 1

Consider the equation $3x + 5 = 20$. Test each value to determine if it makes the equation true.

Values to test: $x = 5$ | $x = 4$ | $x = 3$ | $x = 6$

Which value(s) make the equation true? Show your substitution work for each.

Show your work below:

Station 1: Substitution Detective | Problem 2

Consider the inequality $2y - 3 > 7$. Test each value to determine if it makes the inequality true.

Values to test: $y = 4$ | $y = 5$ | $y = 6$ | $y = 3$

Which value(s) make the inequality true? Show your substitution work for each.

Show your work below:

Station 1: Substitution Detective | Problem 3

The equation $4n + 2 = 18$ represents four groups of students plus 2 extra equaling 18 total. Test each value.

Values to test: $n = 3$ | $n = 4$ | $n = 5$ | $n = 2$

Station 3

Inequality Writer

Standard: 6.EE.B.8

In this station, you are an Inequality Writer. You will read real-world scenarios that describe constraints or conditions and translate them into mathematical inequalities. Key phrases like "at least," "no more than," "less than," and "more than" each correspond to specific inequality symbols. Pay close attention to whether the boundary value is included ($\geq$ or $\leq$) or excluded ($>$ or $<$). This distinction matters in real life: being "at least 48 inches tall" means 48 inches qualifies, but "less than 45 seconds" means exactly 45 does NOT qualify.

Key Vocabulary

Constraint: A condition or limitation on a quantity in a real-world situation

At least: Greater than or equal to ($\geq$) - the boundary value IS included

No more than: Less than or equal to ($\leq$) - the boundary value IS included

Infinitely many: An unlimited number of solutions; cannot be counted

Directions: Work through all 4 problems with your group. Show all work on your recording sheet. If you finish early, try the Extension challenge. Everyone in your group should be able to explain each answer before you move on.

Station 4

Inequality Grapher

Standard: 6.EE.B.8

In this station, you are an Inequality Grapher. You will graph inequalities on number lines, making critical decisions about open versus closed circles and shading direction. An open circle means the boundary value is NOT included ($<$ and $>$). A closed circle means the boundary value IS included ($\leq$ and $\geq$). The shading shows all values that satisfy the inequality. Remember that inequalities have infinitely many solutions, which is why we use a shaded ray with an arrow rather than marking individual points.

Key Vocabulary

Open circle: A hollow dot on a number line showing a value is NOT a solution ($<$, $>$)

Closed circle: A filled dot on a number line showing a value IS a solution ($\leq$, $\geq$)

Shading: A highlighted region on a number line showing all solutions

Number line: A visual tool for representing and comparing numbers and solution sets

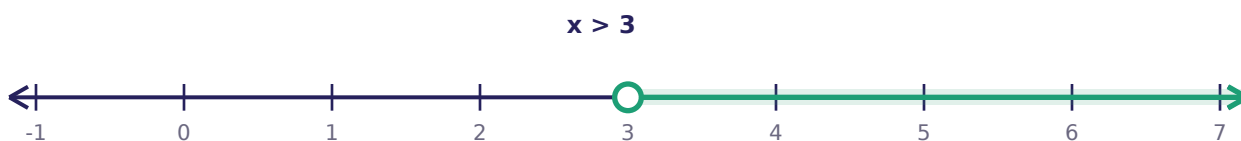
Directions: Work through all 4 problems with your group. Show all work on your recording sheet. If you finish early, try the Extension challenge. Everyone in your group should be able to explain each answer before you move on.

Station 4: Inequality Grapher | Problem 1

Graph the inequality $x > 3$ on a number line.

Draw the number line. Use an open or closed circle at 3, and shade the correct direction. Explain your choices.

Show your work below:

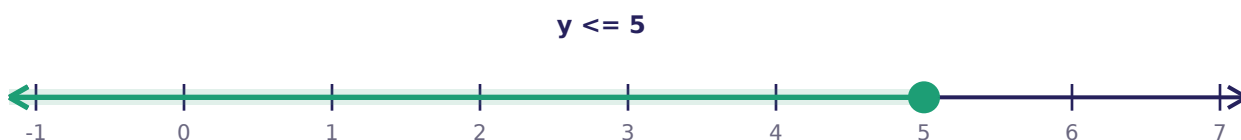


Station 4: Inequality Grapher | Problem 2

Graph the inequality $y \leq 5$ on a number line.

Draw the number line. Use an open or closed circle at 5, and shade the correct direction. Explain.

Show your work below:



Station 4: Inequality Grapher | Problem 3

Graph the inequality $n < -2$ on a number line.

Student Recording Sheet

Use this recording sheet to document your work at each station. Write your answers clearly and show all steps. Each section corresponds to one station.

Name: _____

Date: _____

Class: _____

Teacher: _____

TEST: Station 1 - Substitution Detective

Problem 1:

Work / Answer:

Problem 2:

Work / Answer:

Problem 3:

Work / Answer:

Problem 4:

Work / Answer:

Extension:

TRANSLATE: Station 2 - Variable Translator

Problem 1:

Work / Answer:

Anchor Chart: Inequality Symbols & Real-World Language

This anchor chart shows the four inequality symbols alongside their mathematical meaning and common real-world phrases that translate to each symbol. Post this chart in your classroom or provide copies to students as a reference tool during Stations 3 and 4.

Symbol	Meaning	Real-World Phrases	Example	Circle Type
$>$	Greater than	"more than" "greater than" "exceeds" "over"	Need more than \$5 to ride the bus $m > 5$	OPEN circle
$<$	Less than	"less than" "fewer than" "under" "below"	Speed under 55 mph $s < 55$	OPEN circle
$\geq$	Greater than or equal to	"at least" "minimum" "no less than" "not under"	At least 48" to ride $h \geq 48$	CLOSED circle
$\leq$	Less than or equal to	"at most" "maximum" "no more than" "not over"	No more than 2000 lb $w \leq 2000$	CLOSED circle

Key Insight: The difference between $>$ and $\geq$ (or $<$ and $\leq$) is whether the boundary value itself is a solution. "More than 5" means 5 is NOT enough, but "at least 5" means 5 DOES qualify. This single distinction determines whether to use an open circle or closed circle when graphing.

Quick Translation Practice

Translate each phrase into an inequality symbol:

- "at most 100" $\rightarrow \leq$ (less than or equal to)
- "more than 30" $\rightarrow >$ (strictly greater than)
- "no less than 50" $\rightarrow \geq$ (greater than or equal to)
- "under 75" $\rightarrow <$ (strictly less than)
- "a minimum of 20" $\rightarrow \geq$ (greater than or equal to)
- "fewer than 10" $\rightarrow <$ (strictly less than)

Anchor Chart: Open vs Closed Circle Graphing Rules

When graphing inequalities on a number line, the type of circle at the boundary point is a critical visual signal. This anchor chart explains when to use each type of circle and provides visual examples.

Open Circle (Hollow Dot)

When to Use	Why	Inequality Types
Boundary value is NOT a solution	The value at the circle does not satisfy the inequality when substituted	$x > c$ (greater than) $x < c$ (less than)

$x > 3$ (open circle at 3, shade right)



$x < 5$ (open circle at 5, shade left)



Closed Circle (Filled Dot)

When to Use	Why	Inequality Types
Boundary value IS a solution	The value at the circle satisfies the inequality when substituted	$x \geq c$ (greater than or equal to) $x \leq c$ (less than or equal to)

$x \geq 3$ (closed circle at 3, shade right)



$x \leq 5$ (closed circle at 5, shade left)



Memory Trick: Think of the inequality symbol as a gate. If the line under the symbol is there ($\geq$ or $\leq$), the gate is closed and the boundary value gets in (closed circle). If there is no line under the symbol ($>$ or $<$), the gate is open and the boundary value is kept out (open circle).

Shading Direction Rules

Inequality	Shade Direction	Why
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1. Write an inequality: "Temperature must be at most 32 degrees F for water to freeze." Let t = temperature.

2. Write an inequality: "You need more than 50 signatures to get on the ballot." Let s = signatures.

Exit Ticket 4

Standard: 6.EE.B.8

Name: _____ Date: _____

1. Graph $x < 4$ on a number line. Is the circle at 4 open or closed? Why?

2. How many solutions does $x > 1$ have? Explain.

Exit Ticket Answer Keys

Exit Ticket 1 (6.EE.B.5):

1. $2(7) + 1 = 14 + 1 = 15$. YES, $x = 7$ makes the equation true.
2. $4(3) - 2 = 12 - 2 = 10$. Is $10 > 8$? YES, $y = 3$ makes the inequality true.

Exit Ticket 2 (6.EE.B.6):

1. Total fare = $3.50 + 2.25m$
2. Total books = $4b$

Exit Ticket 3 (6.EE.B.8):

1. $t \leq 32$ ("at most" means less than or equal to)
2. $s > 50$ ("more than" means strictly greater than)

Exit Ticket 4 (6.EE.B.8):

1. Open circle at 4 (because $<$ does not include 4). Shade left.
2. Infinitely many. Any number greater than 1 works (1.001, 2, 3, 100, ...).

Easel Self-Checking Digital Version

This resource includes an Easel by TPT self-checking digital activity that allows students to interact with the content on a digital device. The Easel version provides immediate feedback, making it ideal for independent practice, homework, or distance learning.

Setting Up the Easel Activity

- Step 1:** Open the Easel activity from your TPT purchases or downloads page
- Step 2:** The activity is pre-formatted with draggable elements and clickable zones
- Step 3:** Assign to students via Google Classroom, Canvas, or by sharing the direct link
- Step 4:** Students can work independently with immediate self-checking feedback
- Step 5:** Teacher dashboard shows completion rates and scores in real time
- Step 6:** Use the "Assign with Options" feature to customize time limits or attempts

Interactive Features by Slide Type

Slides 1-5: Substitution Detective

Students drag given values ($x = 5$, $x = 4$, etc.) into "True" or "False" zones. The Easel platform automatically checks if the value makes the equation or inequality true. Incorrect placements bounce back with a hint. Students must show their substitution work in the text box provided before the drag element activates, ensuring they reason through each problem rather than guessing.

Slides 6-10: Variable Translator

Students type variable expressions in the answer box. The Easel version includes a "symbol palette" with common mathematical symbols that students can click to build expressions. A real-time preview shows the formatted expression. The self-checking engine validates equivalent expressions (e.g., " $5 + 3h$ " and " $3h + 5$ " are both accepted). Context sentences are displayed with highlighted key phrases.

Slides 11-15: Inequality Writer

Students drag inequality symbols ($>$, $<$, $\geq$, $\leq$) into place between the variable and the boundary value. Four symbol options are displayed as draggable tokens. A "phrase bank" at the bottom of each slide shows the real-world phrases that map to each symbol, providing built-in scaffolding.

Slides 16-20: Inequality Grapher

WHAT'S INSIDE

THE FULL 80-PAGE RESOURCE

Inequalities Real-World Discovery Stations - Write, Graph & Solve

UM Printables.com

Grade 6 | CCSS 6.EE.B.5, 6.EE.B.6, 6.EE.B.8

4 DISCOVERY STATIONS

- Station 1 - Substitution Detective (6.EE.B.5): test values in equations and inequalities.
- Station 2 - Variable Translator (6.EE.B.6): write variable expressions from contexts.
- Station 3 - Inequality Writer (6.EE.B.8): translate constraints using inequality symbols.
- Station 4 - Inequality Grapher (6.EE.B.8): graph solution sets with open/closed circles.

TEACHER & PLANNING SUPPORT

- Teacher Introduction & Overview plus CCSS Alignment Chart.
- Materials & Setup Guide, Station Rotation Guide, and Pacing Guide & Lesson Planning.
- Differentiation & Scaffolding Guide and Common Misconceptions & How to Address Them.
- Mathematical Discussion Questions and Standards Deep Dive: Understanding 6.EE.B.
- Parent Communication Letter and Formative Assessment Rubric.

STATION PRACTICE

- Each station has 4 core problems plus an extension challenge (20 station prompts total).
- Practice focuses on substitution, expression writing, inequality writing, and number-line graphing.
- Real-world settings are used where appropriate; some items use direct mathematical statements to focus on the skill.

ASSESSMENT & PRACTICE

- Complete Answer Key with Worked Solutions plus additional worked examples.
- Exit Tickets for each station with answer keys.
- Bonus Practice Problems with a dedicated answer-key section.
- Mixed Review covering all four stations with a separate answer key.
- Additional Practice Sets and a Real-World Scenario Collection.

STUDENT-FACING TOOLS

- Student Recording Sheet with TEST / TRANSLATE / WRITE / GRAPH sections.
- 2 printable anchor charts: inequality symbols & real-world language; open vs. closed circle rules.
- Number Line Drawing Practice and Symbol Matching Activity.
- Learning Targets & I Can Statements; Student Self-Assessment Checklist.
- Interactive Notebook Pages and Math Journal Prompts.

EXTENSIONS & DIGITAL SUPPORT

- Digital Self-Checking Activity Guide for the included digital activity.
- Technology Integration Suggestions for classroom use.
- Concept Connection Map linking the major ideas across the resource.
- Blank Templates for creating custom inequality and substitution problems.
- Review Request page included at the end of the full resource.

FULL RESOURCE AT A GLANCE

80 pages • 4 discovery stations • 20 station prompts • answer keys • anchor charts • assessment • practice

Designed for flexible station rotation, small-group work, whole-class instruction, independent practice, homework, or intervention.