



Math Exploration

Learning Objectives

- Select the graph of the solution set to a two-variable quadratic inequality.

Materials

- Print the following worksheets and data sheets:
 - *Unit 70 Lesson 1 MTH Warm-Up Worksheet 5 Lv 1* (per Level 1 student)
 - *Unit 70 Lesson 1 MTH Warm-Up Worksheet 5 Lv 2* (per Level 2 student)
 - *Unit 70 Lesson 1 MTH Warm-Up Worksheet 5 Lv 3* (per Level 3 student)
 - *Unit 70 Lesson 1 MTH Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 2* (per Level 2 student)
 - *Unit 70 Lesson 1 MTH Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 3* (per Level 3 student)
 - *Classroom Resources Coordinate Plane with Axes and Numbers (-10 to 10) Worksheet* (two copies)
 - *Classroom Resources Coordinate Plane with Axes and Numbers (-6 to 6) Worksheet* (two copies)
 - *Classroom Resources Yes/No Cards Worksheet*
 - *Classroom Resources Number Cards Worksheet*
 - *Classroom Resources Scratch Paper Worksheet* (per Level 2 and 3 student)
 - System of Least Prompts Individual (per student) or Group Data Sheet
 - Constant Time Delay Individual (per student) or Group Data Sheet
- Gather the following materials from the enCORE Manipulatives Kit and/or your classroom:
 - Large Dry Erase Pockets
 - Magnetic Picture Pockets
 - Magnetic Whiteboard
 - Calculator (per level 2 and 3 student)
 - Classroom whiteboard
 - Dry erase marker (two colors)
 - Pencil (per Level 2 and 3 student)

Prior to Instruction

To prepare for teaching this lesson segment, follow these steps:

1. Gather, print, and prepare all materials listed above.
2. If you plan to program students' AAC devices, program the following words:

LEVEL 1	LEVEL 2	LEVEL 3
<ul style="list-style-type: none"> • numbers (-6 to 30) • inequality <p>(continued)</p>	<ul style="list-style-type: none"> • numbers (-6 to 6) • inequality <p>(continued)</p>	<ul style="list-style-type: none"> • numbers (-10 to 30) • inequality <p>(continued)</p>

LEVEL 1	LEVEL 2	LEVEL 3
<ul style="list-style-type: none"> • x-coordinate, y-coordinate • parabola • greater than, less than 	<ul style="list-style-type: none"> • x-coordinate, y-coordinate • parabola • greater than, less than, greater than or equal to, less than or equal to 	<ul style="list-style-type: none"> • x-coordinate, y-coordinate • parabola • greater than, less than, greater than or equal to, less than or equal to

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the Adapted Book *Beowulf*. **In *Beowulf*, we learned that King Beowulf allowed 11 warriors to travel with him to the dragon’s cave. Upon hearing King Beowulf cry out while he fought the dragon, all but one warrior ran away. How many warriors ran away?** Wait for students to respond. To support the students in responding, write $11 - 1 = _$ on the classroom whiteboard.

Math Warm-Ups

The following activities are designed to engage your students at the beginning of the math lessons, as well as provide frequent practice on important math skills and/or math-focused transition skills. For Level 1 students, the Math Warm-Up Activity involves a hands-on activity and descriptions of different ways for students to respond or interact based on their abilities, and Warm-Up Worksheet to be completed with teacher assistance. For Level 2 and 3 students, a Warm-Up Worksheet is provided for independent or group work.

Materials: *Unit 70 Lesson 1 MTH Warm-Up Worksheet 5 Lv 1* (per Level 1 student), *Unit 70 Lesson 1 MTH Warm-Up Worksheet 5 Lv 2* (per Level 2 student), *Unit 70 Lesson 1 MTH Warm-Up Worksheet 5 Lv 3* (per Level 3 student), *Classroom Resources Number Cards Worksheet*, *Classroom Resources Scratch Paper Worksheet* (per Level 2 and 3 student), Magnetic Whiteboard, Magnetic Picture Pockets, calculator (per Level 2 and 3 student), pencil (per Level 2 and 3 student)

Prior to Instruction: For Level 1 students, have students gather around a group table. On the Magnetic Whiteboard, write an inequality using numbers up to 30 with a blank line on the right side of the inequality symbol. Cut out the Number Cards from the Number Cards Worksheet and place up to five numbers at a time on the table in front of the students. Make sure some numbers in the response field are greater than and some are less than the targeted number on the Magnetic Whiteboard. Gather the Level 1 Warm-Up Worksheet for this segment. For Level 2 and 3 students, gather Warm-Up Worksheets for this segment, Scratch Paper Worksheets (if needed), calculators (if needed), and pencils.

LEVEL 1	LEVEL 2	LEVEL 3
<p>Point to the inequality on the Magnetic Whiteboard as you say to the student to your left, Hold up a number that is [greater than/less than] [#]. The student can hold up any number from the response field that makes the inequality true. Then, move to the next student. You can choose to change the inequality, or if more numbers in the response field make the inequality true, you can say to the next student, Show me another number that is [greater</p>	<p>Give each student a pencil and the appropriate level Warm-Up Worksheet for this segment. Provide each student with a calculator and Scratch Paper Worksheet, as needed.</p> <p>Instruct students to complete the Warm-Up Worksheet independently, with a partner, or in a small group. Review the Warm-Up Worksheet with students by level once all students have completed it.</p>	

LEVEL 1	LEVEL 2	LEVEL 3
<p>than/less than] [#]. Repeat with various inequalities until each student has had 2-3 turns. If the Number Cards are difficult for the students to pick up, place the cards inside Magnetic Picture Pockets. The Magnetic Picture Pockets can make grasping the Number Cards easier.</p> <p>Alternative Action: Have students point to or touch the response number</p> <p>Give each student a Level 1 Warm-Up Worksheet for this segment. Assist students by working individually with each student and recording their answers. If working in a group, give each student a turn to respond to each item, and record their individual answers as they go.</p>		

Core Vocabulary and Concepts

In this section, introduce the vocabulary words listed below one at a time by saying, **One of our vocabulary words is [vocabulary word]. [Vocabulary word] means [definition]. Let’s do an activity to help us understand the word.**

Then use either Constant Time Delay or System of Least Prompts to implement the activity listed below the definition. For details on these instructional methods, see the Core Vocabulary and Concepts Instructional Methods section at the front of this Teacher’s Guide or access the Core Vocabulary and Concepts Instructional Methods resource under Resources > Instructional Methods on the enCORE 9-12 web-based application.

Repeat with the remaining vocabulary words.

Materials: Constant Time Delay Individual (per student) or Group Data Sheet, System of Least Prompts Individual (per student) or Group Data Sheet, Magnetic Whiteboard, dry erase marker

Prior to Instruction: Select instructional method (i.e., Constant Time Delay or System of Least Prompts). Then, prepare the corresponding individual or group data sheet to collect data on your students as you do the activities listed below.

VOCABULARY WORD	DEFINITION	LEVELS
greater than	<p>bigger; the symbol $>$ means greater than (more than)</p> <p>For Level 1 students, write $x > -5$ on the Magnetic Whiteboard. Show students how the greater than sign shows that x has a value that is greater than negative five. For additional support, draw a number line with an open circle on the number negative five and a line with arrow going up the number line. Explain that the sign looks like an alligator mouth that eats the bigger value. Have students touch the greater than sign. Repeat with 5-10 trials per student with various inequalities using the greater than sign.</p>	1

VOCABULARY WORD	DEFINITION	LEVELS
less than	<p>smaller; the symbol $<$ means less than</p> <p>For Level 1 students, write $x < -3$ on the Magnetic Whiteboard. Show students how the less than sign shows that x has a value that is less than negative three. For additional support, draw a number line with an open circle on the number negative three and a line with arrow going down the number line. Explain that the sign looks like an alligator mouth that eats the bigger value and points to the smaller value. Have students touch the less than sign. Repeat with 5-10 trials per student with various inequalities using the less than sign.</p>	1
quadratic inequality	<p>an equation of the second degree that uses an inequality sign instead of an equal sign</p> <p>For Level 2 and 3 students, write $x^2 - 4 = 0$ and $x^2 - 4 \geq 0$ on the Magnetic Whiteboard. Show the students how one is a quadratic equation and the other is a quadratic inequality. Have the students point to the quadratic inequality. Repeat with 5-10 trials per student with various quadratic inequalities and quadratic equations.</p>	2, 3

Concept Building

Materials: *Unit 70 Lesson 1 MTH Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 2* (per Level 2 student), *Unit 70 Lesson 1 MTH Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 3* (per Level 3 student), *Classroom Resources Coordinate Plane with Axes and Numbers (-6 to 6) Worksheet* (two copies), *Classroom Resources Coordinate Plane with Axes and Numbers (-10 to 10) Worksheet* (two copies), *Classroom Resources Yes/No Cards Worksheet*, *System of Least Prompts Individual* (per student) or *Group Data Sheet*, Large Dry Erase Pockets, Magnetic Picture Pockets, Magnetic Whiteboard, classroom whiteboard, dry erase marker (two colors), pencil (per Level 2 and Level 3 student)

Prior to Instruction: For Level 1 and 2 students, cut out the Yes/No Cards from the Yes/No Cards Worksheet. Place two Coordinate Plane with Axes and Numbers (-6 to 6) Worksheets inside Large Dry Erase Pockets.

For Level 1 students, write $y > x^2 - 6x + 5$ on the Magnetic Whiteboard. On one coordinate plane, graph the quadratic inequality $y > x^2 - 6x + 5$ by drawing a parabola that has the zeros (1, 0) and (5, 0) and a vertex on (3, -4). Draw the parabola with a solid line. Shade the inside of the parabola using a light-colored dry erase marker. On the other coordinate plane, graph the quadratic inequality $y < x^2 - 6x + 5$. The parabola will be drawn in the same position as the other parabola, but the shading should be on the outside of the parabola to show the inequality is less than. Place the graph showing $y < x^2 - 6x + 5$ on the table in front of the students to their left and the graph showing $y > x^2 - 6x + 5$ on the students' right.

For Level 2 students, write $y \geq x^2 - 6x + 5$ on the Magnetic Whiteboard. On one coordinate plane, graph the quadratic inequality $y \geq x^2 - 6x + 5$ by drawing a parabola that has the zeros (1, 0) and (5, 0) and a vertex on (3, -4). Draw the parabola with a solid line. Shade the inside of the parabola using a light-colored dry erase marker. On the other coordinate plane, graph the quadratic inequality $y \leq x^2$ by drawing a parabola that goes through the points (-1, 1), (1, 1), (-2, 4) and (2, 4) and has a vertex on (0, 0). Draw the parabola with a solid line. Shade the outside of the parabola using a light-colored dry erase marker. Place the graph showing $y \leq x^2$ on the table in front of the students to their left and the graph showing $y \geq x^2 - 6x + 5$ on the students' right.

For Level 3 students, write $y \geq x^2 - 6x + 5$ on the classroom whiteboard. Place the Coordinate Plane with Axes and Numbers (-10 to 10) Worksheets inside Large Dry Erase Pockets. On the coordinate plane, graph the quadratic inequality $y \geq x^2 - 6x + 5$ by drawing a parabola that has the zeros (1, 0) and (5, 0) and a vertex on (3, -4). Draw the parabola with a solid line. Shade the inside of the parabola using a light-colored dry erase marker. On the other coordinate plane, graph the quadratic inequality $y > x^2$ by drawing a parabola that goes through the points (-1, 1), (1, 1), (-2, 4) and (2, 4) and has a vertex on (0, 0). Draw the parabola with a dotted line. Shade the outside of the parabola using a light-colored dry erase marker. Place the graph showing $y > x^2$ on the table in front of the students to their left and the graph showing $y \geq x^2 - 6x + 5$ on the students' right.

	LEVEL 1	LEVEL 2	LEVEL 3
INTRODUCE	<p>Today we are going to decide which graph matches an inequality!</p>	<p>Today we are going to decide which graph matches a quadratic inequality!</p>	
MODEL	<p>Use the following materials: Coordinate Plane with Axes and Numbers (-6 to 6) Worksheet (two copies), Yes/No Cards Worksheet, Large Dry Erase Pockets, Magnetic Picture Pockets, Magnetic Whiteboard, and dry erase marker (two colors).</p> <p>Let's practice deciding which graph matches the inequality. Point to $y > x^2 - 6x + 5$. The inequality we will match to a graph is $y > x^2 - 6x + 5$. Point to the coordinate planes on the table. Here are the two graphs I have to choose from.</p> <p>To help me decide which graph to choose, I will look at the inequality symbol. Point to the inequality sign in $y > x^2 - 6x + 5$. The greater than sign tells me the inside of the parabola should be shaded. Remember, greater than is shaded inside the parabola. Less than is</p> <p style="text-align: center;"><i>(continued)</i></p>	<p>Use the following materials: Coordinate Plane with Axes and Numbers (-6 to 6) Worksheet (two copies), Yes/No Cards Worksheet, Large Dry Erase Pockets, Magnetic Whiteboard, and dry erase marker (two colors).</p> <p>Let's practice deciding which graph matches a quadratic inequality. Point to $y \geq x^2 - 6x + 5$ as you say, The inequality we will match to a graph is $y \geq x^2 - 6x + 5$. Point to the coordinate planes on the table. Here are the two graphs I have to choose from.</p> <p>To help me decide which graph to choose, I will compare important parts of the inequality with important parts of each graph. Point to the inequality sign in $y \geq x^2 - 6x + 5$. The first important part of the inequality that I see is that the symbol tells me that y is greater than or equal</p> <p style="text-align: center;"><i>(continued)</i></p>	<p>Use the following materials: Coordinate Plane with Axes and Numbers (-10 to 10) Worksheet (two copies), Large Dry Erase Pockets, classroom whiteboard, and dry erase marker (two colors).</p> <p>Let's practice deciding which graph matches a quadratic inequality. Point to $y \geq x^2 - 6x + 5$ as you say, The inequality we will match to a graph is $y \geq x^2 - 6x + 5$. Point to the coordinate planes on the table. Here are the two graphs I have to choose from.</p> <p>To help me decide which graph to choose, I will compare key features of the inequality with key features of each graph. Remember, key features are important parts or information. I will start by looking at the inequality. Point to the inequality sign in $y \geq x^2 - 6x + 5$. The first important part of the</p> <p style="text-align: center;"><i>(continued)</i></p>

LEVEL 1

shaded outside of the parabola.

Now, I will look at the graphs. Point to the graph on the students' left. **This graph is shaded on the outside of the parabola. I know that the graph needs to be shaded on the inside, so this graph does NOT match.** Place the No Card under the graph. Point to the second graph. **This graph is shaded on the inside. The shading inside the parabola tells me this graph shows a greater than inequality and matches $y > x^2 - 6x + 5$.** Place the Yes Card under the graph.

Repeat with some or all of the following examples:

quadratic inequality: $y < x^2 - 2x - 3$; parabola zeros: $x = 3$ and $x = -1$; vertex: $(1, -4)$; distractor inequality: $y > x^2 - 2x - 3$

quadratic inequality: $y > x^2 - 4x$; parabola zeros: $x = 0$ and $x = 4$; vertex: $(2, -4)$; distractor inequality: $y < x^2 - 6x + 5$

quadratic inequality: $y > x^2 + 2x$; zeros: $x = -2$ and $x = 0$; vertex: $(-1, -1)$; distractor inequality: $y < x^2 + 2x$

LEVEL 2

to $x^2 - 6x + 5$. The symbol being greater than or equal to means the area inside the parabola should be shaded. Remember, greater than and greater than or equal to is shaded inside the parabola. Less than and less than or equal to is shaded on the outside of the parabola. Circle the inequality sign in $y \geq x^2 - 6x + 5$. **The second important part of the written inequality is that it tells me the line creating the parabola will be solid. A solid line shows when an inequality is greater than or equal to or less than or equal to. When an inequality is greater than or less than, the line will be dotted.**

Now, I will look at the graphs. Point to the graph on the students' left. **This graph has a solid line but is shaded on the outside. I know that the graph needs to be shaded on the inside, so this graph does NOT match.** Place the No Card under the graph. Point to the second graph. **This graph is shaded on the inside and has a solid line. The shading inside the parabola and the solid line tells me this graph matches $y \geq x^2 - 6x + 5$.** Place the Yes Card under the graph.

Repeat with some or all of the following examples:

quadratic inequality: $y < x^2 - 2x - 3$; parabola zeros: $x = 3$ and

LEVEL 3

inequality that I see is that the symbol tells me that y is greater than or equal to $x^2 - 6x + 5$. The symbol being greater than or equal to means the area inside the parabola should be shaded. Remember, greater than and greater than or equal to is shaded inside the parabola. Less than and less than or equal to is shaded on the outside of the parabola. Circle the inequality sign in $y \geq x^2 - 6x + 5$. **The second important part of the written inequality is that it tells me the line creating the parabola will be solid. A solid line shows when an inequality is greater than or equal to or less than or equal to. When an inequality is greater than or less than, the line will be dotted.**

Now, I will look at the graphs. Point to the graph on the students' left. **This graph is shaded on the inside but has a dotted line. I know that the graph needs a solid line, so this graph does NOT match.** Turn the graph over. Point to the second graph. **This graph is also shaded on the inside but instead of a dotted line, the line of the parabola is solid. The shading inside the parabola and the solid line tells me this graph most likely matches $y \geq x^2 - 6x + 5$; however, to make sure**

LEVEL 1	LEVEL 2	LEVEL 3
	<p>$x = -1$; vertex: $(1, -4)$; distractor inequality: $y > x^2 - 2x - 3$</p> <p>quadratic inequality: $y \geq x^2 - 4x$; parabola zeros: $x = 0$ and $x = 4$; vertex: $(2, -4)$; distractor inequality: $y \leq x^2 - 4x$</p> <p>quadratic inequality: $y \leq 2x^2 - 12x + 16$; zeros: $x = 4$ and $x = 2$; vertex: $(3, -2)$; distractor inequality: $y \geq 2x^2 - 12x + 16$</p>	<p>I am correct, I will replace the variables x and y with the values from a point that is inside the parabola. Point to $(2, 2)$ on the graph.</p> <p>I will use the coordinates from the point $(2, 2)$ to make sure I am correct in matching the graph. If I am correct, the inequality will be true. If I am NOT correct, the inequality will be false. Write $2 \geq 2^2 - 6(2) + 5$ under $y \geq x^2 - 6x + 5$. Point to 2^2. Two squared or 2 x 2 = 4. Write 4 - under $2 \geq 2^2 - 6(2) + 5$. Point to $6(2)$. 6 x 2 = 12. Write $12 + 5$. Now I will use a calculator to help me solve the rest of the inequality.</p> <p>Use the calculator to model the previously taught procedure for solving an equation with multiple numbers.</p> <p>4 - 12 + 5 = -3. Write $2 \geq -3$ under the equation. Point to each number and symbol in $2 \geq -3$ as you say, 2 is greater than negative three, so the inequality is true. Point to the graph and then the written inequality as you say, I am correct.</p> <p>This graph matches the quadratic inequality, $y \geq x^2 - 6x + 5$.</p> <p>Repeat with some or all of the following examples:</p> <p>quadratic inequality: $y \geq x^2 + 12x + 32$; parabola zeros: $x = -4$ and $x = -8$; vertex: $(-6, -4)$; point $(-2, 1)$; distractor inequality: $y > x^2 - 4x$; parabola</p> <p><i>(continued)</i></p>

	LEVEL 1	LEVEL 2	LEVEL 3
			zeros: $x = 0$ and $x = 4$; vertex: $(2, -4)$ quadratic inequality: $y \leq x^2 - 2x - 3$; parabola zeros: $x = 3$ and $x = -1$; vertex: $(1, -4)$; point $(-1, 5)$; distractor inequality: $y > x^2 - 2x - 3$; parabola zeros: $x = 3$ and $x = -1$; vertex: $(1, -4)$ quadratic inequality: $y < x^2 - 4x$; parabola zeros: $x = 0$ and $x = 4$; vertex: $(2, -4)$; point $(2, -2)$; distractor inequality: $y > x^2 - 2x - 3$; parabola zeros: $x = 3$ and $x = -1$; vertex: $(1, -4)$
GUIDED PRACTICE	Use the following materials: Coordinate Plane with Axes and Numbers (-6 to 6) Worksheet (two copies), Yes/No Cards Worksheet, Large Dry Erase Pockets, Magnetic Whiteboard, and dry erase marker (two colors). Use the procedure detailed above in the Model section to have your students help you choose the graph that matches each quadratic inequality below. For each individual step of a problem, call on a student to help you demonstrate how to do it. Then state aloud what the student did or have the student state it. quadratic inequality: $y < x^2 - 8x + 12$; parabola zeros: $x = 2$ and $x = 6$; vertex: $(4, -4)$; distractor inequality: $y > x^2 - 8x + 12$ quadratic inequality: $y > x^2 - 4x + 3$; parabola zeros: $x = 1$ and $x = 3$; vertex: $(2, -1)$; distractor inequality: $y < x^2 - 4x + 3$	Use the following materials: Coordinate Plane with Axes and Numbers (-6 to 6) Worksheet (two copies), Yes/No Cards Worksheet, Large Dry Erase Pockets, Magnetic Whiteboard, and dry erase marker (two colors). Use the procedure detailed above in the Model section to have your students help you choose the graph that matches each quadratic inequality below. For each individual step of a problem, call on a student to help you demonstrate how to do it. Then state aloud what the student did or have the student state it. quadratic inequality: $y < x^2 - 8x + 12$; parabola zeros: $x = 2$ and $x = 6$; vertex: $(4, -4)$; distractor inequality: $y > x^2 - 8x + 12$ quadratic inequality: $y > x^2 - 4x + 3$; parabola zeros: $x = 1$ and $x = 3$; vertex: $(2, -1)$; distractor inequality: $y < x^2 - 4x + 3$ quadratic inequality: $y \leq x^2 + 8x + 15$; parabola zeros: $x = -3$ and $x = -5$; vertex: $(-4, -1)$; distractor inequality: $y \geq x^2 + 8x + 15$	Use the following materials: Coordinate Plane with Axes and Numbers (-10 to 10) Worksheet (two copies), Large Dry Erase Pockets, classroom whiteboard, and dry erase marker (two colors). Use the procedure detailed above in the Model section to have your students help you choose the graph that matches each quadratic inequality below. For each individual step of a problem, call on a student to help you demonstrate how to do it. Then state aloud what the student did or have the student state it. quadratic inequality: $y < x^2 + 4x - 5$; parabola zeros: $x = 1$ and $x = -5$; vertex: $(-2, -9)$; point $(-1, 6)$; distractor inequality: $y \leq x^2 - 8x + 12$; parabola zeros: $x = 2$ and $x = 6$; vertex: $(4, -4)$ quadratic inequality: $y > x^2 - 8x + 12$; parabola zeros: $x = 2$ and $x = 6$; vertex: $(4, -4)$; point $(3, 4)$; distractor inequality: $y < x^2 + 4x - 5$; parabola zeros: $x = 1$ and $x = -5$; vertex: $(-2, -9)$

	LEVEL 1	LEVEL 2	LEVEL 3
	<p>quadratic inequality: $y < x^2 + 8x + 15$; parabola zeros: $x = -3$ and $x = -5$; vertex: $(-4, -1)$; distractor inequality: $y > x^2 + 8x + 15$</p> <p>quadratic inequality: $y > x^2 - 2x$; parabola zeros: $x = 0$ and $x = 2$; vertex: $(1, -1)$; distractor inequality: $y < x^2 - 2x$</p> <p>quadratic inequality: $y < x^2 - 6x + 5$; zeros: $x = 1$ and $x = 5$; vertex: $(3, -4)$; distractor inequality: $y > x^2 - 6x + 5$</p>	<p>quadratic inequality: $y \geq x^2 - 2x$; parabola zeros: $x = 0$ and $x = 2$; vertex: $(1, -1)$; distractor inequality: $y \leq x^2 - 2x$</p> <p>quadratic inequality: $y < x^2 - 6x + 5$; zeros: $x = 1$ and $x = 5$; vertex: $(3, -4)$; distractor inequality: $y > x^2 - 6x + 5$</p>	<p>quadratic inequality: $y < x^2 - 4x + 3$; parabola zeros: $x = 1$ and $x = 3$; vertex: $(2, -1)$; point $(-2, 1)$; distractor inequality: $y \leq x^2 + 8x + 15$; parabola zeros: $x = -3$ and $x = -5$; vertex: $(-4, -1)$</p> <p>quadratic inequality: $y \geq x^2 + 8x + 15$; parabola zeros: $x = -3$ and $x = -5$; vertex: $(-4, -1)$; point $(-5, 5)$; distractor inequality: $y > x^2 - 4x + 3$; parabola zeros: $x = 1$ and $x = 3$; vertex: $(2, -1)$</p> <p>quadratic inequality: $y \geq x^2 - 2x$; parabola zeros: $x = 0$ and $x = 2$; vertex: $(1, -1)$; point $(3, 8)$; distractor inequality: $y < x^2 - 2x$; parabola zeros: $x = 0$ and $x = 2$; vertex: $(1, -1)$</p>
INDEPENDENT PRACTICE	<p>Use the following materials: Coordinate Plane with Axes and Numbers (-6 to 6) Worksheet (two copies), Yes/No Cards Worksheet, Large Dry Erase Pockets, Magnetic Whiteboard, and dry erase marker (two colors).</p> <p>Use the procedure from the Model section above to have the student select the matching graph for some or all of the inequalities below.</p> <p>quadratic inequality: $y > x^2 + 4x + 3$; parabola zeros: $x = -1$ and $x = -3$; vertex: $(-2, -1)$; distractor inequality: $y < x^2 + 4x + 3$</p> <p>quadratic inequality: $y > x^2 - 6x + 8$; parabola zeros: $x = 2$ and $x = 4$; vertex: $(3, -1)$; distractor inequality: $y < x^2 - 6x + 8$</p> <p style="text-align: right;"><i>(continued)</i></p>	<p>Use the following materials: Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 2 (per Level 2 student), Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 3 (per Level 3 student), and pencil.</p> <p>Pass out Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 2 (per Level 2 student), Selecting a Graph Showing a Quadratic Inequality Worksheet Lv 3 (per Level 3 student), and a pencil to each student.</p> <p>Your turn. Circle the graph that matches each quadratic inequality on your worksheet. Give students support with staying on task and provide prompts as needed. If the completed worksheet will not provide enough data, use System of Least Prompts Individual (per student) or Group Data Sheet to collect additional data as needed.</p>	

	LEVEL 1	LEVEL 2	LEVEL 3
	<p>quadratic inequality: $y > x^2 - 1$; parabola zeros: $x = -1$ and $x = 1$; vertex: $(0, -1)$; distractor inequality: $y < x^2 - 1$</p> <p>quadratic inequality: $y < x^2 - 4$; parabola zeros: $x = 2$ and $x = -2$; vertex: $(0, -4)$; distractor inequality: $y > x^2 - 4$</p> <p>$y > x^2 + 4x$; parabola zeros: $x = 0$ and $x = -4$; vertex: $(-2, -4)$; distractor inequality: $y < x^2 + 4x$</p> <p>Use System of Least Prompts Individual (per student) or Group Data Sheet to collect data.</p>		
PROMPTING AND ERROR CORRECTION	<p>Verbal Prompt: The graph [does/does not] match the inequality. Place the [Yes/No] Card under the graph.</p> <p>Model Prompt: Watch me. The graph [does/does not] match the inequality. I place the [Yes/No] Card under the graph. Model placing the Yes/No Card under the corresponding graph. Your turn.</p> <p>Physical Prompt: Do it with me. The graph [does/does not] match the inequality. Place the [Yes/No] Card under the graph. Use hand-over-hand guidance and physically prompt the student to place the Yes/No Card under the corresponding graph.</p>		<p>Verbal Prompt: Write the coordinates of the point [(#, #)] into the inequality for the x and y variables.</p> <p>Model Prompt: Watch me. I write the coordinates of the point [(#, #)] into the inequality for the x and y variables. Model writing the inequality with the x and y variables substituted with the point coordinates. Your turn.</p> <p>Physical Prompt: Do it with me. Write the coordinates of the point [(#, #)] into the inequality for the x and y variables. Use hand-over-hand guidance and physically prompt the student to write the inequality with the x and y variables substituted with the point coordinates.</p>
REINFORCE	<p>Great work deciding which graph matches an inequality!</p>	<p>Great work deciding which graph matches a quadratic inequality!</p>	

Math for Life: Generalization and Extension Activities

To provide your students with opportunities to generalize and extend their knowledge via Math-focused Transition skills, please complete any or all of the following activities.

ACTIVITY	DESCRIPTION
Home Skills	Have students compare the prices of store items to determine which item costs more or less. If possible, use weekly ads from local stores to have the students compare the price of the same item at two different stores. For example, students could compare the cost of a gallon of milk, laundry detergent, or a bag of apples at two different stores.
Community Skills	Using a map, have students identify a location they go to often within the community. Identify the location on the map, then determine the most direct route to get to the targeted place.
Leisure Skills	Give students a set amount of time and a list of preferred leisure activities. Have students identify the activity or activities that can be completed in the given amount of time. Depending on students' level, you can include travel time to get to the preferred activity. For example, "You have one hour and 30 minutes to go bowling. It takes 10 minutes to walk to the bowling alley and a game takes 45 minutes to complete. Do you have enough time to get to the bowling alley and bowl a game in one hour and 30 minutes?"
Vocational Skills	Give students an amount of money earned in a specified workday. Then, give students an amount they earned in tips. Have students add the tip money to the hourly wages to find the total earned. For example, "You earned \$75.00 working. You also earned \$22.00 in tips. How much money did you earn altogether?"
Personal Life Skills	Give students an amount of money earned in a month of work. Then, give students two or three amounts that they need to "pay out" for bills (e.g., phone bill, groceries, etc.). Have students subtract the amount for each bill from their monthly income and determine how much money is left over.