

Inequality Boundaries

Write, graph, and explain strict inequalities.

GRADE 6 • 6.EE.B.8

CCSS.Math.Content.6.EE.B.8 "Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions..."

NAME _____

DATE _____

THE BIG IDEA

Use $x > c$ when x must be greater than c , and use $x < c$ when x must be less than c . The boundary number c is not included, so place an open circle at c and shade in the direction of the solutions. There are infinitely many solutions because the shaded line keeps going.

WORKED EXAMPLE

The temperature x must be above 14 degrees. Write an inequality and represent it on a number line.

1. Above means greater than.
2. Write $x > 14$.
3. Place an open circle at 14 and shade to the right.

Answer: $x > 14$; open circle at 14, shaded to the right.

PRACTICE 6 problems

- 1** A video must be shorter than 9 minutes. Let x be the number of minutes. Write an inequality.

ANSWER _____

- 2** A skateboarder needs a score higher than 60 to move to the next round. Let x be the score. Write an inequality.

ANSWER _____

- 3** A number line has an open circle at 5 and is shaded to the left. Write the inequality.

ANSWER _____

- 4** Draw a number line to represent $x > -2$.

ANSWER _____

- 5** List three possible solutions of $x < 4$.

ANSWER _____

- 6** Which inequality has 7 as a solution? A. $x < 7$ B. $x > 7$ C. $x < 8$ D. $x > 9$

ANSWER _____

APPLY IT Show your work

- 1** A student video contest accepts entries longer than 30 seconds. Let x be the video length in seconds. Write an inequality and represent its solutions on a number line.

WORK SPACE

ANSWER _____

- 2** A robotics club practice room can be used only if fewer than 18 students are there. Let x be the number of students. Write an inequality and represent its solutions on a number line.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

At an arcade, you can choose a prize only if you have more than 45 tickets. Let x be the number of tickets. Write an inequality, describe its number line graph, and explain why 45 is not a solution but 46 is.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A video must be shorter than 9 minutes. Let x be the number of minutes. Write an inequality.	$x < 9$
2	A skateboarder needs a score higher than 60 to move to the next round. Let x be the score. Write an inequality.	$x > 60$
3	A number line has an open circle at 5 and is shaded to the left. Write the inequality.	$x < 5$
4	Draw a number line to represent $x > -2$.	Open circle at -2, shaded to the right.
5	List three possible solutions of $x < 4$.	3, 0, -1
6	Which inequality has 7 as a solution? A. $x < 7$ B. $x > 7$ C. $x < 8$ D. $x > 9$	C. $x < 8$

PART 2 • APPLY IT

- $x > 30$; open circle at 30, shaded to the right.** The phrase longer than means greater than. Since 30 seconds is not accepted, use an open circle at 30.
- $x < 18$; open circle at 18, shaded to the left.** The phrase fewer than means less than. Since 18 students is not allowed, use an open circle at 18.

CHALLENGE

$x > 45$; open circle at 45, shaded to the right. The number 45 is not a solution because the rule says more than 45. The number 46 is a solution because $46 > 45$.

Accept equivalent verbal descriptions of the graphs, as long as the boundary has an open circle and the shading direction is correct. For the list of solutions, accept any three numbers less than 4.