

Inequality Line Up

Write, read, and graph solution sets.

GRADE 6 • 6.PAR.7.4

6.PAR.7.4 "Recognize and generate inequalities of the form $x > c$, $x \geq c$, $x \leq c$, or $x < c$ to explain situations that have infinitely many solutions; represent solutions of such inequalities on a number line."

NAME _____

DATE _____

THE BIG IDEA

An inequality compares x to a boundary number. Use an open circle for $>$ or $<$ because the boundary is not included, and use a closed circle for $\geq$ or $\leq$ because it is included. Shade right for greater and left for less.

WORKED EXAMPLE

Write and graph: x is at least 14.

1. "At least" means 14 is included.
2. Write $x \geq 14$.
3. Put a closed circle at 14 and shade to the right.

Answer: $x \geq 14$; closed circle at 14, shaded right.

PRACTICE 6 problems

- 1** 1. Write an inequality and graph it on a number line: x is greater than 9.

ANSWER _____

- 2** 2. Write an inequality and graph it on a number line: x is no more than -4.

ANSWER _____

- 3** 3. Graph $x \geq 5$ on a number line.

ANSWER _____

- 4** 4. A number line has an open circle at -8 and is shaded to the right. Write the inequality.

ANSWER _____

- 5** 5. A number line has a closed circle at 13 and is shaded to the left. Write the inequality.

ANSWER _____

- 6** 6. The mass x of a package must be less than 20 kg. Write an inequality and graph it on a number line.

ANSWER _____

APPLY IT Show your work

- 1** Part 2 APPLY. A music festival allows reusable water bottles that hold no more than 750 mL. Let x be the bottle's capacity in milliliters. Write and graph an inequality for allowed bottles.

WORK SPACE

ANSWER _____

- 2** Part 2 APPLY. A new game needs at least 24 GB of free storage to install. Let x be the amount of free storage in GB. Write and graph an inequality for devices that can install the game.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Part 3 CHALLENGE. Mina graphs $x < 11$ with a closed circle at 11 and shading to the left. Is her graph correct? Explain what she should change.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	1. Write an inequality and graph it on a number line: x is greater than 9.	$x > 9$; open circle at 9, shaded right.
2	2. Write an inequality and graph it on a number line: x is no more than -4.	$x \leq -4$; closed circle at -4, shaded left.
3	3. Graph $x \geq 5$ on a number line.	Closed circle at 5, shaded right.
4	4. A number line has an open circle at -8 and is shaded to the right. Write the inequality.	$x > -8$
5	5. A number line has a closed circle at 13 and is shaded to the left. Write the inequality.	$x \leq 13$
6	6. The mass x of a package must be less than 20 kg. Write an inequality and graph it on a number line.	$x < 20$; open circle at 20, shaded left.

PART 2 • APPLY IT

1. $x \leq 750$; closed circle at 750, shaded left. "No more than" includes 750, so use $\leq$. Graph a closed circle at 750 and shade left.
2. $x \geq 24$; closed circle at 24, shaded right. "At least" includes 24, so use $\geq$. Graph a closed circle at 24 and shade right.

CHALLENGE

No. She should use an open circle at 11 and shade left, because 11 is not a solution to $x < 11$.

Accept equivalent inequality wording and any clear, correctly oriented number-line graph. Open circles must be used for $<$ and $>$, while closed circles must be used for $\leq$ and $\geq$.