Graphing linear inequalities

In this lesson we'll look at how to graph linear inequalities on a coordinate plane.

To graph a linear inequality, first draw the boundary line. The boundary line will be dashed if the symbol is $<$ or $>$, to indicate that the boundary line isn't part of the graph of the inequality. The boundary line will be solid if the symbol is $\leq$ or $\geq$, to indicate that the boundary line is part of the graph of the inequality. After you draw the boundary line, shade in the correct side. Shade above the line if you have a $>$ or $\geq$ sign. Shade below the line if you have a $<$ or $\leq$ sign.

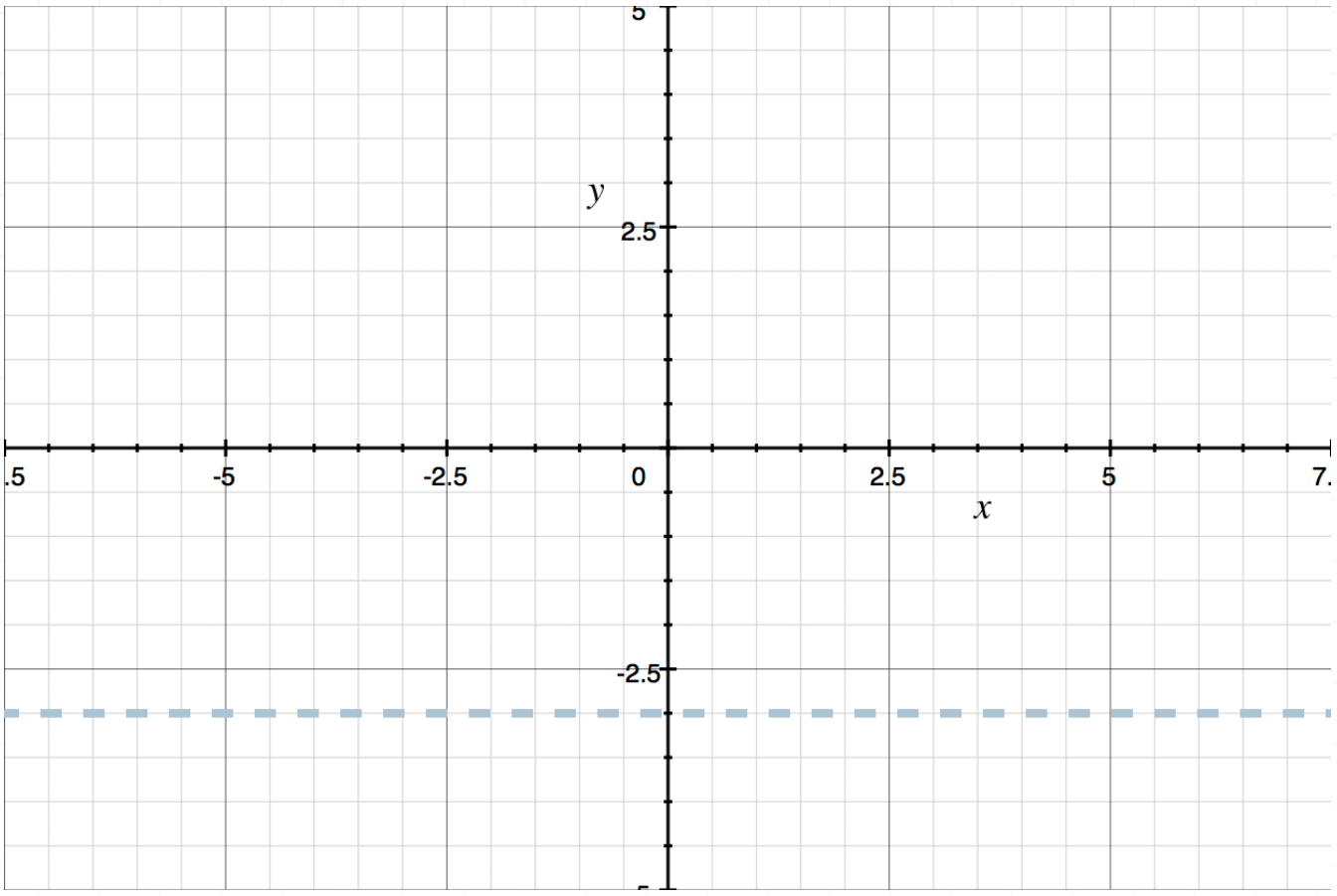
Let's do some examples so you can get the idea.

Example

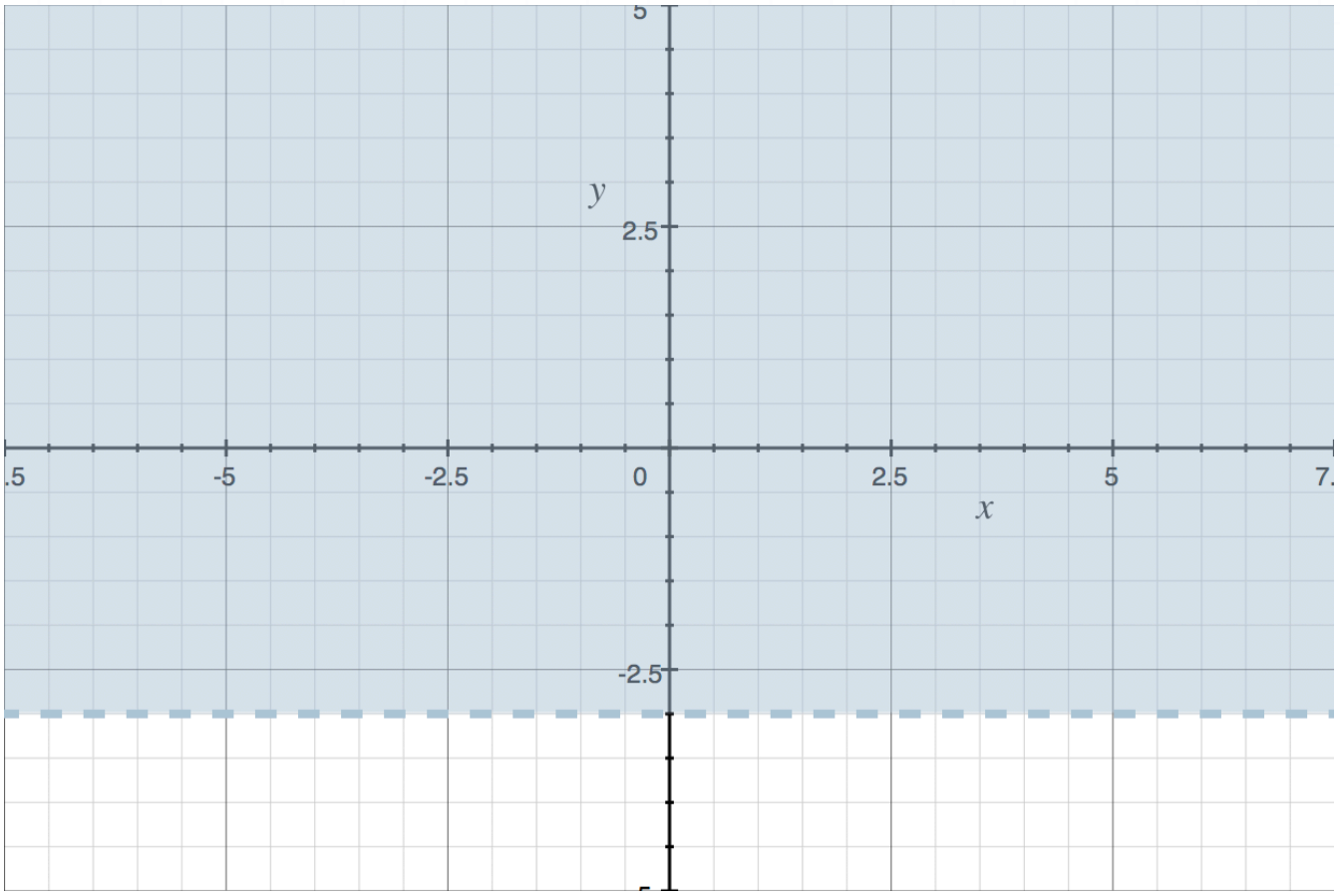
Graph the inequality.

$$y > -3$$

Let's begin by drawing the boundary line $y = -3$ with a dashed line since the sign is $>$.



Now because we have the > symbol, we need to shade above the line.



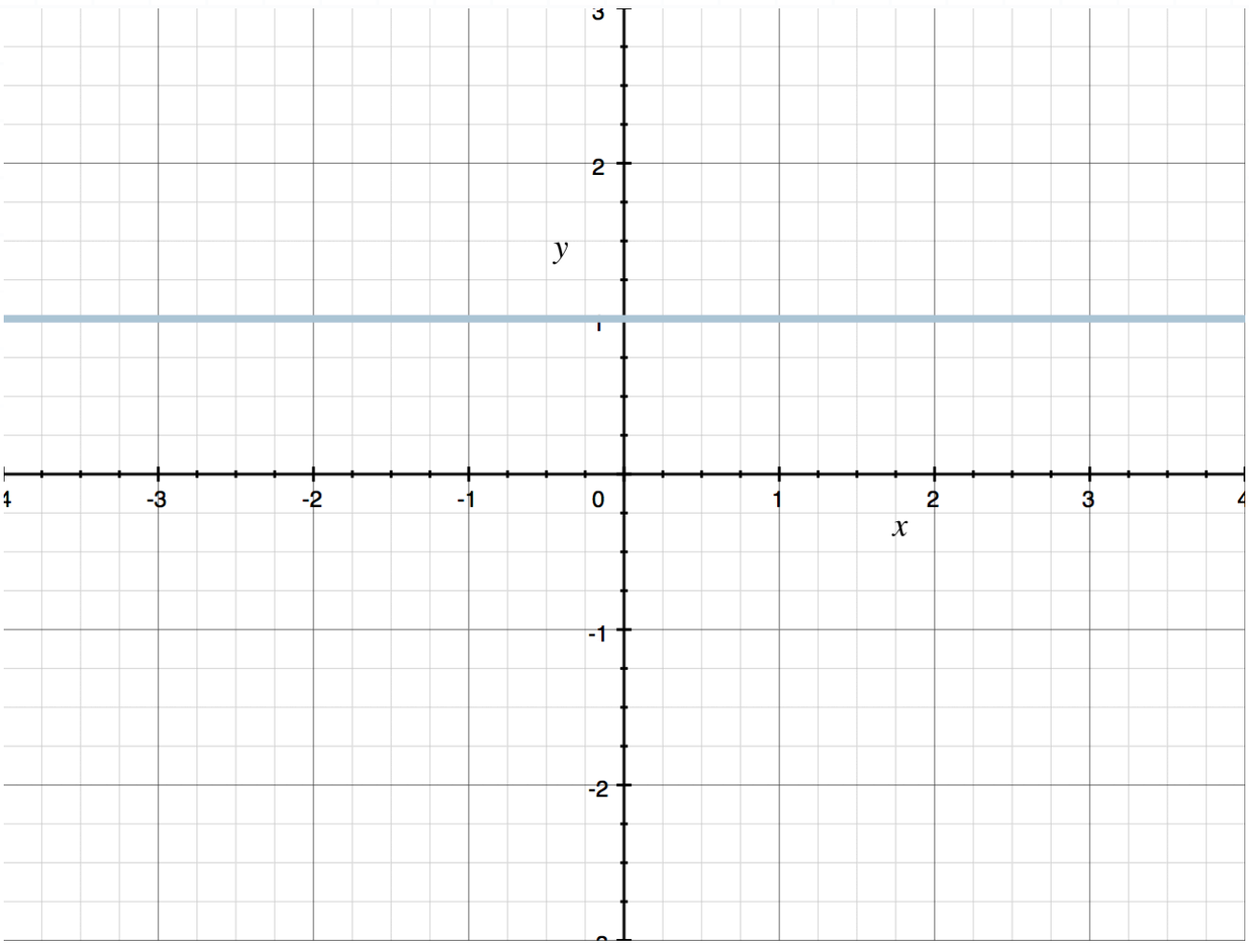
Let's try another.

Example

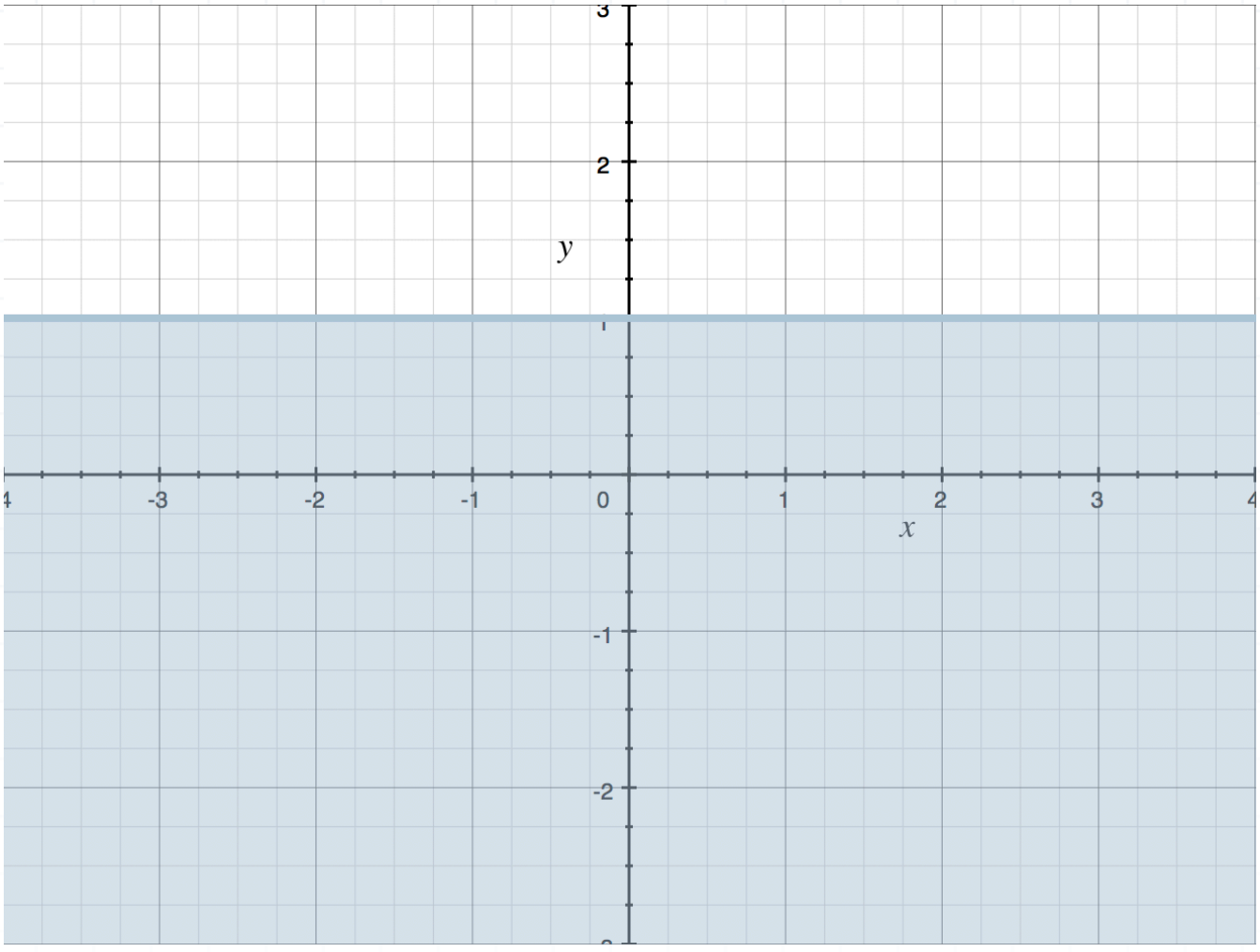
Graph the inequality.

$$y \leq 1$$

This time we start with a solid line at $y = 1$ because we have the $\leq$ sign.



This time we shade below the boundary line, because we have the $\leq$ sign.



The boundary line for each of the two linear inequalities we've graphed thus far is horizontal. Now let's look at a linear inequality whose boundary line isn't horizontal.

Example

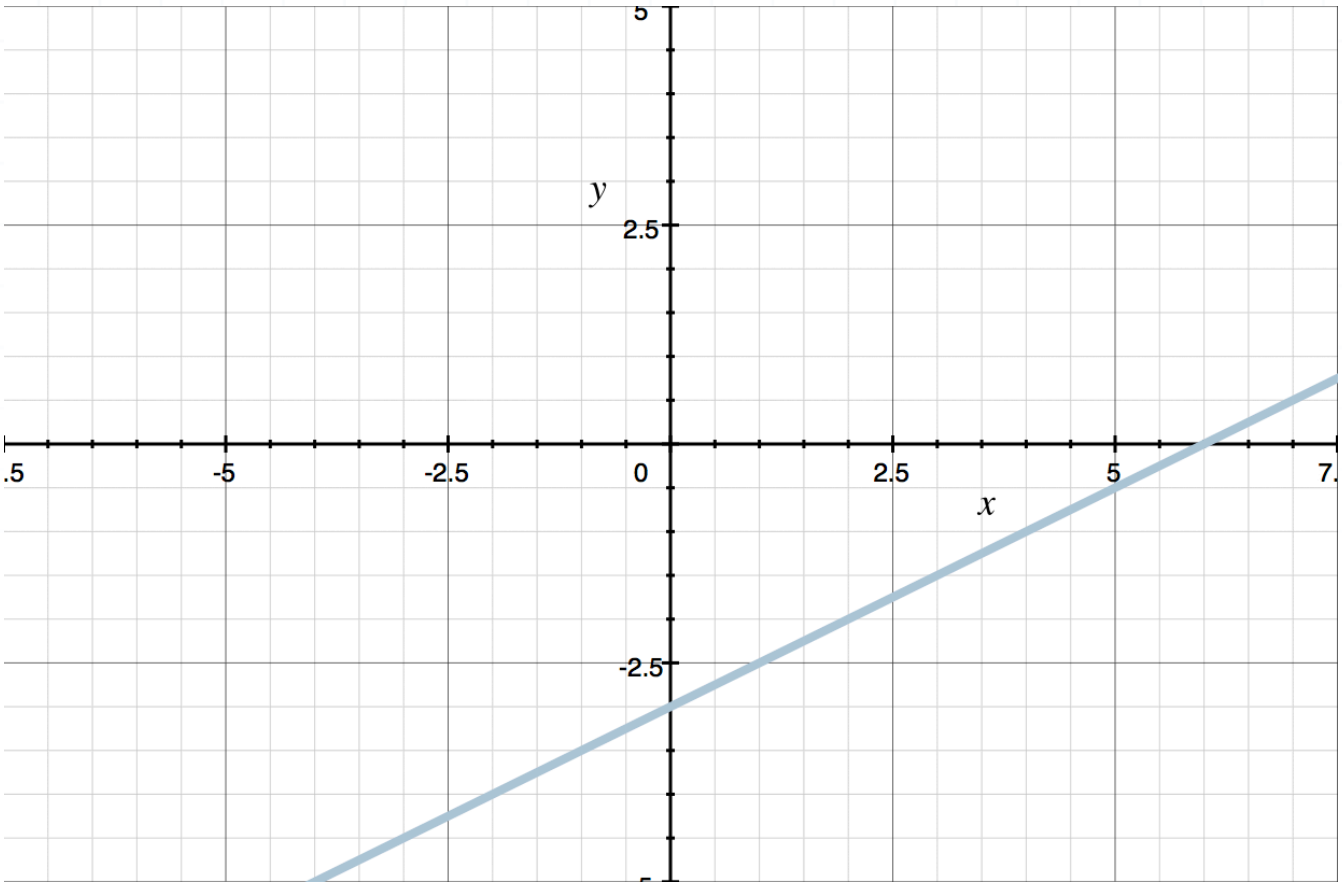
Graph the inequality.

$$y \geq \frac{1}{2}x - 3$$

Begin by drawing the boundary line

$$y = \frac{1}{2}x - 3$$

with a solid line because we have the $\geq$ symbol. To do this, plot two points on the line and then draw the line that passes through those two points. Start with the y-intercept, which has coordinates $(0, -3)$. Then use the slope to count up 1 and over 2 to the right to place the other point, which is $(2, -2)$. Draw the solid line that passes through those two points: $(0, -3)$ and $(2, -2)$.



Shade above the line because you have a $\geq$ symbol.