Applications of Linear Inequalities
## Student Activity

Name _____

Class _____

Open the TI-Nspire document
Applications_of_Linear_Inequalities.tns.

This activity applies the use of linear inequalities in two variables to solve problems. The graphs provide a visual way of thinking about the solution set to the inequality.

| 1.1 | 1.2 | 1.3 | ▶ Applications_...ies ▽ |

Applications of Linear Inequalities

Algebra 1
Use linear inequalities in two variables to solve problems
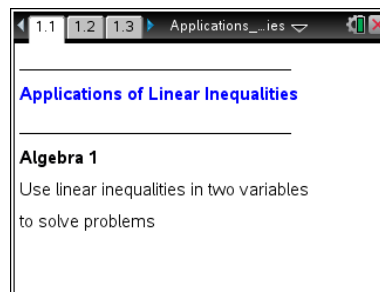
Move to pages 1.2 – 1.7.

Press ctrl ▶ and ctrl ◀ to navigate through the lesson.

Suppose the company you work for manufactures dirt bikes. It takes one person 4 hours to assemble a bike and 1 hour to road test a bike. The company does not allow employees to work more than 50 hours each week. How many bikes can one person assemble and road test in one week?

1. When writing an inequality to represent the problem, which inequality symbol would be used? How can you tell?

2. When writing an inequality to represent the problem, which inequality symbol would be used? How can you tell?

3. Solve the inequality from Question 2 for *y*. Show your work below.

4. To graph the inequality from Question 3, would the boundary line be graphed as a solid or dashed line? Explain.

Move to page 1.8.

5. On page 1.8 is the graph of the inequality that represents the problem on page 1.2. How does this inequality compare to your result from Questions 2 and 3?

Move to pages 1.9 – 1.13.

On page 1.8, suppose the *x*-coordinate of point *P* represents the number of bikes assembled and the *y*-coordinate represents the number of bikes that are road tested.

6. Grab and move point *P* around the graph. Notice the word *true* or *false* appears on the screen depending on the position of the point. What does this mean? Explain.

7. Which solutions graphed on page 1.8 make sense in the context of the problem? Explain.

8. Choose three different coordinates for point *P* by dragging the point above the boundary line, on the boundary line, and below the boundary line. Record the three you chose in the table below. Complete the table by testing each point in the inequality and showing your work.

	Above the boundary line	On the boundary line	Below the boundary line
Coordinates (*x*, *y*) of the point			
Verify by substituting the coordinates into the equation or inequality			

Verify your results on the table by returning to the graph on page 1.8 and using the true/false indicator for each of the coordinates for point *P* you chose.

Move to pages 1.14 – 1.18.

Extension Questions

9. Suppose the company policy states that employees must work less than 50 hours per week. How would this change the graph? Explain.

10. Suppose the company policy states that employees must work *more than* 20 hours per week. How would this change the graph? Explain.

11. Suppose the company policy states that employees must work *at least* 20 hours per week. How would this change the graph? Explain.

On page 1.18, use the up and down arrows to change the inequality graphed in order to verify your responses to Questions 9–11.