

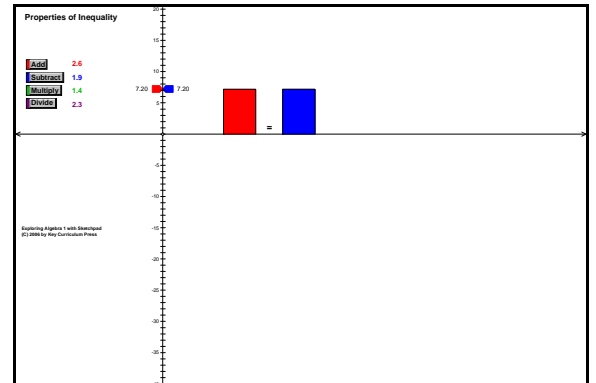
# Discovering Properties of Equalities and Inequalities

Open the file: Properties of Inequalities

You will first discover what happens to an equality when you perform various operations on the equality.

Notice that the two bars are the same height and their height is indicated by the blue and red arrows along the vertical scale. (DO NOT MOVE THESE ARROWS for part I.) Notice that the sign between the two bars indicates that the bars are the same height.

On the right side of the screen are four rectangular buttons with a red, blue, green, and purple number. You will be able to double click on the numbers and change them.



## PART I

1. Click on the ADD button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
2. Double click on the number next to the ADD button and try some different numbers and repeat step 1.
3. Click on the SUBTRACT button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
4. Double click on the number next to the SUBTRACT button and try some different numbers and repeat step 3.
5. Click on the MULTIPLY button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
6. Double click on the number next to the MULTIPLY button and try some different numbers and repeat step 5.
7. Click on the DIVIDE button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
8. Double click on the number next to the DIVIDE button and try some different numbers and repeat step 7.
9. Summarize what you learned from adding, subtracting, multiplying and dividing the height of the bar by various numbers.

## Part II

Drag either the blue or red arrow along the vertical number line. What happens to the height of the bars? Start by making the blue bar higher than the red bar.

1. Click on the ADD button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
2. Double click on the number next to the ADD button and try some different numbers and repeat step 1.
3. Click on the SUBTRACT button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
4. Double click on the number next to the SUBTRACT button and try some different numbers and repeat step 3.
5. Click on the MULTIPLY button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
6. Double click on the number next to the MULTIPLY button and try some different numbers and repeat step 5. Were there numbers that you could multiply by that changed the direction of the arrow? What type of numbers changed the direction?
7. Click on the DIVIDE button. Describe what happens to the red and blue bar. Study the sign between the two bars. What does it indicate?
8. Double click on the number next to the DIVIDE button and try some different numbers and repeat step 7. Were there numbers that you could divide by that changed the direction of the arrow? What type of numbers changed the direction?
9. Summarize what you learned from adding, subtracting, multiplying and dividing the height of the bar by various numbers.
10. Thinking about working with an inequality, what will change the inequality? What will keep it the same?