ACTIVITY 6.1

Developing Concepts

*Group Activity for use with Lesson 6.1*

# Investigating Inequalities

**GROUP ACTIVITY**
Work in a small group.

**MATERIALS**
- paper
- pencil

## QUESTION How do operations change an inequality?

## EXPLORING THE CONCEPT

1. Each member of your group should write a different inequality by choosing two numbers and placing $>$ or $<$ between them to show which is greater.
2. Apply each rule below to both sides of your inequality. Write the correct inequality symbol between the two resulting numbers.

   **a.** Add 4. **b.** Subtract 4.

   **c.** Multiply by 4. **d.** Divide by 4.

   **e.** Multiply by $-4$. **f.** Divide by $-4$.
3. In **Step 2**, when did you have to change the direction of the inequality symbol?
4. Use your inequality from **Step 1**. Repeat **Step 2**, but change 4 and $-4$ to some other positive and negative numbers. When did you have to change the direction of the inequality symbol?

## DRAWING CONCLUSIONS

**In Exercises 1–6, predict whether the direction of the inequality symbol will change when you apply the given rule. Check your prediction.**

**1.** $4 < 9$; add 7 **2.** $15 > 12$; subtract $-4$ **3.** $4 > -3$; multiply by 5

**4.** $2 > -11$; add $-7$ **5.** $-6 < 2$; divide by $-3$ **6.** $1 < 8$; multiply by $-10$

**7.** Copy and complete the table.

| Does the inequality symbol change directions? | | |
|---|---|---|
| | a positive number | a negative number |
| Add | ? | ? |
| Subtract | ? | ? |
| Multiply by | ? | ? |
| Divide by | ? | ? |

**Apply the given rule to solve the inequality.**

**8.** $x + 3 > 9$; subtract 3 **9.** $x + 7 \leq 12$; add $-7$

**10.** $4x \geq 15$; divide by 4 **11.** $-3x > 11$; divide by $-3$

**12.** $2x < 11$; multiply by $\frac{1}{2}$ **13.** $-\frac{1}{3}x \leq 12$; multiply by $-3$

**14.** $x + 6 < 15$; subtract 6 **15.** $x - 2 \geq 90$; add 2

**16.** $5x \leq 25$; divide by 5 **17.** $-6x > 30$; multiply by $-\frac{1}{6}$