

## 6.2 Inequalities with Negative Coefficients



**MATERIALS** • index cards

**QUESTION** How do you solve an inequality with a negative coefficient?

**EXPLORE** Check solutions of inequalities

**STEP 1** *Write integers* Write the integers from  $-5$  to  $5$  on index cards. Place the cards face up as shown.



**STEP 2** *Check solutions* Determine whether each integer is a solution of  $4x \geq 8$ . If the integer is *not* a solution, turn over the card.



**STEP 3** *Check solutions* Turn all the cards face up. Repeat Step 2 for  $-4x \geq 8$ .



**DRAW CONCLUSIONS** Use your observations to complete these exercises

- State an operation that you can perform on both sides of  $4x \geq 8$  to obtain the solutions found in Step 2. Then solve the inequality.
- Copy and complete the steps below for solving  $-4x \geq 8$ .
  - $-4x \geq 8$      Write original inequality.
  - ?     Add  $4x$  to each side.
  - ?     Subtract  $8$  from each side.
  - ?     Divide each side by  $4$ .
  - ?     Rewrite inequality with  $x$  on the left side.
- Does dividing both sides of  $-4x \geq 8$  by  $-4$  give the solution found in Exercise 2? If not, what else must you do to the inequality when you divide by  $-4$ ?
- Do you need to change the direction of the inequality symbol when you divide each side of an inequality by a positive number? by a negative number?

**Solve the inequality.**

- $20x \geq 5$
- $-9x \leq 45$
- $-8x > 40$
- $7x < 21$