

## ACTIVITY 1.7

### Developing Concepts

Group Activity for use with Lesson 1.7

# Absolute Value Equations and Inequalities

#### SET UP

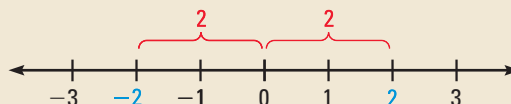
Work with a partner.

#### MATERIALS

11 index cards numbered from  $-5$  to  $5$

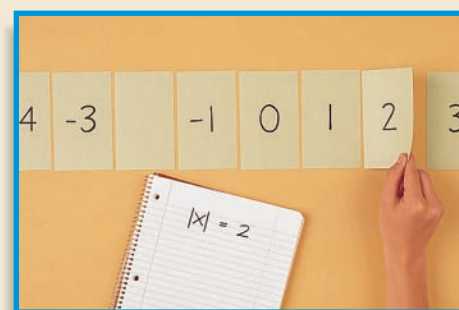
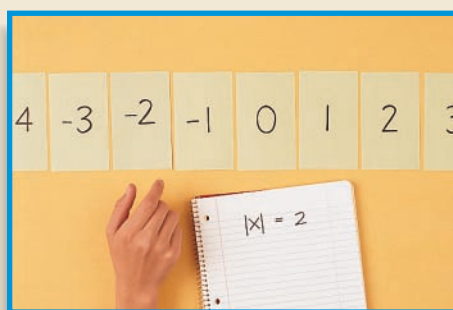
► **QUESTION** What does the solution of an absolute value equation or inequality look like on a number line?

The *absolute value* of a number  $x$ , written  $|x|$ , is the distance on a number line that the number is from 0. Because both 2 and  $-2$  are 2 units from 0,  $|2| = 2$  and  $|-2| = 2$ . Notice that the absolute value of a number is always positive or 0.



#### ► EXPLORING THE CONCEPT

- 1 You should work with a partner. Each pair of partners should have a set of index cards numbered from  $-5$  to  $5$ . The cards should be placed face up in numerical order to form a number line.



- 2 For each absolute value equation or inequality below, one partner should turn over the cards whose numbers are solutions. The other partner should then agree or disagree as to whether the solutions are correct. Once in agreement, both of you should graph the solutions on a number line. You should take turns turning over the cards and checking the solutions.

a.  $|x| = 4$

b.  $|x| \leq 4$

c.  $|x| \geq 4$

d.  $|3x| = 9$

e.  $|3x| \leq 9$

f.  $|3x| \geq 9$

g.  $|x - 1| = 2$

h.  $|x - 1| \leq 2$

i.  $|x - 1| \geq 2$

#### ► DRAWING CONCLUSIONS

1. Describe the nature of the solutions of the absolute value equations in parts (a), (d), and (g). Do you think that all absolute value equations will have solutions of this nature? Will all absolute value equations have the same number of solutions?
2. Describe the nature of the solutions of the absolute value inequalities in parts (b), (e), and (h), all of which involve the  $\leq$  sign. What difference, if any, would there be if the inequalities involved the  $<$  sign?
3. Describe the nature of the solutions of the absolute value inequalities in parts (c), (f), and (i), all of which involve the  $\geq$  sign. What difference, if any, would there be if the inequalities involved the  $>$  sign?