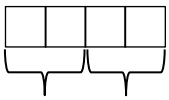
Lesson 1: The Relationship of Addition and Subtraction

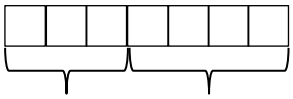
Classwork

Opening Exercise

a. Draw a tape diagram to represent the following expression: $5 + 4$.

b. Write an expression for each tape diagram.

i. 

ii. 

Exercises

1. Predict what will happen when a tape diagram has a large number of squares, some squares are removed, and then the same amount of squares are added back on.

2. Build a tape diagram with 10 squares.
   a. Remove six squares. Write an expression to represent the tape diagram.

   b. Add six squares onto the tape diagram. Alter the original expression to represent the current tape diagram.

c. Evaluate the expression.

3. Write an equation, using variables, to represent the identities we demonstrated with tape diagrams.

4. Using your knowledge of identities, fill in each of the blanks.

a. $4 + 5 - \_\_\_\_\_ = 4$

b. $25 - \_\_\_\_\_ + 10 = 25$

c. $\_\_\_\_\_ + 16 - 16 = 45$

d. $56 - 20 + 20 = \_\_\_\_\_$

5. Using your knowledge of identities, fill in each of the blanks.

a. $a + b - \_\_\_\_\_ = a$

b. $c - d + d = \_\_\_\_\_$

c. $e + \_\_\_\_\_ - f = e$

d. $\_\_\_\_\_ - h + h = g$

Problem Set

1. Fill in each blank.
   a. $\_\_\_\_\_ + 15 - 15 = 21$
   b. $450 - 230 + 230 = \_\_\_\_\_$
   c. $1289 - \_\_\_\_\_ + 856 = 1289$

2. Why are the equations $w - x + x = w$ and $w + x - x = w$ called *identities*?