

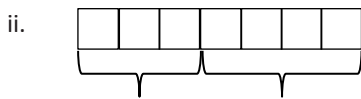
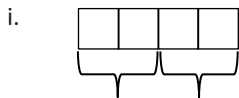
## Lesson 1: The Relationship of Addition and Subtraction

### Classwork

#### Opening Exercise

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

- b. Write an expression for each tape diagram.



#### Exercises

- 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.
- Build a tape diagram with 10 squares.
  - Remove six squares. Write an expression to represent the tape diagram.
  - 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.  $4 + 5 - \underline{\hspace{1cm}} = 4$
- b.  $25 - \underline{\hspace{1cm}} + 10 = 25$
- c.  $\underline{\hspace{1cm}} + 16 - 16 = 45$
- d.  $56 - 20 + 20 = \underline{\hspace{1cm}}$
5. Using your knowledge of identities, fill in each of the blanks.
- a.  $a + b - \underline{\hspace{1cm}} = a$
- b.  $c - d + d = \underline{\hspace{1cm}}$
- c.  $e + \underline{\hspace{1cm}} - f = e$
- d.  $\underline{\hspace{1cm}} - h + h = g$

**Problem Set**

1. Fill in each blank.
  - a.  $\underline{\quad\quad} + 15 - 15 = 21$
  - b.  $450 - 230 + 230 = \underline{\quad\quad}$
  - c.  $1289 - \underline{\quad\quad} + 856 = 1289$
  
2. Why are the equations  $w - x + x = w$  and  $w + x - x = w$  called *identities*?