

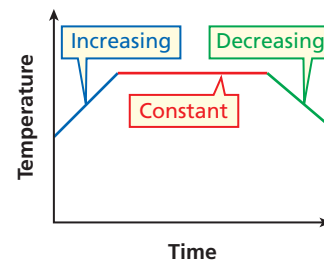
# Section Overview

## Graphing Relationships

Lesson 4-1

**Why?** Interpreting the situations that graphed relationships represent prepares students for understanding and graphing functions.

The heat was turned on in the morning.  
The temperature **increased** until it reached a comfortable level.  
The temperature stayed **constant** throughout the workday.  
Finally, the heat was turned off and the temperature **dropped**.



## Identifying, Writing, and Evaluating Functions

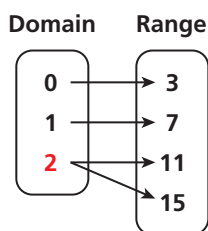
Lessons 4-2, 4-3

**Why?** Functions can be used to represent real-world situations.

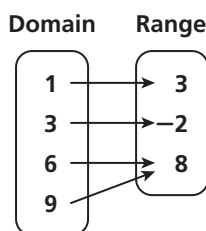
A **function** is a relation that pairs each element of the domain with exactly one element of the range.

A phone company charges a \$3.00 service fee plus \$0.50 for each minute.

**Relation**  
 $\{(0, 3), (1, 7), (2, 11), (2, 15)\}$      **Relation**  
 $\{(1, 3), (3, -2), (6, 8), (9, 8)\}$



**NOT a function**



**Function**

Total cost **is a function of** the number of minutes used.

**Independent variable,  $x$ :** number of minutes

**Dependent variable,  $f(x)$ :** total cost

$$f(x) = 3 + 0.50x$$

Total cost for **125** minutes is  $f(125)$ .

$$\begin{aligned} f(x) &= 3 + 0.50x \\ f(125) &= 3 + 0.50(125) \\ &= 3 + 62.50 \\ &= 65.50 \end{aligned}$$

## Graphing Functions

Lesson 4-4

**Why?** The graph of a function can be used to estimate values in many situations.

The function  $y = 80x$  represents the number,  $y$ , of Calories burned in  $x$  hours by a student sitting in class.

$x$	$y = 80x$	$(x, y)$
1	$y = 80(1) = 80$	(1, 80)
2	$y = 80(2) = 160$	(2, 160)
3	$y = 80(3) = 240$	(3, 240)
4	$y = 80(4) = 320$	(4, 320)

