

## Speed and Velocity (pages 312–317)

### Calculating Speed (pages 312–313)

**Key Concept:** If you know the distance an object travels in a certain amount of time, you can calculate the speed of the object.

- **Speed** is a rate. It tells how far something moves in a certain amount of time. For example, *1 meter per second* is a speed.
- To find speed, use the formula:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

- On a bike ride, you slow down and speed up. **Average speed** tells the total distance you rode divided by the total time it took. **Instantaneous speed** is the speed you were moving at an instant in time during the bike ride.

*Answer the following questions. Use your textbook and the ideas above.*

1. Read the words in the box. Use the correct words to fill in the blanks in the formula for speed.

Distance	Rate	Time
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$$\text{Speed} = \frac{\text{a. } \underline{\hspace{2cm}}}{\text{b. } \underline{\hspace{2cm}}}$$

2. Is the following sentence true or false? Your average speed on a bike ride was the speed you were moving at an instant in time during the ride. \_\_\_\_\_

**Motion** ▪ *Adapted Reading and Study*

3. How would you find the speed of a person who walked 10 meters in 8 seconds? Circle the letter of the correct answer.
- a.  $\text{Speed} = 10 \text{ meters} \div 8 \text{ seconds}$
  - b.  $\text{Speed} = 8 \text{ seconds} \times 10 \text{ meters}$
  - c.  $\text{Speed} = 8 \text{ seconds} \div 10 \text{ meters}$

**Describing Velocity** (pages 314–315)

**Key Concept:** When you know both the speed and direction of an object's motion, you know the velocity of the object.

- **Velocity** is speed in a given direction.
- For example, the velocity of a person walking is 3 kilometers per hour, west. This tells the speed the person is walking. It also tells you the direction the person is walking.

*Answer the following questions. Use your textbook and the ideas above.*

4. Speed in a given direction is \_\_\_\_\_.
5. What do you need to know to describe the velocity of an object? Circle the letter of each thing you need to know.
- a. distance
  - b. direction
  - c. speed
6. A velocity tells speed and direction. Circle the letter of each velocity.
- a. 2 meters per second east
  - b. 5 kilometers per hour
  - c. 10 meters per second west

**Motion** ▪ *Adapted Reading and Study***Graphing Motion** (pages 316–317)

**Key Concept:** You can show the motion of an object on a line graph in which you plot distance versus time.

- Motion can be shown on a line graph. A motion graph shows time along the bottom, or x-axis. A motion graph shows distance along the side, or y-axis.
- The steepness of the line on the graph is called **slope**. A line that rises steeply shows that an object is moving quickly. A line that rises less steeply shows that an object is moving more slowly. A line that is flat shows that an object is not moving at all.

*Answer the following questions. Use your textbook and the ideas above.*

7. The steepness of the line on a graph is called \_\_\_\_\_.

8. Look at the graph. Which part of the line shows a time when the object was not moving?

- a. A
- b. B
- c. C

