*Name*_____
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Guided Reading Chapter 4: Motion

Section 4-1: Describing and Measuring Motion

1. An object is in _____ when its distance from another object is changing.

2. What is a reference point?

3. An object is in motion if it changes position relative to a(n) _____.

4. Complete the table about SI.

SI	
Question	**Answer**
What is its whole name?	
What number is it based on?	
What is its basic unit of length?	

5. How many centimeters are there in a meter?

6. How many meters are there in a kilometer?

7. What is the formula used to calculate the speed of an object?

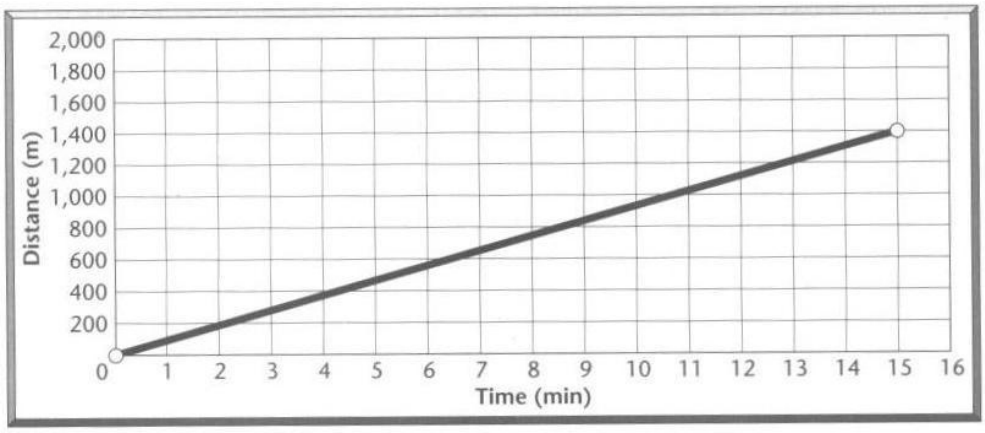
8. How would you find the average speed of a cyclist throughout an entire race?

9. Speed in a given direction is called _____.

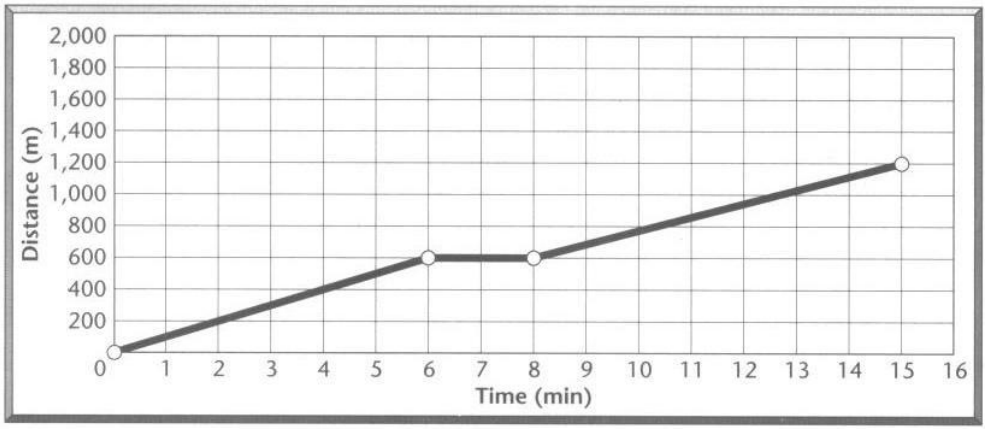
10. An approaching storm is moving at 14 km/hr. What do you need to know to determine its velocity?

11. The slant of a line on a graph is called its _____.

12. Is the following sentence true or false? The steepness of a motion graph's slope depends on how quickly or slowly the object is moving.



13. The motion graph above graphs the motion of a jogger on a run one day. How far did the jogger run in 15 minutes?



14. The motion graph above also shows the motion of a jogger on a run one day. The line is divided into segments. The middle segment is horizontal. What does that tell you about the jogger's progress between minute 6 and minute 8?

Section 4-2: Slow Motion on Planet Earth

1. Is the following sentence true or false? Earth's rocky outer shell is all one piece.

2. The upper layer of Earth consists of more than a dozen pieces called _____.

3. What is the theory of plate tectonics?

4. Circle the letter of each sentence that is true about Earth's plates.
    a. Some plates push toward each other.
    b. Some plates slide past each other.
    c. Earth consists of five major plates.
    d. Some plates pull away from each other.

5. Is the following sentence true or false? The speed of Earth's plates is very slow.

6. By knowing the average speed of a plate, what can scientists estimate about Earth's continents?

7. What formula do scientists use to predict how far a plate will move in a certain amount of time?

8. Is the following sentence true or false? The shapes and positions of Earth's continents will not change in the future.

9. A conversion factor is a fraction in which the numerator and the denominator are _____.

Section 4-3: Acceleration

1. What is acceleration?

2. Acceleration involves a change in what two components?

3. Any time the speed of an object increases, the object experiences _____.

4. Is the following sentence true or false? Acceleration refers to increasing speed, decreasing speed, or changing direction.

5. Deceleration is another word for negative _____.

6. Is the following sentence true or false? An object can be accelerating even if its speed is constant.

7. Circle the letter of each sentence that describes an example of acceleration.
    a. A car follows a gentle curve in the road.
    b. A batter swings a bat to hit a ball.
    c. A truck parked on a hill doesn't move all day.
    d. A runner slows down after finishing a race.

8. The moon revolves around Earth at a fairly constant speed. Is the moon accelerating? Explain.

9. Use the table below to compare and contrast the meanings of *acceleration*.

Acceleration	
In Everyday Language	**In Scientific Language**
	Increasing Speed
Slowing Down	
Turning	

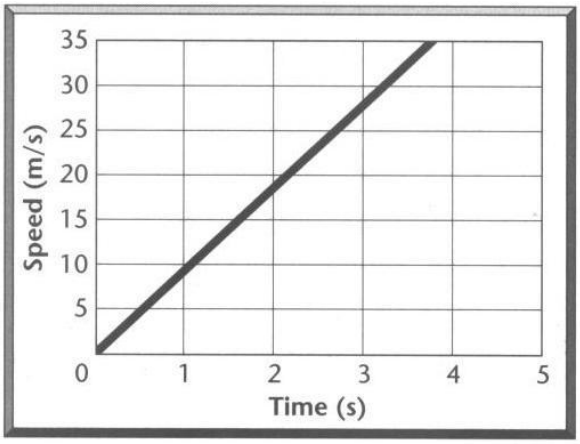
10. What must you calculate to determine the acceleration of an object?

11. What is the formula you use to determine acceleration?

12. Is the following sentence true or false? To calculate the acceleration of an automobile, you must first subtract the final speed from the initial speed.

13. Circle the letter of each sentence that is true about calculating the acceleration of a moving object.
    a. If an object is moving without changing direction, then its acceleration is the change in its speed during one unit of time.
    b. If an object's speed changes by the same amount during each unit of time, then the acceleration of the object at any time is the same.
    c. To determine the acceleration of an object, you must calculate the change in velocity during only one unit of time.
    d. If an object's acceleration varies, then you can describe only average acceleration.

14. Suppose velocity is measured in kilometers/hour and time is measured in hours. What is the unit of acceleration?



15. The graph above shows the motion of an object that is accelerating. What happens to the speed of the object over time?

16. The graph line is slanted and straight. What does this line show about the acceleration of the object?

17. Circle the letter of the sentence that is true when a graph of distance versus time is a curved line.
    a. The speed of the object never changes.
    b. The distance traveled by the object varies each second.
    c. The distance traveled by the object is the same each second.
    d. The object does not accelerate.