CHAPTER
2 Study Guide

Representing Motion
Vocabulary Review

Write the term that correctly completes the statement. Use each term once.

average speed   instantaneous   origin   resultant

average velocity   position   particle model   scalar

coordinate system   instantaneous velocity   position   time interval

displacement   magnitude   position-time graph   vector

distance   motion diagram

1. _____ The speed and direction of an object at a particular instant is the _____.

2. _____ Another term given for the size of a quantity is the _____.

3. _____ The _____ is the location of an object relative to an origin.

4. _____ The formula $t_f - t_i$ represents _____.

5. _____ A _____ is a quantity with both magnitude and direction.

6. _____ Ratio of the change in position to the time interval during which the change occurred is the _____.

7. _____ A system that defines the zero point of the variable you are studying is the _____.

8. _____ The zero point is also called the _____.

9. _____ A graph with time data on the horizontal axis and position data on the vertical axis is a _____.

10. _____ A _____ shows a series of images showing the position of a moving object over equal time intervals.

11. _____ A vector that represents the sum of two or more vectors is a _____.

12. _____ A simplified motion diagram that shows the object in motion as a series of points is a _____.

13. _____ A scalar quantity that is the length, or size, of the displacement vector is _____.

14. _____ A quantity that has only magnitude is _____.

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15. _____ The location of an object at a particular instant is _____.

16. _____ The vector quantity that defines the distance and direction between two positions is _____.

17. _____ The absolute value of the slope on a position-time graph is _____.

Section 2.1 Picturing Motion

In your textbook, read about motion diagrams on pages 31–33.

Refer to the diagrams below to answer questions 1–5. Circle the letter of the choice that best completes the statement.
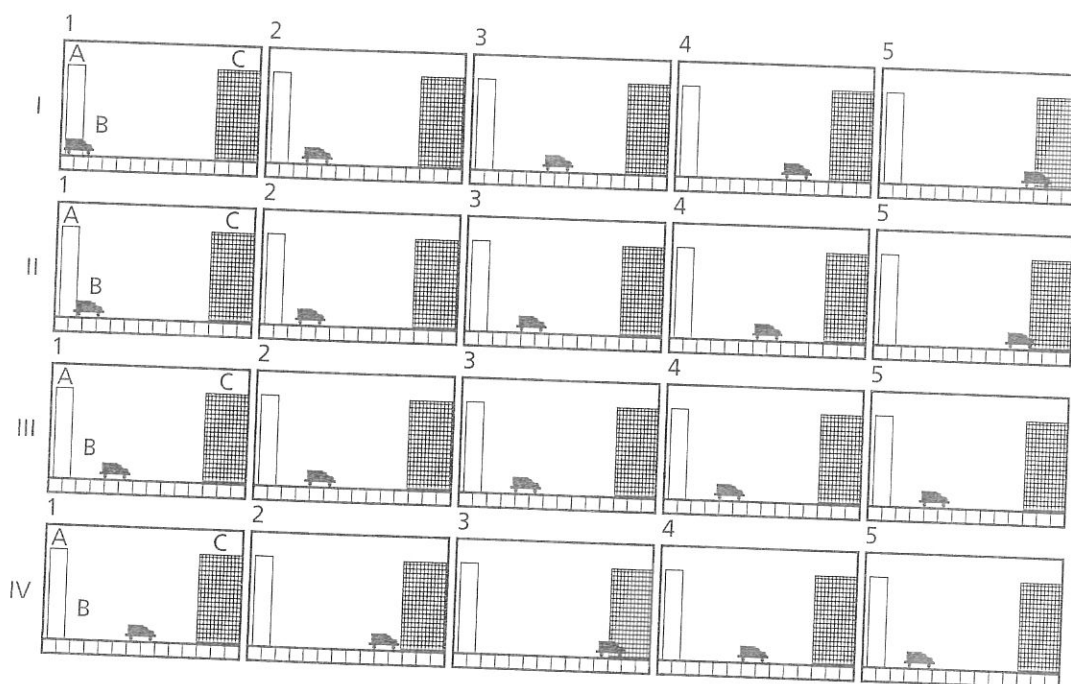
1. In set I, the object that is moving is _____.

   a. A

   b. B

   c. C

   d. none of the above

2. Set II shows that object B is _____.

   a. at rest

   b. increasing its speed

   c. slowing down

   d. traveling at a constant speed

3. Set _____ shows object B is slowing down.

   a. I

   b. II

   c. III

   d. IV

4. Set _____ shows object B at rest.

   a. I   **c.** III

   b. II   **d.** IV

5. Set _____ shows object B traveling at a constant speed.

   a. I   **c.** III

   b. II   **d.** IV

Section 2.2 # Where and When?

In your textbook, read about coordinate systems on pages 34–35.
Refer to the diagrams below to answer questions 1–5.

1. What are the position vectors for A, B, C, D, and E?

_____

2. If the object is moving from left to right in D, and each division represents the passage of 1 s, what is the velocity of the object?

_____

3. If the object is moving from right to left in D, what is the velocity of the object?

_____

CHAPTER

2 — Reinforcement

Average Velocity

Velocity is one of the more common measures you encounter each day. As you know, average velocity is the change in position (displacement) divided by the time interval during which the displacement took place. If you know two of the three quantities in this relationship, you can determine the third mathematically.

1. A car travels at 55 km/h for 6.0 hours. How far does it travel?

2. A missile travels 2500 km in 2.2 hours. What is its velocity?

3. How many minutes will it take a runner to finish an 11-km race at 18 km/h?

4. A motorcyclist travels 350 km from home on the first day of a trip. The second day he travels at 75 km/h for 8.0 hours. How far is he from home at the end of the second day?

5. A businesswoman on a trip flies a total of 23,000 km. The first day she traveled 4000 km, the second day 11,000 km, and on the final day she was on a plane that could travel at 570 km/h. How long was she on the plane the final day?

Motion Diagrams

t_1

$\bar{v}$

Δd

d_0 d_1

t_0

Meters

x

0   10   20   30   40   50   60   70   80   90   100

Transparency 2-2
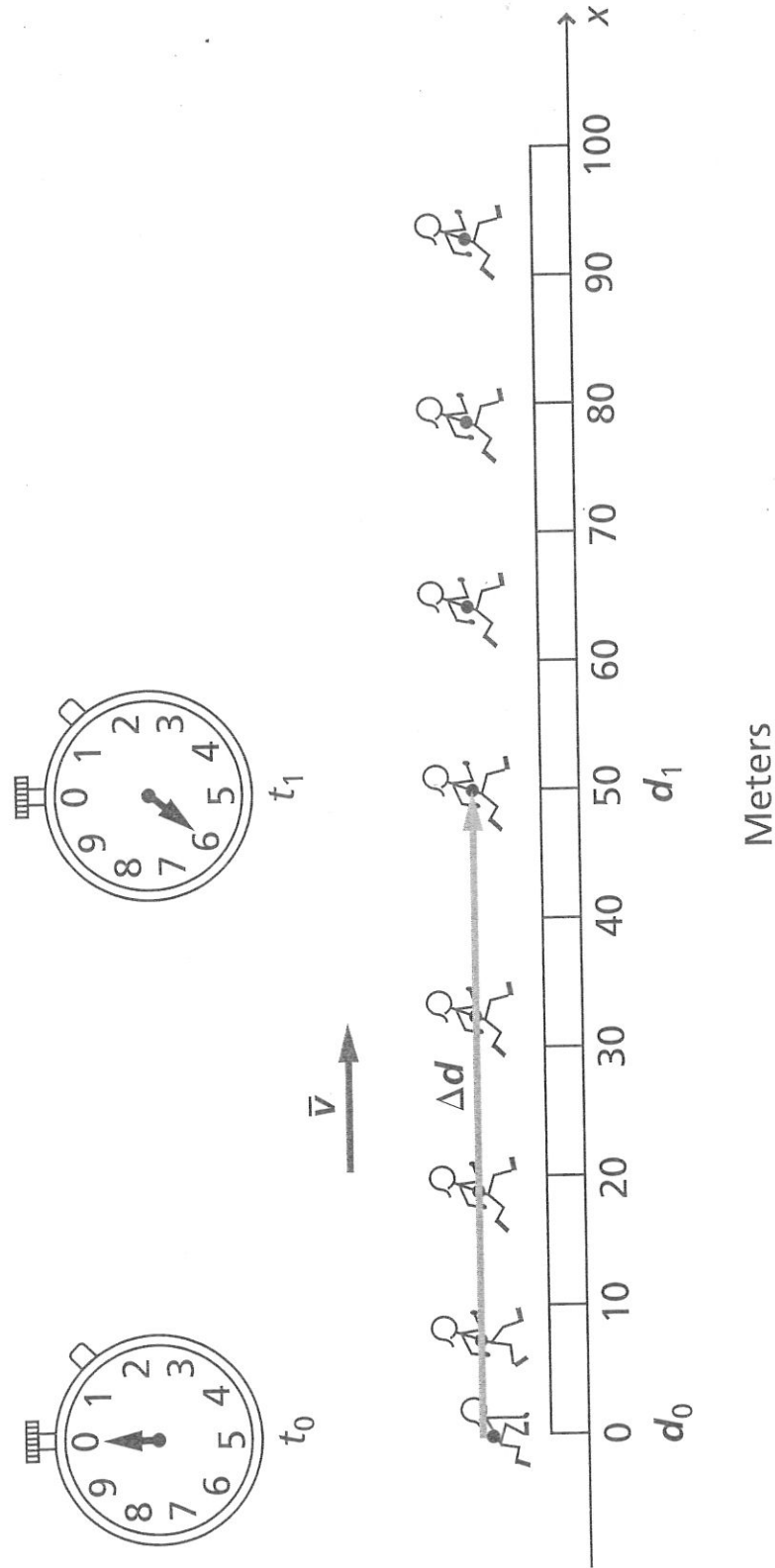
Vector Addition

Same Direction

40 m/s

30 m/s

Addition
40 m/s + 30 m/s = 70 m/s

70 m/s

Opposing Directions

40 m/s

30 m/s

Subtraction
40 m/s − 30 m/s = 10 m/s

10 m/s

2 — Transparency 2-2 Worksheet

Vector Addition

1. A plane is headed north at 120 km/h and has a tailwind of 30 km/h. What is the velocity of the plane relative to the ground?

2. Draw a vector diagram of problem 1.

3. A plane is headed north at 120 km/h and has a headwind of 30 km/h. What is the velocity of the plane relative to the ground?

4. Draw a vector diagram of problem 3.

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