

Motion and Energy ▪ *Reading/Notetaking Guide***Describing Motion** (pp. 338–341)

This section explains how to recognize when an object is in motion.

Use Target Reading Skills

After you read this section, reread the paragraphs that contain definitions of Key Terms. Use all the information you have learned to write a definition of each Key Term in your own words. Be sure your definition could be used to explain the term to someone who has not read the section.

motion

reference point

distance

displacement

vector

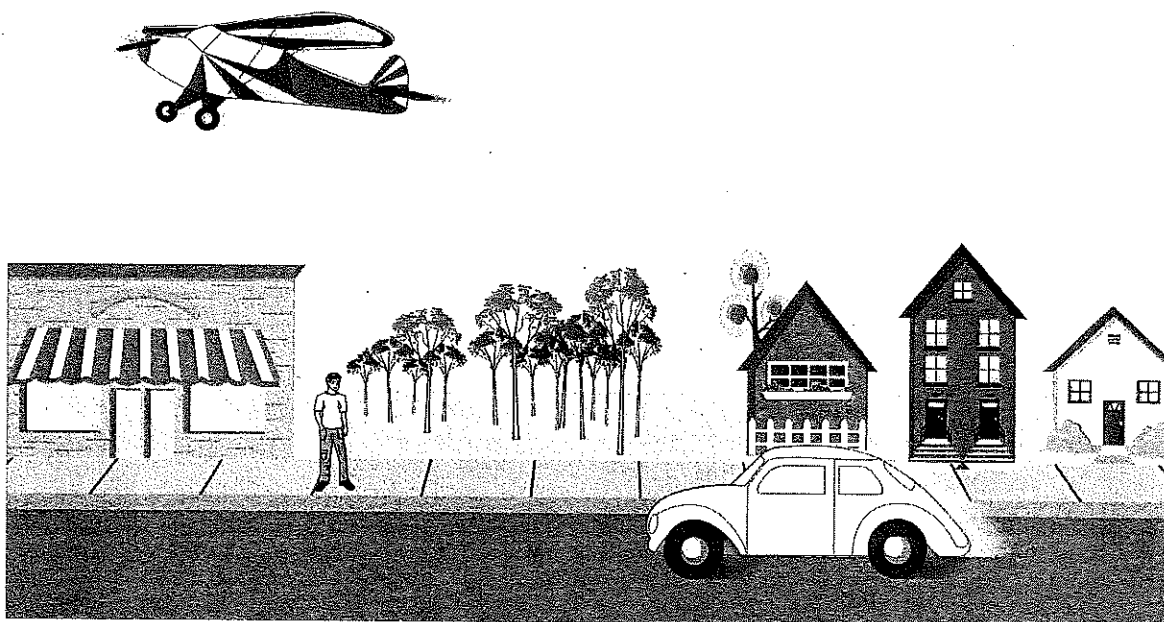
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Motion (pp. 339–340)

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) _____.

Use the figure below to answer questions 4–6.



4. Suppose you are standing on the sidewalk. Describe your motion relative to the car and the plane.

5. Suppose you are riding in the car. Describe your motion relative to the person standing on the sidewalk and the plane.

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Describing Motion (*continued*)

6. Suppose you are riding in the plane. Describe your motion relative to the person standing on the sidewalk and the car.

Distance and Displacement (pp. 340–341)

7. An object's _____ is the length and the direction that the object has moved from its starting point.
8. Circle the letter of each sentence that is true about distance.
- a. It is the length and direction that an object has moved from its starting point.
 - b. It is a vector.
 - c. It is the length of the path between two points.
 - d. It is a quantity that consists of both a magnitude and a direction.
9. What can be shown graphically by using an arrow?

Motion and Energy • Reading/Notetaking Guide**Speed and Velocity** (pp. 342–347)

This section describes the movement of an object in terms of speed and velocity. It also shows how to graph an object's motion.

Use Target Reading Skills

Locate the main idea of the text under the heading "Velocity" on pages 344–345. It is the boldfaced sentence. Write the main idea in the graphic organizer below. Then look for details and examples that support the main idea. Write these supporting details in the lower portion of the graphic organizer.

Main Idea		
Detail	Detail	Detail

Calculating Speed (pp. 342–343)

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

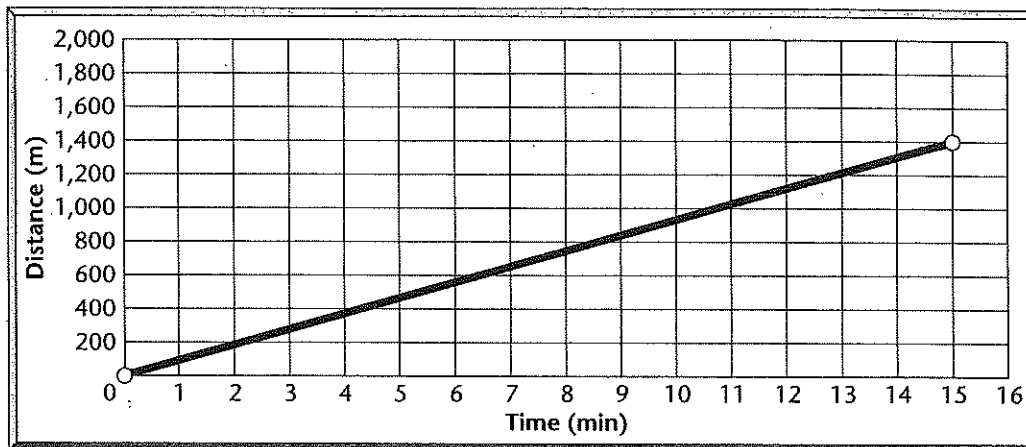
2. How would you find the average speed of a cyclist throughout an entire race?

Velocity (pp. 344–345)

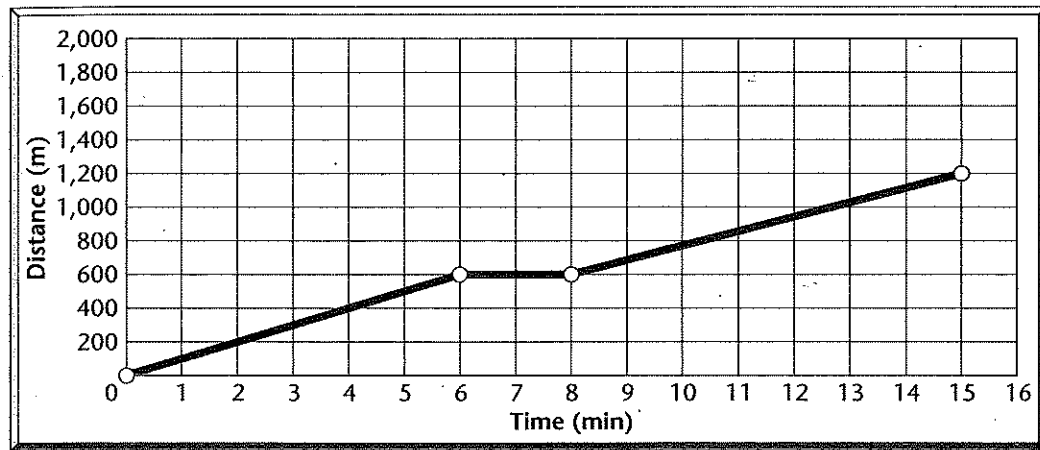
3. Speed in a given direction is called _____.
4. An approaching storm is moving at 15 km/hr. What do you need to know to determine its velocity?

Motion and Energy ▪ *Reading/Notetaking Guide***Graphing Speed** (pp. 346–347)

5. The slant of a line on a graph is called its _____.
6. Is the following sentence true or false? The steepness of a graph's slope for distance versus time depends on how quickly or slowly the object is moving. _____



7. The distance-versus-time graph above shows the motion of a jogger. How far did the jogger run in 15 minutes? _____

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8. The distance-versus-time graph above also shows the motion of a jogger. 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?

Motion and Energy • Reading/Notetaking Guide**Acceleration** (pp. 350–355)

This section describes what happens to the motion of an object as it accelerates, or changes velocity. It also explains how to calculate acceleration.

Use Target Reading Skills

Locate the main idea of the text under the heading "Calculating Acceleration" on page 352. It is the boldfaced sentence. Write the main idea in the graphic organizer below. Then look for details and examples that support the main idea. Write these supporting details in the lower portion of the graphic organizer.

Main Idea		
Detail	Detail	Detail

Changing Velocity (pp. 350–351)

1. What is acceleration?

2. Acceleration involves a change in either _____ or _____.

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

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. _____

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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?
- _____
- _____
9. Use the table below to compare and contrast the meanings of acceleration.

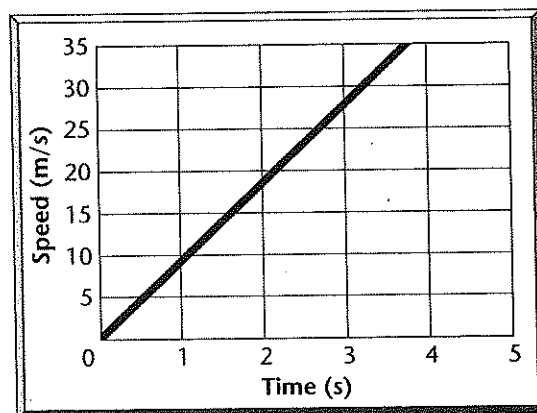
Acceleration	
In Everyday Language	In Scientific Language
	Increasing speed
Slowing down	
Turning	

Calculating Acceleration (pp. 352–353)

10. What must you calculate to determine the acceleration of an object?
- _____
- _____
11. What is the formula you use to determine the acceleration of an object moving in a straight line?
- _____
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. _____

Motion and Energy ▪ *Reading/Notetaking Guide***Acceleration** *(continued)*

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 speed during only one unit of time.
 - d. The change in an object's velocity can be found by subtracting the initial velocity from the final velocity.

Graphing Acceleration (pp. 354–355)

14. The graph above shows the motion of an object that is accelerating. What happens to the speed of the object over time?
- _____
- _____
15. The line on the graph is slanted and straight. What does this line show about the acceleration of the object?
- _____
- _____

Motion and Energy • Reading/Notetaking Guide**Energy** (pp. 358–363)

This section explains how work, power, and energy are related. It also identifies the two basic kinds of energy.

Use Target Reading Skills

As you read about energy, complete the outline below. Use the red headings for main topics and the blue headings for subtopics. If no blue headings exist, create your own subtopics. Include supporting details or examples where indicated in the outline.

Energy	
I.	Kinetic Energy
A.	
B.	
II.	Potential Energy
A.	
1.	
2.	
B.	
1.	
2.	
III.	Energy Transformation and Conservation
A.	
1.	
2.	
B.	
1.	
2.	

Introduction (p. 358)

1. The ability to do work or cause change is called _____.
2. Why can work be thought of as the transfer of energy?

3. What are the two general kinds of energy?
a. _____ b. _____

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Kinetic Energy (p. 359)

4. What is kinetic energy?

5. The kinetic energy of an object depends on both its _____ and its _____.
6. Kinetic energy increases as speed _____.
7. What formula do you use to calculate kinetic energy?

8. Because speed is squared in the kinetic energy equation, doubling an object's speed will _____ its kinetic energy.

Potential Energy (p. 360)

9. What is potential energy?

10. What is the potential energy called that is associated with objects that can be stretched or compressed?

11. What is potential energy called that depends on height?

12. What is the formula you use to determine the gravitational potential energy of an object?

13. Is the following sentence true or false? The greater the height of an object, the greater its gravitational potential energy.

Energy Transformation and Conservation (pp. 361–363)

14. What two forms of energy are associated with mechanical energy?

15. How would you calculate an object's mechanical energy?

16. What SI unit is used to measure mechanical energy?

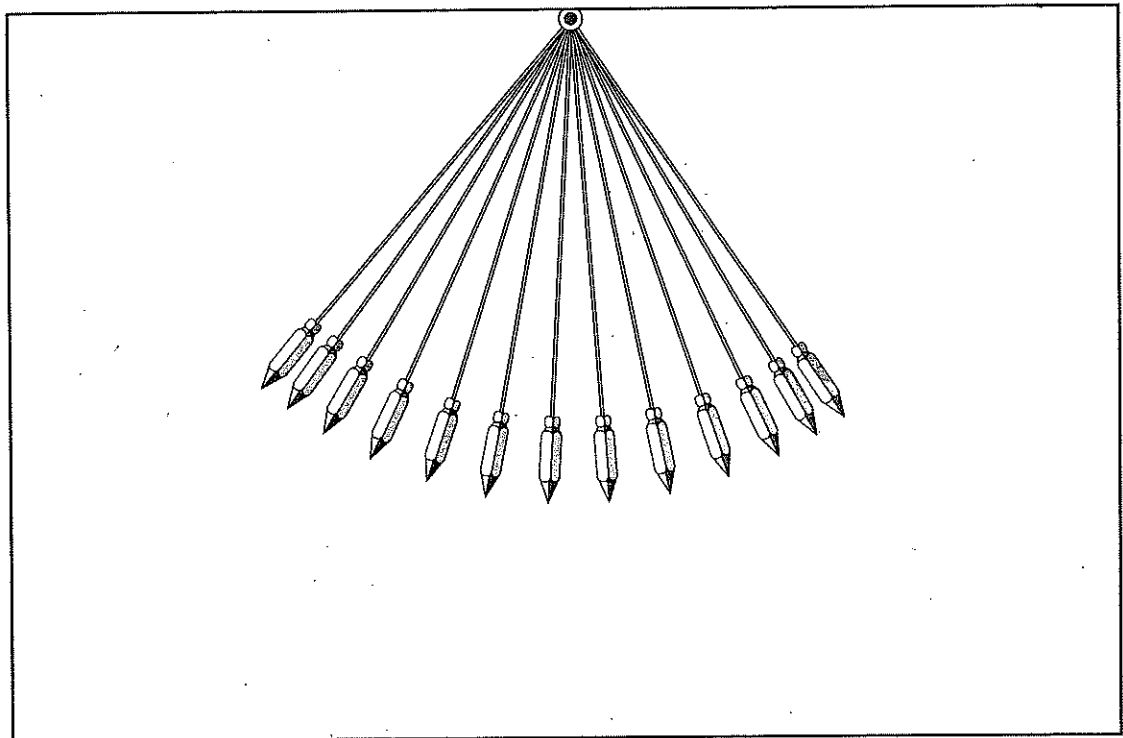
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Energy (*continued*)

17. When you throw an orange up into the air, what kind of energy increases as its height increases? _____

18. As an orange falls from its greatest height, what kind of energy increases and what kind of energy decreases?

19. On the diagram of a moving pendulum, label the places where the pendulum has maximum potential energy and where it has maximum kinetic energy.



20. What does the law of conservation of energy state?
