NAME DATE CLASS

Chapter 4

REINFORCEMENT

4.1

Use with Text Pages 94–99

• Accelerated Motion

Use the equation $F = m \times a$ to solve the following problems. Show your calculations in the spaces provided.

1. How much force is needed to accelerate a 1000-kg car at a rate of 3 m/s^2?

2. If a 70-kg swimmer pushes off a pool wall with a force of 250 N, at what rate will the swimmer accelerate from the wall?

3. A weightlifter raises a 200-kg barbell with an acceleration of 3 m/s^2. How much force does the weightlifter use to raise the barbell?

4. A dancer lifts his partner above his head with an acceleration of 2.5 m/s^2. The dancer exerts a force of 200 N. What is the mass of the partner?

Answer the following questions.

1. What does Newton's second law of motion state? _____

_____

2. What two factors affect the rate of acceleration of an object? _____

_____

3. At what rate does gravity cause objects to accelerate at sea level on Earth? _____

4. What is air resistance? _____

5. What three factors affect the amount of air resistance on an object? _____

_____

6. What is terminal velocity? _____

_____

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REINFORCEMENT

Use with Text Pages 100–107

Projectile and Circular Motion

4.2

Use the diagrams below to complete the following.

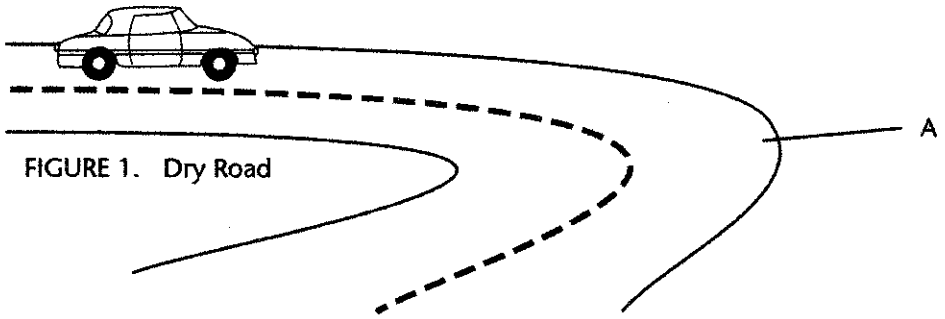

FIGURE 1. Dry Road

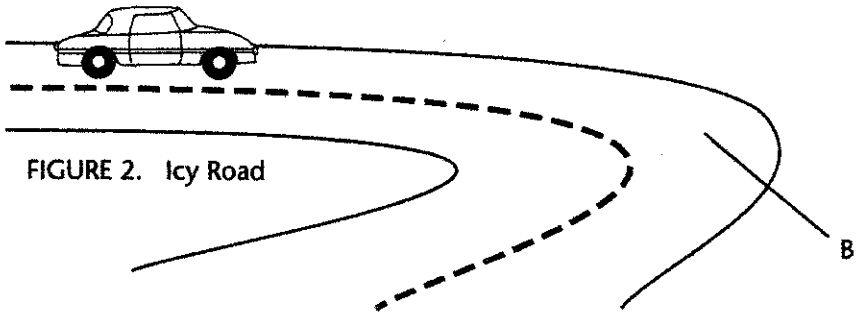

FIGURE 2. Icy Road

1. What force causes a moving object to move in a curved or circular path? _____

2. What is the centripetal force that allows a car to move around a sharp curve in a roadway?

_____

_____

3. Draw an arrow on the top diagram to show the direction the car will move when it reaches point A.

4. Draw an arrow on the bottom diagram to show the movement of the car if the centripetal force of the road and car is not enough to overcome the car's inertia when it reaches point B.

5. Explain how you know the car is accelerating when it reaches point A in the first diagram.

_____

_____

_____

_____

_____

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REINFORCEMENT

Use with Text Pages 108–109

• Sending Up Satellites 4.3

Write your answers to the following questions and activities in the spaces provided.

1. Compare and contrast natural and artificial satellites. _____

2. How did Isaac Newton propose placing a cannonball in orbit as a satellite? _____

3. How are most satellites placed in orbit? _____

4. Complete the following table about the first artificial Earth satellite.

Name	Sputnik
Year of launch	
Country of origin	
Mass	
Diameter	
Time for one revolution around Earth	

5. How does a geostationary satellite differ from other satellites? _____

6. How are the tasks that geostationary satellites perform related to their geostationary orbits? _____

7. What are some other tasks that satellites perform? _____

8. What eventually happens to artificial satellites? _____

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Chapter 4

REINFORCEMENT

Use with Text Pages 110–116

• Action and Reaction 4.4

Use the diagram to complete the following.

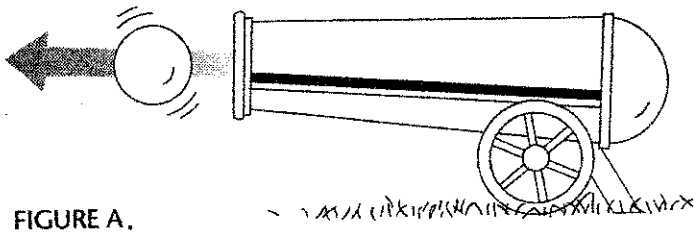

FIGURE A.

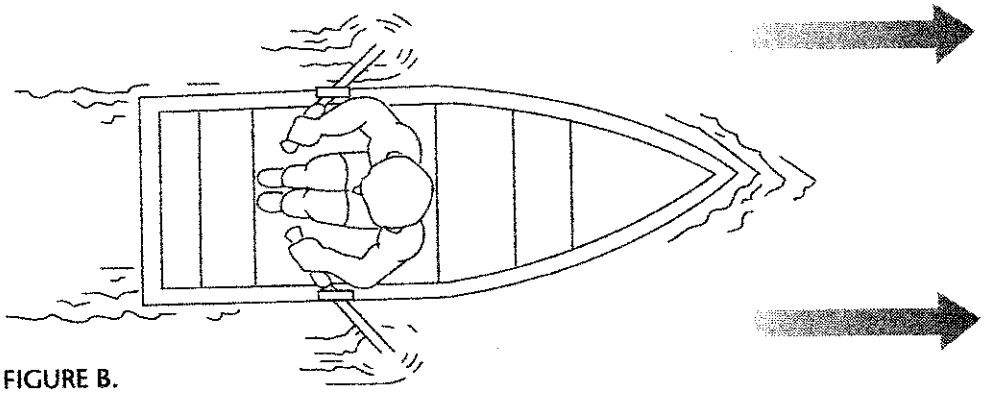

FIGURE B.

1. Draw an arrow on Figure A to show the direction the cannon will move when the cannonball is fired.
2. Draw arrows on Figure B to show the direction the oars must move to propel the boat forward.
3. Does the arrow you drew on Figure A represent an action force or a reaction force?

   _____

4. Does the arrow you drew on Figure B represent an action force or a reaction force?

   _____

5. If the force which propels the cannonball forward is 500 N, how much force will move the cannon backward? Explain. _____

   _____

Solve the following.

1. What is the momentum of a 2-kg toy truck that moves at 10 meters per second?

2. What is the momentum of a 2000-kg truck that moves at 10 meters per second?

3. Which truck has more momentum? Why? _____

   _____