

## Chapter 12 Forces and Motion

**Section 12.1 Forces****(pages 356–362)**

*This section describes what forces are and explains how forces affect the motion of various objects.*

**Reading Strategy (page 356)**

**Relating Text and Visuals** As you read about forces, look carefully at Figures 2, 3, and 5 in your textbook. Then complete the table by describing the forces and motion shown in each figure. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Forces and Motion		
Figure	Is Net Force 0?	Effect on Motion
2A	Yes	None
2B		
3		
5A		
5B		

**What Is a Force? (pages 356–357)**

- A force is defined as a(n) \_\_\_\_\_ or a(n) \_\_\_\_\_ that acts on an object.
- Is the following sentence true or false? A force can act to cause an object at rest to move or it can accelerate an object that is already moving.  
\_\_\_\_\_
- Circle the letter of the best answer. What force causes a 1-kg mass to accelerate at a rate of 1 meter per second each second?
  - $1 \text{ kg/m} \cdot \text{s}^2$
  - $1 \text{ kg/s}$
  - 1 newton

**Combining Forces (pages 357–358)**

- The combination of all the forces acting on an object is the \_\_\_\_\_.
- Circle the letter of the correct answer. How do unbalanced forces affect the motion of an object?
  - no change because the net force is zero
  - no change because the net force is negative
  - acceleration because the net force is not zero

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**Friction (pages 359–360)**

6. Is the following sentence true or false? Friction is a force that helps objects that are touching move past each other more easily.

\_\_\_\_\_

7. Circle the letters that identify types of friction.

- a. rolling
- b. gravity
- c. sliding

8. The friction force that acts on objects that are at rest is \_\_\_\_\_.

9. Use the terms in the box to complete the table below about friction forces.

In-line skates  
Sliding  
Walking

Types of Friction Forces	
Friction Force	Example
Static	
	Pushing a book along your desk
Rolling	

10. Is the following sentence true or false? Fluid friction is a force that opposes the motion of an object through a fluid such as water.

\_\_\_\_\_

**Gravity (page 361)**

11. Gravity is a(n) \_\_\_\_\_ force that pulls objects together.

12. Is the following sentence true or false? Earth’s gravity acts downward toward the center of Earth. \_\_\_\_\_

13. Is the following sentence true or false? Terminal velocity is the constant velocity of a falling object when the force of air resistance equals the force of gravity. \_\_\_\_\_

**Projectile Motion (page 362)**

14. The curved path caused by the combination of an initial forward velocity and the downward force of gravity is known as \_\_\_\_\_ motion.