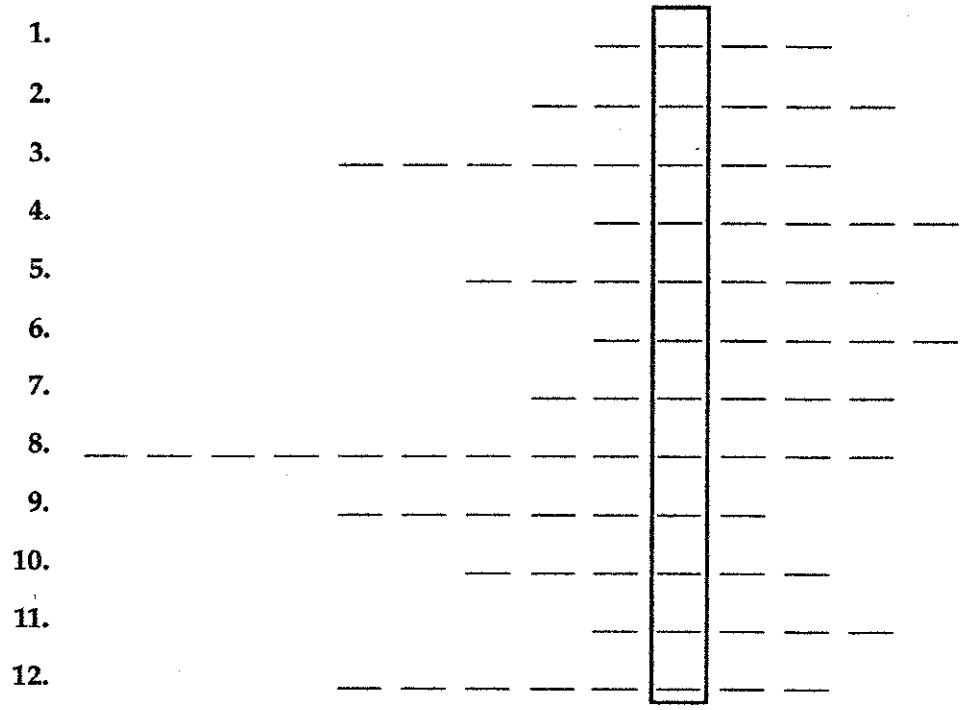
• Accelerated Motion

Solve the puzzle below by writing the term in the diagram that best completes each statement. You will find another term spelled vertically in the black box.



1. Force equals ____ times acceleration.
2. Newton's ____ law of motion states that a net force acting on an object causes the object to accelerate in the direction of the force.
3. The law of inertia states that when the forces acting upon an object are ____, the motion of the object will not change.
4. The unit of force is the ____.
5. Gravity causes____ objects to accelerate.
6. The force of gravity acting upon the mass of an object is the object's ____.
7. The ____ the force acting upon an object, the greater the acceleration of the object.
8. The force air exerts on a moving object is ____ ____. (2 words)
9. Weight is a measure of the force of ____.
10. Any change in an object's position is ____.
11. In the equation $F = m \times a$, F stands for ____.
12. The highest velocity reached by a falling object is its ____ velocity.

Fill in the blank below with the term in the black box.

Force equals _____ times mass.

NAME DATE CLASS

Chapter 4

STUDY GUIDE

Use with Text Pages 100–107

Projectile and Circular Motion

Determine whether the italicized term makes each statement true or false. If the statement is true, write the word "true" in the blank. If the statement is false, write in the blank the term that makes the statement true.

_____ 1. Anything that is thrown or shot through the air is called a *projectile.*

_____ 2. Because of Earth's gravitational pull and their own inertia, projectiles travel in a *straight* path.

_____ 3. Motion parallel to Earth's surface is *vertical* motion.

_____ 4. Motion perpendicular to Earth's surface is *vertical* motion.

_____ 5. Objects fall toward Earth at a rate of 9.8 m/s^2 because of *centripetal force.*

_____ 6. Acceleration is a change in *motion.*

_____ 7. The word centripetal means "toward the *outside.*"

_____ 8. Acceleration toward the center of a curved or circular path is called *gravitational* acceleration.

_____ 9. Centripetal force is a force that causes a moving object to move in a *curved or circular* path.

_____ 10. An orbiting space shuttle and its contents are in *freefall* around Earth.

_____ 11. A change in the speed or direction of an object is called *inertia.*

Answer the following question with complete sentences.

12. Why do objects that are thrown or shot follow a curved path? _____

_____

_____

_____

_____

_____

13. Draw a diagram below to illustrate your answer for question 12.

Sending Up Satellites

Determine whether the italicized term makes each statement true or false. If the statement is true, write the word "true" in the space provided. If the statement is false, write in the blank the term that makes the statement true.

1. *Artificial* satellites are human-made devices that orbit Earth for specific purposes.
2. Earth's moon is an *artificial* satellite.
3. Isaac Newton originated the idea of launching a satellite by blasting it *vertically* from a mountain top.
4. Most modern satellites are lifted to their desired orbiting heights by multistage *rocket* systems.
5. The speed necessary for a satellite to stay in a circular *orbit* is about 8 km/s, or about 29 000 km/hr.
6. The former Soviet Union launched the first artificial Earth satellite in *1980*.
7. Most communication and weather satellites are *geostationary* satellites.
8. Geostationary satellites appear to be *moving* high above a given location because they are placed in orbit with a speed that matches the movement of Earth as it spins on its axis.
9. Many satellites are used by the military to monitor actions in other countries because they can *photograph* tiny details.
10. Air resistance gradually causes most orbiting satellites to lose energy allowing the Earth's *rotation* to pull them lower.
11. As a satellite moves through the denser part of Earth's atmosphere, it usually burns up in the extreme *heat* generated by atmospheric friction.

Chapter 4

STUDY GUIDE

Use with Text Pages 110–116

Action and Reaction

Choose the term from the list below that is best described by each statement. Write the term to the left of each statement.

Newton's second law of motion	reaction	mass
conservation of momentum	momentum	action
Newton's third law of motion	velocity	

_____ 1. When one object exerts a force on a second object, the second object exerts a force that is equal in size and opposite in direction.

_____ 2. The backward "kick" of a rifle that is fired is an example of a(n) ____ force.

_____ 3. The total amount of momentum of a group of objects does not change unless outside forces act on the objects.

_____ 4. A net force acting on an object causes the object to accelerate in the direction of the force.

_____ 5. Air rushing out of the neck of a balloon causes the balloon to move. The air that comes from the balloon is an example of a(n) ____ force.

_____ 6. In the equation $p = m \times v$, p represents ____.

_____ 7. Momentum has direction because ____ has direction.

_____ 8. Momentum is a property a moving object has because of its ____ and velocity.

Think for a minute about Newton's third law of motion. Can you remember any event when you experienced this law? If so, draw a diagram below to show the action-reaction forces. If you can't remember an event that you experienced, try to think up one and draw it below.