

Physical Science, 12e (Tillery)

Chapter 2 Motion

1) Imagine an experiment in which an 8 lb bowling ball and a heavier 10 lb bowling ball are dropped from a building's fifth floor window at the same time. The heavier ball will reach the ground first.

Answer: FALSE

Section: 02.04

Topic: Gravity

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

2) When you roll a ball across the floor, it comes to a stop because you are no longer exerting a force on it.

Answer: FALSE

Section: 02.03

Topic: Inertia

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

3) An object accelerates when it slows or its direction of movement changes.

Answer: TRUE

Section: 02.02

Topic: Kinematics

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Gradable: automatic

4) A car traveling at 20 mph on a curved exit ramp has a constant velocity.

Answer: FALSE

Section: 02.02

Topic: Kinematics

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

5) Newton's second law states that if an unbalanced force acts on an object, it will move at constant velocity.

Answer: FALSE

Section: 02.06

Topic: Newton's laws

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

6) The reason a moving object slows down is that its force of motion gradually runs out.

Answer: FALSE

Section: 02.03

Topic: Inertia

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

7) The momentum of an object remains the same unless an unbalanced force acts on it.

Answer: TRUE

Section: 02.07

Topic: Momentum

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

8) Astronauts experience a weightless condition when they are in orbit.

Answer: FALSE

Section: 02.09

Topic: Gravity and Motion

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

9) The force of gravity near the surface of Earth is 9.8 m/s^2 .

Answer: FALSE

Section: 02.04

Topic: Gravity and Motion

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Gradable: automatic

10) The attractive force a 70 kg person exerts on Earth is much, much smaller than the force Earth exerts on the person.

Answer: FALSE

Section: 02.06

Topic: Newton's laws

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

$$\bar{v} = \frac{d}{t}, \bar{v}$$

11) In the equation $\bar{v} = \frac{d}{t}$, $\bar{v}$ represents

A) average speed.

B) instantaneous speed.

C) final speed.

D) constant speed.

Answer: A

Section: 02.02

Topic: Kinematics

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

12) Ignoring air resistance, the velocity of a falling object

A) is constant.

B) is constantly increasing.

C) increases for a while, then becomes constant.

D) depends on the mass of the object.

Answer: B

Section: 02.04

Topic: Gravity and Motion

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

13) The tendency of a moving object to remain in unchanging motion in the absence of an unbalanced force is called

- A) inertia.
- B) free fall.
- C) acceleration.
- D) impulse.

Answer: A

Section: 02.03

Topic: Inertia

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Gradable: automatic

14) A heavy object and a light object are dropped from rest at the same time on a planet with no air (vacuum). The heavier object will reach the ground

- A) before the lighter object.
- B) at the same time as the lighter object.
- C) after the lighter object.
- D) It depends on the shape of the object.

Answer: B

Section: 02.04

Topic: Gravity and Motion

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

15) Gravity is an attractive force between

- A) all massive objects.
- B) Earth and objects on Earth.
- C) Earth and Moon, and objects on Earth.
- D) all objects everywhere.

Answer: D

Section: 02.09

Topic: Newton's laws

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

16) The newton is a unit of

- A) motion.
- B) energy.
- C) power.
- D) force.

Answer: D

Section: 02.06

Topic: Newton's laws

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Gradable: automatic

17) The weight of a 50 kg box is closest to

- A) 5 N.
- B) 50 N.
- C) 500 N.
- D) 5000 N.

Answer: C

Section: 02.06

Topic: Weight and mass

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

18) The pound is an English unit of measure; its SI counterpart is the

- A) newton.
- B) kilogram.
- C) joule.
- D) momentum.

Answer: A

Section: 02.06

Topic: Weight and mass

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

19) Suppose that a rock tied to a string is swinging in a circle. If the string length is increased so that the length doubled but the same speed is maintained, then the force now exerted on the string is

- A) the same as before.
- B) doubled.
- C) half as great.
- D) four times as great.

Answer: C

Section: 02.08

Topic: Circular motion

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

20) A skateboarder pushes on the ground with her foot. She and the skateboard accelerate down the sidewalk due to the force

- A) she exerts against the ground.
- B) between the skateboard wheels and the ground.
- C) the ground exerts against her foot.
- D) of gravity acting on the skateboard.

Answer: C

Section: 02.06

Topic: Newton's laws

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

21) If an unbalanced force applied to an object doubles, then

- A) its velocity doubles.
- B) its acceleration doubles.
- C) its acceleration is cut in half.
- D) its acceleration increases by a factor of four.

Answer: B

Section: 02.06

Topic: Newton's laws

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

22) Everything that happens in the universe can be traced to interactions of

- A) matter and gravity.
- B) light and matter.
- C) four fundamental forces.
- D) gravity waves and light.

Answer: C

Section: 02.02

Topic: Forces

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic

23) The mass of a 100 N sack of seed is closest to

- A) 10 kg.
- B) 10 lb.
- C) 98 kg.
- D) 1,000 kg.

Answer: A

Section: 02.06

Topic: Weight and mass

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

24) A block of iron is transported to the Moon. Which of the following is true?

- A) both its mass and weight remain unchanged.
- B) its mass decreases, but its weight remains the same.
- C) its mass remains the same, but its weight decreases.
- D) both its mass and weight decrease.

Answer: C

Section: 02.06

Topic: Weight and mass

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

25) From the equation $w = mg$, it is apparent that weight is a(n)

- A) force.
- B) mass.
- C) acceleration.
- D) None of the answers is correct.

Answer: A

Section: 02.06

Topic: Weight and mass

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

26) If you double the mass of an object while an unbalanced force remains constant,

- A) the object moves at half the speed.
- B) the acceleration of the object is doubled.
- C) the object will gradually slow down.
- D) the acceleration of the object is halved.

Answer: D

Section: 02.06

Topic: Newton's laws

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

27) If you consider the total distance and total time for a trip, you are calculating a(n)

- A) instantaneous speed.
- B) constant speed.
- C) average speed.
- D) nonuniform speed

Answer: C

Section: 02.02

Topic: Kinematics

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

- 28) To hit a golf ball farther, you should "follow through the swing" because
- A) this increases the force.
 - B) momentum is conserved.
 - C) of the relationship $\Delta p = Ft$.
 - D) momentum is mv .

Answer: C

Section: 02.07

Topic: Momentum

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

- 29) A heavy cannon ball and a lighter bowling ball were dropped at the same time from the top of a building. At the instant before the balls hit the sidewalk, the cannon ball has greater
- A) velocity.
 - B) acceleration.
 - C) momentum.
 - D) All of the answers are correct.

Answer: C

Section: 02.07

Topic: Momentum

Bloom's: 4. Analyze

Accessibility: Keyboard Navigation

Gradable: automatic

- 30) A 250 g ball travels at a velocity of 40 m/s. Its momentum is
- A) 4 kg•m/s.
 - B) 10 kg•m/s.
 - C) 160 kg•m/s.
 - D) 10,000 kg•m/s.

Answer: B

Section: 02.07

Topic: Momentum

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Gradable: automatic