

Chapter 8: Force and Laws of Motion Quiz

Force and its Effects

1. What can force do?

- Change speed, direction, or shape
- Only change speed
- Only change direction
- Nothing

Answer: Change speed, direction, or shape

2. Force is based on the concept of?

- Push, hit, or pull
- Mass and volume
- Speed and time
- Energy

Answer: Push, hit, or pull

3. Can force change the shape of an object?

- Yes
- No
- Only for liquids
- Only for gases

Answer: Yes

4. Pushing a stationary object can?

- Put it into motion
- Break it
- Change its color
- Do nothing

Answer: Put it into motion

5. Stopping a moving object requires?

- Effort or force
- No effort
- Magic
- Waiting

Answer: Effort or force

Balanced Forces

1. Balanced forces are?

- Equal in magnitude, opposite in direction
- Unequal in magnitude
- Same direction
- Zero magnitude

Answer: Equal in magnitude, opposite in direction

2. Do balanced forces change the state of motion?

- No
- Yes
- Sometimes
- Only for light objects

Answer: No

3. If a block is pulled equally from both sides, it?

- Does not move
- Moves right
- Moves left
- Moves up

Answer: Does not move

4. The net force in a balanced system is?

- Zero
- Double
- Half
- Infinite

Answer: Zero

5. Balanced forces can change?

- Shape
- Speed
- Velocity
- Direction

Answer: Shape

Unbalanced Forces

1. Unbalanced forces act in the direction of?

- The greater force
- The smaller force
- Gravity
- Friction

Answer: The greater force

2. What is required to accelerate an object?

- Unbalanced force
- Balanced force
- No force
- Friction only

Answer: Unbalanced force

3. If an unbalanced force acts on an object, it?

- Changes speed or direction
- Stops moving
- Remains at rest
- Disappears

Answer: Changes speed or direction

4. To keep an object moving with uniform velocity, the net force must be?

- Zero
- Positive
- Negative
- Unbalanced

Answer: Zero

5. When you stop pedaling a bicycle, it slows down due to?

- Unbalanced friction force
- Balanced force
- Inertia
- Gravity

Answer: Unbalanced friction force

Friction

1. Friction force acts in which direction?

- Opposite to motion
- Same as motion
- Perpendicular to motion
- Downwards

Answer: Opposite to motion

2. Friction arises between?

- Two surfaces in contact
- Air and water
- Space
- Magnets

Answer: Two surfaces in contact

3. If a pushed box doesn't move, friction is?

- Balancing the push
- Less than the push
- Zero
- Helping the push

Answer: Balancing the push

4. To move a heavy box, pushing force must be?

- Greater than friction
- Equal to friction
- Less than friction
- Zero

Answer: Greater than friction

5. Friction is a type of?

- Contact force
- Non-contact force
- Magnetic force
- Gravitational force

Answer: Contact force

First Law of Motion

1. First Law of Motion is also known as?

- Law of Inertia
- Law of Momentum
- Law of Action-Reaction
- Law of Gravity

Answer: Law of Inertia

2. An object at rest tends to?

- Remain at rest
- Start moving
- Fly
- Vibrate

Answer: Remain at rest

3. An object in uniform motion tends to?

- Keep moving in a straight line
- Stop
- Change direction
- Accelerate

Answer: Keep moving in a straight line

4. What changes the state of motion?

- Applied unbalanced force
- Inertia
- Mass
- Time

Answer: Applied unbalanced force

5. Who presented the three laws of motion?

- Newton
- Galileo
- Einstein
- Darwin

Answer: Newton

Inertia

1. Inertia is the tendency to?

- Resist change in state of motion
- Change state of motion
- Move faster
- Stop moving

Answer: Resist change in state of motion

2. Why do passengers fall back when a bus starts?

- Inertia of rest
- Inertia of motion
- Gravity
- Friction

Answer: Inertia of rest

3. Why do passengers fall forward when a bus stops?

- Inertia of motion
- Inertia of rest
- Acceleration
- Speed

Answer: Inertia of motion

4. Why does a coin fall into a glass when the card is flicked?

- Inertia of the coin
- Gravity only
- Card pushes it
- Coin is heavy

Answer: Inertia of the coin

5. Which objects have inertia?

- All objects
- Only moving objects
- Only heavy objects
- Only solids

Answer: All objects

Inertia and Mass

1. Inertia is measured by?

- Mass
- Volume
- Speed
- Force

Answer: Mass

2. Which has more inertia?

- A stone
- A rubber ball of same size
- Both same
- Depends on speed

Answer: A stone

3. Heavier objects have?

- Larger inertia
- Smaller inertia
- No inertia
- Variable inertia

Answer: Larger inertia

4. Which is harder to push?

- Box full of books
- Empty box
- Small toy
- Feather

Answer: Box full of books

5. Mass is a measure of?

- Inertia
- Velocity
- Acceleration
- Distance

Answer: Inertia

Momentum

1. Formula for momentum (p) is?

- mv
- ma
- $\frac{1}{2}mv^2$
- mg

Answer: mv

2. SI unit of momentum is?

- kg m/s
- kg m/s²
- N
- Joule

Answer: kg m/s

3. Momentum has?

- Magnitude and direction
- Only magnitude
- Only direction
- Neither

Answer: Magnitude and direction

4. Direction of momentum is same as?

- Velocity
- Acceleration
- Force
- Displacement

Answer: Velocity

5. An object at rest has momentum?

- Zero
- Infinite
- Equal to mass
- Variable

Answer: Zero

Second Law of Motion

1. Rate of change of momentum is proportional to?

- Applied unbalanced force
- Velocity
- Mass
- Time

Answer: Applied unbalanced force

2. This law gives a method to measure?

- Force
- Inertia
- Energy
- Work

Answer: Force

3. Force acts in the direction of?

- Change of momentum
- Velocity
- Mass
- Gravity

Answer: Change of momentum

4. A greater force produces?

- Greater change in velocity/momentum
- Less change
- No change
- Constant velocity

Answer: Greater change in velocity/momentum

5. Change in momentum depends on?

- Force and time
- Force only
- Time only
- Mass only

Answer: Force and time

Mathematical Formulation of Second Law

1. Mathematical formula for Second Law is?

- F = ma
- F = mv
- F = m/a
- a = mF

Answer: F = ma

2. Acceleration 'a' is?

- $(v - u) / t$
- v / t
- u / t
- s / t

Answer: $(v - u) / t$

3. The constant 'k' in $F = kma$ is?

- 1
- 0
- 10
- 9.8

Answer: 1

4. If mass is 2kg and acceleration is 5m/s², Force is?

- 10 N
- 2.5 N
- 7 N
- 3 N

Answer: 10 N

5. If Force is 0, acceleration is?

- 0
- Constant
- Infinite
- 1

Answer: 0

Unit of Force

1. SI unit of force is?

- Newton (N)
- Dyne
- Pascal
- Joule

Answer: Newton (N)

2. 1 Newton is force required to accelerate?

- 1 kg mass at 1 m/s^2
- 1 g mass at 1 cm/s^2
- 1 kg at 10 m/s^2
- 10 kg at 1 m/s^2

Answer: 1 kg mass at 1 m/s^2

3. Symbol for Newton is?

- N
- n
- Kg
- m

Answer: N

4. Force is a?

- Vector quantity
- Scalar quantity
- Fundamental quantity
- None

Answer: Vector quantity

5. kg m s^{-2} is equivalent to?

- Newton
- Pascal
- Watt
- Joule

Answer: Newton

Applications of Second Law

1. Why does a fielder pull hands back while catching?

- To increase time and reduce force
- To show style
- To decrease time
- To catch faster

Answer: To increase time and reduce force

2. Increasing time of impact?

- Decreases rate of change of momentum
- Increases force
- Does nothing
- Increases momentum

Answer: Decreases rate of change of momentum

3. High jumpers fall on cushions to?

- Increase time of fall stop
- Decrease time
- Increase force
- Bounce back

Answer: Increase time of fall stop

4. Stopping a ball suddenly causes?

- Large force and injury
- No force
- Less force
- Slow stop

Answer: Large force and injury

5. Karate player breaks ice slab with?

- Single fast blow
- Slow push
- Heavy hammer
- Heat

Answer: Single fast blow

Third Law of Motion

1. Third Law states?

- To every action there is equal and opposite reaction
- Force equals mass times acceleration
- Objects remain at rest
- Energy is conserved

Answer: To every action there is equal and opposite reaction

2. Action and reaction forces act on?

- Two different objects
- Same object
- No object
- One object only

Answer: Two different objects

3. Action and reaction are?

- Simultaneous
- One after another
- Delayed
- Random

Answer: Simultaneous

4. If A exerts force on B, B exerts force on A that is?

- Equal and opposite
- Equal and same direction
- Unequal
- Zero

Answer: Equal and opposite

5. Do action and reaction cancel each other?

- No, because they act on different objects
- Yes
- Sometimes
- Only in space

Answer: No, because they act on different objects

Action and Reaction

1. When walking, we push the ground?

- Backwards
- Forwards
- Downwards
- Upwards

Answer: Backwards

2. The ground pushes us?

- Forwards
- Backwards
- Downwards
- Sideways

Answer: Forwards

3. Why do equal forces produce different accelerations?

- Different masses of objects
- Different times
- Different shapes
- Different colors

Answer: Different masses of objects

4. A sailor jumps forward from a boat. The boat moves?

- Backwards
- Forwards
- Downwards
- Doesn't move

Answer: Backwards

5. This is explained by?

- Third Law of Motion
- First Law
- Second Law
- Law of Gravitation

Answer: Third Law of Motion

Recoil of a Gun

1. Recoil of a gun is due to?

- Third Law of Motion
- First Law
- Friction
- Gravity

Answer: Third Law of Motion

2. Gun exerts forward force on bullet. Bullet exerts?

- Backward force on gun
- Forward force
- No force
- Downward force

Answer: Backward force on gun

3. Why is gun acceleration less than bullet?

- Gun has much greater mass
- Gun is fixed
- Bullet is sharp
- Gun is lighter

Answer: Gun has much greater mass

4. Recoil force is in which direction?

- Opposite to bullet
- Same as bullet
- Perpendicular
- Random

Answer: Opposite to bullet

5. This phenomenon is an example of?

- Conservation of momentum
- Conservation of energy
- Inertia
- Friction

Answer: Conservation of momentum