

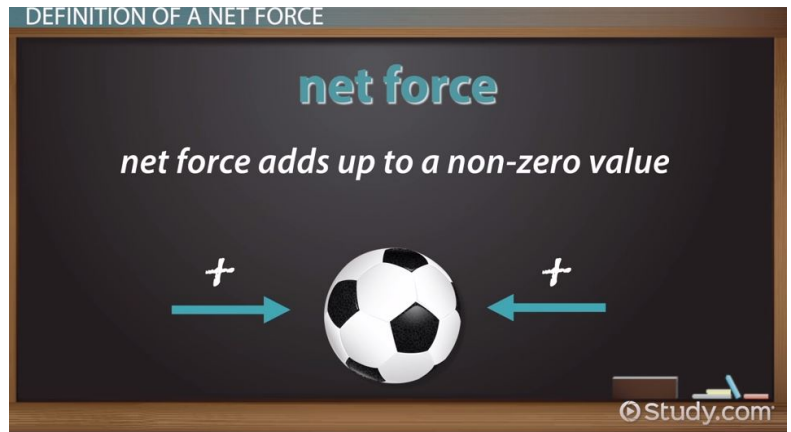
D2. Net Force

Net Force

Have you ever wondered why objects move or stop moving? The answer lies in a concept called net force! Net force is what makes things move, change direction, or come to a stop. Let's explore this fascinating concept and see how it affects our everyday lives.

What is Net Force?

Net force is the overall force acting on an object when all the individual forces are added together. Forces can be pushes or pulls, and they can make things speed up, slow down, or change direction.



Balanced Forces

When two forces are equal in size and opposite in direction, they balance each other out. This means that there is no net force acting on the object, and it will stay at rest or continue to move at a constant speed in the same direction.

Imagine two teams playing a tug-of-war. If both teams pull with the same strength in opposite directions, the rope won't move in either direction. This is similar to balanced forces.

Unbalanced Forces

When two forces acting on an object are not equal, they create an unbalanced force. An unbalanced force causes the object to accelerate in the direction of the stronger force.

For example, if you push a toy car, it starts moving faster because your push is an unbalanced force. The net force is in the direction of your push, causing the car to accelerate.

Net Force and Direction

Net force is not just about strength; it also affects the direction of an object's motion. When forces act in the same direction, their values add up to create a larger net force in that direction.

On the other hand, when forces act in opposite directions, their values subtract from each other to create a smaller net force in the stronger direction.

Examples of Net Force

1. Swinging on a Swing

When you swing on a swing, the force from your push is the net force that makes the swing move forward and backward. As the swing moves higher, the net force decreases, and gravity slows it down until it starts moving back in the other direction.

2. Throwing a Ball

When you throw a ball, your arm exerts a force on the ball, giving it a push. This push becomes the net force that causes the ball to move through the air.

3. Sliding on a Slide

When you slide down a slide, the force of gravity is the net force pulling you down the slide. Friction between you and the slide provides resistance, but the net force is still in the direction of sliding down.

1. What is net force?
 - A) The overall force acting on an object when all the individual forces are added together.
 - B) The force that makes objects stop moving.
 - C) The force that makes objects slow down.
 - D) The force of gravity acting on an object.
2. When two forces are equal in size and opposite in direction, they create:
 - A) An unbalanced force.
 - B) A balanced force.
 - C) A net force of zero.
 - D) A net force in one direction.
3. What happens to an object when the net force acting on it is zero?
 - A) It stops moving.
 - B) It moves at a constant speed in the same direction.
 - C) It moves faster.
 - D) It changes direction.
4. What is an unbalanced force?
 - A) Two forces that are equal in size and opposite in direction.
 - B) Two forces that are equal in size and direction.
 - C) Two forces that are not equal in size and opposite in direction.
 - D) Two forces that are not equal in size and direction.
5. How does net force affect an object's motion?
 - A) It makes the object slower.
 - B) It keeps the object at rest.
 - C) It makes the object move faster.
 - D) It has no effect on the object's motion.
6. What happens when two forces act in the same direction?

- A) Their values add up to create a larger net force in that direction.
 - B) Their values subtract from each other.
 - C) Their values cancel each other out.
 - D) Their values stay the same.
7. What happens when two forces act in opposite directions?
- A) Their values add up to create a larger net force in one direction.
 - B) Their values subtract from each other to create a smaller net force in the stronger direction.
 - C) Their values stay the same.
 - D) Their values cancel each other out.
8. What provides resistance to an object's motion?
- A) Net force
 - B) Gravity
 - C) Friction
 - D) Push
9. What is an example of an unbalanced force?
- A) A tug-of-war with equal teams
 - B) Sliding down a slide
 - C) Riding a bike at a constant speed
 - D) A book resting on a table
10. How does net force affect the direction of an object's motion?
- A) It has no effect on the direction.
 - B) It makes the object move in a zigzag pattern.
 - C) It causes the object to move in the direction of the stronger force.
 - D) It makes the object stop moving.

ANSWERS & EXPLANATIONS

1. A - The overall force acting on an object when all the individual forces are added together.
 - Net force is the total force acting on an object when all the individual forces acting on it are combined.
2. B - A balanced force.
 - When two forces are equal in size and opposite in direction, they create a balanced force, which means there is no net force acting on the object.
3. B - It moves at a constant speed in the same direction.
 - When the net force on an object is zero, the object will either stay at rest or move at a constant speed in the same direction.
4. C - Two forces that are not equal in size and opposite in direction.
 - An unbalanced force occurs when two forces are not equal in size and/or opposite in direction, causing the object to accelerate in the direction of the stronger force.
5. C - It makes the object move faster.
 - Net force affects an object's motion by causing it to accelerate in the direction of the stronger force.
6. A - Their values add up to create a larger net force in that direction.
 - When two forces act in the same direction, their values add up to create a larger net force in that direction.
7. B - Their values subtract from each other to create a smaller net force in the stronger direction.
 - When two forces act in opposite directions, their values subtract from each other, and the net force is in the direction of the stronger force.
8. C - Friction
 - Friction is the force that provides resistance to an object's motion.
9. B - Sliding down a slide
 - Sliding down a slide is an example of an unbalanced force. The force of gravity pulls the object down the slide, causing it to accelerate.
10. C - It causes the object to move in the direction of the stronger force.
 - Net force determines the direction in which an object will accelerate. It will move in the direction of the stronger force acting on it.