

Understanding Normal Force

Physics · Answer Key · 15 Questions

1. What is the normal force?

- A) A force that acts parallel to a surface.
- B) A force that acts perpendicular to a surface.**
- C) The force of gravity acting on an object.
- D) The applied force on an object.

2. When is the normal force equal to the gravitational force?

- A) When an object is on an inclined surface.
- B) When an object is in free fall.
- C) When an object is at rest on a horizontal surface.**
- D) When an object is being pushed at an angle.

3. What is the formula for normal force in equilibrium on a horizontal surface?

- A) Normal Force = Applied Force
- B) Normal Force = Gravitational Force**
- C) Normal Force = Gravitational Force + Applied Force
- D) Normal Force = Gravitational Force - Applied Force

4. When an object is on an inclined surface, how does the normal force relate to the gravitational force?

- A) Normal force is greater than the gravitational force.
- B) Normal force is equal to the gravitational force.
- C) Normal force is less than the gravitational force.**
- D) Normal force is zero.

5. What component of gravity acts perpendicular to an inclined surface?

- A) $mg \sin(\theta)$
- B) $mg \cos(\theta)$**
- C) $mg \tan(\theta)$
- D) mg

6. If an applied force is at an angle to the surface, how does it affect the normal force?

- A) It increases the normal force.
- B) It decreases the normal force.**
- C) It has no effect on the normal force.
- D) It makes the normal force zero.

7. What does 'equilibrium' mean in the context of forces?

- A) The object is accelerating rapidly.
- B) The net force acting on the object is zero.**
- C) The object is moving at a constant velocity.
- D) The object is at rest.

8. How many vectors are typically acting on an object on a flat surface in equilibrium?

- A) One
- B) Two**
- C) Three
- D) Four

9. In the diagram provided (implied), 'Fg' represents:

- A) Applied Force
- B) Normal Force
- C) Gravitational Force**
- D) Friction Force

10. Which of the following is NOT a way to find the normal force?

- A) Object on a flat surface.
- B) Object on an inclined surface.
- C) Object in free fall.**
- D) Applied force at an angle.

11. When is the normal force calculated as $N = mg \cos(\theta)$?

- A) On a horizontal surface with no applied force.
- B) On an inclined surface with an applied force pulling upwards.**
- C) On an inclined surface with an applied force pushing downwards.
- D) On an inclined surface where the applied force is parallel to the incline.

12. What does 'mg' represent in physics formulas?

- A) Mass times acceleration.
- B) Momentum times gravity.
- C) Gravitational force (weight).**
- D) Mass times velocity.

13. If an object is on a horizontal surface and a downward force is applied, what happens to the normal force?

- A) It decreases.
- B) It stays the same.
- C) It increases.**
- D) It becomes zero.

14. What is the direction of the normal force relative to the surface?

- A) Parallel
- B) Perpendicular**
- C) At a 45-degree angle
- D) Opposite to gravity

15. In the context of equilibrium, if the normal force is N and the vertical component of gravity is ' y ', and an upward applied force is ' F_y ', what is the relationship?

- A) $N + y = F_y$
- B) $N = y - F_y$
- C) $N + F_y = y$**
- D) $N = y + F_y$