

Newton's Laws of Motion Questions

Answer the following questions using complete sentences. **Be sure to use Newton's Laws of Motion in your answers.**

1. What happens according to Newton if you let an untied balloon go?

3rd Law

Air will rush out of the balloon forcing the balloon to move through the air in the opposite direction, but equal in force.

2. Describe what happens if you are riding a skateboard and hit something (like a curb) with the front wheels.

1st Law

Your body will keep moving forward and fly off your skateboard since the curb only stops the board, not yourself.

3. Describe what happens if you try and push Mr. Larson. What happens if he pushes back?

2nd Law

If you put force on Mr. Larson, force will be put back on you. Because of Mr. Larson's mass, you most likely will not have enough force to make him accelerate. If Mr. Larson pushed you, you most likely would move in the direction of the force since he has more mass.

4. Describe why you hold your gun next to your shoulder while deer hunting.

3rd Law

When you pull the gun's trigger, it forces the bullet out of the gun, but at the same time, the gun is forced in the opposite direction of the bullet (towards you). Your shoulder is a new force that is introduced in order to keep your gun from flying away from you.

5. What is another name for the first law of motion? Why is it given that name?

Law of inertia.

It is given that name because inertia is the tendency of an object to resist any change in its motion until an unbalanced force acts on it. That is the same thing that Newton's first law states.

6. Why should we wear seatbelts - use one of Newton's Laws in your answer?

We should wear seatbelts so if we are in an accident our body doesn't keep moving at the same speed and in the same direction that the car was going. A new force would be introduced to our bodies (the seatbelt) in order to keep our bodies in place.

7. Using Newton's laws explain why heavier objects require more force than lighter objects to move or accelerate them?

2nd Law

Something with more mass moving at the same acceleration as a lighter object would require more force to change its speed or change its direction. Our formula $F = m \times a$ is derived from Newton's second law.

8. How can Newton's laws be used to explain how rockets are launched into space?

Newton's third law would tell us that when the rocket pushes out fire with a specific amount of force, the rocket will move in the opposite direction, but with the same amount of force. This is what causes the rocket to shoot up into the air.

9. Explain how each of Newton's laws affects a game of Tug of War.

First Law: The rope will stay in the same place until the tugging starts (a new force is introduced)

Second Law: We could measure a team's force that they can pull the rope with based on their body masses and the acceleration that they are causing the rope to move at.

Third: 1 team pulls the rope towards themselves with a certain amount of force and the opposing team is also putting force on the rope. The same amount of force is applied from the ground to the people as they are putting on the ground.

10. How do Newton's laws affect your daily life?

Answers will vary, but EVERYTHING that happens in our lives can be connected back to one of Newton's 3 laws of motion since force is involved in everything.