

Newton's 1st Law: True or False

Name _____ Class _____ Date _____

Determine if the following statements are true or false.

- _____ 1. Inertia is the tendency of an object to resist motion.
- _____ 2. Newton's first law of motion is also called the law of acceleration.
- _____ 3. If an object is at rest, inertia will keep it at rest.
- _____ 4. The inertia of an object is determined by its speed.
- _____ 5. The speed of an object changes only when it is acted on by an unbalanced force.
- _____ 6. A stationary object resists movement only because of gravity.
- _____ 7. The tendency of an object to resist a change in motion depends on its mass.
- _____ 8. If the net force acting on an object is zero, its inertia is also zero.
- _____ 9. When you are moving at a high rate of speed, inertia makes it hard to stop.
- _____ 10. Newton's first law of motion applies only to objects that are already moving.

Critical Reading

Read this passage from the text and answer the questions that follow.

Inertia

Inertia is the tendency of an object to resist a change in its motion. If an object is already at rest, inertia will keep it at rest. If the object is already moving, inertia will keep it moving. Think about what happens when you are riding in a car that stops suddenly. Your body moves forward on the seat. Why? The brakes stop the car but not your body, so your body keeps moving forward because of inertia. That's why it's important to always wear a seat belt.

The inertia of an object depends on its mass. Objects with greater mass also have greater inertia. Think how hard it would be to push a big cardboard box full of books. Then think how easy it would be to push the box if it was empty. The full box is harder to move because it has greater mass and therefore greater inertia.

Questions

1. What is inertia?
2. Describe how inertia affects motion.
3. What is the relationship between mass and inertia?

Multiple Choice

Circle the letter of the correct choice.

1. Newton's first law of motion states that an object's motion will not change unless
 - a. the net force acting on it is greater than zero.
 - b. a force continues to be applied to the object.
 - c. its inertia is stronger than the applied force.
 - d. the object has no inertia.
2. Overcoming an object's inertia always requires a(n)
 - a. large mass.
 - b. massive force.
 - c. unbalanced force.
 - d. two of the above
3. It is more difficult to start a 50-kg box sliding across the floor than a 5-kg box because the 50-kg box has greater
 - a. size.
 - b. inertia.
 - c. volume.
 - d. velocity.

4. Once an object starts moving along a clear path, it would keep moving at the same velocity if it were not for
 - a. inertia.
 - b. friction.
 - c. an unbalanced force.
 - d. two of the above
5. An object's velocity will not change unless it is acted on by a(n)
 - a. net force.
 - b. strong force.
 - c. unbalanced force.
 - d. opposite but equal force.
6. The direction of a moving object will not change if the net force acting on it is
 - a. greater than zero.
 - b. less than zero.
 - c. zero.
 - d. two of the above

Matching

Match each definition with the correct term.

Definitions

- _____ 1. combination of all the forces acting on an object
- _____ 2. force that opposes the motion of any object
- _____ 3. an object's motion will not change unless an unbalanced force acts on it
- _____ 4. factor that determines the inertia of an object
- _____ 5. type of force needed to overcome inertia of an object
- _____ 6. tendency of an object to resist a change in motion

Terms

- a. inertia
- b. unbalanced force
- c. friction

- d. law of inertia
- e. mass
- f. net force

Fill in the Blank

Fill in the blank with the appropriate term.

1. Newton's first law of motion is also called the law of _____.
2. An object at rest will stay at rest unless a(n) _____ force acts on it.
3. When the car you are riding in stops suddenly, you move forward because of _____.
4. Objects with greater mass have _____ inertia.
5. If an object is not moving, _____ will cause it to remain stationary.
6. Once objects start moving, _____ keeps them moving.
7. An object's motion will not change as long as the net force acting on it is _____.

Critical Writing

Thoroughly answer the question below. Use appropriate academic vocabulary and clear and complete sentences.

Explain how Newton's first law of motion is related to the concept of inertia.