

Chapter 5 Newton's First Law of Motion

Newton's First Law of Motion: Inertia

Pre-Test - Post-Test

1. The law of inertia states that an object _____.
 - A) that is not moving will never move unless a force acts on it.
 - B) will continue moving at the same velocity unless an outside force acts on it.
 - C) at rest will remain at rest unless acted on by an outside force.
 - D) will continue moving in a straight line unless an outside force acts on it.
 - E) all of the above

2. After a cannon ball is fired into frictionless space, the amount of force needed to keep it going equals _____.
 - A) one quarter the force with which it was fired.
 - B) twice the force with which it was fired.
 - C) one half the force with which it was fired.
 - D) zero, since no force is necessary to keep it moving.
 - E) the same amount of force with which it was fired.

3. If the force of gravity suddenly stopped acting on the planets, they would
 - A) continue to orbit the sun.
 - B) fly straight away from the sun.
 - C) move in a straight line tangent to their orbit.
 - D) spiral slowly away from the sun.
 - E) spiral slowly towards the sun.

4. Compared to its weight on earth, a 10-kg object on the moon will weigh

A) more.	C) less.
B) the same amount.	

5. Compared to its mass on earth, the mass of a 10-kg object on the moon is

A) more.	C) the same.
B) less.	

6. Which has more mass, 10 kg of feathers or 10 kg of raw liver?

a. feathers	c. same
b. raw liver	d. depends on where they are weighed

7. You would have the largest mass of gold if your chunk of gold weighed 1 N on

A) Earth.	C) the moon.
B) the planet Jupiter.	



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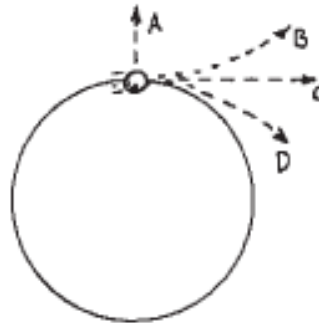
First Law of Motion:

5.01 Motion in the Early Days

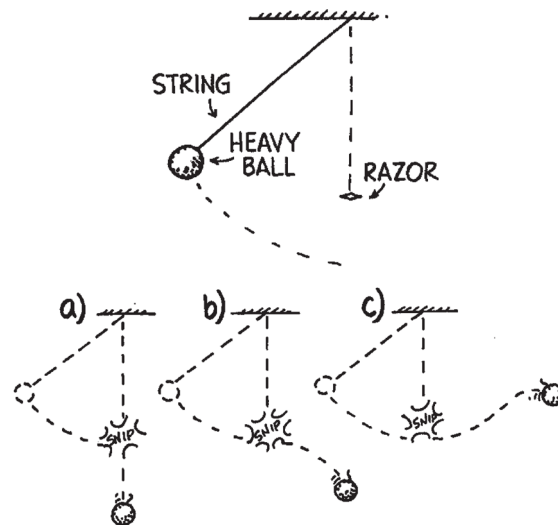
1. How did Aristotle view the cause of an objects motion?
2. How would Aristotle explain the continued motion of an object through the air?
3. Galileo let a ball roll down one incline and then up another. Compared with its initial height, how high did the ball roll up the second incline?
4. How did Galileo view the cause of an objects motion?
5. What does the term inertia mean?
6. According to Galileo, what would eventually cause all objects to stop moving on Earth?

9. To say that an object moves in a straight-line path at constant speed implies what about its velocity?

10. If the force of gravity suddenly stopped acting on a planet, what path would the planet travel?



11. When the ball at the end of a string swings to its lowest point, the string is cut by a razor. Which path will the ball then follow.



5.02 Newton's Law of Inertia

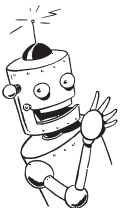
Every object continues in its state of rest, or of motion in a straight line at constant speed, unless it is compelled to change that state by forces exerted upon it.

7. When was Isaac Newton born?
8. What is the tendency of a moving object when no forces act on it?

5.03 Mass and Weight

12. What is mass and what does it measure?
13. How do you measure mass?

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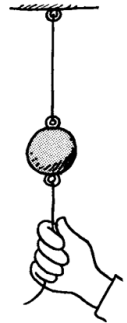
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14. What is weight?
15. How do you measure weight?
16. How do you calculate weight?
17. Distinguish between mass and weight.
18. What does the term "MASS" really stand for?
19. Does a person diet to loose mass or weight?
20. Would it be easier to push a car on the moon or earth?
21. Why is it to your advantage to zigzag if you are being chased by an elephant?
22. In tearing a paper towel or plastic bag from a roll, why is a sharp jerk more effective than a slow pull?
23. Ask a friend to drive a small nail into a piece of wood placed on top of a pile of books on your head. Why doesn't this hurt you?

24. You are taking a drink of water when one of the ice cubes is in the way. Without touching the ice cube can you move it so that it is not in your way by turning the glass? Explain

Classic Demo (mass-weight)

A mass is suspended by a string, and pulled by a string from below.



25. Which string will brake is the string is pulled quickly? Explain
26. Which string will brake if pulled slowly? Explain

5.04 Reference Frames and Inertia

27. If you are standing inside a moving bus and drop a coin directly above your foot, where will it land? Explain
28. Does the classic bird-and-worm argument prove that the earth must be at rest? Explain
29. The Earth rotates at more than 1000 km/h If you stand on the east side of a wall and jump into the air, why doesn't the wall slam into you?
30. You are in a falling elevator. At the moment before the elevator hits the ground you jump upwards or you step off the falling elevator. Will this save your life? Explain.



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