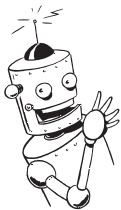


Chapter 6 Newton's Second Law of Motion

Newton's Second Law of Motion**Pre-Test - Post-Test**

- How does acceleration of an object change in relation to its mass?
 - directly proportional.
 - Acceleration doesn't depend on mass at all.
 - inversely proportional.
- The acceleration produced by a net force on an object is _____.
 - in the same direction as the net force.
 - inversely proportional to the mass of the object.
 - directly proportional to the magnitude of the net force.
 - all of the above
 - none of the above
- A 10-kg brick and a 1-kg book are dropped in a vacuum. The force of gravity on the 10-kg brick is _____.
 - 10 times as much as the force on the 1-kg book.
 - zero.
 - the same as the force on the 1-kg book.
- A girl pulls on a 10-kg wagon with a constant force of 30 N. What is the wagon's acceleration?
 - 30 m/s/s.
 - 10 m/s/s
 - 300 m/s/s
 - 0.3 m/s/s
 - 3.0 m/s/s
- A force of 100 N accelerates a mass of 1 kg at the rate of 1 meter per second squared. The acceleration of a mass of 2 kg acted upon by a force of 2 N is _____.
 - the same.
 - twice as much.
 - half as much.
 - none of the above.
- A push on a 1-kilogram brick accelerates the brick. Neglecting friction, to equally accelerate a 10-kilogram brick, one would have to push _____.
 - 100 times the force.
 - 1/10 the force
 - 10 times the force
 - with the same force.
- Which of the following would exert the most pressure on the ground?
 - A woman standing in high heel shoes
 - A woman standing in running shoes
 - A woman standing on skis

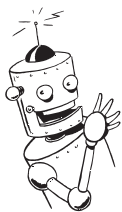


Chapter 6 Newton's Second Law of Motion

Second Law of Motion:**6.1 Newtons Second Law**

"The acceleration of an object is directly proportional to the net force acting on the object, is in the direction of the net force, and is inversely proportional to the mass of the object."

1. What is the acceleration of a moving object if no net force on the object?
2. You are on a plane that is traveling at a constant velocity. You flip a coin in the air, where does it land?
3. You are on a plane that is accelerating down a runway. You flip a coin in the air, where does it land?
4. You are on a plane that is decelerating landing. You flip a coin in the air, where does it land?
5. Two darts are shot horizontally from a gun with the same force, one dart has three times the mass as the other, which dart goes the furthest?
6. Two darts are shot vertically towards the ground from a gun with the same force, one dart has three times the mass as the other, which dart hits the ground first? Explain
7. What causes acceleration?
8. What resist acceleration?
9. What is the relationship between an objects acceleration and the net force?
10. What is the relationship between an objects mass and it's acceleration?
11. State Newton's second law mathematically.
12. If two quantities are inversely proportional to each other, does that mean as one in- creases the other increases also?
13. If the net force acting on a sliding block is tripled, what happens to the acceleration?
14. If the mass of a sliding block is tripled at the same time the net force on it is tripled, how does the resulting acceleration compare with the original acceleration?
15. A 70-kg cart is pulled to the left with a force of 100 N and to the right with a force of 30 N. What is the acceleration of the cart?

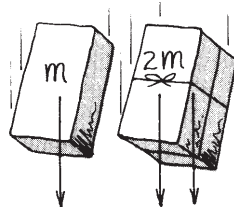


Chapter 6 Newton's Second Law of Motion

6.2 Free Fall Explained

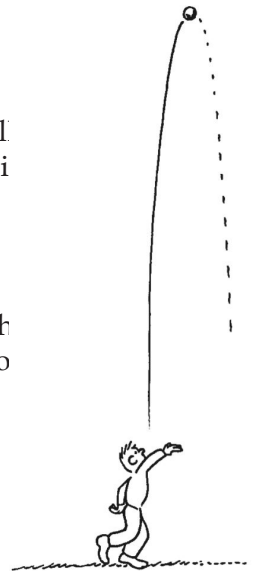
16. Why did Galileo struggle to convince people that objects of varying mass all fall at the same rate?

17. In the absence of air resistance, all objects fall at the same rate. Using Newton's second law, explain.



22. A 1-kg rock is thrown straight upwards into the air. What will acceleration of the rock at the top of its trajectory?

23. From the previous problem, what will be the net force acting on the rock at the tippity-top of its path?



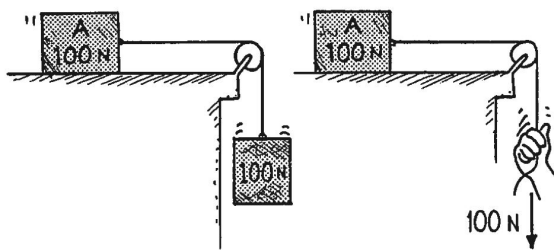
18. The ratio of circumference/diameter for all circles is π . What is the ratio of force/mass for all freely-falling bodies?

19. Aristotle believed that an object that weighed 10 times as much as another would fall 10 times faster, what did Aristotle fail to understand?

20. As a young kid, Doc Fizzix noticed that the cars of a roller coaster never collide even when they are loaded with varying sized people, explain.

Brain Challenge

In both cases an applied force of 100 N accelerates the 100-N block.



21. In which case is the acceleration greater? Explain

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