Sharya Academy

Physics Worksheet Grade IX
Force and Laws of Motion

1. Name the physical quantity that measures inertia. State its Sl unit.
2. Write an activity to distinguish between balanced and unbalanced forces.
3. Which has highest inertia - Solids made of aluminium, steel and wood of same shape and same volume.
4. Why do the athletes in a high jump event made to fall either on a cushioned bed or on a sand bed?
5. A force is applied on a metal block lying on the floor and still it does not move. Name the force which is balancing the applied force.
6. Why does the pillion rider fall forward when brakes are applied?
7. Name the physical quantity which is measured by the rate of change of momentum.
8. Which is having higher value of momentum- A bullet of mass 10 g moving with a velocity of 400m/s (or) a cricket ball of mass 400 g thrown with a speed of 90 km/hr.
9. State why Newton's first law of motion is called Law of Inertia.
10. Derive a mathematical formula to measure force using Newton's second law of motion. (or) Establish the relation F = ma
11. Give reason.
    a. Water sprinkler used for grass lawns begins to rotate as soon as water is supplied.
    b. Water drops are removed from wet clothes by giving light jerks to the clothes.
12. A body of mass 1 kg is kept at rest. A constant force of 6 N starts acting on it. Find the time taken by the body to move through a distance of 12m (Ans t =2s)
    a) State Newton's third law of motion.
    b) When air from an inflated balloon is allowed to be released, the balloon moves in a direction opposite to that of air. Explain.
13. State Newton's First Law of Motion.
14. A man weighing 60 kg runs along the rails with a velocity of 18km/h and jumps into a car of mass 100 kg standing on the rails. Calculate the velocity with which the car start travelling along the rails. (Ans: v=1.775m/s)
15. What is meant by inertia? What are the different types of inertia. Give two examples in each casem
16. State the law of conservation of momentum.
17. Explain how a karate player can break a pile of tiles with a single blow of his hand.
18. Newton's first law of motion can be mathematically stated from the mathematical formulation of Newton's second law of motion. Justify the statement,
19. Give few examples of Newton's third law of motion.
20. Derive the mathematical formula of law of conservation of momentum.

21. An iron sphere of mass 1 kg is dropped from a height of 10 m. If the acceleration of the sphere is 9.8m/s ^{2}, calculate the momentum transferred to the ground by the ball. (14kg m/s)
22. A man pushes a box of mass 50 kg with a force of 18 N. What will be the acceleration of the box due to this force. What would be the acceleration if the mass were doubled.
23. What force would be needed to produce an acceleration of 4m/s ^{2} on a body of mass 6 kg (Ans: 24N)
24. A car A of mass 1500 kg travelling at 25 m/s collides with another car B of mass 1000 kg travelling at 15m/s in the same direction. After collision, velocity of the car A becomes 20m/s. Calculate the velocity of car B after collision. (Ans: v=22.5m/s)
25. A gun of mass 500 g fires a bullet of 10 g with a speed of 100m/s. Find
    a. Initial momentum of gun + bullet.
    b. Momentum gained by the bullet after firing. (1kgm/s)
    c. Recoil velocity of the gun. (-2m/s)