

# SP1&2 Forces & Motion Low Stakes Questions

**Give this sheet to a person you trust. Ask them to ask you these questions and write down your answers. Check them against the answers at the bottom and then revise topics that you didn't get right.**

**Also learn all 7 equations for this topic.**

1. Why is velocity a vector and speed a scalar?
2. How do you work out the overall displacement of a journey?
3. How do you calculate speed?
4. What is the equation for acceleration? And the units?
5. How do you work out how far something has travelled from its velocity-time graph?
6. What does the length of a force arrow represent?
7. If 1500N acts downwards on an object, and 1500N also acts upwards on it, what is the resultant force on the object?
8. How will the object in Q2 move?
9. In which direction does a centripetal force act? Give an example of where there is a centripetal force.
10. What is the equation linking mass and weight?
11. If the weight on a parachutist is bigger than the air resistance on them, how will they move? (accelerate/steady speed/decelerate)?
12. What is Newton's Second Law?
13. Define inertial mass.
14. How can you use 2 light gates to calculate the acceleration of a trolley?
15. What is the reaction force when a footballer headers a ball? (the action force is the force of her head on the ball.)
16. What is the equation for momentum? And the units?
17. If a skater with a momentum of 120 kgm/s collides with a stationary (plastic) penguin, and the pair of them carry on moving across the ice joined together, what is their joint momentum?
18. What is the link between stopping distance, thinking distance and braking distance?
19. Does a crumple zone make the time taken for a car to decelerate larger or smaller?
20. What equation links the force that the car experiences to the deceleration?

**Answers:**

1. Velocity has a magnitude (size) and a direction, so it's a vector. Speed only has a magnitude.
2. Draw a line from the start to the finish and find its size and direction.
3.  $speed = \frac{distance}{time}$
4.  $a = \frac{v - u}{t}$ ,  $m/s^2$
5. Distance is given by the area under the line of a v-t graph
6. Length of the force arrow tells us the size of the force.
7. Resultant force (means overall force) = 0
8. Steady speed or stationary
9. Centripetal force acts toward the centre of the circle eg cars going round curve, planets orbiting sun etc
10. Weight (N) = mass (kg) x gravitational field strength (N/kg)
11. Accelerate downwards
12.  $F = m \times a$
13.  $Inertial\ mass = \frac{force}{acceleration}$
14. Calculate the velocity at each light gate, find the difference and divide by the time it took to travel between the gates.
15. Reaction force is the force of the ball on the head
16. Momentum = mass x velocity; kgm/s
17. 120 kgm/s (Conservation of Momentum: Total momentum before collision = total momentum after the collision)
18. Stopping distance = thinking distance + braking distance
19. Deceleration is smaller
20.  $F = m \times a$  where a can be deceleration (as well as acceleration)