

## Momentum 1

- 1) What is the momentum of a car travelling at 5m/s with a mass of 1000kg?
- 2) which has more momentum the car above or a motorbike of mass 200kg travelling at 30m/s.
- 3) Which would have more momentum if the car and bike were travelling at the same velocity.
- 4) What force is needed to make 10kg mass accelerate from 2m/s to 4m/s in 5 seconds?
- 5) What is the force from a rocket engine which, in 2 seconds, pushes out 4kg of exhaust gas at a velocity of 200m/s
- 6) An astronaut floating in space kicks against a rock, also floating in space. If the astronaut has a mass of 100kg, the rock has a mass of 200kg, and the rock gains velocity of 2m/s to the right, what velocity does the astronaut gain to the left?
- 7) A car driver of mass 80kg, travelling at 72km/hr collides with a wall and comes to rest in 0.2s. What is the average force on the passenger in the collision?
- 8) What time is needed to change the force acting on the passenger in Q7 to be 400N.
- 9) Name 3 things that can reduce the impact on a passenger in a car crash.
- 10) A car travelling at 20m/s collides with another car. The passenger, who is not wearing a seatbelt, continues to move forward hitting the dashboard in a collision that lasts 0.1second. a) Calculate the value of the force that the windscreen exerts on the passengers head. Assume the mass of the passenger is 50kg. b) Explain how a seatbelt would have protected the passenger from serious injury.