

Which of these is the correct definition for momentum and its unit?

	definition	unit
A	$p = m + v$	N/m
B	$v = p \times m$	kgm/s
C	$v = p + m$	kgm/s
D	$p = m \times v$	N/kg

Complete the following sentence:

*Impulse is equal to...*

- A Momentum
- B Velocity multiplied by time
- C A corresponding change in momentum
- D Force multiplied by the distance it acts

A rollercoaster speeds along a track with considerable momentum.

If a different rollercoaster travels at four times the speed but has half as much mass, its momentum is would be:

- A Zero
- B Twice as much
- C Four times as much
- D Unchanged

Padded dashboards in cars are safer in an accident than non-padded ones because a passenger hitting the dashboard would experience

- A** Lengthened time of contact
- B** Shorter time of contact
- C** Decreased impulse
- D** Increased momentum

After a car crash the car driver's airbag inflates. The airbag then deflates when it is hit by the driver's head.

How does an airbag reduce the risk of injury?

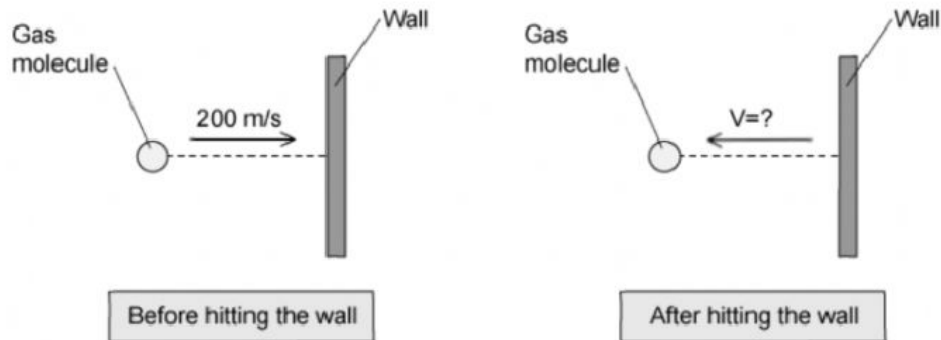
- A** Collision time increases, which increases the rate of change of momentum.
- B** Collision time increases, which reduces the rate of change of momentum.
- C** Collision time decreases, which increases the rate of change of momentum.
- D** Collision time decreases, which reduces the rate of change of momentum.

An object of mass 150 kg accelerates from a velocity of 5 m/s to a velocity of 10 m/s in the same direction.

What is the impulse provided to cause this acceleration?

- A** 750 Ns
- B** 1500 Ns
- C** 2250 Ns
- D** 7500 Ns

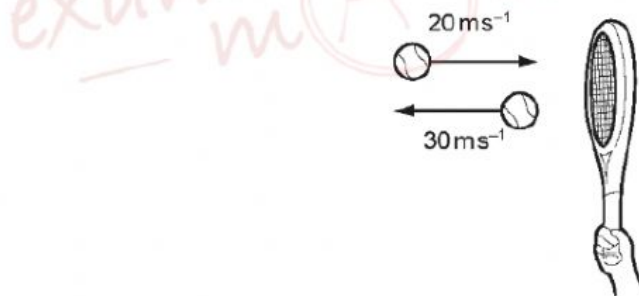
A gas molecule strikes the wall of a container with a speed of 200m/s. It rebounds with the same kinetic energy as it had before striking the wall.



What is its final velocity?

- A 100 m/s
- B - 100 m/s
- C 200 m/s
- D - 200 m/s

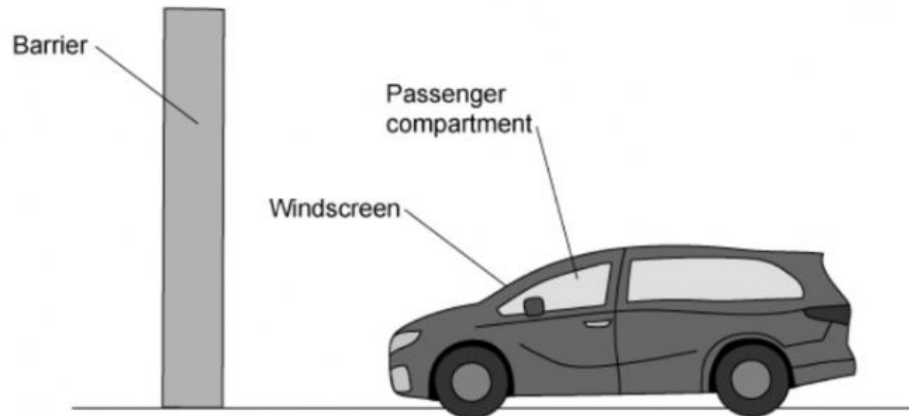
A tennis ball of mass 100 g is struck by a tennis racket. The velocity of the ball is changed as shown.



What is the magnitude of the change in momentum of the ball?

- A  $1 \text{ kg ms}^{-1}$
- B  $5 \text{ kg ms}^{-1}$
- C  $1000 \text{ kg ms}^{-1}$
- D  $5000 \text{ kg ms}^{-1}$

A passenger of mass 90 kg is involved in a minor car crash.



The car approaches a solid barrier at 32 m/s. It crashes into the barrier and stops in 0.2s.

Determine the impulse that must be applied to the car to bring it to rest.

- A 2.8 Ns
- B 14 Ns
- C 580 Ns
- D 2900 Ns

During a paintball fight, a paint pellet of mass 150g hits a stationary target with a speed of 220m/s. It takes 0.025s from the moment the pellet comes into contact with the wall until it flattens onto the wall.

What is the force exerted as a result of the paintball "splat"?

- A  $1.3 \times 10^3$  N
- B 33 N
- C  $1.3 \times 10^6$  N
- D  $33 \times 10^3$  N