

More Momentum Questions

- 1) As part of a circus act, Dimitri, a 136 kg strongman, catches cannonballs fired at his chest. If a 34 kg cannonball is fired toward Dimitri with a speed of 20 mph (32 km/h), with what speed does the combination of Dimitri and the cannonball tumble backward, once the cannonball is caught?
- 2) A 0.3g mosquito is flying toward a girl with a speed of 4.5 mph. Just before landing on the girl, the fly is swatted straight back at a speed of 12 mph. If the flyswatter and the fly were in contact for 0.2 s, what is the force that was exerted on the fly?
- 3) A 50 kg girl is skateboarding across a waxed floor at 5 m/s. Just as she is about to crash, she jumps off of the 15 kg skateboard and lands at rest, firmly on her feet. What is the skateboard's velocity after the jump? How much impulse was the skateboard given?
- 4) In terms of impulse and momentum, explain the following: (a) Why does having airbags in a car reduce injuries? (b) How is it possible to catch a water balloon without popping it?
- 5) In a game of billiards, the cue ball strikes the 6-ball, and instead of coming to rest after the collision, the cue ball bounces off at an angle. Explain this scenario in terms of momentum.