

Assessment

Momentum and Collisions

Section Quiz: Momentum and Impulse

Write the letter of the correct answer in the space provided.

- _____ 1. What is the product of an object's mass and its velocity?
- kinetic energy
 - momentum
 - impulse
 - inertia
- _____ 2. Which of the following has the greatest momentum?
- a 4.0 kg bowling ball moving at 2.0 m/s
 - a 0.15 kg baseball moving at 10.0 m/s
 - a 1.6×10^3 kg car moving at 0.5 m/s
 - a 0.02 kg bullet moving at 950 m/s
- _____ 3. How does the momentum of an object change if the object's velocity doubles?
- The momentum doubles.
 - The momentum increases by a factor of four.
 - The momentum decreases by a factor of 1/2.
 - The momentum decreases by a factor of 1/4.
- _____ 4. What are the units of momentum?
- N
 - J
 - kg•m/s
 - kg•m/s²
- _____ 5. Which of the following can determine the magnitude of the change in an object's momentum?
- mass and acceleration
 - force and time interval
 - force and distance
 - acceleration and time interval
- _____ 6. Which of the following is true of changes in momentum?
- A small force may produce a large change in momentum by acting over a short time interval.
 - A small force may produce a large change in momentum by acting over a long distance.
 - A large force may produce a small change in momentum by acting over a short time interval.
 - A small force may produce a large change in momentum by acting on a very massive object.

Momentum and Collisions *continued*

- _____ **7.** If a net force acts on an object, then the object's momentum
- will increase.
 - will decrease.
 - will either increase or decrease.
 - may or may not change.
- _____ **8.** Which of the following involves a change in momentum?
- A bowling ball rolls down the lane at constant speed.
 - A car coasts down a hill at constant speed.
 - A sky diver descends with terminal velocity.
 - A spacecraft travels at constant speed while slowly losing mass.
- 9.** Define impulse, and state the impulse-momentum theorem.

- 10.** A 1.0×10^4 kg spacecraft is traveling through space with a speed of 1200 m/s relative to Earth. A thruster fires for 2.0 min, exerting a continuous force of 25 kN on the spacecraft in a direction opposite the spacecraft's motion. Calculate the initial momentum and the final momentum of the spacecraft.