Worksheet: Momentum and Impulse **Name**_____

1. Define momentum. Give the equation and unit.

2. Two cars, one twice as heavy as the other, move down a hill at the same speed. Compared to that of the lighter car, the momentum of the heavier car is _____ as much.

3. a. For a constant force, if the duration of impact upon an object is doubled, how is the impulse affected?

   b. How is the resulting change in momentum affected?

4. If the time of impact in a collision is extended by four times, by how much is the force of impact altered?

5. Define impulse. Give its equation and unit.

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Use the impulse-momentum equation to answer questions 6-9:

6. Why is it important to "follow through" when trying to hit a home run?

7. Why does it hurt more when you fall on a concrete floor than on a wooden floor?

8. Why are car dashboards, steering wheels, and boxing gloves padded?

9. How can a karate "chop" break a board?

10. What is the momentum of a golf ball with a mass of 62 g moving at 73 m/s?

11. If in the problem above, the impact between the ball and club lasted for 2.0×10^{-3} s, what force acted on the ball? What force acted on the club?

12. For how long a time must a tow truck pull with a force of 550 N on a stalled 1200 kg car to give it a forward velocity of 2.0 m/s?

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