

Name: _____ Date: _____ Period: _____

1. Define Momentum.
2. What is the equation for momentum and the units for each variable?
3. What is the equation for impulse?
4. What happens to momentum if you increase the velocity of the object with the same mass?
5. What is elastic collision and give two examples of this occurring?
6. What is the equation for elastic collision?
7. What is inelastic collision and give two examples of this occurring?
8. Manipulate the conservation of momentum equation to solve for inelastic collisions.
9. What are two ways that you can increase momentum?
10. If the momentum is increased and the mass remains constant what happens to velocity?
11. The change in momentum is equal to?
12. In order for there to be momentum what must the object do?
13. A 21 kg ball is thrown 13 m/s. What is the balls momentum?
14. A 14 kg ball has a momentum of 2 kg * m/s, what is the balls speed?
15. A ball is moving at 34 m/s and has a momentum of 148 kg*m/s. What is the ball's mass?
16. What is the average momentum of a 32 kg runner who covers 1000 meters in 120s?
17. A 12 kg cement block moving horizontally at 3.1 m/s plows into a pillow and comes to a stop in 0.8 seconds. What is the average impact force on the pillow?
18. A 15 kg girl and a 22 kg boy face each other on friction-free roller skates. The girl pushes the boy, who moves at a speed of 1.3 m/s. What is the girl's speed?
19. A 16 kg child is riding a 6.2 kg bike with a velocity of 4.6 m/s to the northwest. What is the total momentum of the child and the bike together?
20. What happens to force if you decrease the time? What if it was the other way, time was increased?
21. A 0.35 kg soccer ball approaches a player horizontally with a velocity of 15 m/s to the north. The player strikes the ball and causes it to move in the opposite direction with a velocity of 19 m/s.
 - (a) What impulse was delivered to the ball by the player?
 - (b) What is the change in momentum?
22. A 0.9 kg football is thrown with a velocity of 22.0 m/s to the right. A stationary receiver catches the ball and brings it to rest in 0.06 seconds. What is the force exerted on the receiver?
23. A 5 kg mass moves with a speed of 3.0 m/s. It collides head-on with a 3.2 kg mass at rest. If the collision is inelastic, what is the speed of the masses after the collision?

1. A 1250 kg car is stopped at a traffic light. A 3550 kg truck moving at 8.33 m/s hits the car from behind. If bumpers lock, how fast will the two vehicles move?
2. The muzzle velocity of a 50.0 g shell leaving a 3.00 kg rifle is 400. m/s. What is the recoil velocity of the rifle?
3. Imagine that you are hovering next to a space shuttle and your buddy of equal mass who is moving a 4 km/h with respect to the ship bumps into you. If he holds onto you, how fast do you both move with respect to the ship?
4. Joe and his brother Bo have a combined mass of 200.0 kg and are zooming along in a 100.0 kg amusement park bumper car at 10.0 m/s. They bump into Melinda's car, which is sitting still. Melinda has a mass of 25.0 kg. After the collision, the twins continue ahead with a speed of 4.12 m/s. How fast is Melinda's car bumped across the floor?
5. If an 800. kg sports car slows to 13.0 m/s to check out an accident scene and the 1200. kg pick-up truck behind him continues traveling at 25.0 m/s, with what velocity will the two move if they lock bumpers after a rear-end collision?