Name _____ Period _____ Date _____

Momentum and Impulse

Pre-Test - Post-Test

1. Which of the following has the largest momentum?
A) A dog running down the street
B) A pickup truck traveling down the highway
C) A tightrope walker crossing Niagara Falls
D) The science building at your school
E) A Mack truck parked in a parking lot

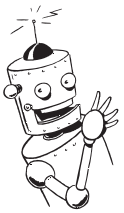
2. In order to increase the final momentum of a golf ball, we could _____.
A) increase the time of contact with the ball.
B) increase the force acting on it.
C) swing as hard as possible.
D) follow through when hitting the ball.
E) all of the above

3. A freight train rolls along a track with considerable momentum. If it were to roll at the same speed but had twice as much mass, its momentum would be _____.
A) doubled.
B)quadrupled.
C) unchanged.
D) zero.

4. Compared to falling on a wooden floor, a wine glass may not break when it falls to a carpeted floor because
A) lesser impulse in stopping.
B) longer time to stop.
C) less change in momentum.
D) none of these.

5. In order to catch a ball, a baseball player moves his or her hand backward in the direction of the ball's motion. Doing this reduces the force of impact on the player's hand principally because _____.
A) the time of impact is decreased.
B) the momentum of impact is reduced.
C) the velocity of the hand is reduced.
D) the time of impact is increased.
E) none of the above

6. The force of an apple hitting the ground depends upon _____.
A) the time of impact with the ground.
B) the speed of the apple just before it hits.
C) whether or not the apple bounces.
D) air resistance on the apple as it falls.
E) all of the above



Name _____ Period _____ Date _____

Momentum and Impulse

8.1 Momentum

1. What has greater mass, a pencil or Mac truck?

2. Which would be harder to stop, a moving pencil or a moving Mac truck?

3. What is momentum and what is the formula for momentum?

4. What factors affect an object's momentum?

5. By time the Titanic spotted the iceberg it was way to late to change it faith. Discuss in terms of momentum.

8.2 Impulse Changes Momentum

6. How do you change the momentum of an object?

7. What is the formula for impulse?

8. Derive the impulse/momentum formula from newton's laws.

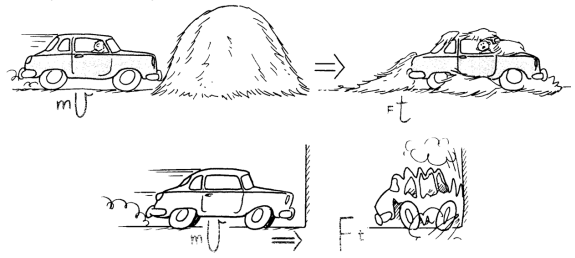
9. In sports that requiring contact with a ball, why is the follow through so important?

10. If the same amount of powder is used in two guns, explain how the length of a gun's barrel effect the speed of a bullet as it comes out and why.

11. Discuss the advisability of loose coupling with railroad cars and slack between the cars from the point of view of impulse and momentum.

12. You can't throw a raw egg against a wall it breaks, but you can throw it with the same speed into a sagging sheet it will not breaking. Explain.

Two identical cars are traveling at the same speed. One collides with a brick wall, and the other with a haystack. They both come to a complete stop.

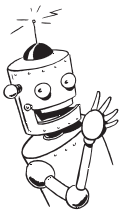


13. Which car will experience the greater change in momentum?

14. Which car will experience the greater change in impulse?

15. Which car will experience the greater force?

16. Why do you bend your knees when you land on the floor after jumping?



Name _____ Period _____ Date _____

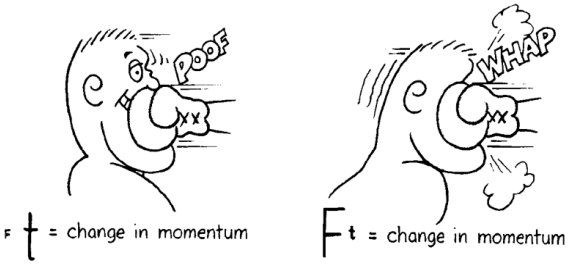
Chapter 8 Momentum

17. What is the advantage of playing on natural turf verses artificial grass?

18. Many years ago, automobiles were manufactured to be as rigid as possible. Today's autos are designed to crumple upon impact. Why

19. You are sky diving and your shoot does not open, give one option that may save your life.

20. When a boxer is going to be hit by a punch they are told to "ride" it out, what does this mean and why do boxers do it?



21. A boxer tires more readily when he misses hi opponent then when he hits him. Why is this so?

22. What factors affect how much an object's momentum changes?

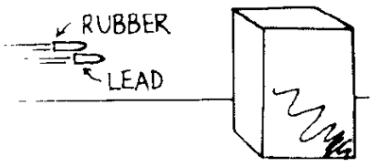
8.3 Bouncing

23. How does the impulse of a bounce compare to stopping only?

24. Why is the Pelton Wheel an improvement over paddle wheels with flat blades?

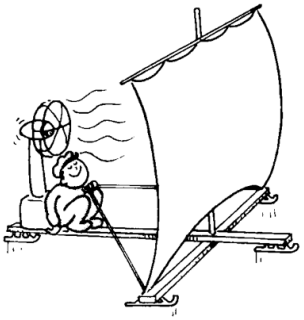
25. A glass falls off the counter and lands on the floor. Discuss how the likely hood of the glass surviving the fall if it hits the floor and bounces verse hitting the floor and not bouncing.

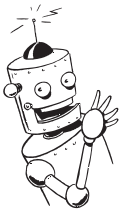
26. A rubber bullet and an metal bullet both have the same size, speed, and mass. They are fired at a block of wood. Which is most likely to knock the block over? Which is most likely to damage the block?



Brain Challenge

27. An ice sail craft is stalled on a frozen lake on a windless day. The skipper sets up a fan as shown. If all the wind bounces backward from the sail, will the craft be set in motion? If so, in what direction?





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