Momentum Quiz Name: _____Per: ____

Formulas: $p = mv$ $Ft = m\Delta v$ $KE = \frac{1}{2} mv^2$ $PE = mgh$

$V = gt$ $d = \frac{1}{2} gt^2$

1. If a smart car has a mass of 820 kg (1807.79 lbs), what is its momentum at a velocity of 30 m/s?

2. An offensive lineman with a mass of 140 kg has a momentum of 250 kg m/s, what is his velocity?

3. A beach ball is rolling in a straight line towards you at a speed of 0.5 m/s. Its momentum is 0.25 kg m/s. What is the mass of the beach ball?

You are given the following data about a baseball hitting a stationary baseball on a tee.

Mass of baseball bat	= .350 kg	Speed of bat before collision	=38 m/s
Mass of Baseball	= .046 kg	Speed of bat after collision	= 29 m/s

Calculate the following and SHOW YOUR WORK! Remember UNITS!

4. Momentum of the bat before the collision. Answer = _____

5. Momentum of the bat after the collision. Answer = _____

6. Momentum of the baseball before the collision. Answer = _____

7. Momentum of the baseball after the collision. Answer = _____

8. Identify the Impulse for the baseball after the collision. Answer = _____

9. What is the average force exerted by the ball after 2 seconds? Answer = _____

10. Velocity of the baseball right after it was hit by the bat. Answer = _____

11. Define the period of a pendulum.

12. Identify the most significant variable that affects the period of a pendulum.

13. Explain why this variable effects the pendulum period.

14. Draw a diagram of yourself swinging. Label where there is all kinetic energy and where there is all potential energy and where PE = KE.

15. Calculate the kinetic energy of an 8 kg bowling ball moving at 2 m/s.

16. Calculate the gravitational potential energy of Mrs. Chamberlain is she has a mass of 63.5 kg in a plane 4000 m above the ground?

17. Calculate Mrs. Chamberlain's velocity after falling for 4 sec.

18. What is Mrs. Chamberlain's momentum at 4 sec?

19. Explain why Mrs. Chamberlain prepares to land, by falling into a mattress with her parachute open instead of the concrete.

20. A moving car has momentum, If it moves twice as fast, its momentum is _____ as much.

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

22. Wiley Coyote runs into a speeding train and makes a big umpfh when he gets flattened on the front window. For the following questions answer True or False by writing out the entire word.

    a. _____ The train and Coyote experience the same force during the collision.

    b. _____ The time of impact is the same for both the train and Coyote, the impulse is less for the Coyote than the impulse on the train.

    c. _____ The Coyote experiences a greater acceleration than the train.