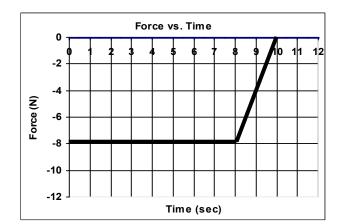# Momentum 5

1. Decide if the following are Elastic Collisions (E), Inelastic Collisions (I), or Perfectly Inelastic Collisions (PI).
   A. ___ They collide, stick together, and do not conserve kinetic energy.
   B. ___ They collide, remain independent, and kinetic energy is conserved.
   C. ___ They collide, do not stick together, and kinetic energy is not conserved.

2. If a 1 kg ball going 5 m/s is bounced off of a wall and ends up going 4 m/s. Find the Δp of the ball.

3. If the collision with the wall took 0.4 seconds, find the force the ball felt from the wall.

4. How much force did the wall feel from the ball?

5. For the following equations circle the cause and underline the effect: A. $ma = F_{net}$ B. $\Delta p = F\Delta t$ C. $E_k = W$

6. A 60 kg person catches a 0.5 kg ball. If after the catch the person and ball are going 3 m/s, find the net momentum after-wards.

7. A 4 kg object is thrown by a 60 kg person from rest. If the 60 kg object goes to the right at 1.5 m/s, find the final velocity of the 4 kg object.

8. For the previous problem, use kinetic energy to figure out what kind of collision it was.

9. Using the graph at the right find out the initial velocity of a 10 kg object that ends up going 10 m/s.

Force vs. Time

10. Which of the following are the most closely related?
    A. If they share the same order
    B. If they share the same kingdom
    C. If they share the same class

11. Which of the following are the most closely related?
    A. *Canis lupus*
    B. *Hedycarya arborea*
    C. *Canis familiaris*
    D. *Sophora microphylla*

12. In Europe a species went extinct named *Homo neanderthalensis* (Neanderthals). Some scientists want to change this sci-entific name to *Homo sapien neanderthalensis*.
    A. What does the first name tell you about Neanderthals?

    B. What would be the significance of the name change?

13. Are the following at equilibrium or not?
    A. ____ An object experiencing a 2 N force from the right and a two 1 N forces from the left.
    B. ____ An object speeding up.
    C. ____ An object during an impulse. (Remember what an impulse causes.)
    D. ____ An object on a ramp when the force of friction and the force of gravity are equal and opposite.

14. Are the following accelerating or not?
    A. ____ An object feeling an impulse.
    B. ____ For an object on which Fx < Fs.
    C. ____ If work is done.
    D. ____ If there is a net force.
    E. ____ If Fx = Fs.

15. A 1.5 kg wayward bird going 25 m/s to the right slams into a rigid box at rest on a frictionless surface exactly at the bottom of a ramp inclined at 20°. If the box weighs 30 N, find how fast the box is moving afterward if the bird stops after the collision and doesn't attach to the box. *(The bird was "CareFlight"-ed to St. Tweety's avian hospital in time, recovered for the most part, and is recuperating somewhere down south.)*

16. Now that you know how fast the box is going use Conservation of Energy to find out how far up the ramp the box will go before it mercilessly slides back down on top of the hapless bird?