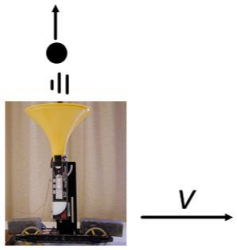
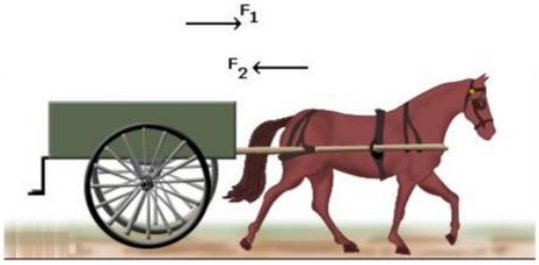
1. What is an inertial and non-inertial frame of reference? Give an example of each and be sure to clearly indicate what the frame of reference is.

2. Is the ball in the image below likely to land in the funnel if the cart is maintaining a constant velocity? What about if the cart has a constant acceleration? Provide an explanation for your answers.



3. Using Newton's 3rd law describe how the floor pushes you forward and that you do not push the floor.

4. Considering Newton's 3rd Law, how is the horse able to move the cart?



5. A 3.5 kg ball is accelerated from rest to a velocity of 18 m/s over a distance of 10 m. What force is exerted on the ball during this time? (F = 57 N)

6. An applied force of 35 N is needed to accelerate a 12 kg wagon at 1.5 m/s^2 along a sidewalk.
   a. How large is the frictional force? ($|F_f| = 17$ N)
   b. What is the coefficient of friction? ($\mu = 0.14$)

7. An elevator with a mass of 750 kg is accelerated upward at 2.4 m/s^2. What force does the cable apply to give this acceleration? ($F_a = 9160$ N)

8. A high jumper falling at a 7.5 m/s lands on foam pit and comes to rest compressing the pit 0.60 m. If the pit is able to exert an average force of 1700 N on the high jumper breaking the fall, what is the jumper's mass? (m = 36 kg)

9. A 45 kg diver steps off a 13 m high platform (initial velocity is zero). The swimmer comes to a stop 2.8 m below the surface of the water. Calculate the net stopping force exerted by the water. (F = 2050 N)