PROBLEM SOLUTIONS

1. Use ratio 4000/1 = 150 lbs/lb x = 0.0375 lbs x 16 oz/lb = 0.6 oz (About a third the mass of an average empty aluminum pop can.)

2. M = mass x velocity Mtrain = 6500 tons x 40 mph = 260,000 tons mph.

   Therefore 260,000 tons mph = 2 tons x v car

   V car = 130,000 mph Divide by speed of sound (1090 ft/sec or 747 mph) =174 times greater than speed of sound.

3. Distance = velocity x time
   Distance = 74 ft/sec x 16 sec = 1184 ft. (3 3/4+ football fields)

4. Momentum before collision = momentum after collision
   12,000 tons x 45 mph = 12,002 tons x velocity after velocity after = 44.99 mph

5. Train Distance = velocity x time 500 ft = 65.7 ft/sec x t
   t = 7.6 sec for train to reach crossing.
   Car Distance = 1/2 a x t^2 50 ft x 2 = 5 ft/sec^2 x t^2
   t^2 = 20 sec^2 t = 4.4 sec to travel 50 ft
   4.4 sec + 4 sec wait time = 8.4 sec
   Call 911 as train reached crossing .8 sec before car.