Worksheet for Exploration 2.7: Drop Two Balls; One with a Delayed Drop

Two giant tennis balls are released from rest at a certain height. One (the ball on the right) can be dropped after the first ball is dropped. You may change the time delay from 0 to 2.5 s (enter the time delay in the text box and click the "set delay and play" button). The ghost images mark the balls’ positions every 0.5 s (position is given in meters and time is given in seconds). Restart.

Choose a one second delay (for simplicity) and then answer the following questions.

a. Once the second tennis ball (the ball on the right) is released, does the difference in the speeds increase, decrease, or stay the same?

i. Sketch a velocity vs. time plot for each object noting on each the time the balls strike the ground. What is the meaning of the area under each plot?

b. Once the second tennis ball (the ball on the right) is released, does their separation increase, decrease, or stay the same?

c. Is the time interval between the instants at which they hit the ground smaller than, equal to, or larger than the time interval between the instants at which they were released?