Worksheet for Exploration 8.7: A Bouncing Ball



The animation represents the seemingly simple example of a ball hitting the ground and bouncing back (**position is given in meters and time is given in seconds**). The graph can show velocity vs. time or acceleration vs. time and can be zoomed in to see the collision with the ground. Also shown are three bar graphs representing the different types of energy associated with the ball: the kinetic energy (orange), the gravitational potential energy (**blue**), and the elastic potential energy (**green**). <u>Restart</u>.

- a. There are 3 important time intervals during the animation. What are they? Briefly describe what is happening during these intervals.
 - i. Interval 1, time range & discuss
 - ii. Interval 2, time range & discuss

- iii. Interval 3, time range & discuss
- b. Draw energy diagrams, that is, find the values and plot a bar graph, for the kinetic energy of the ball (vs. time).

c. Draw the graph of momentum vs. time. Describe what is happening to the momentum during the three important time intervals. If the momentum of the ball is changing, describe why.



d. Draw the graph of the net force vs. time. Describe what is happening to the net force on the ball during the three important time intervals. If the net force of the ball is changing, describe why.

