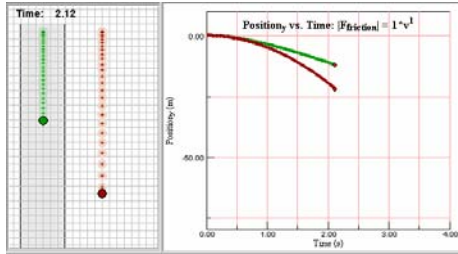


## Worksheet for Exploration 5.6: Air Friction



Two identical balls are dropped. The one on the left is in a resistive medium represented by varying shades of blue. The resistive force is represented as  $b v^n$ , where  $b$  is a constant between 0 and 2 and  $n$  is an integer between 0 and 2 (note that as you vary  $n$ , the units of  $b$  also change). [Restart](#).

Select values for  $b$  and  $n$ , and then click on a graph link to show the motion and that particular graph. *When you get a good-looking graph, right-click on it to clone the graph and*

*resize it for a better view.*

a. How does your choice of  $n$  (0, 1, 2) affect the unit of  $b$ ?

i. Write out each equation for  $F_{\text{resistive}} =$  , and then solve for  $b$ 's. Give units.

$b_0 \rightarrow$  \_\_\_\_\_

$b_1 \rightarrow$  \_\_\_\_\_

$b_2 \rightarrow$  \_\_\_\_\_

b. For  $b = 1$ , how does your choice of  $n$  (0, 1, 2) affect the position vs. time graph?

c. For  $b = 1$ , how does your choice of  $n$  (0, 1, 2) affect the velocity vs. time graph?

d. For  $b = 1$ , how does your choice of  $n$  (0, 1, 2) affect the acceleration vs. time graph?

e. For  $b = 1$ , how does your choice of  $n$  (0, 1, 2) affect the terminal velocity?