12. Use the arrow keys to trace along the curve. On the far left and the far right, the curve represents the position of the block before and after its motion. The middle section of the curve represents the motion of the falling block. Sketch this graph in your lab notebook.

a. Choose a point on the curve at the beginning of this middle section. Press the right arrow key once to select the next point. The difference between the *x*-values for these two readings will be 0.05 s, the time interval between successive readings. Find the difference between the *y*-values of these two points, and record it as *A–B* for *Trial 1* in your data table.

b. Press the right arrow key twice to move to another point on the curve. Press the right arrow key once more to select the next point. Find the difference between the *y*-values of these two points, and record it as *C–D* for *Trial 1* in your data table.

c. Choose two more pairs of points along the curve. Select points at even intervals along the curve so that the first pair is at the beginning of the block's motion and the last pair is at the end. Find the difference between the *y*-values of each pair of points. Record them as *E–F* and *G–H* for *Trial 1*. Press ENTER to return to the graph selection screen.

13. Press the down arrow key once, and then press ENTER to display a graph of the velocity in m/s against time in seconds. Sketch this graph in your lab notebook. Press ENTER to return to the graph selection screen.

14. Press the down arrow key once and then press ENTER to display a graph of the acceleration in m/s^2 against time in seconds. Sketch this graph in your lab notebook. Press ENTER to return to the graph selection screen. Select MAIN SCREEN to return to the main screen of DataMate®.

15. Repeat this procedure using wooden blocks of different masses. Drop each block from the same level in each trial. Record all data for each trial.

16. Clean up your work area. Put equipment away safely so that it is ready to be used again.

ANALYSIS, CONCLUSIONS, AND EXTENSION

Complete the Analysis and Conclusions items for the Skills Practice Lab "Free-Fall Acceleration." Your teacher may also instruct you to complete the Extension exercise. (Note: For Analysis item 1, use 0.02 s for the average period of the timer.)

Figure 1

Step 8b: While you read the distance measurements displayed on the calculator, move the wooden block up and down below the motion detector to check the readings.

Step 9: Hold the block flat and parallel to the tape mark.

Step 10: Release the block by pulling hands straight to the sides. It may take some practice to release the block so that it falls straight down without turning. If the block turns while falling, the motion detector will measure the distance to the closest part of the block and introduce error into your results.