to trace along the curve. The *y*-value is the force in newtons; it should be fairly constant. Record this value as the *Accelerating Force* in the data table. 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 distance in meters against time. Use the arrow keys to trace along the curve. On the far left and the far right, the flat portion of the curve represents the positions of the cart before and after its motion. The middle section of the curve represents the motion of the cart. Choose a point on the curve near the beginning of this middle section (but not the beginning point itself), and choose another point near the end.

15. Find the difference between the *y*-values of these two points, and record it as the *Distance* for *Trial 1* in your data table. Find the difference between the *x*-values for these two readings to find the time elapsed between measurements. Record this as the *Time Interval* for *Trial 1* in your data table. Press ENTER to return to the graph selection screen.

a. Press the down arrow key once, and then press ENTER to display a graph of the velocity in m/s against time. Press ENTER to return to the graph selection screen.

b. Press the down arrow key once, and then press ENTER to display a graph of the acceleration in m/s^2 against time. Press ENTER to return to the graph selection screen. Select MAIN SCREEN to return to the main screen.

16. Replace the 0.10 kg mass in the cart. Remove the 0.20 kg mass from the cart, and attach it securely to the end of the cord. Repeat the procedure for *Trial 2*.

17. Leave the 0.20 kg mass on the end of the cord, and attach the 0.10 kg mass from the cart securely to the end of the cord. Repeat the procedure for *Trial 3*.

Constant Force with Varying Mass

18. For the two trials in this part of the experiment, keep 0.30 kg and the counterweight on the cord. Be sure to include this mass when recording the total mass for these trials.

19. Add a 0.50 kg mass to the cart. Tape the mass to the cart to keep it in place. Run the experiment and record the total mass, accelerating mass, accelerating force, distance, and time under *Trial 4* in your data table.

20. Tape a 1.00 kg mass to the cart, and repeat the procedure. Record the data under *Trial 5* in your data table.

21. 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 "Force and Acceleration." Your teacher may also instruct you to complete the Extension exercise. (Note: For Analysis item 1, do not enter new values for *Accelerating Force* in your data table. Instead, compare your calculated values with the values you entered earlier.)

Figure 1

Step 6: Make sure that the motion detector has a clear view of the cart. For all trials, start the cart from the same position.

Step 13: Using the data collection interface with the graphing calculator will allow you to view graphs of the motion after each trial.