Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_

***Speed/Acceleration Lab***

**Purpose:** To determine when a runner stops accelerating and maintains a constant speed.

**Materials**:

stopwatches

masking tape

meter stick

open space of 25 meters in length

**Procedure:**

1. Measure and mark the distances marked on the data chart.

2. Station individuals with stopwatches at each mark.

3. For the first trial, have a runner jog through the course maintaining a steady pace.

4. Record the times under Trial #1.

5. Have a second runner start from a standstill and walk slowly to first mark, faster to the second mark, slow jog to next, increasing speed between each mark to the end.

6. Record the times from each mark under Trial #2.

7. Mark out any new stations and restation the timers for the last trial.

8. Have the third volunteer start from a standstill and sprint as fast as he/she can to the end of the course.

9. Record the times under Trial #3.

**Trial #1** **Trial #2** **Trial #3**

5 m \_\_\_\_ 5 m \_\_\_\_ 1 m \_\_\_\_

10 m \_\_\_\_ 10 m \_\_\_\_ 2 m \_\_\_\_

15 m \_\_\_\_ 15 m \_\_\_\_ 3 m \_\_\_\_

20 m \_\_\_\_ 20 m \_\_\_\_ 5 m \_\_\_\_

25 m \_\_\_\_ 25 m \_\_\_\_ 10 m \_\_\_\_

15 m \_\_\_\_

20 m \_\_\_\_

25 m \_\_\_\_

**10. Graph** the data from each of the Trials on the computer**.** Label the y axis **Distance in meters** and the x axis **time in seconds.** Also put in a box above each graph the **Trial #**. Plot the points and connect with a line. Staple to this sheet.

Questions:

1. Calculate the average speed the runner was moving in Trial #1, Trial 2, and Trial 3. Show your work!

(Find speed in meters per second) Write the formula, then calculate.

Trial 1 Trial 2 Trial 3

2. Which graphs show acceleration and which show constant speed? Describe what each of these motions look like when graphed.

3.How is the line for constant speed different than the line for acceleration?

4. Look at your graph of Trial 3. At what point did the runner stop accelerating? How can you tell?

5. Sketch a graph of times and distances showing someone sprinting for 3 seconds, going at top speed for for 5 seconds, slowing down for 3 seconds, and stopping for 5 seconds.