

Purpose: To experimentally determine the acceleration due to gravity and to practice linearizing data

Materials: Tennis ball, stopwatch, meter stick

Procedure:

- Drop the tennis ball from at least 5 different heights
- Record the amount of time it takes the ball to fall
- Plot distance fallen vs fall time on a piece of graph paper

Table 1

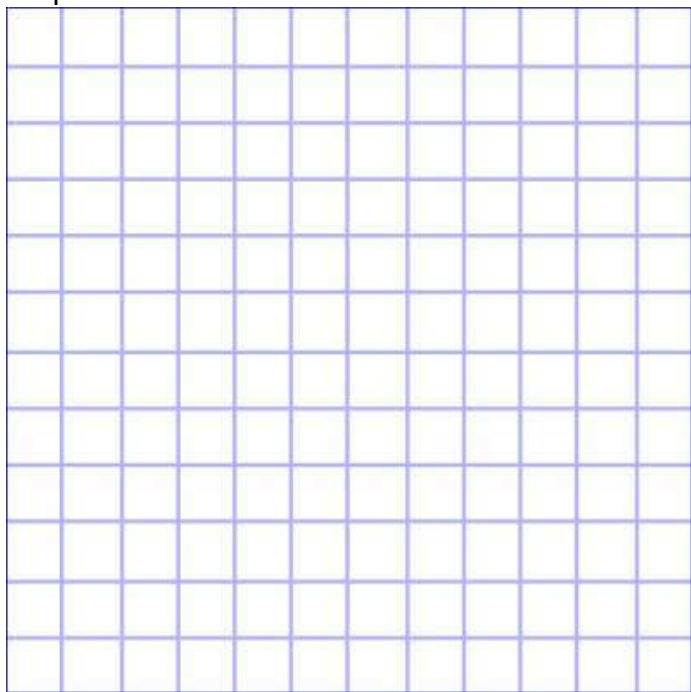
Distance (m)	Time (s)

Table 2


Analysis:

1. What is the shape of your distance vs time graph?
  
2. Now you will be asked to linearize your data:
  - a. If only distance and time are used, what quantities should be graphed in order to show a linear relationship between the quantities? Label and complete Table 2 with these quantities.
  - b. Graph these quantities on a separate sheet of graph paper and use the slope of the line to calculate the acceleration due to gravity. Show which points you used in calculating your slope. What is your experimental acceleration due to gravity?
  
  - c. Calculate percent error ( $(D-S)/S$ ) in your acceleration due to gravity
  
3. What, if any, are sources of experimental error in this exercise?
  
4. What can be done to improve your calculation for the acceleration due to gravity?

Graph 1 - Distance vs Time



Graph 2 - \_\_\_\_\_ vs \_\_\_\_\_

