

# Lab - Dropping a Golf Ball

**Purpose:** To determine how the motion of a dropped golf ball changes as it falls.

**Introduction:** In this experiment, you will develop a procedure that shows the motion changes of a golf ball as it falls from different height. The experiment will take place by dropping the golf ball from the stadium bleachers. You must decide how it best increase the accuracy and precision of your data, and then construct a graph to show the data. In collecting your data, you should ask yourselves the following questions:

- How many different heights should we drop it from?
- Is it better to alter the time or the distance of the drop?
- How many drops at each height/time should be made? Will 1 be enough? How do you ensure that the data is accurate and precise?
- Given that we will spend most of the period measuring data, what information will you want to collect?
- How are you going to measure the distance and the time?

**Procedure:**

**Data:** Make a table or list that shows the data that was collected.

**Graph:**

Construct a graph of height versus average time. Use Google spreadsheets, Excel or graph paper to construct the graph.

**Questions:**

- 1) What kind of relationship do you see in the graph? In other words, is the relationship most likely linear or is it something else?
- 2) In terms of distance covered in a certain amount of time, does the data you collected appear that doubling the distance also doubles the time, or is there some other relationship?
- 3) Speed is a measure of distance/time. Can a speed be determined from the graph? Is the speed constant?
- 4a) To your data table above, add another data column. Label it  $\text{time}^2$ . For each data point, square the average time.  
b) Construct a new graph of height versus  $\text{time}^2$ . Paste the graph below.
- c) Does the data seem more or less linear for this graph? Is there a relationship in the data?
- 5) Make a statement about the change in motion of a falling object.

**Conclusion:**