**DISCUSSION:**

A simple pendulum consists of a bob suspended from a string whose weight is insignificant compared to the bob. When swinging in a plane, the motion of the pendulum is nearly periodic. Several of the bob’s parameters can be varied: the mass of the bob, length of the string, and amplitude of the motion. In this lab you will investigate how the period of the pendulum depends on the string length and amplitude.

**THE EXPERIMENT:**

In this experiment you will develop techniques for determining factors that affect the period of a pendulum and then use that understanding to determine a value for gravity on earth’s surface.

**PART A**

1. Use the brass spotter as a bob. Be sure to make the mass large enough to eliminate any effects of air resistance. Attach the bob to the end of the string and attach the string to the metal rod.
2. Measure the length of the pendulum by measuring the distance from the center of the bob to the location of where the string is attached to the clamp. Set the pendulum length near 20 cm. Record your length as L.
3. Using trigonometry, calculate the displacement the bob would have to give it a displacement of 10°. Displace the bob to the right that amount and release. Be sure to start the stopwatch at that moment.
4. Determine the time for one complete cycle. ***Allow the bob to move through at least 5 cycles.***
5. Repeat the procedure for lengths near 40cm, 60cm, and 80cm. Be sure to record the length L for each pendulum. Collect the data in a table.

**PART B**

1. Develop an experiment, to investigate the influence of mass of the bob on the period of a pendulum. ***Clearly describe your procedure***.
2. Perform the experiment and record the results you obtain.

**PART C**

1. Develop an experiment to investigate the influence of horizontal displacement of the bob on the period of the pendulum. ***Clearly describe your procedure***.
2. Perform the experiment and record the results you obtain in a table.

**PART D**

1. Develop an experiment to determine a value for “gravity” using the pendulum and the bob. ***Clearly describe your procedure.***
2. Perform the experiment and record the results you obtain.