**Pendulum: Discovering What Variables Affect a Pendulum’s Period**

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Pendulums are a periodic motion contraption that when released from a certain height will follow oscillate at the same period that is dependent upon the weight of the mass at the end of the pendulum and the length of the pendulum, and will theoretically continue for a very long time unless acted upon by an outside force. The purpose of this experiment was to find out what factors affect the period of a pendulum and how they affect the pendulum. The method of determining what factors affected the period were broken up into three sections, the first, where the drop angle was changed on each trial, the second, where the pendulum length was changed, and the third, where the weight changed, for each of these we let the pendulum go through 19 oscillations to get a mean period for each method. The first method we discovered that with changing the degree at which the mass was dropped did not affect the period of the pendulum, with a mean period of 2.04 seconds, performed with the large weight of 494.5g. The Second method we discovered that changing the length of the pendulum did have an effect of the period, with every change in length a drop in a tenth of a second occurred for each trial, with the large weight. The third method the weight was changed and the length stayed constant, it was discovered that changing the weight did not affect the period of the pendulum.

**Section I: Background**

To preform this experiment we used a pendulum, a string of negligible mass, three weights of masses 494.5g, 187.2g, and 91.1g, and a photogate to accurately time the pendulums period. The experiments objective was to fined what changes to the system would affect the period of the pendulum in a noticeable way. All these items were used to perform 13 runs all with 19 oscillations.

**Section II: Theory and Procedure**

The experiment was performed with a crossbar that had a string attached to it with a weight and the end of the string which as a whole it created the pendulum. The pendulum would oscillate through a photogate that was connected to the computer and through the capstone program would track the period of the pendulum with much higher accuracy then someone with a stopwatch