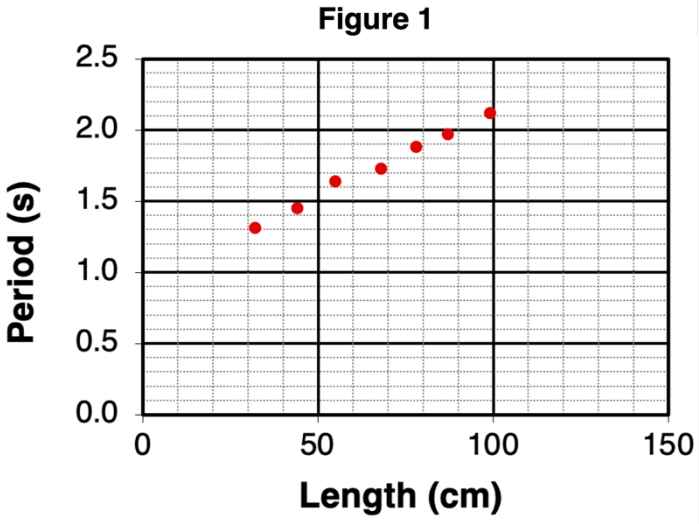
The Period of a Pendulum

A **simple pendulum** consists of a light string tied at one end to a pivot point and attached to a mass at the other end. The **period** of a pendulum is the time it takes the pendulum to make one full back-and-forth swing. A group of students are investigating factors that might affect the period of a pendulum. They conduct three experiments.

Experiment 1

In the first experiment, the students make a pendulum by hanging a 200.0-gram mass on the end of a string. They pull the mass back such that it makes an angle of 30° with its usual vertical orientation. They then release the mass, allowing it to swing back and forth. They use a stopwatch to measure the time it takes the pendulum to complete five full swings. They use this time to determine the period. They vary the length of the string while keeping the mass and angle constant. A plot of their data is shown in **Figure 1**.



Experiment 2

The students make a pendulum with a length of 65 cm. They release the mass from rest after pulling it back 30° from its vertical orientation. They conduct several trials using varying amounts of mass hanging on the end of the string. A plot of their data is shown in **Figure 2**.

Experiment 3

The students hang a 200.0-gram mass on the end of a string to create a pendulum with a length of 67 cm. They conduct several trials while varying the angle that the string makes with the vertical orientation. A plot of their data is shown in **Figure 3**.