

Pendulum Lab Procedure

SET UP

1. Obtain a piece of lightweight string about 45 cm long. Tie one end to a paper clip to serve as a holder for the "bob" of the pendulum. Tie the other end of the string to a rod on a stand, making the length of the pendulum 40 cm. You may need to extend the rod beyond the edge of the table so that the pendulum can swing freely.
2. To complete the pendulum, attach a washer to the paper clip hook to serve as a bob.

FOR DATA TABLE I

3. To study the factors which might affect the frequency of the pendulum, first determine the frequency of the pendulum you have made. One person should watch a stopwatch or second hand of a clock while another counts the number of full swings ("A" back to "A"). Pull the bob back about 10 cm from the equilibrium position. On "Go" release the bob and count the number of vibrations in 10 seconds and convert the frequency to vibrations per minute. Repeat the process two more times, pulling the string back the same distance each time. Record the frequencies in Table I. (*The trials marked with the * are all the same, but are listed separately for comparisons. Record the same frequency for all three.*)

*You will do three trials for each procedure and then calculate an average of these trials.

4. Change the mass of the pendulum by adding washers to the bob. First add two washers and determine the frequency as in step #3 and record the average value in Table I. Repeat with four washers.

FOR DATA TABLE II

5. Take off the washers. Next, change the amplitude of the vibration by releasing the bob from a position closer to "C" (about 5 cm). Determine the frequency as in step #3 and record the values in Table II. Repeat with amplitude of about 15 cm.

FOR DATA TABLE III

6. Finally, change the length of the pendulum by holding the string in place at the top while returning the amplitude to 10cm. Determine the frequencies for 25 cm and 10 cm lengths and record the average value in Table III.