c. We know that the rotational frequency can be written in terms of the period using Eq. (14.3). For a mass-spring system, the rotational frequency is also related to the spring constant and mass of the oscillating object. Use this relation, along with Eq. (14.3), to solve for the period T in terms of k and m.

d. Based on your result from part (c), how does increasing the mass affect the period of oscillation? What about decreasing the mass? Explain why this makes sense physically, all other things being equal.

e. Similarly, how does increasing or decreasing the spring constant affect the period of oscillation? Explain why this makes sense physically, all other things being equal. Remember that the spring constant represents the *stiffness* of the spring: a larger value of k implies a larger (magnitude) restoring force.

f. Finally, return to your position-time data from part (b) of Activity 14.3.1. Use your plot, along with the known value of the effective mass, to determine the spring constant of the spring used in that experiment.

14.6. THE SIMPLE PENDULUM

As we have seen, a mass-spring system will oscillate when displaced from equilibrium and released. Another example of an oscillating system is a simple pendulum, which has been used throughout history to record the passage of time. But how do clock makers go about constructing a pendulum with a given period? What factors go into changing the period of a pendulum? For the following activity, you will need:

- 4 bobs (small round objects with different masses)
- 4 strings
- 1 table clamp