ANALYSIS

1. **Organizing Data** For each trial, calculate the period of the pendulum.
2. **Organizing Data** Calculate the value for the free-fall acceleration, a_g, for each trial. Use the equation for the period of a simple pendulum, rearranged to solve for a_g.
3. **Constructing Graphs** Plot the following graphs:
   - **a.** the period vs. the length (for constant-mass trials)
   - **b.** the period vs. the mass of the bob (for constant-length trials)
   - **c.** the period vs. the square root of the length (for constant-mass trials)

CONCLUSIONS

4. **Evaluating Results** Use 9.81 m/s^2 as the accepted value for a_g.
   - **a.** Compute the absolute error for each trial using the following equation:

$$absolute\ error = |experimental - accepted|$$

   - **b.** Compute the relative error for each trial using the following equation:

$$relative\ error = \frac{(experimental - accepted)}{accepted}$$

5. **Drawing Conclusions** Based on your data and your graphs, how does the mass of the pendulum bob affect the period of vibration?
6. **Drawing Conclusions** Based on your data and your graphs, how does the length of the pendulum affect the period of vibration?

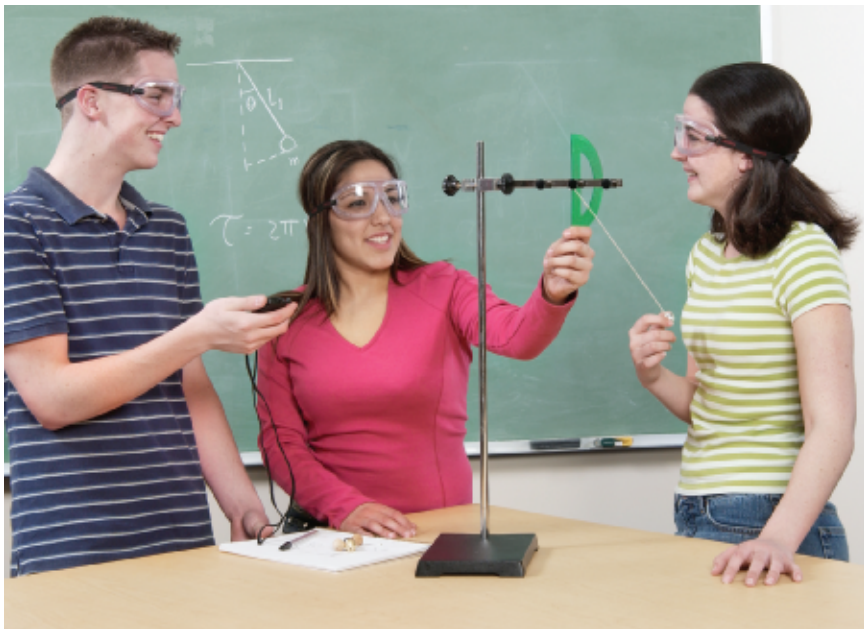

Figure 1

- Hold the bob so that the cord is perfectly straight while you measure the angle.
- Release the bob gently so that it swings smoothly. Practice counting and timing cycles to get good results.