AP Physics Lab

Lab 6-A: *Velocity of a Ballistic Pendulum*

Equipment:

- ballistic pendulum
- steel ball
- meter stick
- electronic balance

Purpose:

- Calculate the initial velocity of a steel ball, using conservation of momentum & energy in a ballistic pendulum.

Procedures:

- Fire the steel ball into the ballistic pendulum.
- Record the angle at which the arm of the ballistic pendulum raises up.
- Measure the length of the arm of the ballistic pendulum.
- Measure the mass of the steel ball and the ballistic pendulum arm.
- Repeat the procedures several times to obtain an average, using the same initial launcher setting each time.

Report:

1. Use the angle at which the arm of the ballistic pendulum raises up and the length of the arm to calculate the maximum height of the ballistic pendulum. *(NOTE: Use the Homework Example Video "Conservation of Energy (III)" from Chapter 5 as a guide if needed.)*

2. Calculate the velocity of the steel ball and ballistic pendulum combination immediately after the collision.

3. Calculate the initial velocity of the steel ball.

4. Is momentum conserved in the collision?
   Is kinetic energy conserved in the collision?
   Is total energy conserved as the combination rises to the top?
   Explain your answers.