01-06 Acceleration of Gravity *Name:* _____

Adapted from Take-Home Physics by Michael Horton

Objectives

- Find the acceleration due to gravity.

Materials

- Marble
- Pie pan
- Stopwatch
- Meter stick

Distance	Time 1	Time 2	Time 3	Average Time	Average Velocity	Final Velocity	Acceleration
2.00 m							

Procedure

We have already learned that

$$\overline{v} = \frac{v_f + v_0}{2}$$

If the initial velocity is 0 and the acceleration is constant, then

$$v_f = 2\overline{v}$$

1. Drop the marble from 2.00 m into a pie pan on the floor. Use to stopwatch to measure the time it takes a marble to. Measure three times and find the average time.
2. Use $\overline{v} = \frac{\Delta x}{\Delta t}$ to find the average velocity.
3. Find the final speed of the marble.
4. We have learned that

   $$a = \frac{\Delta v}{\Delta t} = \frac{v - v_0}{t}$$

   So calculate the acceleration of the marble.
5. Repeat this procedure of another distance (not less than 1.0 m).
6. Since gravity is pulling the marble down, the acceleration you found should be the acceleration due to gravity. Find the percent error of your acceleration with the accepted 9.8 m/s^2. _____
7. What is the biggest source of error in this lab? _____