Adapted from Take-Home Physics by Michael Horton

Objective

- Use conservation of energy to find the final speed of a falling object.

Materials

- Marble
- Stopwatch
- Meter stick
- Pie pan
- Balance

Procedure

1. Work is force × displacement. Work and energy are similar concepts. Energy is work that has not happened yet. To find out how much energy an object has above the earth, the force is its weight and the displacement is the height. $PE = mgh$
2. Find the mass of the marble. m = _____ kg
3. Find the potential energy of the marble at 1 m above the ground. Record it in the table.
4. Find the potential energy of the marble at 2 m above the ground.
5. When you drop the marble, the height decreases until the height is zero at the ground. What is the potential energy of the marble on the ground? _____

Height	Potential Energy	Time 1	Time 2	Time 3	Average Time	Average Speed of Fall	Final Speed at Ground	Kinetic Energy at Ground
1 m								
2 m								

6. Drop the marble from 1 m three times and record the times. It helps to drop the marble into a pie pan. Then find the average time of fall.
7. Find the average speed of the fall and the final speed like you did in lab 01-05 Final Speed.
8. Calculate the kinetic energy the marble had at the ground using the final speed.
9. Repeat steps 6-8 dropping the marble from 2 m.
10. What is the percent difference between the PE at the beginning and the KE at the ground for the 1 m fall? _____

$$\% \, diff = \frac{theoretical - experimental}{theoretical} \times 100\%$$

where PE it the theoretical and KE is the experimental.

11. What is the percent difference between the PE at the beginning and the KE at the ground for the 2 m fall? _____
12. What does this tell you about the PE and KE when objects fall? _____