

Investigation: Do Heavy Objects Fall Faster than Light Ones?

Question: Is the weight of an object related in any way to the speed that objects fall?

Hypothesis or guess: Heavy objects should fall faster than light ones. _____

Implication? If an object is twice as heavy, how much faster should it fall? _____

Experiment:

1. Measure the weight of the empty tennis ball _____
2. Accurately locate a point from which the ball will be dropped - the higher the better.
3. Accurately measure the distance from this point to the floor (the distance that the tennis ball will fall) three times. Use three different pairs of students. Record your measurements below:

Distance 1 _____ Distance 2 _____ Distance 3 _____

4. Drop the "empty" tennis ball and measure the fall time. Record your fall times below:

Fall Time 1 _____ Fall Time 2 _____ Fall Time 3 _____

5. Put the lead weights inside the tennis ball. How many balls did you add? _____

6. Measure the weight of the tennis ball loaded with weights. Note: Your scale may not weight the ball with all of the weights at the same time. Figure out a way to make the measurement.

7. How many times heavier is the ball with the weights? _____

8. How much faster do you expect the ball to fall? _____

9. Drop the tennis ball dropped with the added weights. Record the fall time below:

Fall Time 4 _____ Fall Time 5 _____ Fall Time 6 _____

10. Calculate the following values to report to class: Average drop distance: _____

Average fall time w/o weights: _____ Average fall time w/weights: _____

11. What are your conclusions?

12. What are the sources of error for this experiment? Which source of error do you think had the greatest impact on your experiment?