

Name: _____

Number: _____

Date: ____/____/____

Unit 3: Newtonian Mechanics – Mass, Force, and Newton's Laws

LAB: Inertial Mass vs. Gravitational Mass

Objective:

- Compare the inertial and gravitational masses of one object. Pro-tip: It is always advisable to research and write your background before deciding on your hypothesis.
 - State your hypothesis:

Background:

Inertial mass is a measure of the tendency of an object not to _____.

Gravitational mass is a measure of the effect of _____ on mass. No experiment has ever proven them to be _____ for the same object.

Therefore this experiment should show _____.

An inertial balance swings with an oscillatory period that is unaffected by _____ in the pan. Because it swings _____, gravity has _____ on its motion and the measurements that can be obtained from it. By measuring _____ on an inertial balance for a variety of different _____, a graph can be created of _____ v _____. Subsequently taking a measurement of the _____ of an unknown mass on the inertial balance can help identify the inertial mass of the unknown by using the equation of the trendline of the graph and plugging in the period as the _____-value. To measure gravitational mass, a(n) _____ can be used. Then the two values of inertial mass and gravitational mass of an unknown can be compared using a _____ statistical analysis.

Equipment:

- Inertial balance with known masses
- Triple-beam balance
- Unknown mass
- Timer or video recorder

Procedure: Briefly (in five steps or less) state the steps in your procedure.

Data: *Create table(s) and graph(s) in Excel and attach.*

Calculations: Show the statistical analysis calculations used to test your hypothesis. Be sure to label units.

Conclusion: Write NO MORE THAN ONE SENTENCE for each of the following.

- Claim:

- Evidence:

- Reason:

- Identify one or more sources of systematic or random error.