

AP Physics B
Experiment, Galileo's Experiment

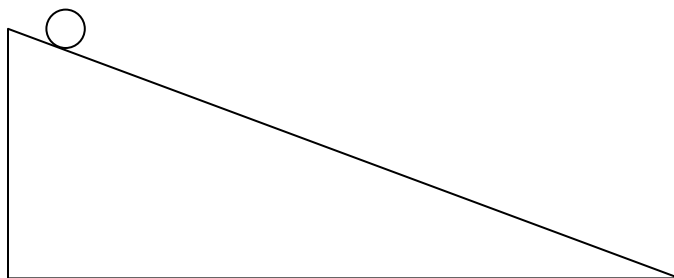
Name: _____

In the fourth century BC, Aristotle described the motion of an object in free fall as a short period of acceleration, after which the object fell at constant velocity. He also felt that the magnitude of this constant velocity depended on the mass of the falling object.

In the early 1600's Galileo hypothesized that the object accelerated uniformly throughout the fall and that this acceleration is independent of the mass. Galileo designed experiments to test his hypothesis, and you will be recreating one of his experiments today in lab.

Freefall can be modeled by an object moving freely down an inclined plane; the phenomenon is almost the same but it is slower so easier to measure. (Imagine if you had no stopwatch!)

The purpose of this experiment is to determine if the acceleration of a ball rolling down an inclined plane is uniform, and to find the average acceleration on the slope provided.



We will let the ball roll different distances, measuring the time taken for each distance. By graphing distance versus time, we can determine if the acceleration down the inclined plane is uniform. In your write-up, please include the following sections:

- (1) Title, Names, etc. (Section 1 on the handout: Lab Reports)
- (2) Purpose (Section 2 on the handout: Lab Reports)
- (3) Method (Section 3 on the handout: Lab Reports)
- (4) Data (Section 4 on the handout: Lab Reports)
- (5) Analysis (Section 5 on the handout: Lab Reports)
Include an appropriate graph of your data with a regression equation and R^2 value.
- (6) Conclusion (Section 6 in the handout: Lab Reports)
Your conclusion will need to be a couple of good paragraphs. You may want to consider the following questions. Is the acceleration uniform? Why or why not? What is the value of the average acceleration? How reliable is your value, and why?