

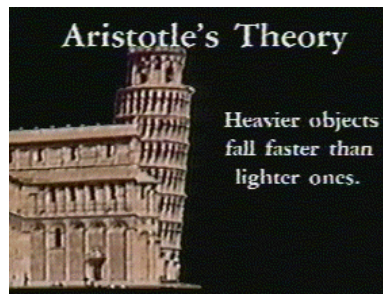
Aristotle or Galileo?

Name: _____

Aristotle was an ancient Greek philosopher who was born around 384 B.C. in Stagira, Greece. When he turned 17, he enrolled in Plato's Academy. In 338 BC, he began tutoring Alexander the Great. In 335 BC, Aristotle founded his own school, the Lyceum, in Athens, where he spent most of the rest of his life studying, teaching and writing. Aristotle died in 322 B.C. Aristotle believed that heavy objects (objects with more mass) would fall faster than light objects (objects with less mass.) For two thousand years, this was the accepted understanding of how gravity worked... heavier objects fall faster than lighter ones.

Galileo Galilei (born on February 15, 1564) was an Italian scientist and astronomer who followed the teachings of Copernicus – one of the first scientists to maintain that the Earth moved around the sun... but that's a story for another day. Galileo performed experiments to test Aristotle's nearly 2000 year old view of gravity and physics, and tested whether or not objects with more mass fall faster than objects with less mass.

Both of these men were great Scientists and well respected in their time, but why do their theories not match up? Who was right?



Hypothesis: Who do you believe was correct, Aristotle or Galileo? _____

Why do you think that? _____

Experiment part I: the book and the feather

Directions: drop the textbook and the feather at the same time, from the same height, and watch them hit the floor.

Which one hit the floor first? _____ Whose theory does this seem to support, Aristotle or Galileo?

_____ What does that theory state? _____

Draw a picture of what happened:

Experiment part II: the book and the coin

Directions: drop the textbook and the coin (use any coin you like) at the same time, from the same height, and watch

them hit the floor. Which one hit the floor first? _____ Whose theory does this seem to support,

Aristotle or Galileo? _____ What does that theory state? _____

Draw a picture of what happened:

Aristotle or Galileo?

Name: _____

Let's find the definite answer – Experiment III: two marbles with different masses

On your lab table are two marbles made of the same material and both are the same shape. The only difference between them is their mass and size. This would be a true test – two objects that would have the same shape and same air resistance, but have different masses. Drop the two marbles from the same height at the same time and watch them hit the floor. What happens? _____

Whose theory does that seem to support? _____

Try again. Does this happen every time? _____ Draw a picture of what happened:

In the year 1589, the Italian scientist Galileo dropped two balls of different masses from the Leaning tower of Pisa, in order to demonstrate that they fall at the same rate, regardless of their mass. He proved Aristotle wrong – Aristotle believed that heavier objects fall faster than light ones. Which of your experiments today supported Aristotle?

What if you could get rid of “air resistance” and drop a feather and a hammer at the same time, from the same height, without air getting in the way? Would they fall at the same rate? _____

Where can you go to test this, where there is no air resistance? _____

Watch the video from Apollo 15's mission to the moon (You can find it on YouTube, look for Apollo 15 moon feather) and describe: 1) what they did 2) what happened 3) whose theory we can finally accept as true – Aristotle or Galileo:

