Alabama Team #1

Information

Definition:

Projectile motion can be defined as the curved path (or parabola) an object follows when thrown or propelled near the surface of the Earth.

History:

Aristotle (~400 BC) believed the rate at which an object falls was directly related to its mass. It wasn't until the late 1500s that Galileo questioned his ideas and accurately described projectile motion. His most relevant discovery was to divide motion into the separate components of constant forward velocity and the downward acceleration of free fall.

Main Ideas:

- Objects fall to the ground at the same rate because the acceleration due to gravity is the same for all objects.
- All objects accelerate toward Earth at a rate of 9.8 meters per second per second (9.8 m/s/s)
- Horizontal motion of a projectile moves at a constant velocity, covering equal distances in equal time intervals. There is **no horizontal acceleration**.
- The vertical component of a projectile's velocity is subject to the force of gravity. It accelerates downward resulting in greater distances that are covered in each successive time interval.
- **The horizontal and vertical components of projectiles are completely independent of each other.**

Misconception #1:

Going faster horizontally means you don't fall as fast.

Link to animation.

Question:

A bullet is fired horizontally from a gun at the same time that a bullet is dropped from the same height. Assuming the ground is level, which bullet hits the ground first?

Answer: Both land at the same time.

Misconception #2:

The greater the mass of an object, the faster it will fall.

Question:

If you drop a baseball and a marble at the same time from the same height, which will land first?

Answer: They both land at the same time.

Real World Problem

Grade Level Info