KINEMATICS

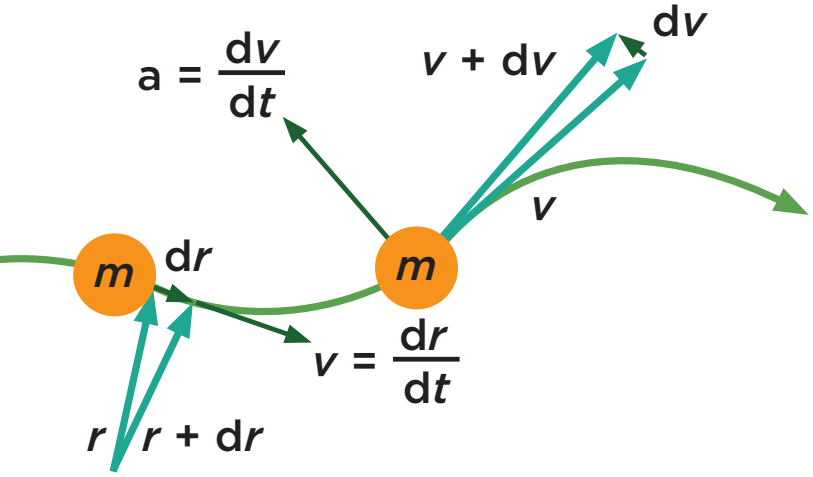
FORCES & MOVEMENT

CONCEPT Kinematics is sometimes called the geometry of motion. Some examples of kinematics are: a giraffe moving in a straight line with no change in speed (constant velocity motion), and a pencil that falls off a desk (free fall motion).

BACKGROUND

"Kinematics" comes from the Greek word "kinesis", which means motion. Kinematics is the science of motion. Documentation shows that kinematics was studied in the 14th century. In the 17th century, Galileo used kinematics as he studied projectiles such as cannonballs.

FORMULAS



KINEMATICS OF A CLASSICAL PARTICLE OF MASS.

- mass - m
- position - r
- velocity - v
- acceleration - a

REAL WORLD CONNECTIONS

A rocket propelling up after the initial thrust will give you vertical motion data, kick a soccer ball and study the projectile motion. This basic information will open up a whole new world of physics.

EXAMPLE

Kinematics is used in astrophysics to describe the motion of celestial bodies and collections of such bodies. In mechanical engineering, robotics, and bio-mechanic kinematics is used to describe the motion of systems composed of joined parts (multi-link systems) such as an engine, a robotic arm or the human skeleton.