

Momentum and Impulse

SPH4U

Linear momentum is defined as the _____ of an object's _____ and its _____:

It is a _____ quantity and has units of _____.

An unbalanced _____ acting on an object will cause an _____ that will change its instantaneous velocity and therefore its momentum:

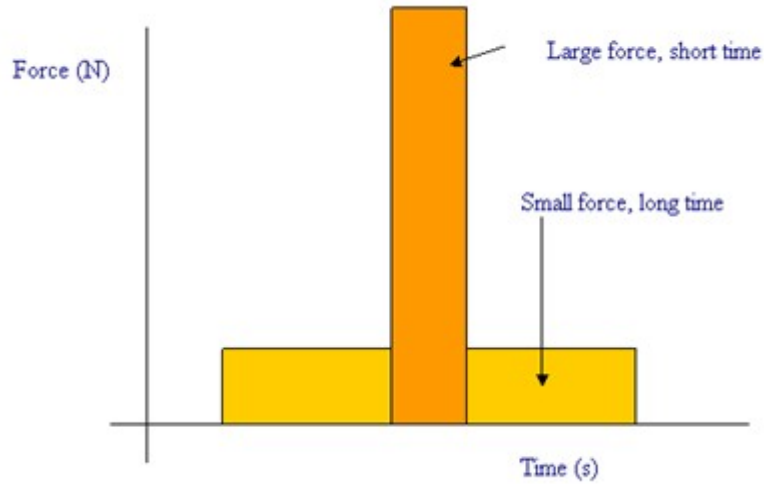
This change in momentum is called the _____.

Example: A book of mass 1-kg falls on the floor and is stopped by the floor. Its speed just before impact was 5 m/s. What is the:

- (a) momentum of the book before impact?
- (b) momentum of the book after impact?
- (c) change in momentum (impulse)?

Newton's 2nd Law:

Impulse is therefore the _____.



Force-time graphs are most useful when the force is _____.

Example sketch:

For such cases, we consider the _____ force, which is the force that if constant would give us an equal area over the same time interval.

Example: A 0.27-kg volleyball with an initial velocity of 2.7 m/s [E], hits a net, stops, and drops to the ground. The average force exerted on the volleyball by the net is 33 N [W]. How long is the ball in contact with the net?