Impulse

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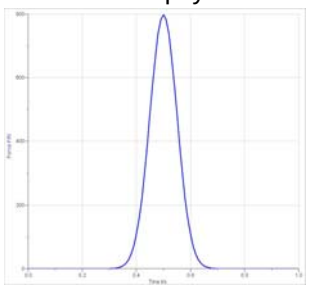
- In a collision of two ordinary objects, both objects are deformed, often considerably, due to the large forces involved.



- When the collision occurs, the force usually jumps from zero at the moment of contact to a very large value within a very short period of time, and then abruptly returns to zero again.



- From Newton's second law, the net force on an object is equal to the rate of change of momentum:

$$F = \frac{\Delta p}{\Delta t}$$

Multiplying both sides by Δt gives:

$$\boxed{\text{Impulse} = F\Delta t = \Delta p = m\Delta v}$$

- Impulse helps us when dealing with forces that occur over a short period of time.
  - A baseball bat hitting a ball
- It should be noted that Impulse ($F\Delta t$) represents the area under a graph of force vs time.