



Flipping Physics Lecture Notes:

Review of Momentum, Impact Force, and Impulse

Conservation of Momentum: $\sum \vec{p}_i = \sum \vec{p}_f$

- Remember to write out the full equation before you use it.
 - $m_1 \vec{v}_{1i} + m_2 \vec{v}_{2i} = m_1 \vec{v}_{1f} + m_2 \vec{v}_{2f}$
- Momentum is conserved when all forces are internal.
 - In other words, during all collisions and explosions.
 - An explosion is a collision moving backwards in time.
- A minimum of two objects in this equation!

Force of Impact: $\sum \vec{F} = \frac{\Delta \vec{p}}{\Delta t} = \frac{m \vec{v}_f - m \vec{v}_i}{\Delta t}$

- Clearly we use this equation when we are solving for the force of impact during a collision.
- This equation only deals with the force acting on 1 object!

Impulse: $\sum \vec{F} = \frac{\Delta \vec{p}}{\Delta t} \Rightarrow \text{Impulse} = \Delta \vec{p} = \sum \vec{F}_{avg} \Delta t$

- Impulse is the area under the curve.
- Again, this equation only deals with the impulse acting on 1 object!
- Impulse equals three things: $\Delta \vec{p}$ and $\sum \vec{F}_{avg} \Delta t$ and Area under the Force vs. Time curve.