Chapter 6 - Work + Energy

- $W = F_{||} \Delta d$
- $W = F \Delta d \cos\theta$
- When no work is done (3 situations)
- W = area under F - Δd graph
- $W = \Delta E$ (Work-Energy)
- Kinetic Energy -> $E_k = \frac{1}{2}mv^2$
- Gravitational Potential Energy -> $E_g = mgh$
- Elastic Potential Energy -> $E_e = \frac{1}{2}kx^2$

  Hooke's Law -> $F_a = kx$ ($F = -kx$)

  (F_a: applied force; F: restoring force)
- Power -> $P = \frac{W}{\Delta t}$
- Efficiency = $\frac{E_o}{E_I} \times 100\%$

Chapter 7 - Conservation of Energy + Momentum

Law of Conservation of Energy:

$$E_{total} = E'_{total}$$ ← no friction.

$$E_k + E_g + E_e = E_k' + E_g' + E_e'$$

Law of Conservation of Momentum

$$\vec{P}_{total} = \vec{P}'_{total}$$ ← no friction

$$\vec{P}_A + \vec{P}_B = \vec{P}_A' + \vec{P}_B'$$

MVP Chant

Recall: $\vec{p} = m\vec{v}$

Elastic Collisions
- Both Momentum AND Kinetic Energy are conserved.