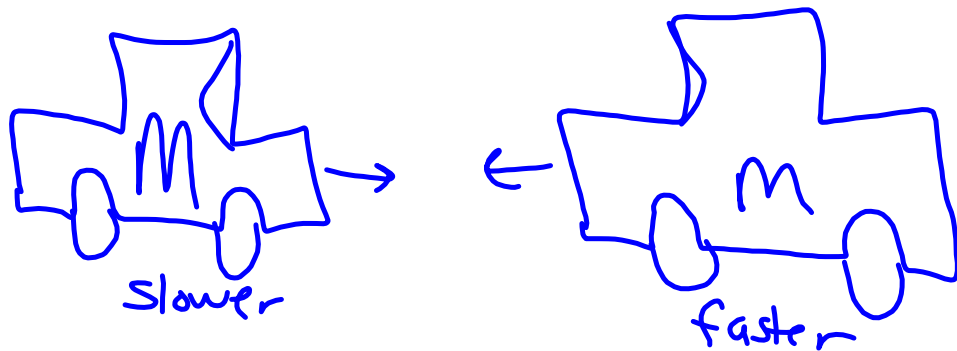


Conservation of Momentum



Same F
Same Δt } Same $\vec{J}$ ($\Delta \vec{p}$)

In a closed system

- For whole system, $\Delta \vec{p} = 0$
- $\vec{p}_{\text{before}} = \vec{p}_{\text{after}}$

$$m_i v_i = m_f v_f$$

$$\star m_1 v_{1i} + m_2 v_{2i} = m_1 v_{1f} + m_2 v_{2f} \star$$

ex/ (elastic)
bouncy collision

before

① →

$m = 0.5 \text{ kg}$

2 m/s

rest

②

$m = 0.8 \text{ kg}$

after

← ①

-0.5 m/s

② →

$v = ?$

solve

$$m_1 v_1 + m_2 v_2 = m_1 v_1 + m_2 v_2$$

$$(0.5 \text{ kg})(2 \text{ m/s}) + \cancel{0} = (0.5 \text{ kg})(-0.5 \text{ m/s}) +$$

$$1 = (-0.25) + .8v \quad \underbrace{0.8 \text{ kg } v_2}$$

$$\frac{1.25}{.8} = \frac{.8v}{.8}$$

$$v = 1.56 \text{ m/s}$$

2 m/s