

Conservation of Momentum:

- In collisions, the total momentum (of all objects combined) stays the same both before & after the collision
- Analogy: buying a CD: money is transferred, but the total stays the same!

Bregar: \$10	Purchase	Bregar: \$4 _{CD}
Trenton: \$15 _{CD}		Trenton: \$21
<hr/>		
\$25 _{CD}		\$25 _{CD}

1	2	⚡	1	2
$m_1 =$	$m_2 =$		$m_1 =$	$m_2 =$
$v_1 =$	$v_2 =$		$v_1' =$	$v_2' =$
$p_1 = m_1 \cdot v_1$	$p_2 = m_2 \cdot v_2$		$p_1' = m_1 \cdot v_1'$	$p_2' = m_2 \cdot v_2'$

$$p = p_1 + p_2$$

$$p' = p_1' + p_2'$$

$p = p'$

↑
conservation
of
momentum

$m_1 = 0.22 \text{ kg}$
 $u_1 = 1.2 \text{ m/s}$
 $m_2 = 0.41 \text{ kg}$
 $u_2 = 0$

$P_1 = m_1 \cdot u_1 = 0.22 \cdot 1.2 = 0.264 \text{ kg} \cdot \text{m/s}$
 $P_2 = m_2 \cdot u_2 = 0$
 $P = P_1 + P_2 = 0.264 + 0 = 0.264 \text{ kg} \cdot \text{m/s}$

$m_1 = 0.22 \text{ kg}$
 $u_1' = 0$
 $m_2 = 0.41 \text{ kg}$
 $u_2' = 0.64 \text{ m/s}$

$P_1' = m_1 \cdot u_1' = 0$
 $P_2' = m_2 \cdot u_2' = 0.41 \cdot 0.64 = 0.264 \text{ kg} \cdot \text{m/s}$

$P' = P_1' + P_2' = 0 + 0.264 = 0.264 \text{ kg} \cdot \text{m/s}$

$P = P'$
 conservation of momentum

$$\frac{0.264}{0.41} = \frac{0.41 \cdot u_2'}{0.41}$$

$$u_2' = 0.64 \text{ m/s}$$