

- Test on Friday 5/27
- To work in shop today:  
BE EFFICIENT in here

## Newton's 3<sup>rd</sup> Law:

- For every force from one thing to a second thing, there is an equal force, in the opposite direction, AT THE SAME TIME.
- Use the format... for partial credit!

## FORMAT for Newton's 3<sup>rd</sup>

In any situation, identify the two forces:

- a) "Thing 1" pushes/pulls "thing 2"
- b) At the same time, "thing 2" pushes/pulls "thing 1".

# Momentum $\hat{=}$ Conservation of Momentum

$$p = m \cdot v$$

Momentum = mass  $\times$  velocity

$$p \left( \frac{\text{kg} \cdot \text{m}}{\text{s}} + \text{dir} \right)$$

$$m \text{ (kg)}$$

$$v \left( \frac{\text{m}}{\text{s}} + \text{dir} \right)$$

If you know	You can find	Using	Units
$m, v$	$p$	$p = m \cdot v$	$\frac{\text{kg} \cdot \text{m}}{\text{s}} + \text{dir}$
$p, m$	$v$	$v = \frac{p}{m}$	$\frac{\text{m}}{\text{s}} + \text{dir}$
$v, p$	$m$	$m = \frac{p}{v}$	kg

# Conservation of Momentum:

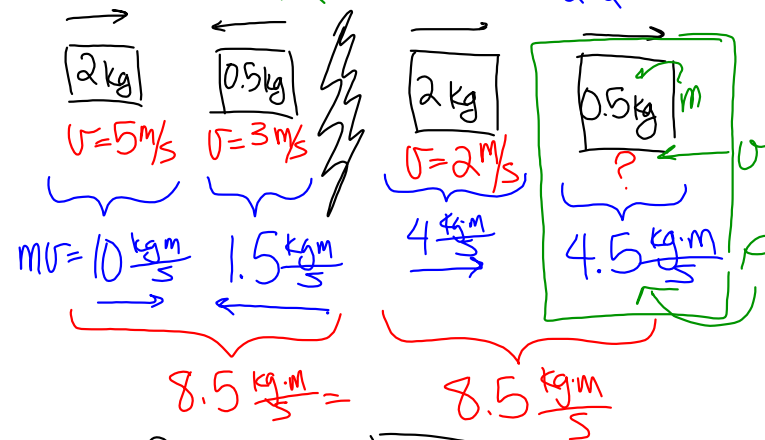
Total momentum of a group of objects will stay the same over time (unless something interferes)

Before

After

$$p_1 + p_2 = p_1 + p_2$$

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



$$v = \frac{p}{m} = \frac{4.5}{0.5} = \boxed{9 \frac{m}{s}}$$