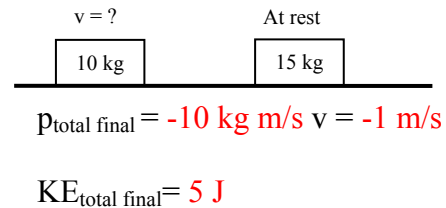
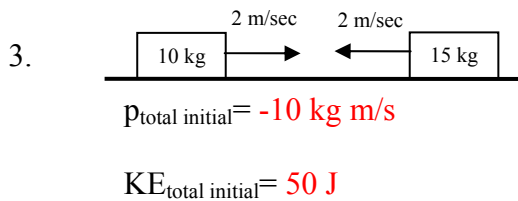
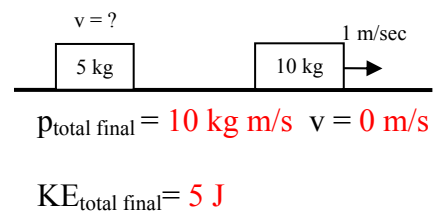
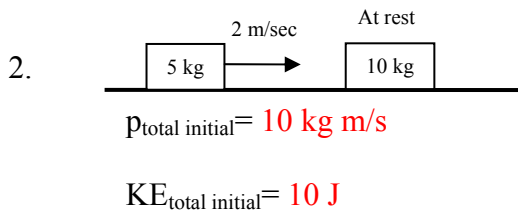
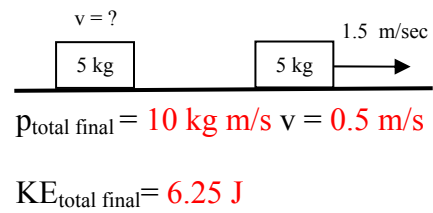
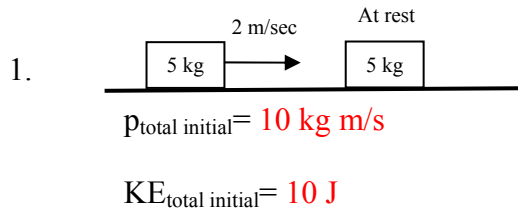
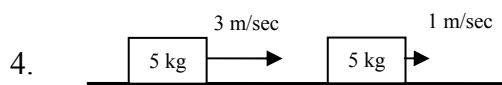


**W7.03****MOMENTUM – KEY**

## Bouncy Collisions

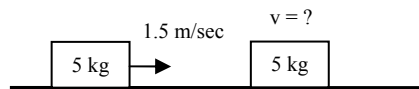
The masses below collide and bounce off, not necessarily conserving KE. Assume that there is no friction. Diagrams on the left are before the collision. Diagrams on the right are after the collision.





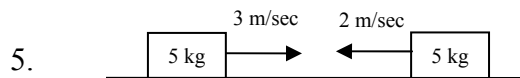
$$p_{\text{total initial}} = 20 \text{ kg m/s}$$

$$KE_{\text{total initial}} = 25 \text{ J}$$



$$p_{\text{total final}} = 20 \text{ kg m/s} \quad v = 2.5 \text{ m/s}$$

$$KE_{\text{total final}} = 21.25 \text{ J}$$



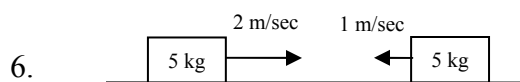
$$p_{\text{total initial}} = 5 \text{ kg m/s}$$

$$KE_{\text{total initial}} = 32.5 \text{ J}$$



$$p_{\text{total final}} = 5 \text{ kg m/s} \quad v = -1 \text{ m/s}$$

$$KE_{\text{total final}} = 12.5 \text{ J}$$



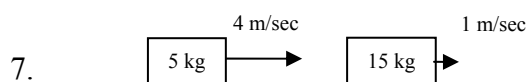
$$p_{\text{total initial}} = 5 \text{ kg m/s}$$

$$KE_{\text{total initial}} = 12.5 \text{ J}$$



$$p_{\text{total final}} = 5 \text{ kg m/s} \quad v = -0.5 \text{ m/s}$$

$$KE_{\text{total final}} = 6.25 \text{ J}$$



$$p_{\text{total initial}} = 35 \text{ kg m/s}$$

$$KE_{\text{total initial}} = 47.5 \text{ J}$$



$$p_{\text{total final}} = 35 \text{ kg m/s} \quad v = 1 \text{ m/s}$$

$$KE_{\text{total final}} = 32.5 \text{ J}$$