

Frisbee:

$$\textcircled{1} \quad \Delta E = \Delta K + \Delta U_g + W_{nc} \quad \text{friction}$$

$\Delta E = 0$ since "universe" is system

initially: $m = 0.075 \text{ kg}$

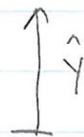
$$y_i = 1.1 \text{ m}$$

$$v_i = 12 \text{ m/s}$$

after: $m = 0.075 \text{ kg}$

$$y_f = 2.1 \text{ m}$$

$$v_f = 10.5 \text{ m/s}$$



from $\textcircled{1}$

$$0 = \frac{1}{2} m (v_f^2 - v_i^2) + mg(y_f - y_i) + W_{nc}$$

$$0 = \frac{1}{2} (0.075) (10.5^2 - 12^2) + 0.075 (9.8) (2.1 - 1.1) + W_{nc}$$

$$W_{nc} = 0.53 \text{ J}$$