

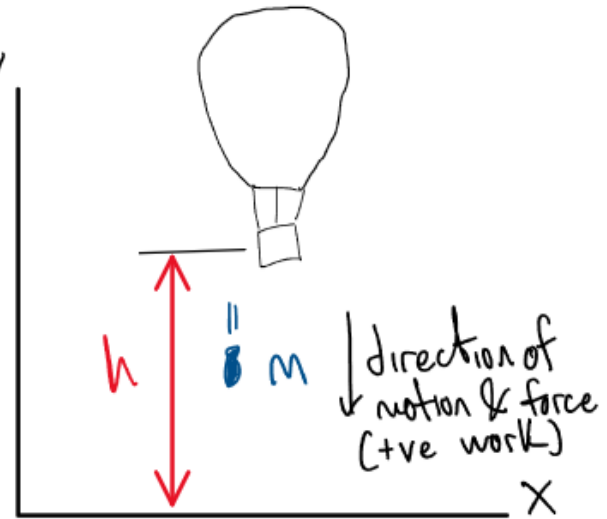
To increase the rate of climb, a ballast is dropped from the hot air balloon.

If the ballast falls  $h$  m from the balloon before hitting the ground and gravity does  $W$  J of work on it, what is the mass of the ballast?

(Assume  $g = 9.81 \text{ m/s}^2$  and neglect air resistance)

given  $W, h, g$   
find  $m$

FBD



Force Equilibrium

$$\sum F_y = ma = -mg$$

Work

$$W = -mg(-h) = mgh$$

$$\underline{m = \frac{W}{gh}}$$