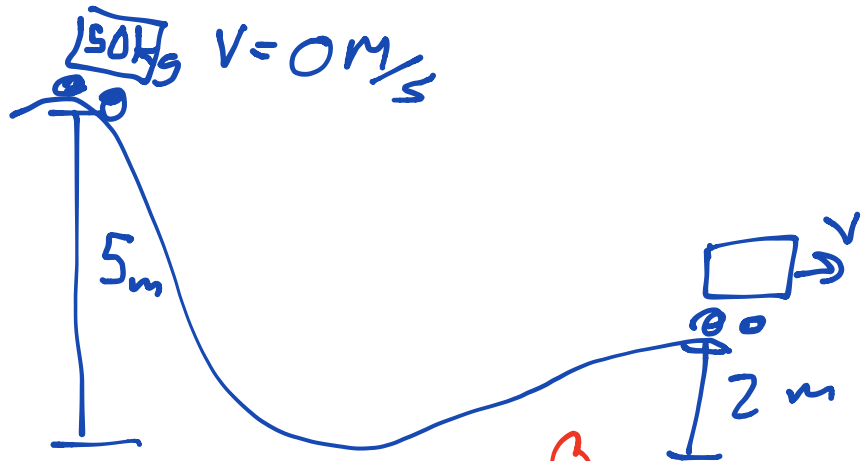




$$PE + KE = PE_0 + KE_0$$

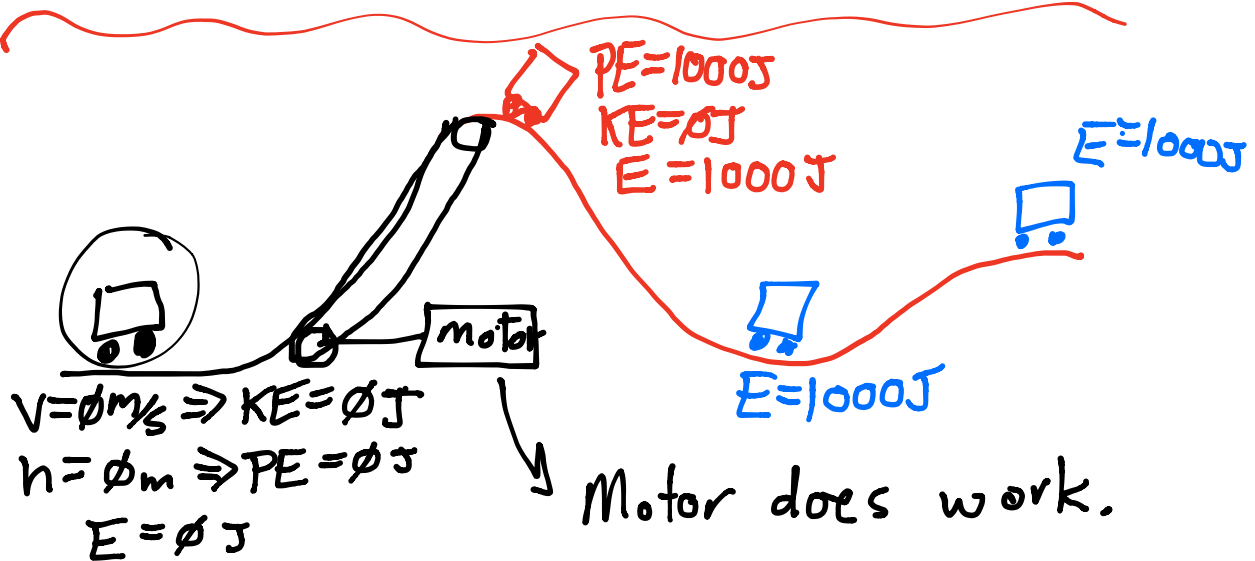
$$mgh + \frac{1}{2}mv^2 = mgh_0$$

$$\frac{1}{2}v^2 = gh_0 - gh$$

$$v^2 = 2g(h_0 - h)$$

$$v = \sqrt{2g(h_0 - h)}$$

$$v = \sqrt{2(9.8)3} = 7.67 \text{ m/s}$$

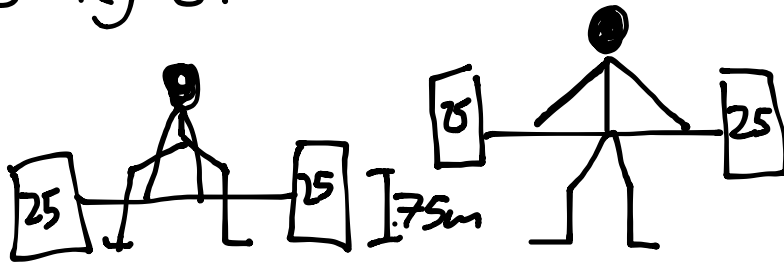


Work - is a change in an object's energy due to a force acting over some displacement or distance.

$$W = \vec{F} \cdot \vec{d} \cos \theta \quad \leftarrow \text{angle between } \vec{F} \text{ and } \vec{d}$$

$$W = \Delta E$$

Find the work done lifting 50kg of mass a distance of 0.75m.



$$\begin{aligned} W &= \vec{F} \cdot \vec{d} \cos \theta \\ &= mg \cdot d \cos \theta \end{aligned}$$

$$\begin{aligned} W &= 50 \cdot 9.8 \cdot 0.75 \\ &= 367.5 \text{ J} \end{aligned}$$

$$W = \Delta E$$

$$W = \Delta PE = mgh$$

Power - rate that energy is converted or transferred.

- symbol = P - scalar - units = $\frac{J}{s} = \text{Watts (W)}$

$$P = \frac{W}{t} = \frac{\Delta E}{\Delta t}$$

$$P = \frac{F \cdot d}{\Delta t} = \vec{F} \cdot \vec{v}$$