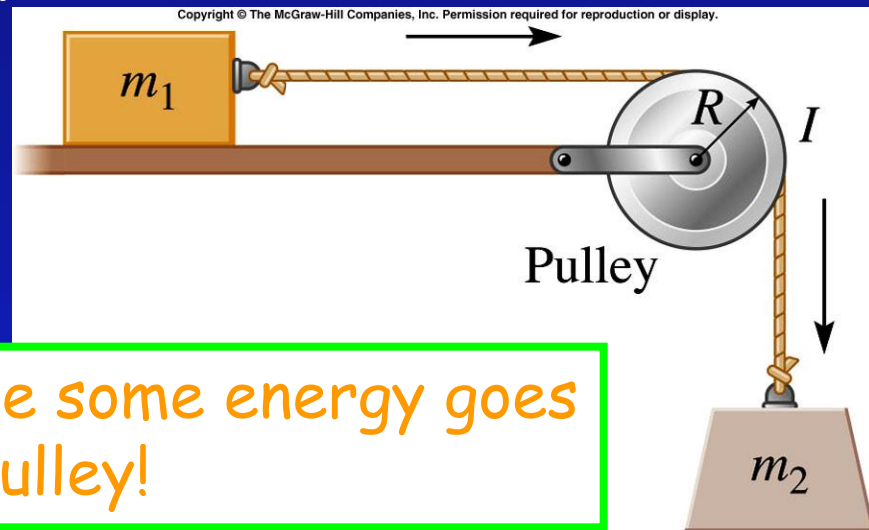


Massive Pulley Act

Consider the two masses connected by a pulley as shown. If the pulley is massive, after m_2 drops a distance h , the blocks will be moving



Slower because some energy goes into spinning pulley!

A) faster than

B) the same speed as

C) slower than

if it was a massless pulley

$$U_{initial} + K_{initial} = U_{final} + K_{final}$$

$$m_2gh = +\frac{1}{2}m_1v^2 + \frac{1}{2}m_2v^2 + \frac{1}{4}Mv^2$$

$$0 = -m_2gh + \frac{1}{2}m_1v^2 + \frac{1}{2}m_2v^2 + \frac{1}{2}I\omega^2$$

$$v = \sqrt{\frac{2m_2gh}{m_1 + m_2 + M/2}}$$

$$m_2gh = +\frac{1}{2}m_1v^2 + \frac{1}{2}m_2v^2 + \frac{1}{2}\left(\frac{1}{2}MR^2\right)\left(\frac{v}{R}\right)^2$$