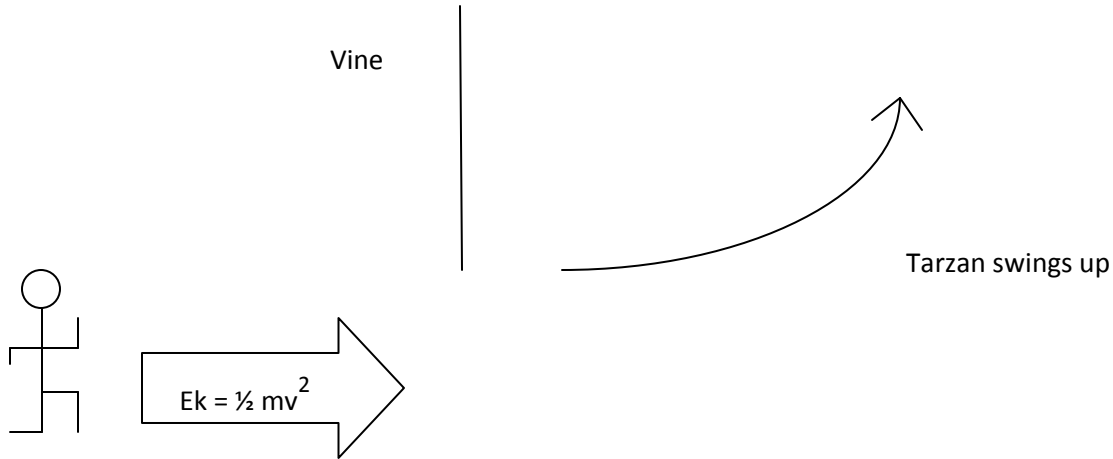


Energy Conservation

Law of Conservation of Energy states that: Energy cannot be created or destroyed but it can change from one form to another. The total amount of energy in the universe remains constant.

Let's take a look at a simple example. If Tarzan is running along the jungle floor and grabs a vine, he will swing up to a maximum height. According to the conservation of energy (and assuming a 100% transfer), all this kinetic (moving) energy goes to gravitational potential energy.



So.... $E_k \rightarrow E_g$ (assuming 100% transfer)

Or... $E_k = E_g$

$$\frac{1}{2}mv^2 = mg\Delta h$$

If we have some givens, we can figure out Tarzan's maximum height!

Say Tarzan's mass = 75 kg = m

And Tarzan can run at 7.0 m/s = v

$$\frac{1}{2}mv^2 = mg\Delta h \quad \text{** mass cancels out on either side so...}$$

$$\frac{1}{2}v^2 = g\Delta h \quad \text{** 'g' here is gravitational intensity = 9.8 N/kg}$$

$$\frac{\frac{1}{2}v^2}{g} = \Delta h$$

$$\Delta h = \frac{1}{2}(7)(7) = 24.5 \text{ m or } 25 \text{ m high.}$$

This is the kind of logic we will use to solve problems using the conservation of energy. Most often we assume no loss of energy to heat or sound. (most typical 'losses')