Mechanical Energy and Work

Mechanical Energy = K+U

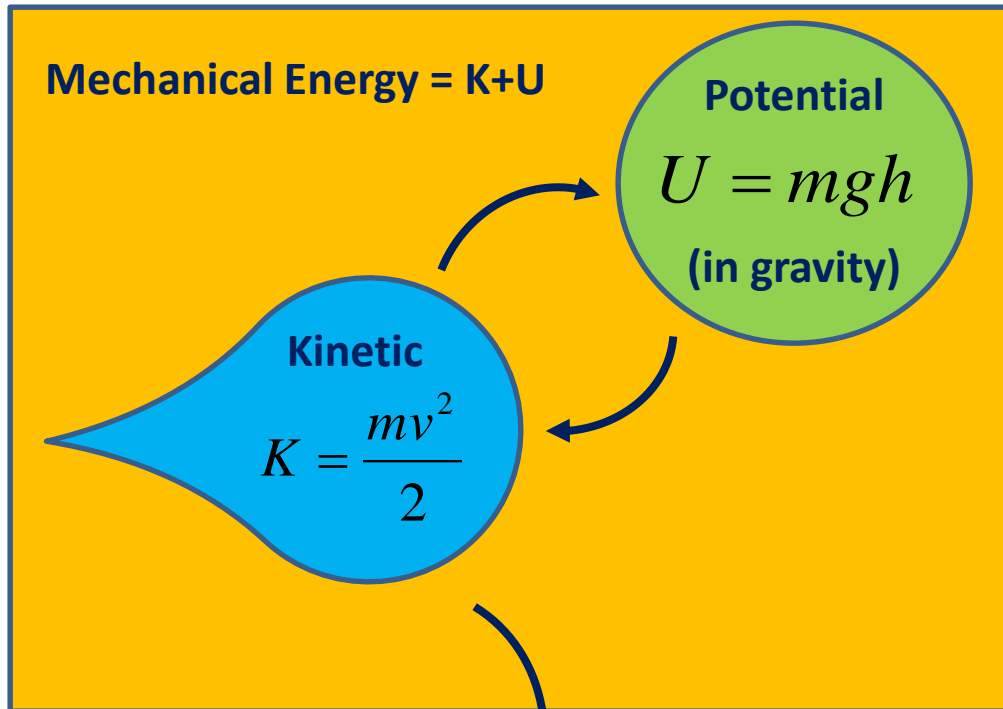**Potential**

$$U = mgh$$

(in gravity)

Kinetic

$$K = \frac{mv^2}{2}$$

Change in Energy= Work

$$W = F\Delta x$$

Unit of Energy & Work is called Joule (J)

$$1J = 1N \cdot m = 1\frac{kg \cdot m^2}{s^2}$$

Homework

A toy car is powered by a rubber band. The car is released, and get accelerated by the rubber band to speed v=2m/s. After that, the car climbs up the ramp of the height h=10 cm (0.1 m).

a) What will be the speed of the car on top of the ramp? Assume the car to have mass M (if the problem is solved correctly, the value of M does not matter. Neglect friction and air resistance, so that the energy stays constant.

b) What is the maximum height of the ramp that the car can climb?