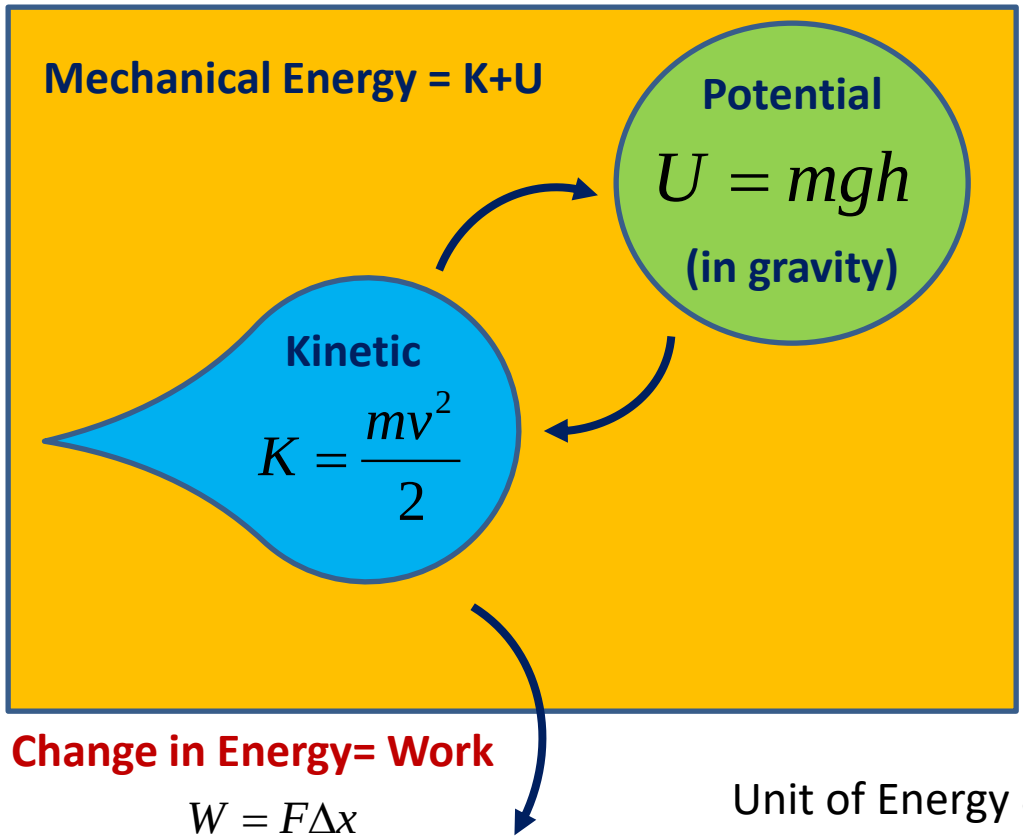
Mechanical Energy and Work



Unit of Energy & Work is called Joule (J)

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

Homework

In each case shown below, find the Energy in Joules

- Yourself running as fast as you can (note that you need to find your mass and your maximum speed).
  - K = _____ J
- Combined Kinetic Energy of all the molecules in $1\ \mathrm{m}^3$ of air. You can assume that the molecules have a typical speed of $500\ {}^{\mathrm{m}}/_{\mathrm{s}}$. The density of air is $1.2\ {}^{\mathrm{kg}}/_{\mathrm{m}^3}$.
  - K = _____ J
- Potential energy you gain after climbing Mount Everest
  - U = _____J
- Work needed to shoot an arrow with a mass of $55\ \mathrm{g}$ to a height of $100\ \mathrm{m}$ using a bow.
  - W = _____J