Work and Kinetic Energy

"Change in kinetic energy is equal to the mechanical work done by all forces"

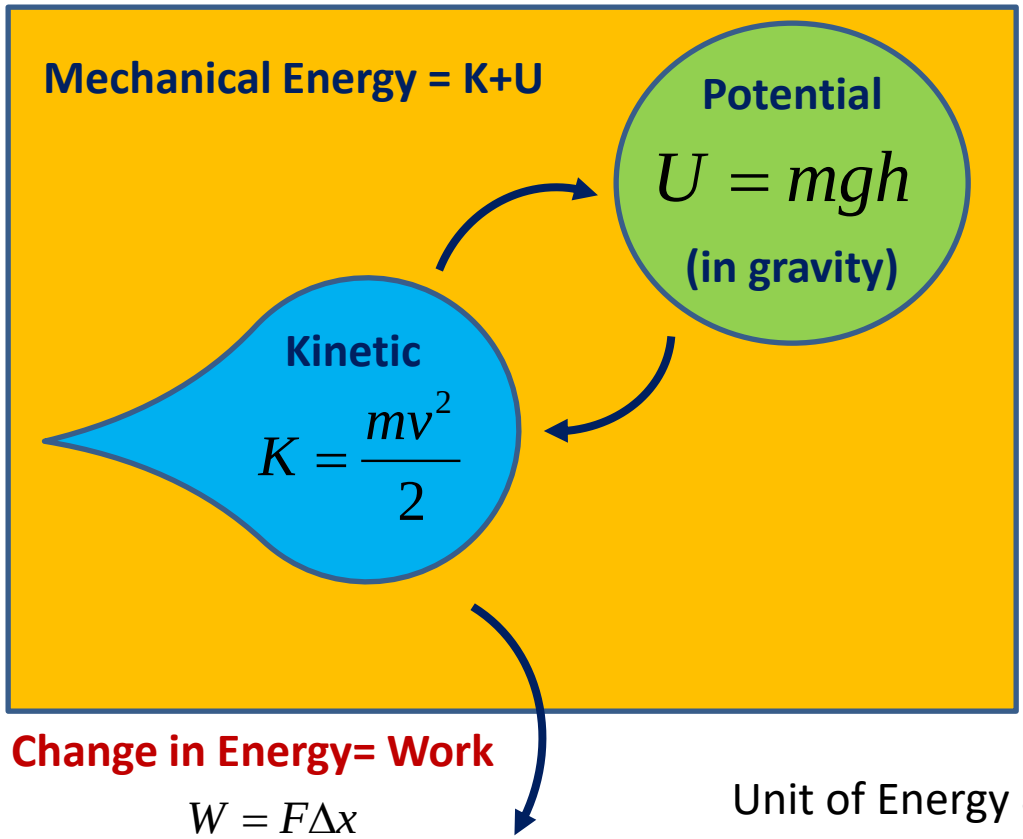
$$\Delta K = W$$

(Work = Force x Displacement)

$K = \frac{mv^2}{2}$, is called Kinetic Energy of an object

$W = F\Delta x$, is called Mechanical Work

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 19

Problem 1.

A driver in the car moving with speed 30 m/s applies brakes. Friction force acting on the car is 10kN. Mass of the car is 2000kg. Find the distance that the car will travel before coming to a complete stop.

Problem 2.

In shot put an athlete is throwing a heavy ball (the shot) as far as possible. The shot has mass 8 kg. The current men's world record is throwing it 23.56 meters that corresponds to a speed of about 15 m/s at the start. During the throwing the athlete makes a complex movement represented on the diagram on the next page. Assuming the athlete's hand with the ball moves 1.5 meters during this process, what is the force exerted by the athlete on the ball?

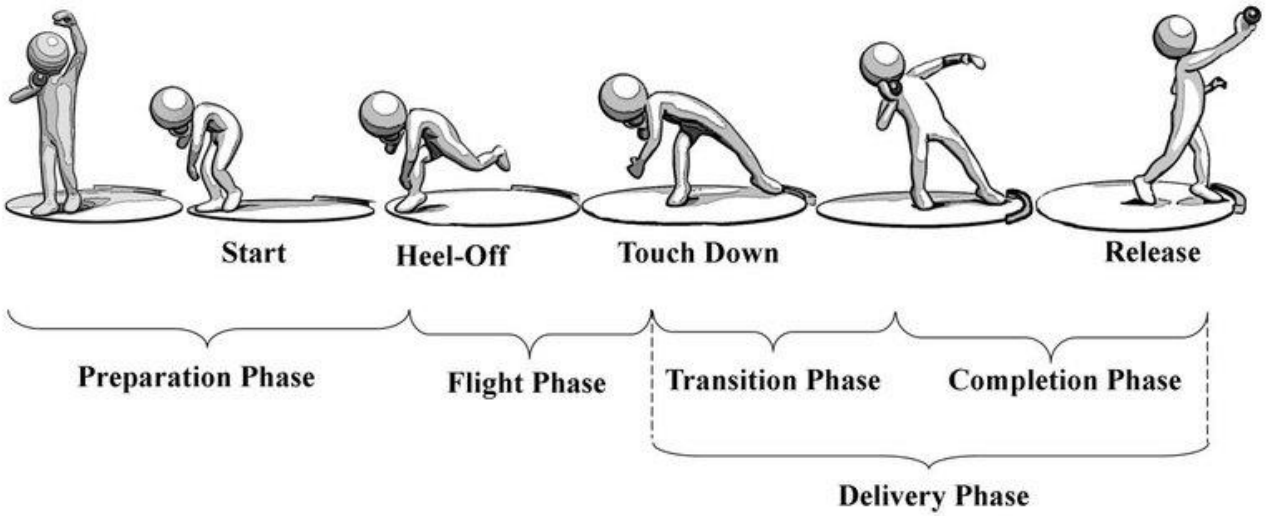


Diagram: shot put technique