

Area under Velocity-Time graph

Displacement


Acceleration (a)

Slope of Position- Time graph


Velocity (V)

## Concept Map: Motion of Objects



## Concept Map: Kinematic in Tow Dimensions

Projectile launched horizontally


Projectile launched at an angle

## Concept Map: Newton's Laws of Motion

Newton's First Law of Motion
$F_{\text {net }}=$ sum of all external forces



Mass (m)

Weight (mg)


Normal Force ( $\mathrm{F}_{\mathrm{N}}$ ) $\qquad$ Newton's Third Law of Motion (Action, Reaction)

Apparent Weight

## Concept Map: Work

Displacement
(s)

Angle between force and displacement

Newton's second law of motion $\mathrm{F}=\mathrm{m} \mathrm{a}$


Energy


Work (w)
$W=(F \cos \theta) s$

$\theta=180^{\circ}$
$W=-F s$
$\theta=0^{\circ}$
$W=F s$

$$
\theta=90^{\circ}
$$

$$
\text { W = } 0 \text { Joules }
$$

## Concept Map: Energy

Height above the surface


Work-Energy Theorem


Mechanical energy


Speed


Kinetic energy


Work-Energy Theorem

Conservation of mechanical energy


Impact Speed

## Concept Map: Linear Momentum

## Momentum



Angular momentum

Linear momentum


Impulse - Momentum Theorem


Linear momentum is conserved
Sum of forces $=0 \mathrm{~N}$


Impulse of force


Linear momentum is not conserved Sum of forces \# 0 N

## Concept Map: Electricity



## Concept Map: Thermodynamic Laws



Concept Map: Light


Angles of reflection, incidence


Law of reflection
Snell's Law of refraction

## Concept Map: Harmonic Motion



Work-Energy Theorem

