System Types

open system	can gain and lose mass and energy
closed system	a system that does not gain nor lose mass
Isolated system	a sytem that does not exchange mass nor energy

Momentum and Impulse

impulse (I)	I or $\Delta P = F\Delta t$
impulse unit	N.s
Location on a graph	under the Force - Time curve
Momentum	P = mv
Law of Conservation Of Momentum	m1v1 + m2v2 = (m1+m2)v

in any closed or isolated system, the momentum is conserved

impulse is the change in momentum, so I = ΔP

Kinetic Energy

KE Formula	KE = (1/2)mv2
work-energy theorem	work is equal to the change in KE (W = KEf - KEi)

Potential Energy

Gravitational Potential Energy	energy stored as a result of the gravitational attraction of the earth on the object
Formula	PE = mgh
Elastic Potential Energy	the energy stored in elastic materials as a result of their stretching or compressing

Machines

Simple Machine	a machine that makes work easier by changing the value of force or its direction
compound machine	a device that uses multiple simple machines
Mechanical advantage	Fr / Fe (resistance force / effort force)
Ideal Mechanical Advantage	de / dr (effort displacement / resistance displacement)
Compound Mechanical Advantage	the product of the MA of its simple machine components
Efficiency	(W output / W input) x 100% or (MA / IMA) x 100%

Machines (cont)

Types of simple machines	pulley - lever - wedge - incline plane - screw

Collision Types

Inelastic collision	the kinetic energy after the collision is less than it originally was
elastic collision	the kinetic energy remains the same after the collision
super elastic collision	the kinetic energy increases after the collision

kinetic energy decreases when the objects stick together

Work

Work	the translation of energy in mechanical ways
Work Formula	Fdcos(θ)
Work Unit	J
Location on graph	under the force - displacement curve
Work done by Friction	-fk x d
Work done by Gravity	mgd
Work = 0	when the force is perpendicular to the displacement (90 degrees)
W is positive	if the work is done on the system
W is negative	if the work is done by the system

Mechanical Energy

mechanical energy	the sum of the potential and kinetic energies

Power

Power	P = W/t
Power Unit	Watt = $kg.m^2/s^3$

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