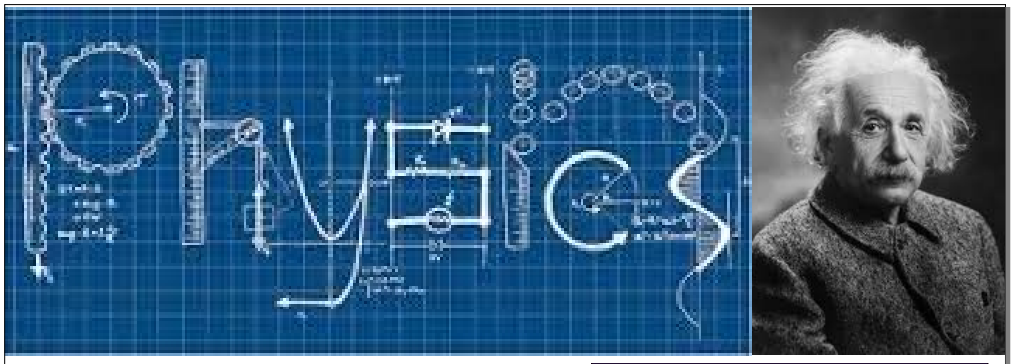
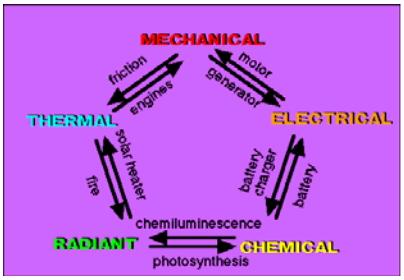


2.5 Energy Types

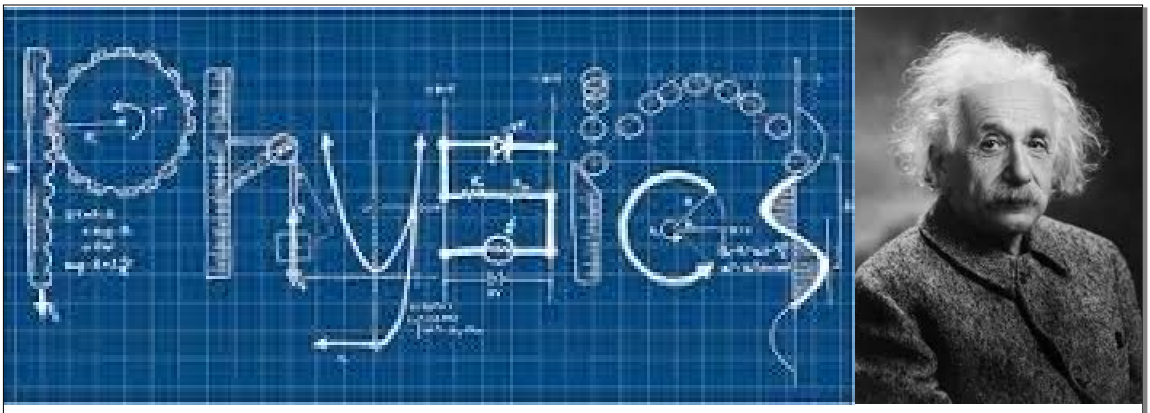


Energy - the ability to do work

Types - Potential, Kinetic, Thermal, Nuclear, Elastic, etc.

Law of Conservation of Energy - energy cannot be created or destroyed; it can only be changed from one form to another, and the total amount of energy never changes

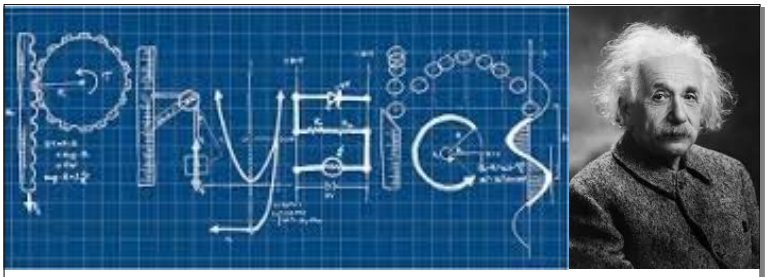
the Sun is the source of all energy on Earth

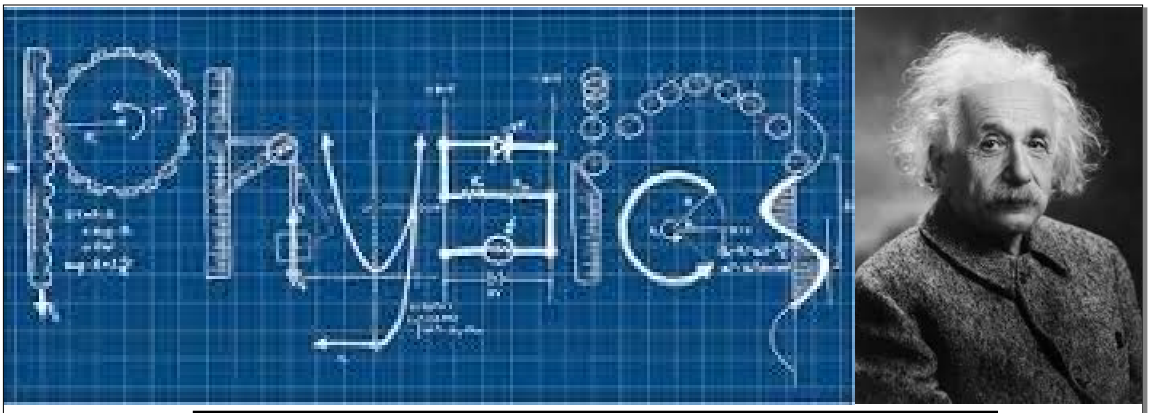


We focus on potential and kinetic energy.

Potential Energy - energy that is stored and held in readiness; energy that has the potential to do work (eg. gravitational, elastic, and chemical)

Kinetic Energy - energy of a moving object (eg. light, heat, and electricity)





Gravitational Potential Energy

$E_p = m\vec{g}h$

m = mass (kg)

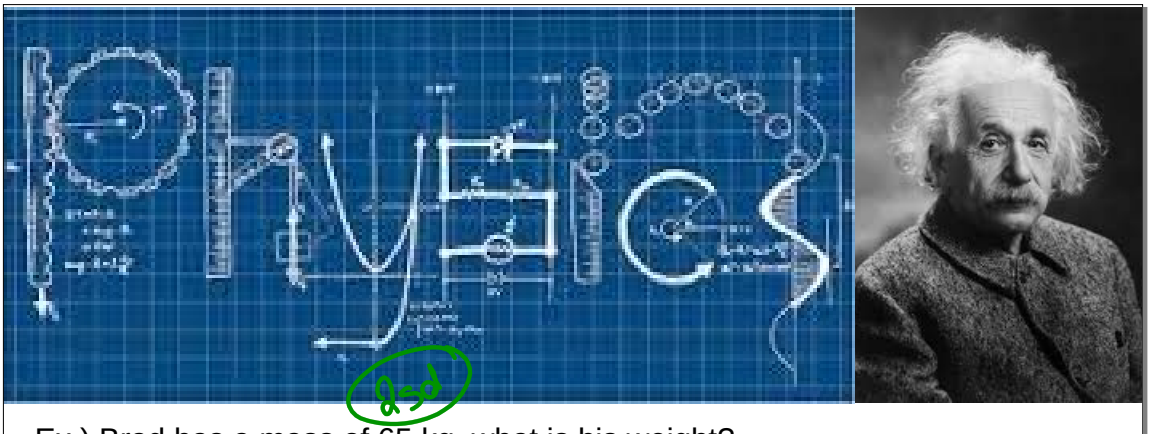
h = height (m)

↑ constant

- stored energy of an object in reference to its' height

- a force on a mass against gravity over a distance

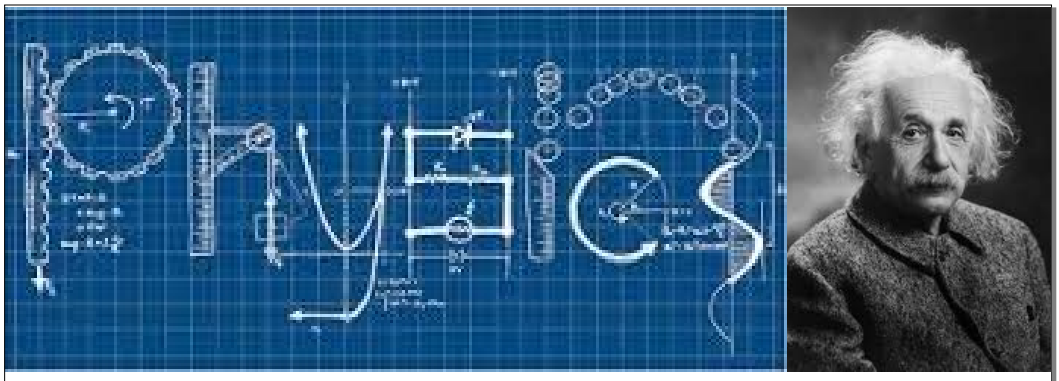
$\vec{g}$ = 9.81 m/s². This is the acceleration due to gravity (the acceleration objects fall to the ground at). It is a constant (found in your data booklet) and does not count towards sig digs!



Ex.) Brad has a mass of 65 kg, what is his weight?

(Note: Mass and weight are different. Weight = mg)

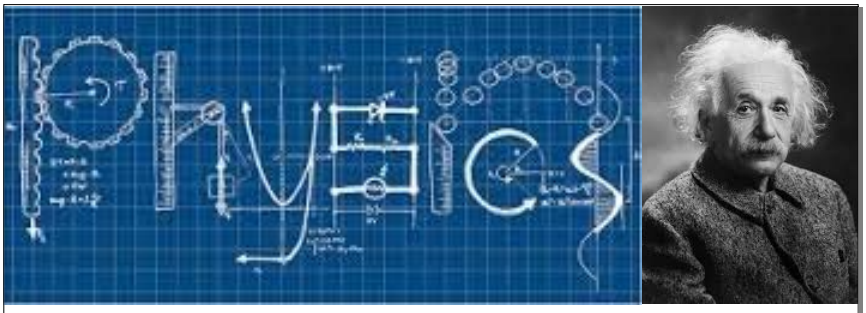
$m = 65\ kg$ $g = 9.81\ m/s^2$ $W = ?$ list all variables	$W = mg$ formula	$W = (65\ kg)(9.81\ m/s^2)$ $W = 637.63 = 6.4 \times 10^2\ N$ substitute (with units) and solve



Ex.) A 7.0 kg box is sitting on a shelf 2.5 m above the ground. What is it's potential energy?

$m = 7.0\ kg$ $h = 2.5\ m$ $g = 9.81\ m/s^2$ list all variables	$E_p = mgh$ formula	$E_p = (7.0\ kg)(9.81\ m/s^2)(2.5\ m)$ $= 171.675$ $= 1.7 \times 10^2\ J$ substitute (with units) and solve

energy units: Joules



Ex.) A 45.0 kg diver is standing on a platform, she has 5345 J of potential energy. How high is the platform?

list all variables	formula	substitute (with units) and solve
$m = 45.0\,kg$ $E_p = 5345\,J$ $g = 9.81\,m/s^2$ $h = ?$	$E_p = mgh$	$\frac{5345\,J}{(45 \times 9.81)} = \frac{(45.0\,kg)(9.81\,m/s^2)h}{(45 \times 9.81)}$ $h = 12.1\,m$