

Basic Physics

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● Physics ?.....

- Basic Terms In Physics
- Unit – Systems of units
 - Length, Area, Volume
 - Scalar, Vector
- Displacement, Velocity, Acceleration
 - Newton's Laws Of Motion
- Energy, Law of conservation of energy
- Momentum, Pressure, Work, Density
 - Newton's Law of gravitation
- Centripital Force, Centrifugal Force
 - Period, Frequency
 - Mass, Weight etc.....

Scientific Notation

Prefix	# of Base Units	Scientific Notation
Terra (T)	1,000,000,000,000	(10^{12})
Giga (G)	1,000,000,000	(10^9)
Mega(M)	1,000,000	(10^6)
Kilo (k)	1,000	(10^3)
Hecto (h)	100	(10^2)
Deca (da)	10	(10^1)
Base	1	(10^0)
Deci (d)	1/10	(10^{-1})
Centi (c)	1/100	(10^{-2})
Milli (m)	1/1,000	(10^{-3})
Micro (μ)	1/1,000,000	(10^{-6})
Nano (n)	1/1,000,000,000	(10^{-9})

Scalar

a measurement that does
NOT contain **direction**.

Example: Speed



Vector

a measurement that contains
direction.

Example: Velocity

Velocity

$$V = \frac{d}{t}$$



speed of an object in a certain direction.

V = velocity (meters/second)

d = distance (meters)

t = time (seconds)

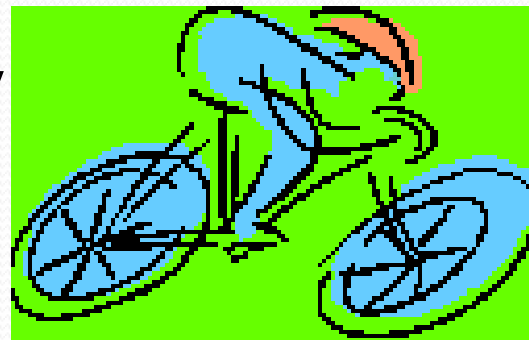
Acceleration the change in velocity over time.

$$\text{Acceleration} = \frac{\text{change in velocity}}{\text{time}}$$

$$\text{Acceleration} = \frac{(v_2 - v_1)}{\text{Time}}$$

V₁ = Initial velocity

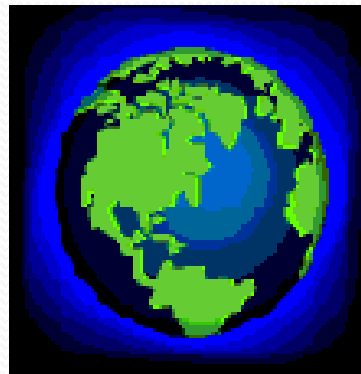
V₂ = Final velocity



NEWTON's Laws

1st Law of Motion :

An object remains at a constant speed in a straight path ,until a net force acts on it.



NEWTON's

2nd Law of Motion :



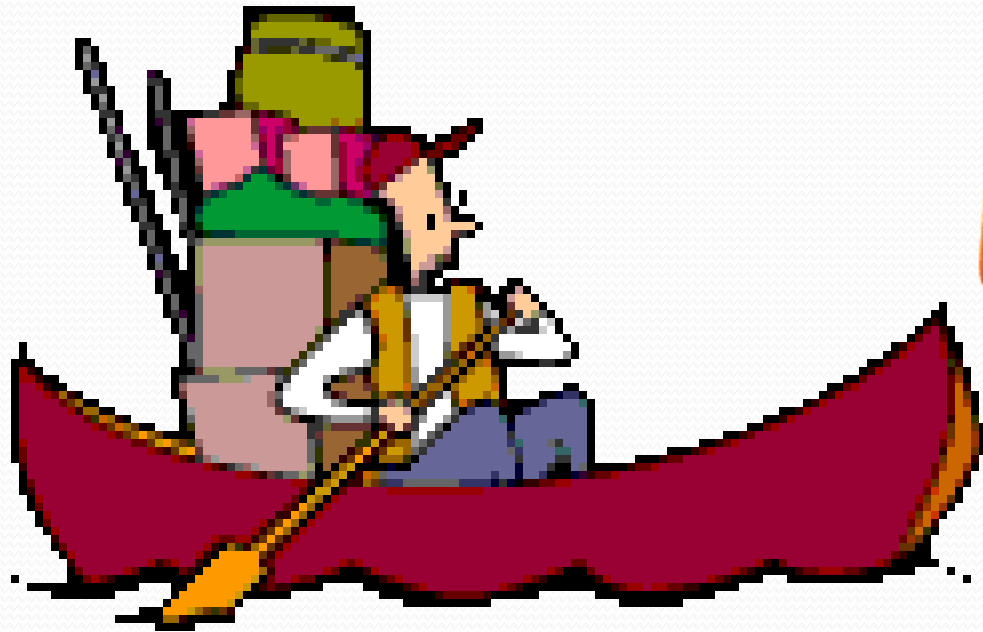
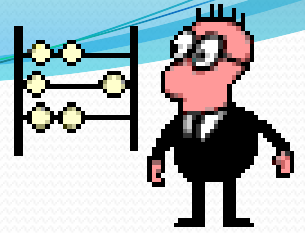
An object that has a force acting on it will change its speed

$$(F=ma)$$

(accelerate).

NEWTON'S

3rd Law of Motion:

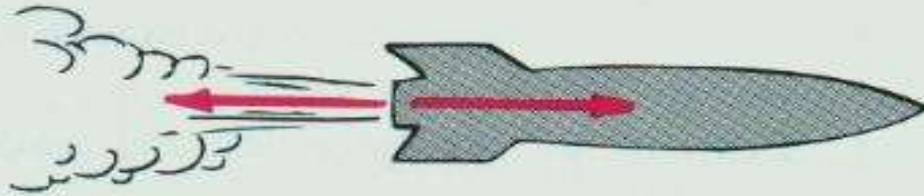


Conservation of energy

For every action there is
an equal and opposite reaction.



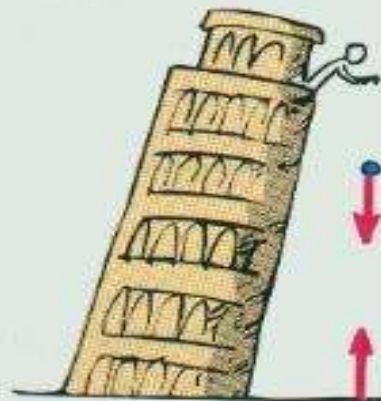
Action: tire pushes on road Reaction: road pushes on tire



Action: rocket pushes on gas Reaction: gas pushes on rocket

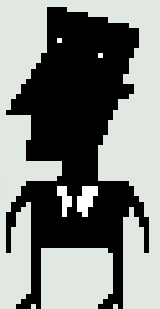


Action: man pulls on spring Reaction: spring pulls on man

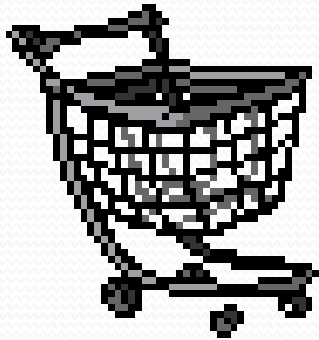


Action: earth pulls on ball

Reaction: ball pulls on earth



momentum



**the force of a
moving body.**

the mass times velocity of an object

$$p = m \cdot v$$

Momentum = mass x velocity

(Kgrams) (meters/second)

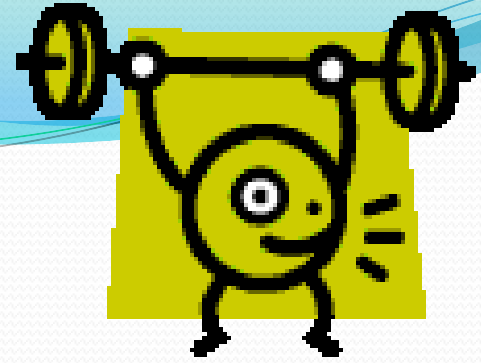
Pressure is the amount of force exerted over a certain area.

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$



Work

Distance {

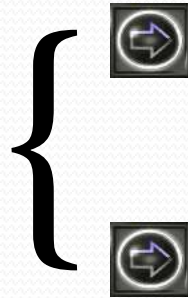


$$W = f \cdot d$$

Force

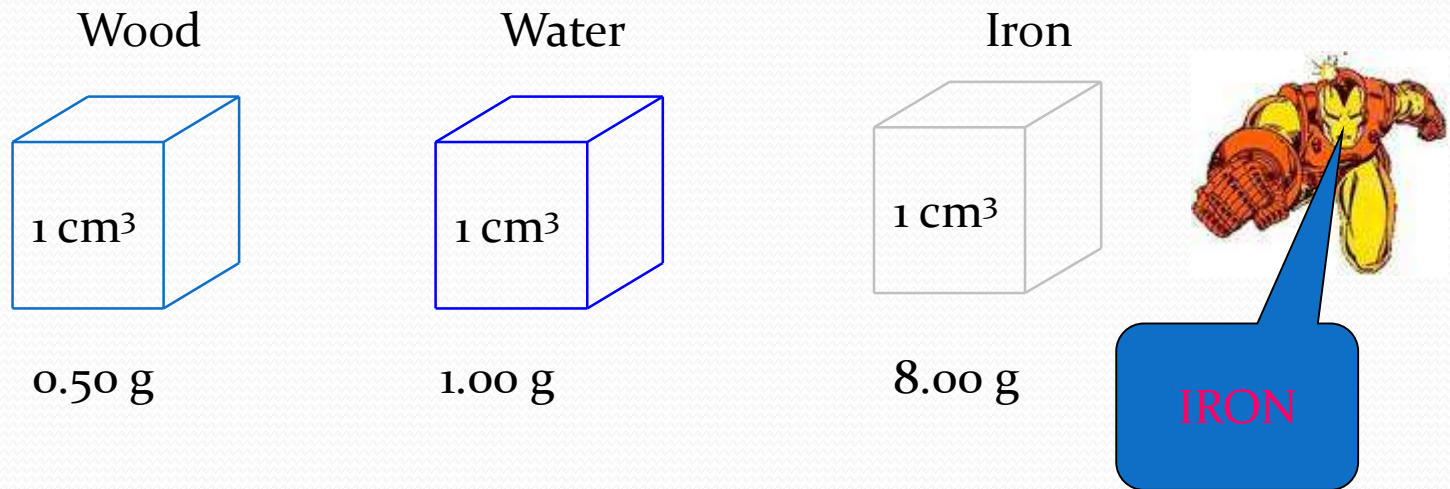


Distance {



What is Density?

If you take the same volume of different substances, then they will weigh different amounts.



Q) Which has the greatest mass and therefore the most dense?

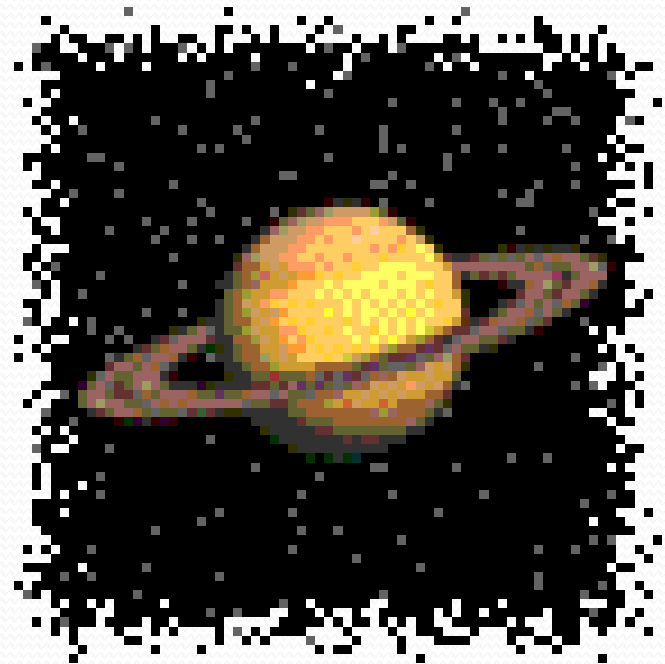
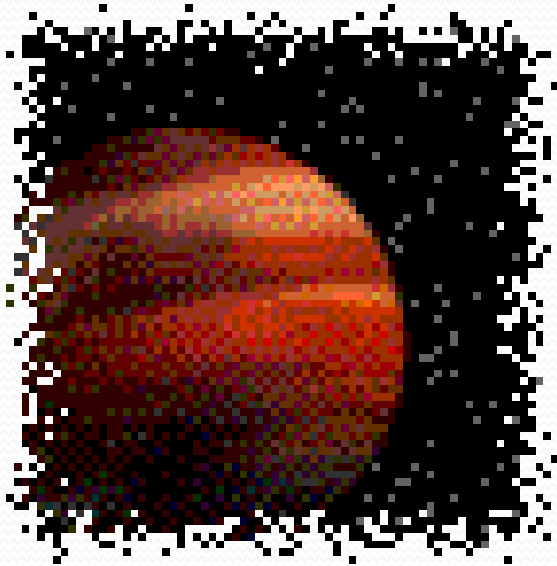
Density is the Mass per unit Volume

$$(P = m / V)$$

Gravitational force ($F = GMm/r^2$)

o **INCREASES** with Mass

o **DECREASES** with Distance



Weight and Mass

$$W = mg$$



Mass = 120 kg
Weight = 120×10
= 1200 N



Mass = 120 kg
Weight = 200 N

Racing Balls



Thank You