# Force & Laws of motion

Inertia ⟹ The tendency of an object to oppose a change in their state of rest or uniform motion (motion along a straight line).

1st Law of motion :-

Every object wants to remains in their state of rest or uniform motion unless, External force act on it.

Seat belt opposes the inertia :-

Measure of inertia ⇒ Mass

more mass = more inertia

Time plays important role in getting accelerated.

Momentum :- The product of mass and velocity of an object.

$p$ = vector quantity $\boxed{mv = p}$ unit of momentum

(Q1) Calculate the momentum of an object with mass 900 g moving with velocity 12 km/hr.

$$P = mv$$

$900\ g = \frac{900}{1000}\ kg$

$12\ km/h = \frac{12 \times 1000}{3600}$

$mv = \frac{9}{10} \times \frac{10}{3}$

$= 3\ kg\ m/s$

H.W

(Q2) Find the velocity of a object having mass 500 kg with momentum = 8000 kg m/s

Ans $P = mv$

$8000\ kg\ m/s = 500\ kg$

$v = \frac{8000\ kg\ m/s}{500\ kg}$

$v = 16\ m/s$