Effects of forces

$$D = \frac{dl}{c\,l\,dt} = \frac{1}{c\,P}\frac{dP}{dt}$$

$$D^2 = \frac{1}{P^2}\frac{P_0 - P}{P} \sim \frac{1}{P^2} \qquad (1a)$$

$$D^2 = \frac{K\rho}{3}\frac{P_0 - P}{P} \sim \frac{1}{3}K\rho \qquad (2a)$$

$$D^2 \sim 10^{-53}$$

$$\rho \sim 10^{-26}$$

$$P \sim 10^{8}\ \text{g.J}$$

$$t \sim 10^{10}(10^{11})\ \text{J}$$

Newton’s Second Law

- Starting , stopping , getting faster or slower are all changes in motion (acceleration).
- Resultant Force is determined using the following formula

(Net force = Driving force – Resisting force)

- Newton’s second Law : **The acceleration of a body is directly proportional the net force acting on the body provided the mass remains constant**

Equation : F=ma

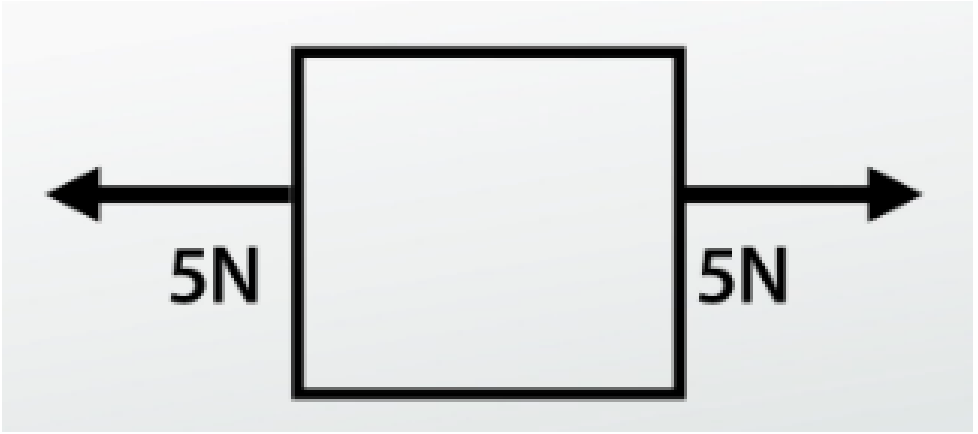
F : Force , m : mass ,a : acceleration

The effect of a zero net force

- This happens when the driving force = Resisting force
- If the object is at rest it will stay at rest
- If the object is moving it will keep moving with constant speed

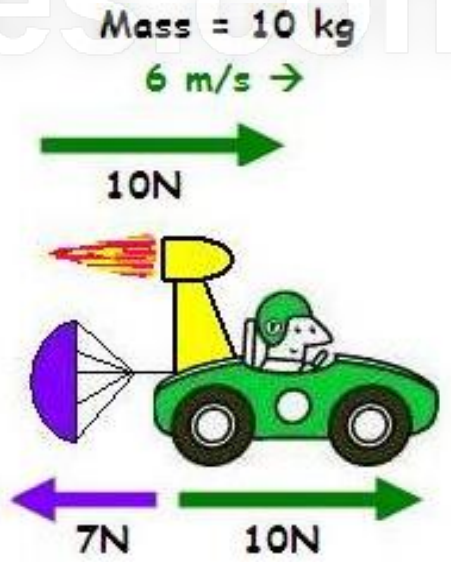
Net Force = Zero

Acceleration = Zero



The effect of a POSITIVE net force

- This happens when Driving forces is greater than Resisting forces
- Or the there is Driving force with no resisting forces
- Object will ***accelerate*** (gain speed)

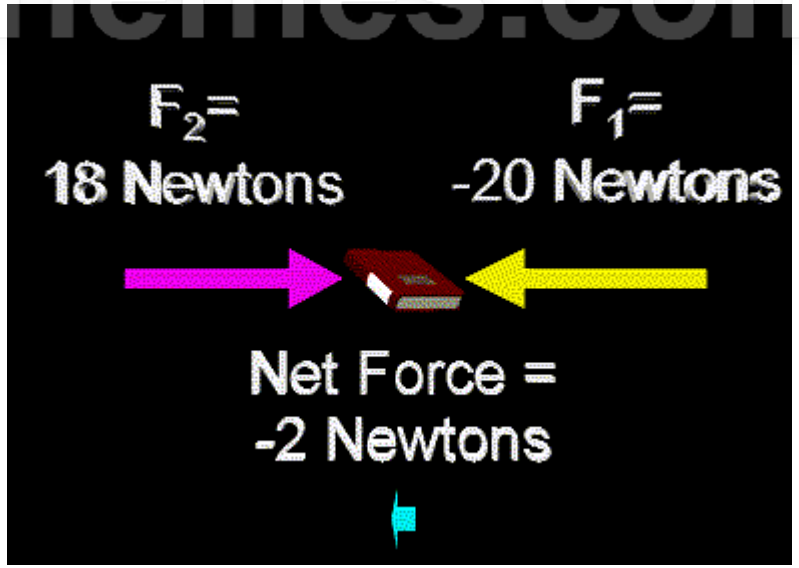


Net Force = Positive

Acceleration = Positive

The effect of a NEGATIVE net force

- This happens when the driving force is less than the resisting force
- Or there is resisting force with no driving Force
- Object will ***decelerate*** (loose speed)



Net Force = Negative

Acceleration = Negative

Force acting perpendicular to direction of motion

- As seen before a force can cause a velocity to change by changing the ***speed*** of an object .
- Force can cause velocity to change by changing the ***direction*** of an object .
- Its neither a driving nor resisting force it acts as a ***Centripetal force***
- ***Centripetal force :****inward force needed to make an object move in a circular motion*

Forces and Deformation

- When a force is applied on an object and causes a change in it shape we say it has experienced ***deformation*** .
- There are two types of deformation:

1. Elastic deformation
2. Plastic deformation

Elastic deformation

- When an object experiences a change In shape it returns to its original shape as soon as the force is removed .
- Examples:

1. Stretching rubber bands
2. Squeezing a tennis ball

Plastic Deformation

- When an object experiences a change in shape and does not return to the original shape when the deforming force is removed
- *This means this object has exceeded its elastic limit that's why it didn't return to its original shape*

Hooke’s Law

- *Hooke’s law : The extension is directly proportional to the stretching force provided that the limit of proportionality is not exceeded*
- Extension = Stretched length – Unstretched Length

Equation : F=Ke

F:Forec, K:stiffnes of the string , e : extension

THANK YOU