



Mechanics L0.7

Qena Student Club

Net Force



The net force is defined as is the sum of all the forces acting on an object.

Net force can accelerate a mass. Some other force acts on a body either at restore motion.

The net force is a term used in a system when there is a significant number of forces.

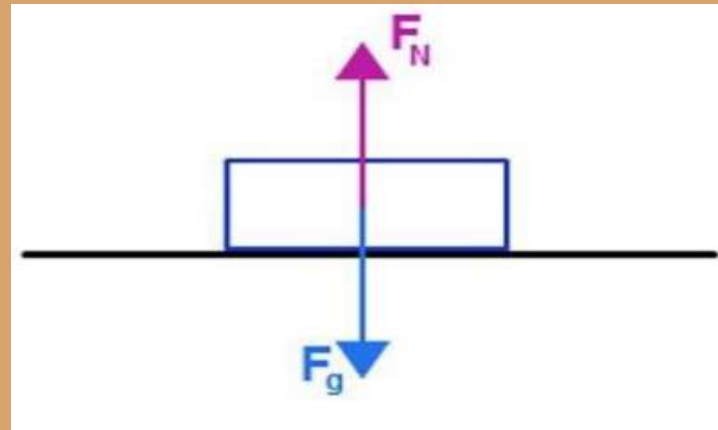
When the body is at rest:

$$F_{\text{net}} = F_a + F_g$$

Where,

F_a = applied force,

F_g = gravitational force





Net force when a body is in motion:

$$F_{\text{net}} = F_a + F_g + F_f + F_N.$$

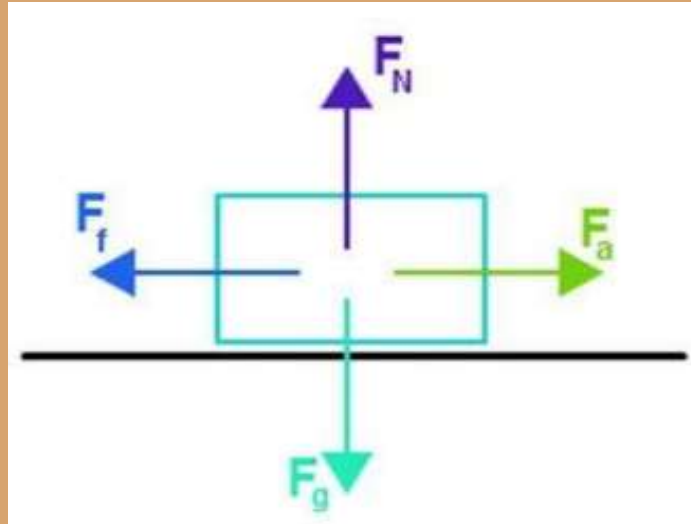
Where,

F_a is applied force,

F_g is the gravitational force,

F_f is the frictional force,

F_N is a normal force.



Mass



- **Mass is the quantity of matter in a physical body. An object's mass also determines the strength of its gravitational attraction to other bodies.**
- **The SI base unit of mass is the kilogram (kg).**
- **An object on the Moon would weigh less than it does on Earth because of the lower gravity, but it would still have the same mass. This is because weight is a force, while mass is the property that (along with gravity) determines the strength of this force.**

Acceleration

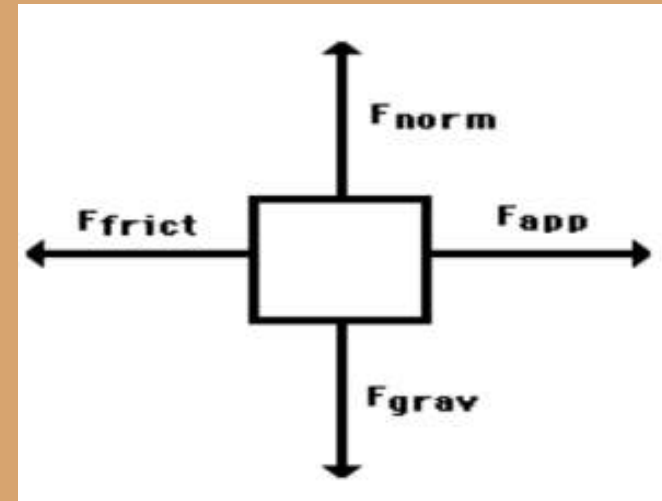


- **Acceleration is a vector in the same direction as the change in velocity, Δv . Since velocity is a vector, it can change either in magnitude or in direction. Acceleration is therefore a change in either speed or direction, or both.**
- **Acceleration is velocity in m/s divided by time in s, the SI units for acceleration are m/s^2**

Free-body diagrams



- They are diagrams used to show the relative magnitude and direction of all forces acting upon an object in a given situation.
- The direction of the arrow shows the direction that the force is acting.

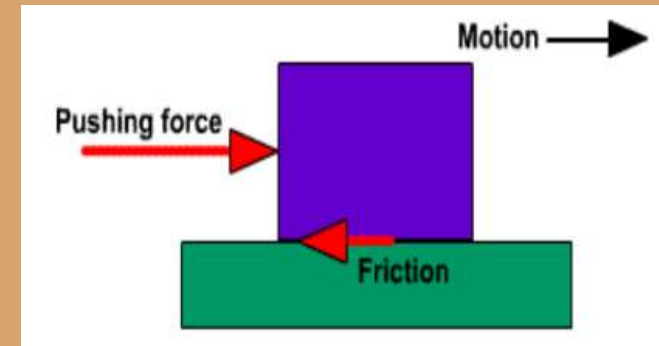


Friction



- Friction is a force between two surfaces that are sliding, or trying to slide, across each other.
- For example, when you try to push a book along the floor, friction makes this difficult.
- Friction always works in the direction opposite to the direction in which the object is moving, or trying to move.

- Friction always slows a moving object down.
- The amount of friction depends on the materials from which the two surfaces are made.
- The rougher the surface, the more friction is produced.





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