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Introduction to Forces



Force

- The force is a pull or push exerted by an object on another.
- Measured in newton (N)
- It is a vector quantity therefore it can be represented by lines and arrows

Note:

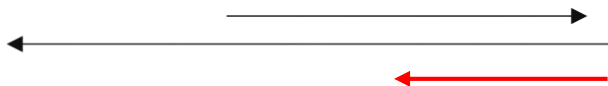
Vector quantity : Is a quantity that has both magnitude and direction .

Scalar quantity : Is a quantity that has only a magnitude without direction



Resultant of Two Forces

- The combined effect of the two Forces is called (***Resultant of Two Forces***)
- 1. Forces acting in the same direction are added together (***$R1 + R2$***)
- 2. Forces acting in the opposite directions are subtracted from each other (***$R1 - R2$***)

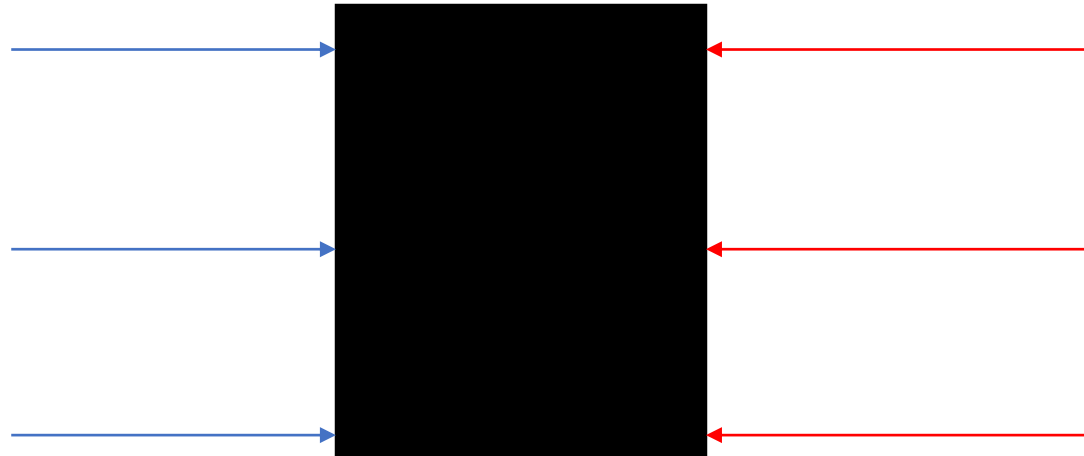




Driving & Resisting Forces

- Driving Force : Forces that are acting in the direction of motion of the object
- Resisting Force : Forces that are acting against the direction of motion of the object

DRIVING FORCE



RESISTING FORCE



Types of Forces

1. Gravitational Forces
2. Normal contact Forces
3. Up thrust Forces
4. Frictional Forces
5. Air Resistance
6. Tension

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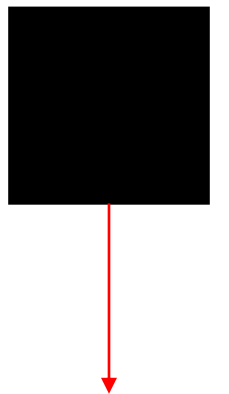


Gravitational Force

- The gravitational pull of the Earth on an object that are within the Earth's Gravitational Field .
- These forces are always drawn as if they act at the centre of gravity ,or centre of mass of the object
- ***Always vertically downwards***

Equation : $w=mg$

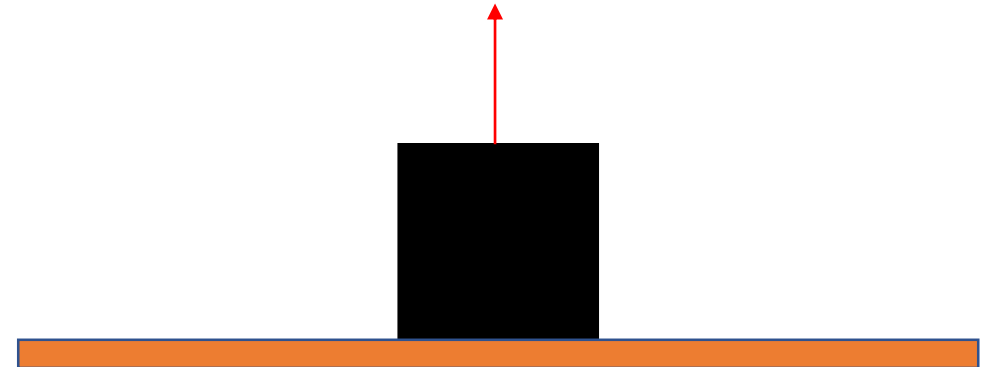
w:weight , m :mass , g:gravitational pull (9.8)





Normal Contact Force

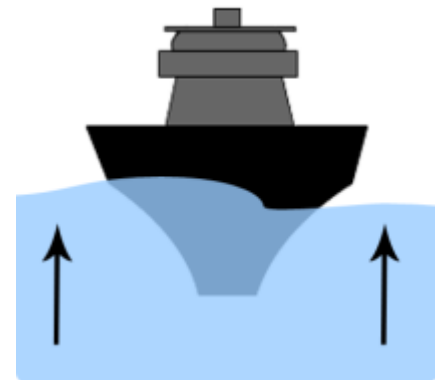
- The force that exist whenever two solid surfaces are in contact .
- It is exerted by a solid surface on an object which pushes against this surface.
- Normal contact force is always ***perpendicular*** to surface that produces it





Up Thrust Force

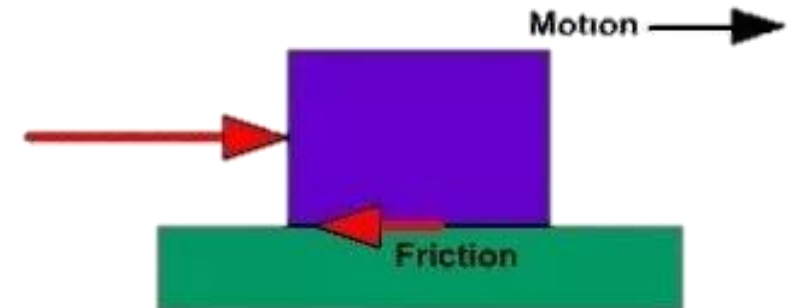
- Any object placed in a fluid such as water or air experiences an upward force whether the object is partially or completely submerged in the liquid.
- This is what makes it possible for things to float in water





Frictional Forces

- Force that arises when two Surfaces are ***sliding or trying to slide*** over one another
- Frictional force is a resisting force
- ***Always acts along a surface***
- ***Always against Sliding***



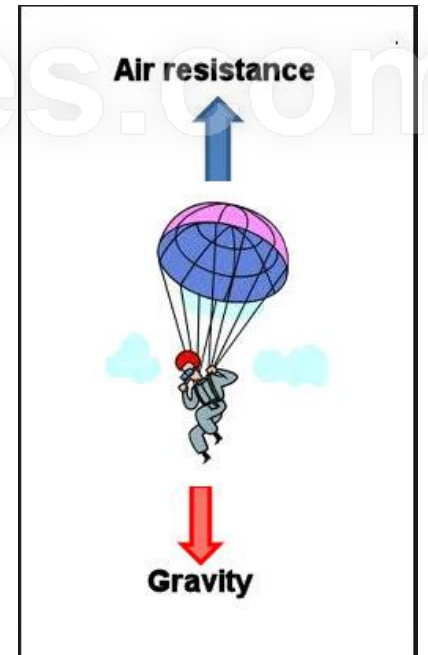


Air Resistance

- Air resistance or drag is a force that occurs when an object is moving through air.
- This due to air having to be pushed out of the way
- Air Resistance is also a resisting force

Air resistance increases with:

1. The speed of the object
2. The are of cutting through the air

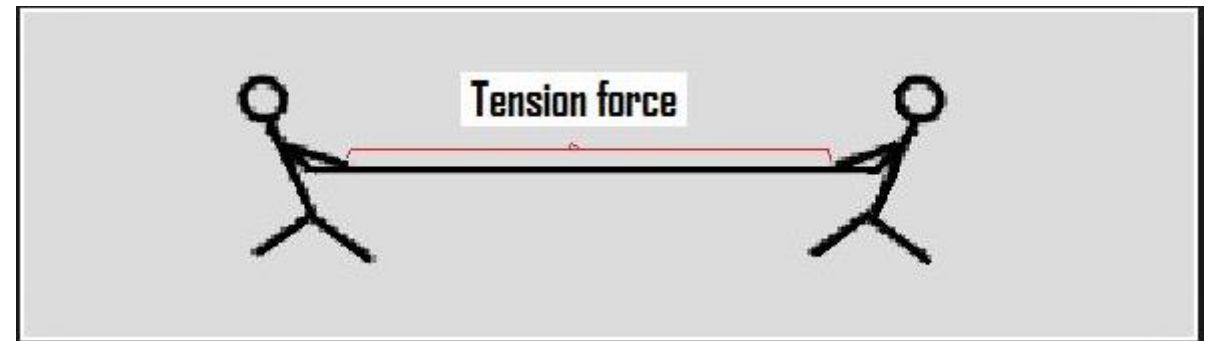




Tension

- This is the force in a rope or a string when it is stretched
- If you stretch a string the tension tends to pull it back
- If you squash a string the tension tends to expand it back

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THANK YOU

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