

Force: Push or Pull that tends to cause movement.

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Types of forces

1. Contact Forces

- Friction Force
- Ground Reaction Force
- Drag Force
- Spring Force
- Applied Force

2. Non-Contact Force

- Gravity

Units: Newtons

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$$F = ma$$

$$= \text{kg} \frac{\text{m}}{\text{s}^2} = \frac{\text{kg} \cdot \text{m}}{\text{s}^2}$$

Base units of
a Newton

Equations:

$$\sum F_{\text{on}} = ma$$

$$F_F = N_F F_N$$

or

$$N_S F_N$$

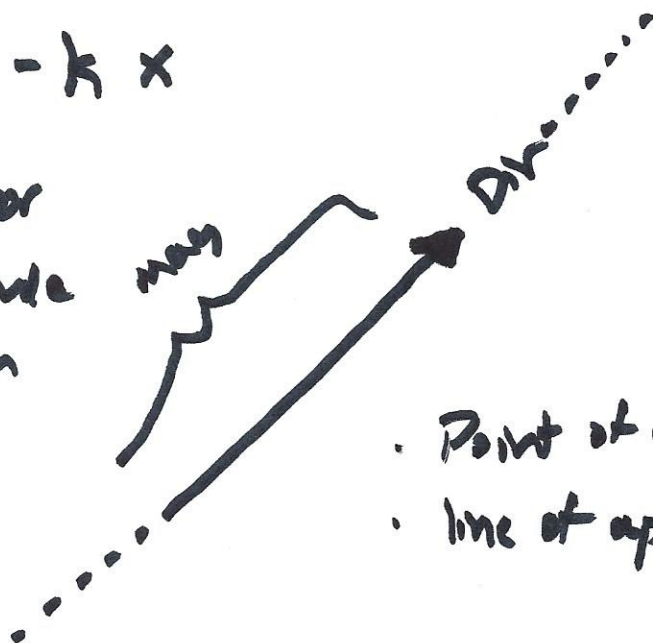
(kinetic)
 $N_K F_N$

$$F_D = \frac{1}{2} \rho C_D A v^2$$

$$F_{\text{spring}} = -kx$$

Force is a vector

- magnitude
- Direction



- Point of application
- line of application