

Newton's 2nd Law

Newton's 2nd Law –

The acceleration of an object is proportional to the unbalanced force on it, and inversely proportional to the mass of the object.

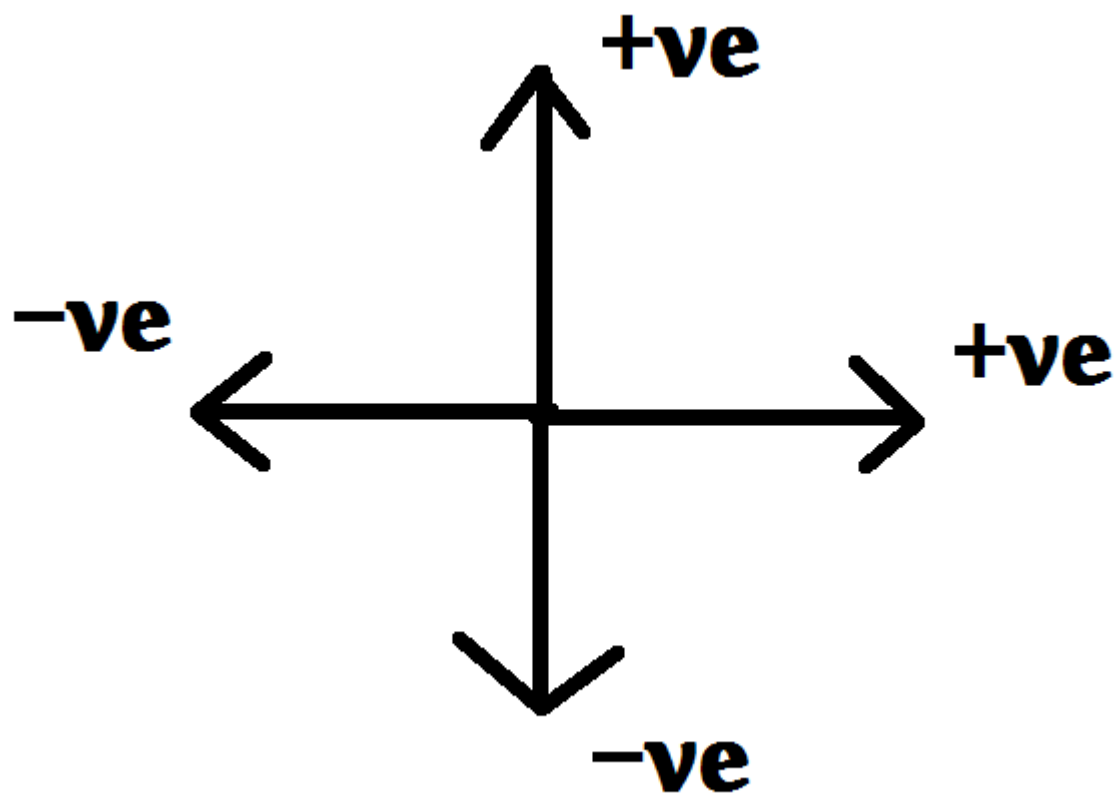
$$\mathbf{F_{net} = ma} \quad \text{OR} \quad \mathbf{\Sigma F = ma}$$

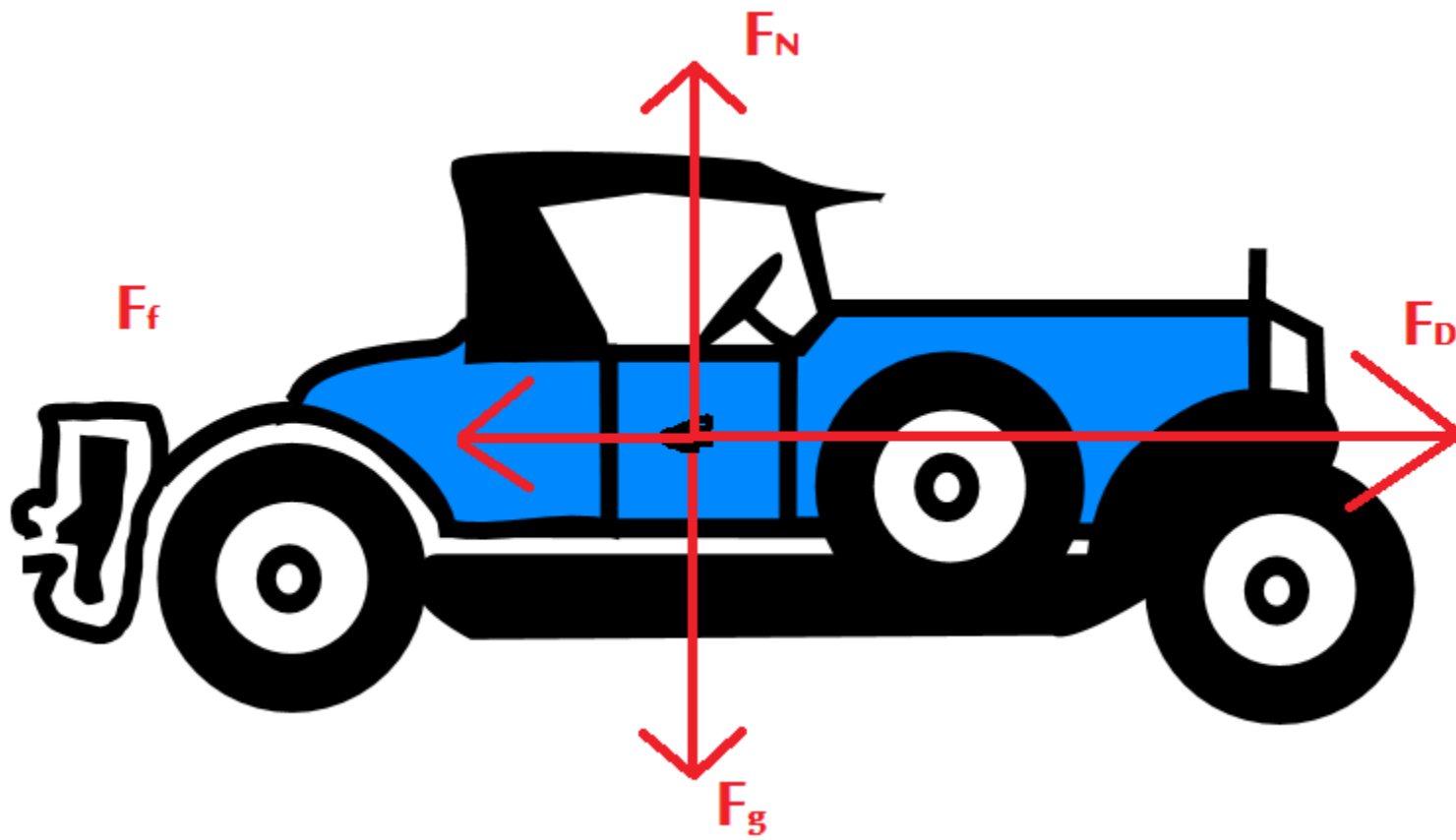
$$\mathbf{F_{net} = ma} \quad \text{OR} \quad \mathbf{\sum F = ma}$$

F = force, in Newtons (N)

m = mass, in Kilograms (Kg)

a = acceleration, in m/s/s (or m/s²)





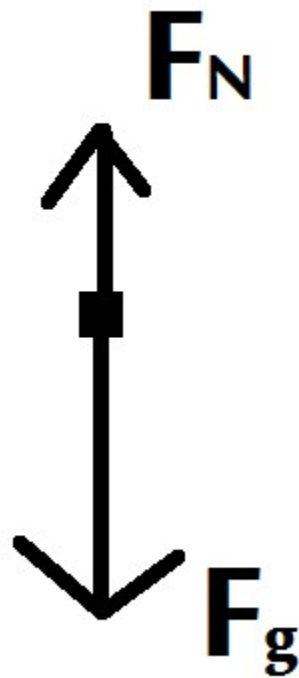
$$\mathbf{F_{net} = ma} \quad \text{OR} \quad \mathbf{\Sigma F = ma}$$

$$\mathbf{F_d - F_f = ma}$$



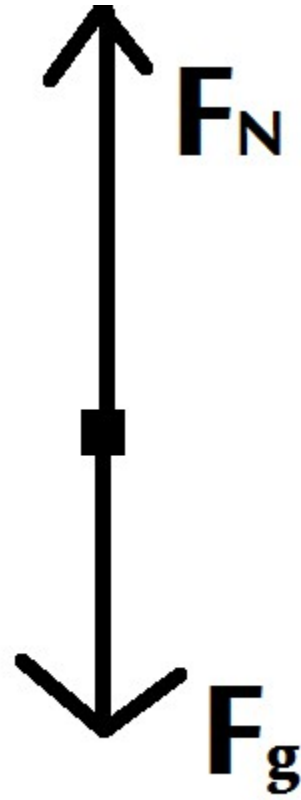
Jolt DOWN

(Slowing to a stop.)

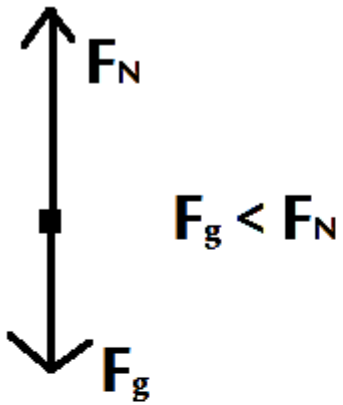


$$F_g > F_N$$

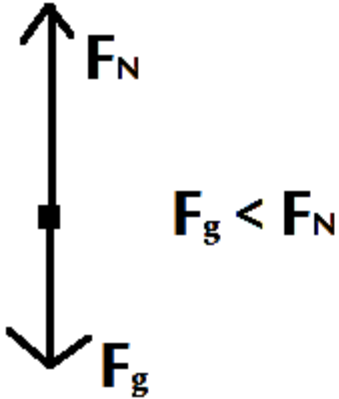
Jolt UP



$$F_{g} < F_{N}$$



$$F_{\text{net}} = ma$$
$$\underbrace{F_N - F_g}_{\text{+ve}} = ma \quad \swarrow \text{so +ve}$$



$$m = 70 \text{ kg}$$

$$g = -9.8 \text{ m/s/s}$$

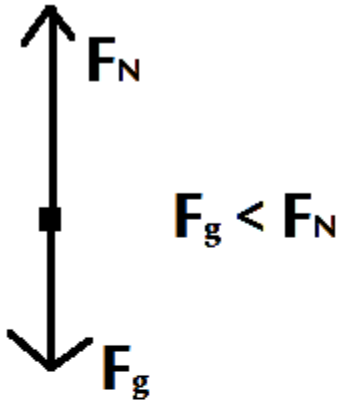
$$F_N = 800 \text{ N}$$

$$F_{\text{net}} = ma$$

$$F_N - F_g = ma$$

$$F_N - mg = ma$$

$$800 - 70(9.8) = 70a$$



$$m = 70 \text{ kg}$$

$$g = -9.8 \text{ m/s/s}$$

$$F_N = 800 \text{ N}$$

$$F_N - mg = ma$$

$$800 - 70(9.8) = 70a$$

$$a = \frac{800 - 70(9.8)}{70}$$

$$a = 0.02 \text{ m/s/s}$$