

# NEWTON'S LAWS OF MOTION

Reference Summary Chart

## FIRST LAW

### Law of Inertia

An object at rest stays at rest, and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

## SECOND LAW

### Law of Acceleration

The acceleration of an object depends on the mass of the object and the amount of force applied.

$$\mathbf{F} = m \mathbf{\tilde{a}} - \mathbf{a} \text{ (Force = Mass } \mathbf{\tilde{a}} \text{— Acceleration)}$$

## THIRD LAW

### Law of Action & Reaction

Whenever one object exerts a force on a second object, the second object exerts an equal and opposite force on the first.

$$\mathbf{F}_{\hat{a}, \square} = -\mathbf{F}_{\hat{a}, ,}$$

## UNIVERSAL LAW

### Law of Gravitation

Every particle attracts every other particle in the universe with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between them.