

NEWTON'S LAWS OF MOTION

With Alternative Descriptions

Newton's First Law of Motion (Law of Inertia)

An object at rest tends to stay at rest, and an object in motion tends to stay in motion in a straight line and at a constant speed unless acted upon by an unequal force.

If no force acts on a moving object, the object will continue moving at the same speed in the same direction. If the object is stopped, it will remain still.

Once an object is moving at a steady speed in a straight line, it will continue moving at a steady speed in a straight line. Once an object is standing still, it will stay still.

Newton's Second Law of Motion

$$\text{Force} = \text{Mass} \times \text{Acceleration}$$

The acceleration of an object is directly proportional to the size of the force producing the acceleration and inversely proportional to the mass of the body.

An object accelerates because a force acts upon it. The mass of an object affects the amount of acceleration a certain force has.

An object accelerates in the direction that you push it.

For example, if you push twice as hard, it accelerates twice as much. If the object's mass increases by twice, it accelerates half as much.

Newton's Third Law of Motion

For every action, there is an equal and opposite reaction.

For every force there is an equal and opposite force.

If you push on an object, it pushes back on you.