

Newton's Three Laws of Motion

First Law (Law of Inertia)

An object at rest remains at rest and an object in motion remains in motion

unless acted upon by an unbalanced force.

Second Law ($F=ma$) ($a = \frac{F}{m}$)

When unbalanced forces act upon an object, the object will accelerate in the direction

of the net force. $F \propto a$ $\uparrow\uparrow$ $\downarrow\downarrow$ directly ^{proportional}
 $a \propto \frac{1}{m}$ $\uparrow\downarrow$ $\downarrow\uparrow$ inversely _{proportional}

Third Law (action-reaction pairs)

When two objects interact, the force one exerts on the other is equal in magnitude and opposite in direction.

$$|F_1| = |F_2|$$
$$m_1 a_1 = -m_2 a_2$$