Physics - Newton's Laws of Motion

Topics : Computer engineering
Written on March 18, 2024

1. **Newton's First Law of Motion (Law of Inertia):**
    - **Definition:** An object at rest will remain at rest, and an object in motion will continue to move at a constant velocity unless acted upon by an external force.
    - **Example:**
        - A book sitting on a table remains stationary until someone applies a force to move it.
        - A moving car continues to move forward until the brakes are applied.
2. **Newton's Second Law of Motion (Law of Acceleration):**
    - **Definition:** The acceleration of an object is directly proportional to the net force acting on it and inversely proportional to its mass. This can be expressed mathematically as F = ma, where F is the net force, m is the mass, and a is the acceleration.
    - **Example:**
        - Pushing a shopping cart with a greater force causes it to accelerate more rapidly.
        - It requires more force to push a heavy box than a light one to achieve the same acceleration.
3. **Newton's Third Law of Motion (Action and Reaction):**
    - **Definition:** For every action, there is an equal and opposite reaction. When one object exerts a force on a second object, the second object exerts an equal and opposite force on the first object.
    - **Example:**
        - When you push against a wall, the wall exerts an equal and opposite force back on you, preventing you from passing through.
        - Swimming: When a swimmer pushes backward against the water with their arms and legs (action), the water exerts an equal and opposite force forward, propelling the swimmer forward (reaction).