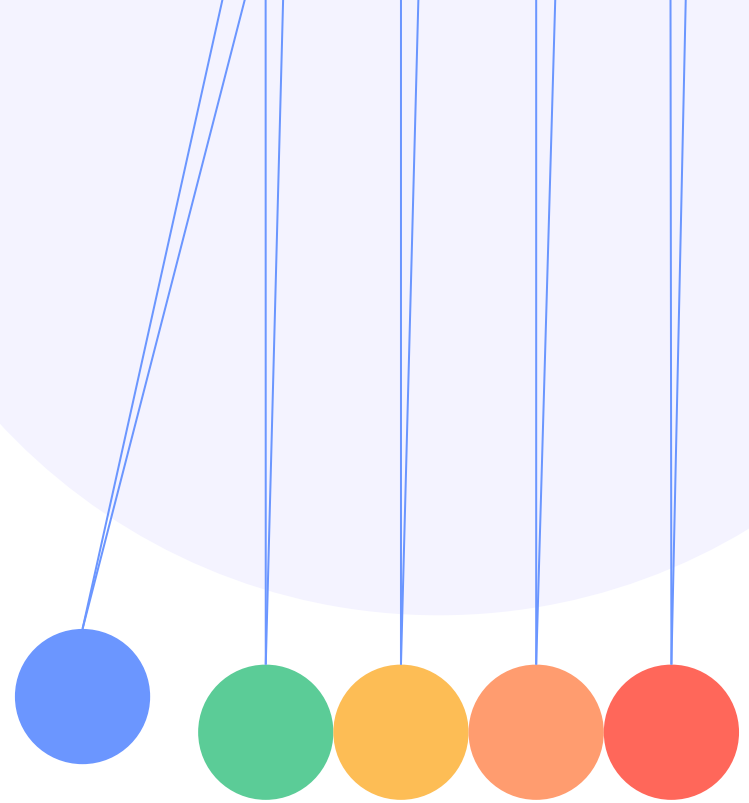


Physics: Newton's Laws



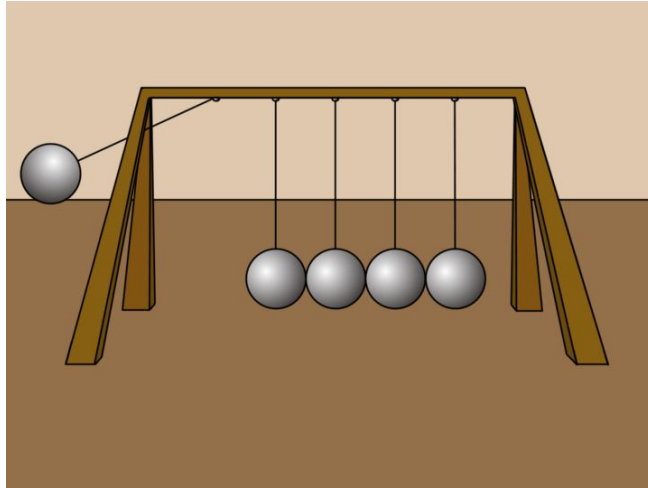
NEWTON'S LAWS OF MOTION



Introduction

Objective: Our mission today is to comprehend the fundamental principles governing the motion of objects around us.

Explanation: Whether it's a ball rolling down a hill or a bird soaring through the sky, everything follows the laws of physics!

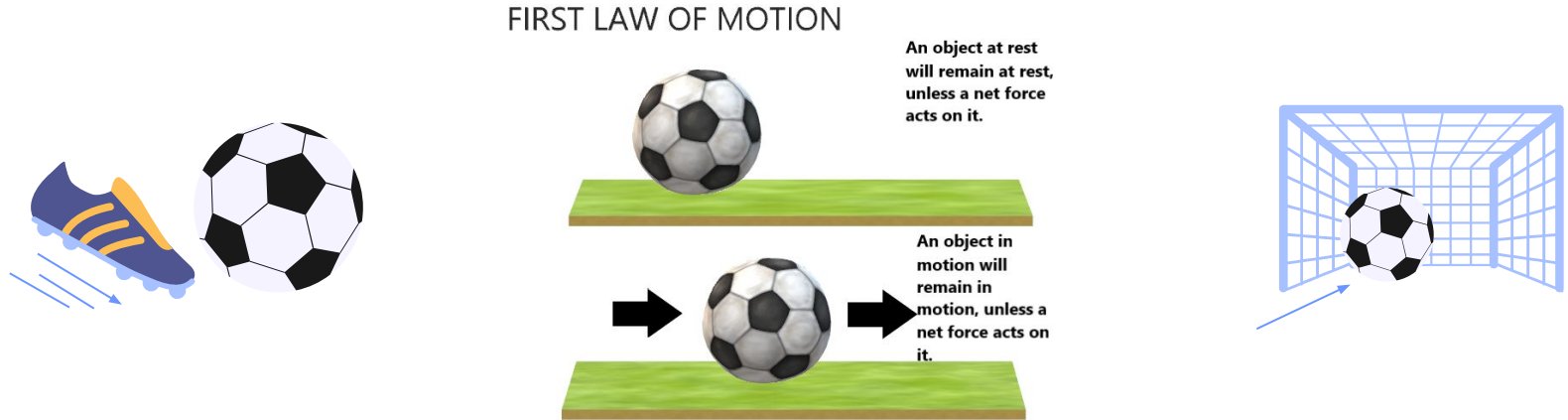


Newton's First Law

Law of Inertia: Objects at rest tend to stay at rest, and objects in motion tend to stay in motion unless acted upon by an external force.

Explanation: This law describes the tendency of objects to resist changes in their state of motion.

Example: Consider a soccer ball lying on the ground. It remains still until someone kicks it, demonstrating the concept of inertia.



Newton's Second Law

Law of Acceleration: The acceleration of an object is proportional to the net force acting on the object and inversely proportional to the mass of the object.

Formula $F = ma$ (force = mass \times acceleration)

Explanation: Acceleration is directly proportional to the net force acting on an object and inversely proportional to the mass of the object: This law quantifies the change in motion of an object when a force is applied.

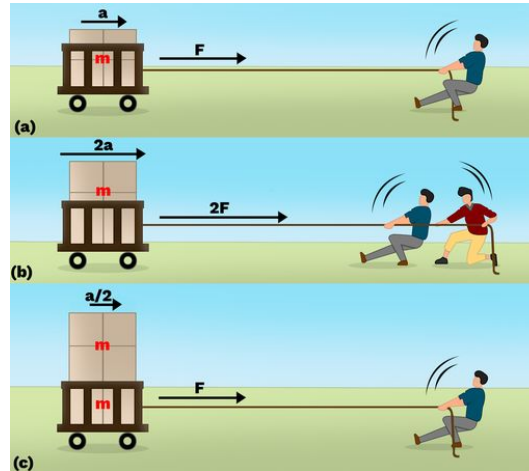
Example: It takes more force to push a heavy box than a light box because the heavier object has more inertia.

Newton's Second Law (Cont.)

Acceleration Direction: The direction of acceleration is determined by the direction of the net force applied to the object.

Explanation: When a force is applied to an object, it accelerates in the direction of that force.

Example: Pushing a toy car forward results in acceleration in the same direction as the applied force.

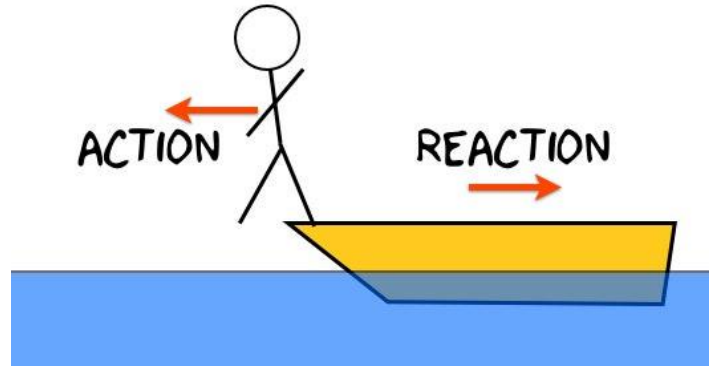


Newton's Third Law

Action-Reaction: For every action, there is an equal and opposite reaction.

Explanation: This law describes the reciprocal nature of forces between interacting objects.

Example: When you jump off a diving board, your action pushes the board downward, and in return, the board pushes you upward, propelling you into the air.



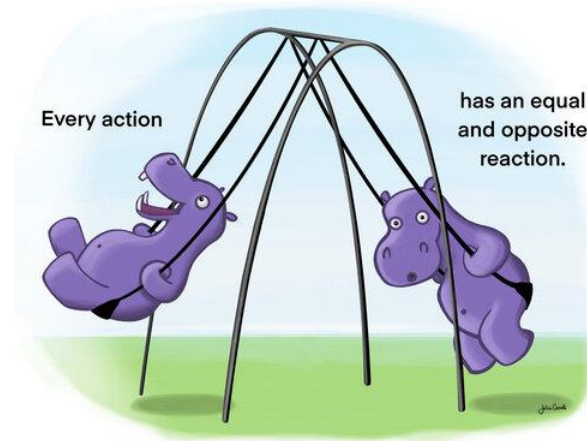
Applications of Newton's Laws

Everyday Examples: Newton's laws are manifested in numerous everyday scenarios that affect how we experience and interact with the world around us.

For example

Riding a bicycle: Pedaling exerts a force on the wheels of a bicycle that propels it forward (Newton's second law).

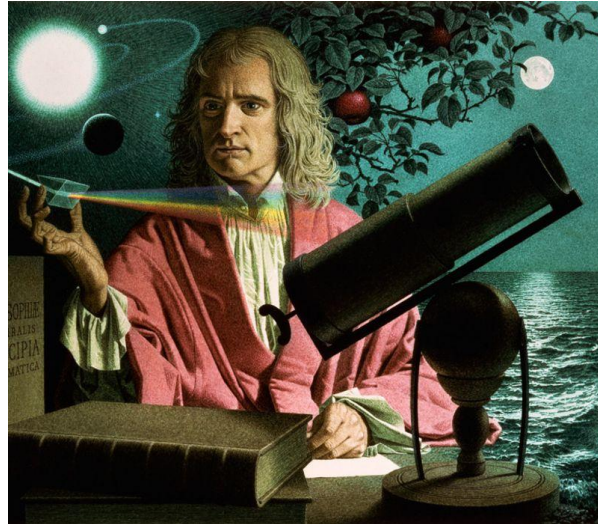
Swinging on a swing: Your initial push starts you moving and inertia keeps you swinging (Newton's first law).



Forces in Action

TYPES OF FORCES: Forces are fundamental to understanding the behavior of moving and stationary objects.

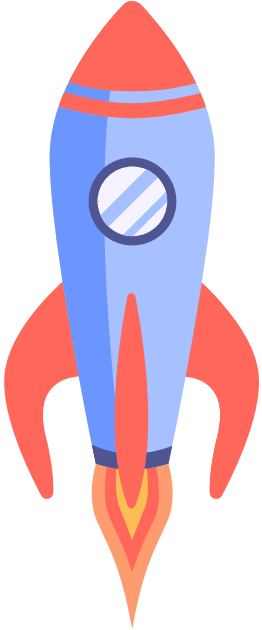
Explanation: Various forces, such as gravity, friction, and magnetism, play a vital role in the dynamics of our physical world.



QUICK QUIZ

Can you recall the formula for Newton's Second Law?

You Did it !



$$F=ma$$

Where:

F represents the force applied to the object

m represents the mass of the object

a represents the acceleration of the object

