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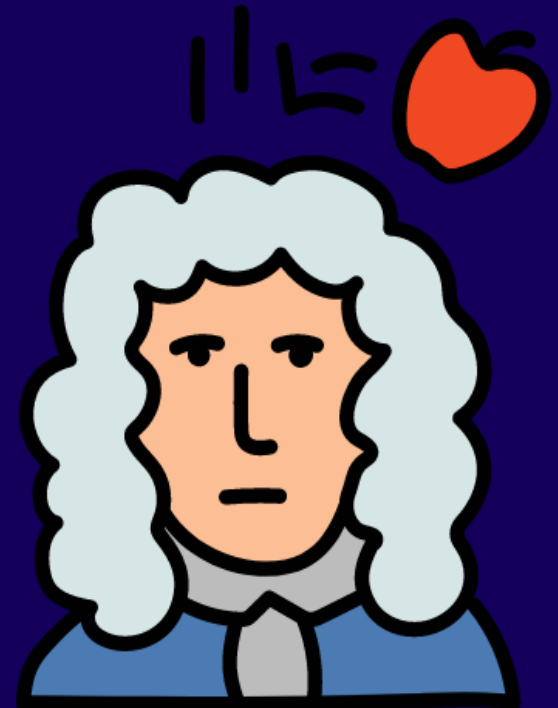
Newton's Law Of Motion

फल टूट कर नीचे ही क्यों गिरते हैं ? जवाब है धरती का गुरुत्वाकर्षण बल





Newton's Law & Its Real-Life Applications





LAW'S OF MOTION



First Law

Every body remains in a state of rest or uniform motion unless acted upon by a **net external force**.



Second Law

The amount of acceleration of a body is proportional to the acting force and inversely proportional to the mass of the body.

$$F = ma$$



Third Law

For every action there is an equal but opposite reaction. If an object A exerts a force on object B, then object B will exert an equal but opposite force on object A.



**NEWTON'S
FIRST LAW OF
MOTION**



An object at rest will remain at rest



Unless acted on by an unbalanced force



An object in motion will continue with constant speed and direction unless acted on by unbalance force



**NEWTON'S
SECOND LAW
OF
MOTION**

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

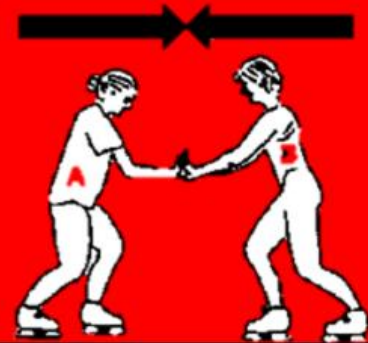
FORCE



ACCELERATION

**NEWTON'S
THIRD LAW OF
MOTION**

For every action force, there is a reaction force equal in strength and opposite in direction



Newton's laws of motion in physics

LAW #1

A body at rest will remain at rest, and a body in motion will remain in motion unless it is acted upon by an external force.

LAW #2

The force acting on an object is equal to the mass of that object times its acceleration, $F = ma$.

LAW #3

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



Newton's First Law

Applied to Rocket Liftoff



"Every object persists in its state of rest or uniform motion in a straight line unless it is compelled to change that state by forces impressed on it."

Before firing:

Object in state of rest, airspeed zero.

Engine fired:

Thrust increases from zero.

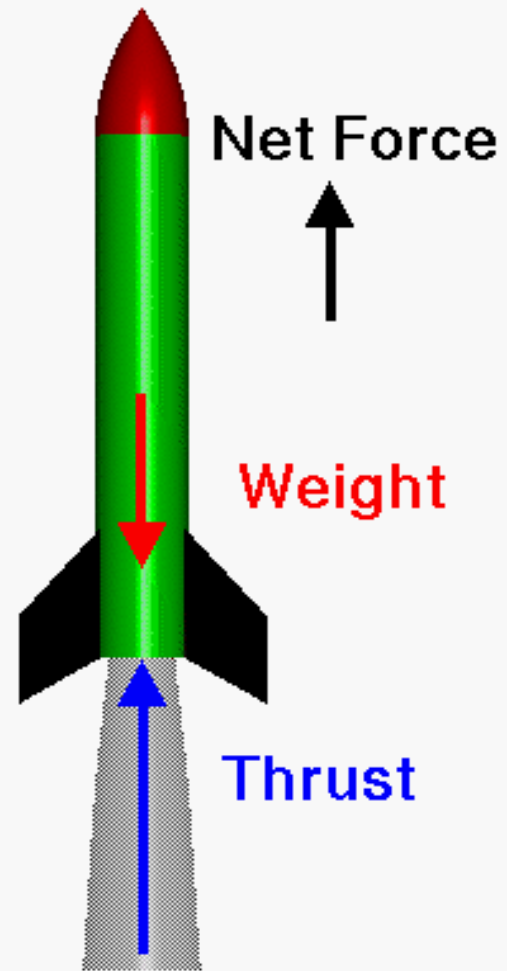
Weight decreases slightly as fuel burns.

When Thrust is greater than Weight:

Net force (Thrust - Weight) is positive upward.

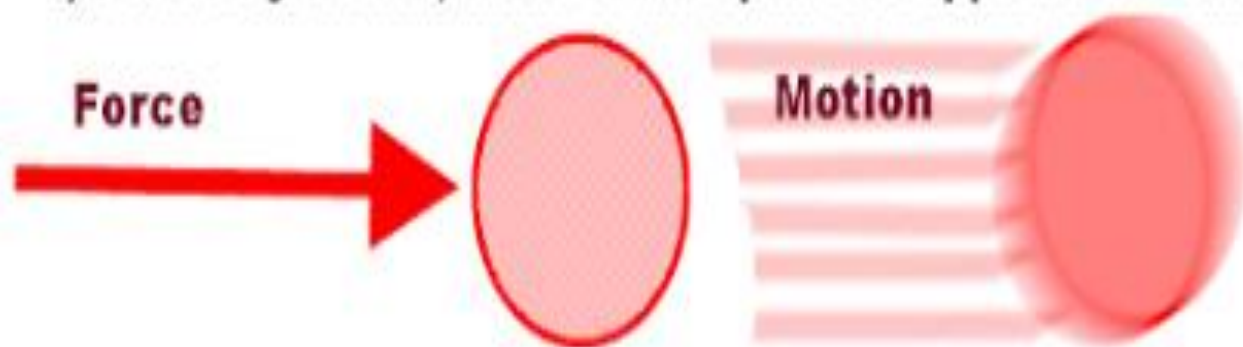
Rocket accelerates upward

Velocity increases



Newton's Laws of Motion

- 1) An object continues in its state of rest or motion unless an external force is applied to it
- 2) The greater the mass of an object, the greater the amount of force is needed to accelerate it
- 3) For every action, there is an equal and opposite reaction



Newton's Laws

- 1) An object's motion is uniform until acted on by a Force
- 2) Acceleration of an object is directly proportional to mass and Force
$$F = m \cdot a$$
- 3) For every action there is an equal and opposite reaction

1

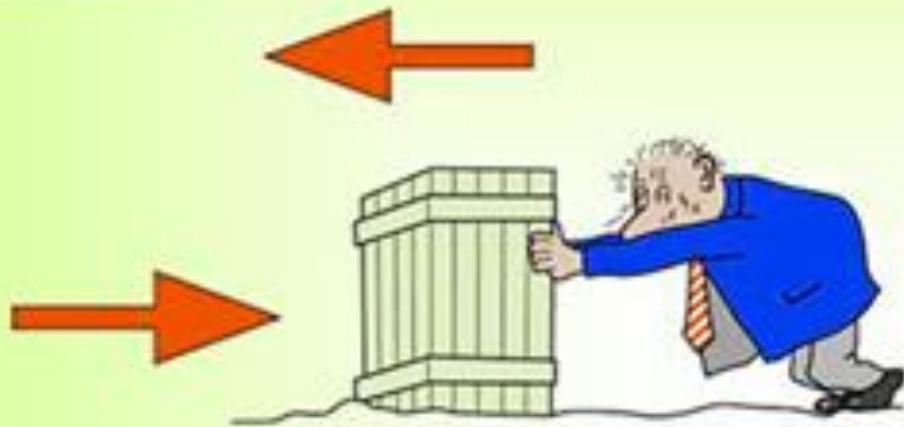
A stationary object will remain stationary and an object in uniform motion will continue its uniform motion unless a force is applied to it.

2

The rate of change of momentum of a body is proportional to the applied force acting on it and the change of momentum also takes place in the direction in which the force acts.

3

When an object applies a force on another object, then the object also applies a force of equal magnitude on the first object but in the opposite direction.



Sliding Friction



Rolling Friction