

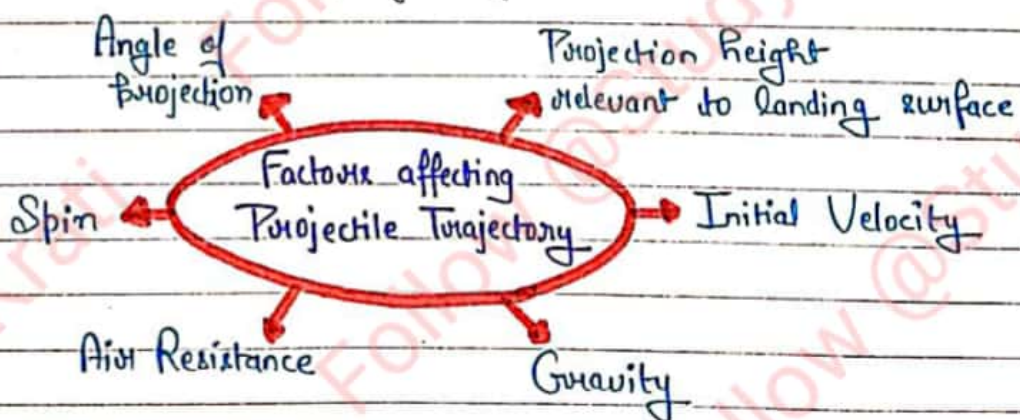
# KINESIOLOGY, BIOMECHANICS & SPORTS

Kinesiology → The term Kinesiology means 'the study of movement'. It is the branch of Physiology that studies mechanics and anatomy in relation to human movement.

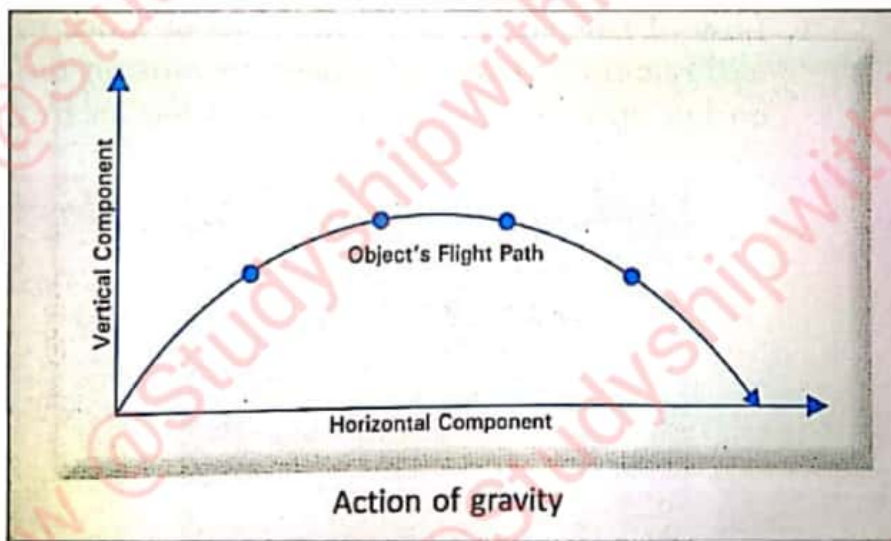
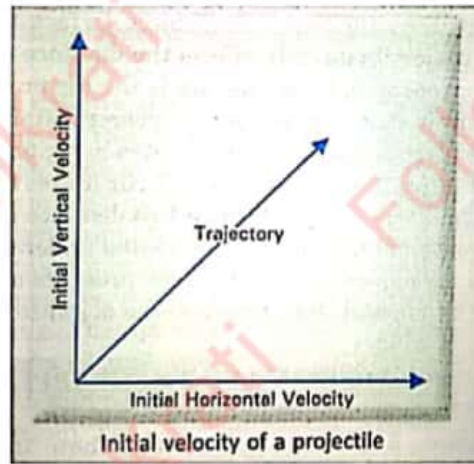
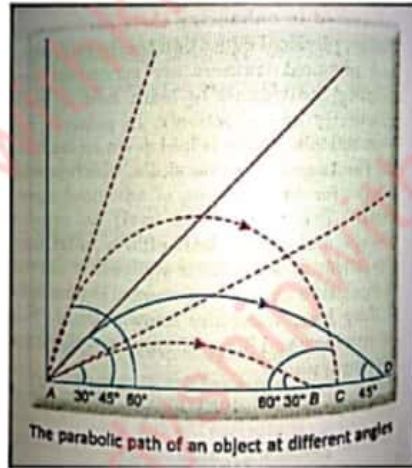
Biomechanics → It is the study of forces and their effects on living system.

## PROJECTILE

An object thrown into the space either horizontally or at an acute angle under the action of gravity is called a projectile.







## Newton's Law Of Motion

### Law of Inertia

A body at rest and at motion will remain at rest or in motion respectively until unless an external force acts upon it."

### Law of acceleration

"A change in the acceleration of an object is directly proportional to the force producing it and inversely proportional to its mass."

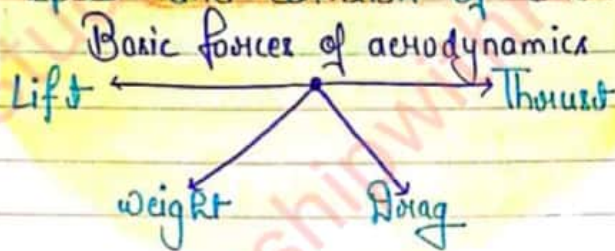
### Law of Reaction

"For every action, there is always an equal and opposite reaction"



## AERODYNAMICS PRINCIPLES

Aerodynamics is related to the flow of air around a projectile, which can influence speed and direction of the object.



## FRICTION

Force of friction is the force that develops at the surface of contact of two bodies and opposes their relative motion.

### Types Of Friction

#### Static friction

The opposing force that comes into play when one body tends to move over the surface of another, but the actual motion has not yet started.

#### Dynamic friction

The force that comes into play when one body is actually moving over the surface of another body.

#### Sliding friction

It comes into play when one body is sliding over another.

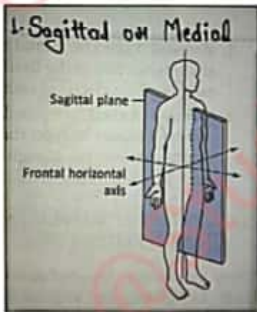
#### Rolling friction

It comes into play when one body is rolling over another.

# PLANE

An imaginary, flat surface passing through the body or organ is called plane.

## Types Of Planes



# AXIS

Sagittal axis

Sagittal axis passes from front to back

Frontal Axis

Frontal axis passes from side to side

Vertical Axis

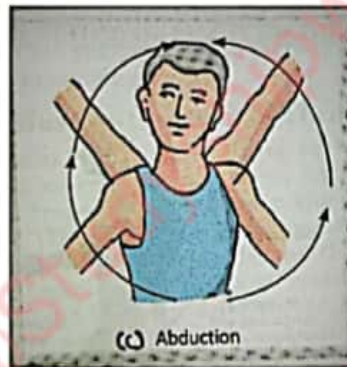
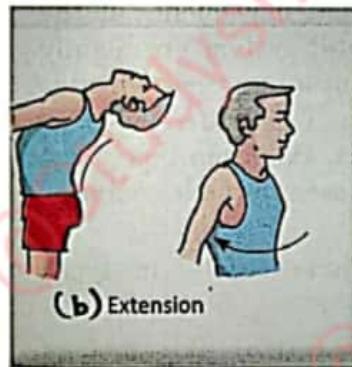
It passes straight through the top of head down between feet.



## MOVEMENTS

1. Gliding Movement → It takes place in a joint, one surface gliding over another without any angular or rotatory movement.

2. Angular Movement → It occurs between long bones which leads to change in angle between bones. These are of four types.



3. Circumduction → Compound circular movement which involves flexion, extension, adduction, and abduction. (for ex- moving a finger in a circular motion without moving the hand)

4. Rotation → Moving a part around an axis (e.g. twisting the head from side to side).

5. Other movements → Hyperextension, Dorsiflexion, Plantar flexion, Inversion, Protraction, Retraction, Elevation, Pronation, Depression, Supination, Eversion

# INVOLVEMENT OF MUSCLES

