

Physics Assignment – 1

Physics Assignment: Forces in Sports & Light and Shadows

Topic 1: Forces in Sports

In sports, physics plays a crucial role, particularly the concept of force. Force is a push or pull acting upon an object resulting from its interaction with another object.

1. **Football Kick** – When a player kicks a football, they apply a muscular force. The direction and magnitude of the force determine how far and fast the ball travels. Newton's Second Law ($F = ma$) is at play here.
2. **Cricket Batting** – A batter applies force through the bat to the ball. The more massive the bat and the faster it moves, the greater the force transferred to the ball, changing its velocity.
3. **High Jump** – Athletes use ground reaction force to propel themselves upward. As they push down on the ground, the ground pushes back with an equal and opposite force (Newton's Third Law), allowing the jump.

Topic 2: Light and Shadows

Light and shadows are fundamental in understanding optics and how we see objects.

1. **Shadow of a Tree** – During sunlight, a tree blocks the path of light and forms a shadow. This is an example of **rectilinear propagation** of light.
2. **Pin-Hole Camera** – A small hole allows light from an object to pass and form an inverted image. This shows that light travels in straight lines.
3. **Solar Eclipse** – Occurs when the Moon comes between the Sun and Earth, casting a shadow on Earth. This is a real-world example of **umbra** and **penumbra** zones.

These topics help us see how basic physics concepts explain daily phenomena and enhance our understanding of the world around us.