ODM EDUCATIONAL GROUP
Changing your Tomorrow

FORCE AND LAWS OF MOTION

CHAPTER NO.9

SUB: PHYSICS

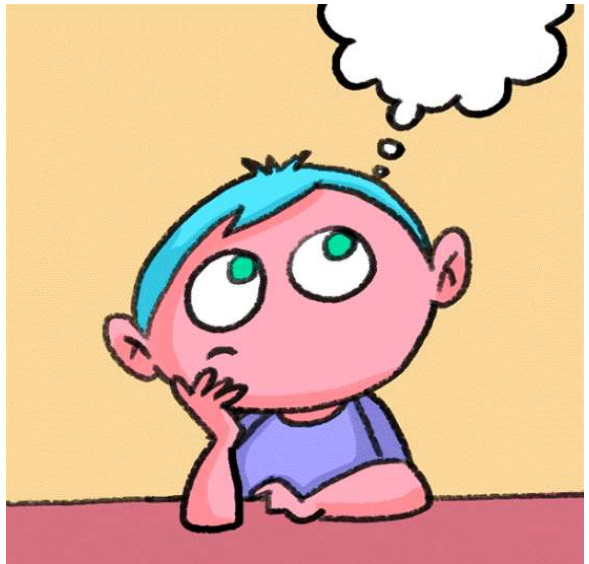
FORCE AND LAWS OF MOTION

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: **1800 120 2316**
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

LEARNING OBJECTIVE

The students will be able to

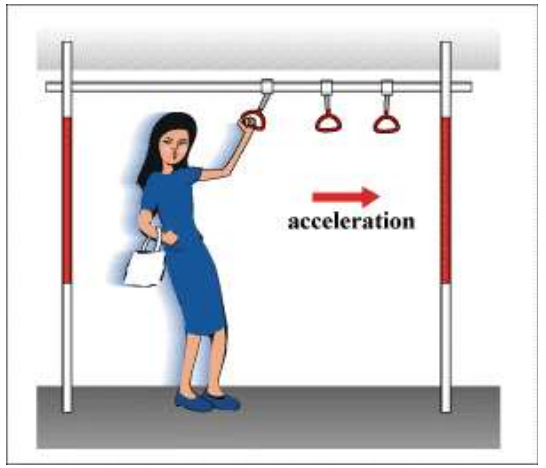
- Define inertia
- State the 1st law of motion

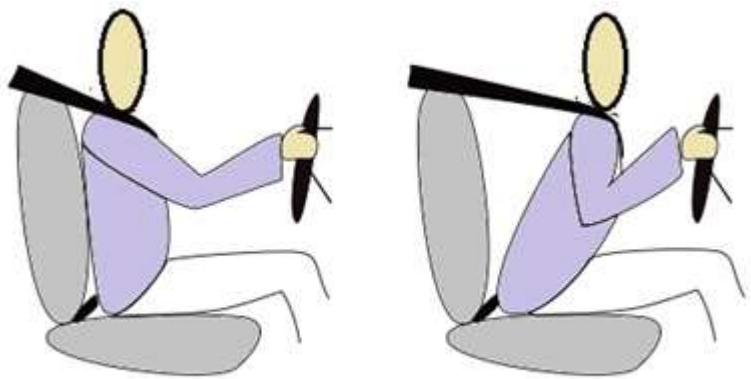


ODM EDUCATIONAL GROUP
Changing your Tomorrow

Inertia

Definition: Inertia is a property or tendency of every object to resist any change in its state of rest or of uniform Force and Laws of Motion.
It is measured by the mass of an object. The heavier the object, the greater will be its inertia.





Because of inertia you feel jerk when brakes are applied

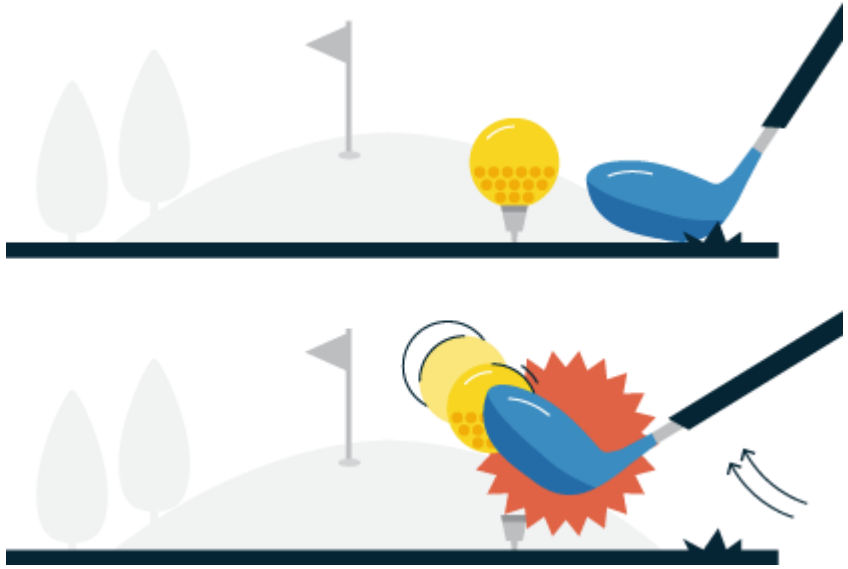
ODM EDUCATIONAL GROUP
Changing your Tomorrow

Inertia and Mass

- The inertia of an object is dependent upon its mass.
- Lighter objects have less inertia, that is, they can easily change their state of rest or motion.
- Heavier objects have large inertia and therefore they show more resistance.
- Hence ‘Mass’ is called a measure of the inertia of an object.

Newton’s First Law of Motion or Law of Inertia

It states that any object will remain in the state of rest or in uniform motion and Laws of Motion along a straight line until it is compelled to change the state by applying external force.



Application of Newton's first law of Force and Laws of Motion:

- When a straight moving bus suddenly stops down, the passengers sitting inside fall in the forward direction. This is because the body of the passenger initially moving in a straight line tends to move the same way even after the brakes are applied, making the passenger fall in the forward direction.
- When we hit a carpet it loses inertia of rest and moves. But the dust in it retains inertia of rest and is left behind. Thus dust and carpet are separated.
- When a tree is shaken, it moves to and fro. But fruit remains at rest due to its inertia of rest. Due to this fruit breaks off the tree.

Newton’s First Law of Motion

HOME ASSIGNMENT

1. Which of the following has more inertia: (a) a rubber ball and a stone of the same size? (b) a bicycle and a train? (c) a five rupees coin and a one-rupee coin?
2. Explain why some of the leaves may get detached from a tree if we vigorously shake its branch.
3. Why do you fall in the forward direction when a moving bus brakes to a stop and fall backwards when it accelerates from rest?

THANKING YOU
ODM EDUCATIONAL GROUP

ODM EDUCATIONAL GROUP
Changing your Tomorrow