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## **Class 7<sup>th</sup>** **Chapter – 9**

# **MOTION**

# **AND**

# **TIME**

## **MOTION**

**An object is said to be in motion if it changes its position with respect to time. For example: A car moving on a road.**

## **SPEED**

**The distance covered by an object in a unit time as the speed of the object. The speed is the total distance covered divided by the total time taken. Thus,**

$$\text{Speed} = \frac{\text{Total Distance Covered}}{\text{Total Time taken}}$$

## **UNIFORM MOTION**

**An object moving along a straight line with a constant speed is said to be in uniform motion.**

## **NON - UNIFORM MOTION**

**If the speed of an object moving along a straight line keeps changing, its motion is said to be non-uniform.**

## **TYPES OF MOTION**

**TRANSLATIONAL MOTION: - A motion in which all parts of body move in the same direction and cover equal distance in a given interval of time. Two types of Translational motion are (i) Rectilinear and (ii) curvilinear motion**

**Rectilinear motion: An object is said to undergo rectilinear motion when it travels along a straight line path. Eg. A car moving along a straight road.**

**Curvilinear motion:** - When an object moved along a curved path, then it is said to be curvilinear motion. Eg. A car taking a turn on a curved road.

**Rotational motion:** An object is said to undergo rotational motion when it spins on its axis. Eg. Motion of a bicycle wheel.

**Circular motion:** When an object moves along a circular path, it is said to be in circular motion. Eg motion of earth around the sun.

**Periodic motion:** Motion that repeats itself after a fixed interval of time.

**Random motion:** - When a body move in different direction and does not have fixed path.

**Vibratory motion:** - A type of motion in which a particle vibrates about a fixed point.

**Oscillatory motion:** - A type of motion in which a particle moves to and fro about a fixed point.

## **MEASUREMENT OF TIME**

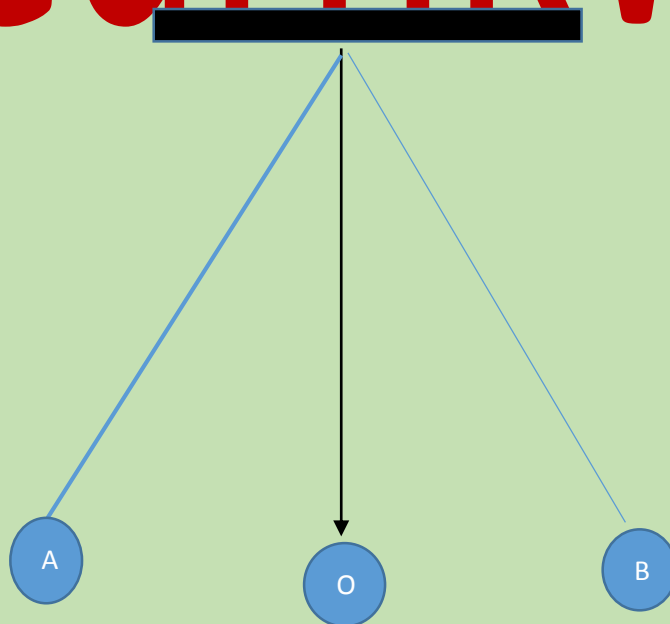
**Clocks or watches are perhaps the most common time measuring devices. The working of clocks is rather complex. But all of them**

**make use of some periodic motion. One of the most well-known periodic motions is that of a simple pendulum.**

**A simple pendulum consists of a small metallic ball or a piece of stone suspended from a rigid stand by a thread. The metallic ball is called the bob of the pendulum.**

**The pendulum at rest in its mean position. When the bob of the pendulum is released after taking it slightly to one side, it begins to move to and fro. The to and fro motion of a simple pendulum is an example of a periodic or an oscillatory motion.**

**The pendulum is said to have completed one oscillation when its bob, starting from its mean position O, moves to A, to B and back to O. The pendulum also completes one oscillation when its bob moves from one extreme position A to the other extreme position B and comes back to A. The time taken by the pendulum to complete one oscillation is called its time period.**



## **Units of time and speed**

**The basic unit of time is a second. Its symbol is s. Larger units of time are minutes (min) and hours (h).**

**Since the speed is distance/time, the basic unit of speed is m/s. It could also be expressed in other units such as m/min or km/h.**

## **SPEEDOMETER AND ODOMETER**

**Speedometer records the speed directly in km/h. There is also another meter that measures the distance moved by the vehicle. This meter is known as an odometer.**

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