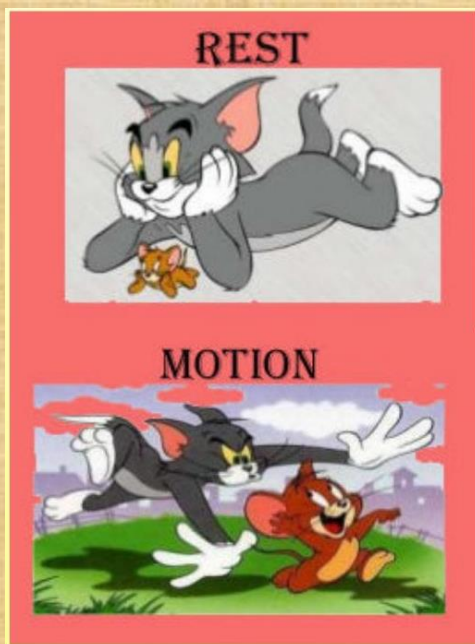


Chapter 04

Motion and Time

Motion and Rest:

In our life, motion is a common experience and daily we see many things moving around. We also see things without any movement. We have two states of objects to learn about. Rest and Motion are the two states of objects.



Motion:

A body said to be in motion if it changes its position with respect to its surroundings.

Ex: A car running on the road is in motion with respect to the trees on the roadside. Blades of a rotating fan, a flying bird, a walking man, a moving train, a sailing ship, blood flowing in veins and arteries are some of the examples of motion.

EXAMPLES FOR THE STATE OF MOTION



Sea Surfing



High Speed Train



Snowboarding

Hence, the position of a body with respect to its surroundings changes with time and the body said to be in motion.

Rest:

A body said to be at rest if its position does not change with respect to its surroundings.

Ex: A book lying on a table will not change its position if it is not disturbed. It is in a state of rest.

Blackboard in a classroom, benches in the park all are examples of state of rest.

EXAMPLES FOR THE STATE OF REST



Tools lying on the floor



Bench in the Park



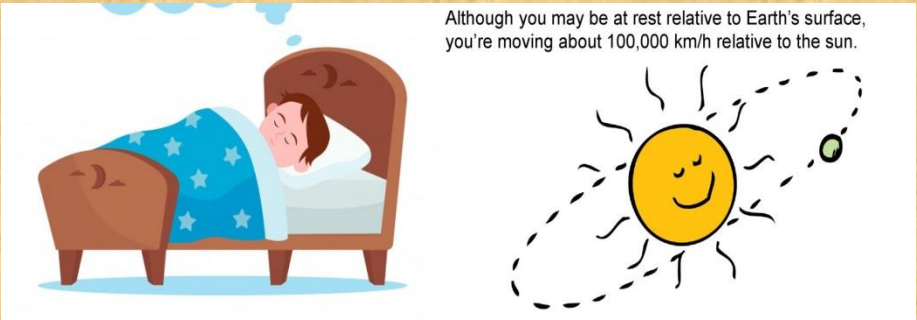
Books on the table

Therefore, when the position of a body with respect to its surroundings does not change with time, the body said to be at rest.

Rest and Motion are relative:

A body can be at rest and motion at the same time.

Ex: You are lying on your bed in bedroom. All the objects inside the room appear to be in rest. The room is on earth and earth itself is always in motion by revolving around the sun. Thus along with earth, you and your room are also revolving around the sun. In relation to the sun, you and objects in your room said to be in motion.



Thus, a body in motion with respect to a set of objects can appear at state of rest at the same time with respect to another set of objects. This way the body can be at rest or in motion at the same time. It is an observer, and surroundings decide whether a given object is at rest or in motion.

Uniform Motion and Non-uniform motion:

- A body said to have a uniform motion if it covers equal distances in equal intervals of time.

Ex: A boy walking on a straight road at constant speed.

- A body said to have a non-uniform motion if it covers unequal distances in equal intervals of time.

Ex: A car moving in a crowded road.

Types of Motion:

Various objects can have different types of motion. Few objects move up and down, few move in straight path and few move in 'to' and 'fro'. Depending on the path taken by object, they are classified.

Translatory Motion:

The motion in which all the particles of a body move through the same distance in same time is translatory motion.

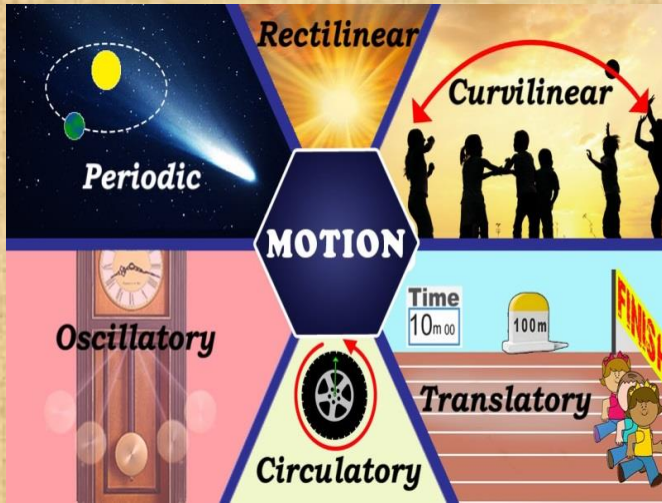
Ex: Coins tossed in the air.

- If a body in translatory motion moves along a straight line, then the motion is **rectilinear motion**.

Ex: An athlete running on a straight path.

- b) If a body in translatory motion moves along a curved path then the motion is **curvilinear motion**.

Ex: A car running on a curved road.



Types of motion

Rotatory Motion:

The motion of all particles of a moving body, follow a circular path with respect to a fixed center or axis of rotation is rotatory motion. **Circular motion** is a special type of rotatory motion.

Ex: The blades of a fan, wheel of a moving vehicle, potter's wheel.

Oscillatory Motion:

The 'to' and 'fro' or back and forth motion of an object about a fixed point along the same path is called oscillatory motion.

Ex: The pendulum of a clock, a child on a swing.

These, are the different types of motion we generally come across in our daily life.