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STUDY MATERIAL SCIENCE CLASS-VII

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▸ 13. MOTION & TIME

Measurement of time :

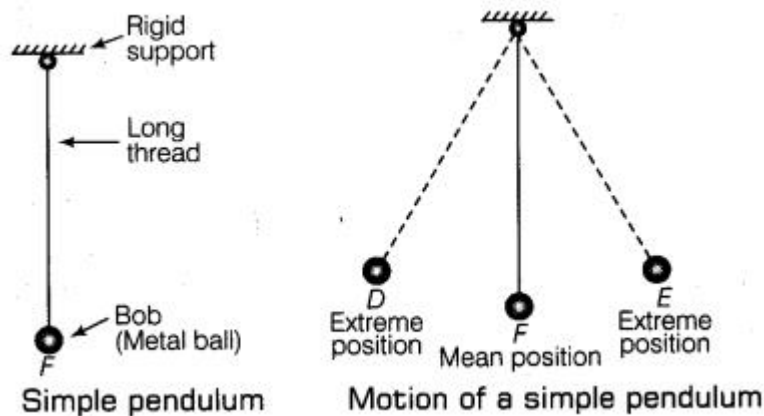
A duration or moment in which things occur is known as **time**. With the help of clocks and watches, we measure time.

In order to measure the time, ancient people used some natural events which repeated regularly after fix time intervals. **e.g.** they found that the sun rises every day in the morning. So, the time between one sunrise and the next one was known as a day. In a similar manner, time from one full moon to the next full moon was. called a month. A year was fixed as the time taken by the earth to complete one revolution of the sun.

Many time measuring devices were used in different parts of the world before the pendulum clocks became popular later. The device which measures time by the position of the shadow cast by the sun is known as **sundial**. **Sand clock** uses the flow of sand from one glass bulb to another in order to measure time. The **water clock** uses the rate at which water drip from one vessel to another for measuring the time interval.

Simple Pendulum :

A simple pendulum consists of a small metal ball called **bob** which is suspended by a long thread from rigid support. 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 **periodic or oscillatory motion**.



The pendulum is said to have completed one oscillation when its bob starting from its mean position F, moves to D, to E and back to F. The pendulum also completes one oscillation when its bob moves from one extreme position D to the other extreme position E and come back to D.

So, the time taken by the pendulum to complete one oscillation is called its **time period**. The time period of a pendulum depends on its **length**. The length of a pendulum is the **length of thread** from the point of suspension to the centre of the bob.

***NOTE :** Galileo was the first person to study the motion of a pendulum. He experimented with various pendulums to verify his observation. He found that a pendulum of a given length takes always the same time to complete one oscillation.

This observation led to the development of pendulum clocks. Winding clocks and wristwatches were refinements of the pendulum clocks.

► **ASSIGNMENT :**

1. How does the time was measured by the ancient people before the invention of pendulum clock?
2. What is sundial?
3. What is a simple pendulum consists of? How does it perform motion?
4. Explain the motion of simple pendulum with diagram.
5. What was the experiment of Galileo?