sns academy

an International CBSE Finger Print School
Coimbatore

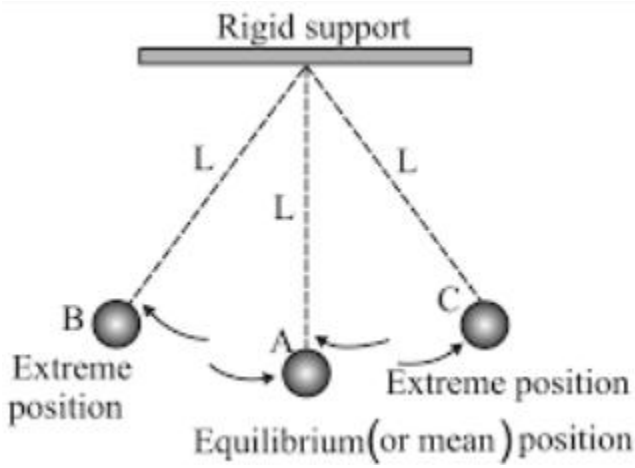
Time and motion

I Word focus

- Motion
- Time
- Speed
- Distance
- Pendulum
- Periodic motion
- Speed = Distance ÷ Time
- Stopwatch
- Distance-time graph

II KWL
III Concept map
IV Q and A

1. Explain the working of a simple pendulum and define its time period.



A **simple pendulum** is a device that consists of a small, heavy object called a **bob**, which is suspended from a fixed point by a **string or rod**. It can swing freely back and forth in a regular path. The working of a pendulum is based on **periodic motion**, which means the motion repeats itself after a fixed interval of time.

Working of a Simple Pendulum:

- When the pendulum is at rest, it hangs straight down (its **mean position**).

- If the bob is gently pulled to one side and released, it starts to swing back and forth. This back-and-forth motion is called **oscillation** or **vibration**.
- This motion continues until friction and air resistance slow it down and it stops.

Time Period of a Pendulum:

The **time period** of a pendulum is the **time it takes to complete one full oscillation** — that is, from the starting point to one side, back to the other side, and returning to the starting point.

Time Period (T) = Total Time for 'n' Oscillations ÷ Number of Oscillations

Factors Affecting the Time Period:

- **Length of the string**: Longer string = longer time period.
- **gravity**
- **NOT affected by**: Mass of the bob

2. Distinguish between uniform and non-uniform motion with examples.

Feature	Uniform Motion	Non-uniform Motion
Definition	Equal distance in equal time intervals	Unequal distance in equal time intervals
Speed	Constant	Changes (increases or decreases)
Example	Car moving at 60 km/h on highway	Bike moving in traffic (slowing and speeding)
Graph	Straight line on distance-time graph	Curved or irregular line on graph
Calculation	Speed easy to calculate	Speed varies—difficult to calculate one fixed value

3. Describe the traditional methods used by people in ancient times to measure time. Give examples.

1. Sundial

- The **sundial** is one of the oldest known instruments to measure time.
- It consists of a **flat plate** with hour markings and a **stick (called a gnomon)** fixed in the center.
- As the **sun moves across the sky**, the stick casts a **shadow** on the plate.
- The position of the shadow shows the approximate time of day.
- It worked only when there was sunlight and could not be used at night or during cloudy weather.

2. Hourglass

- An **hourglass** is made of two glass bulbs connected by a narrow neck.
- One bulb is filled with **fine sand** which slowly trickles down to the lower bulb.
- The **amount of sand** that flows in a specific time (like 1 minute or 5 minutes) is used to measure time.
- It was used in **ancient ships**, **kitchens**, and for **timing speeches or prayers**.

4. Graph question
5. Numericals