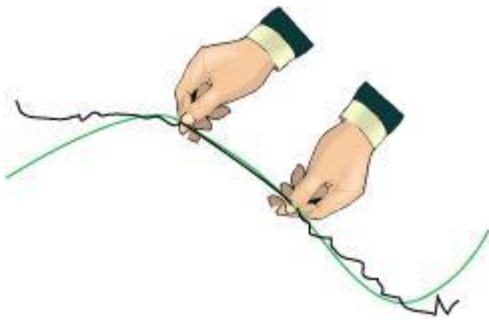


Motion and Measurement of Distances

- The ancient people use hand-span, foot-span, finger width, palm length, the distance of a step, etc. as a units of measurements. All of them are non- standard methods of measurement.
 - This types of measurements are not accurate.
 - The measurement of a quantity is expressed in two parts, one part is a number and the other part is the **unit** of measurement.
 - To measure various quantities such as distance, height, width, weight, etc., a standard system of measurement is needed.
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- Now we use **International system of units (SI)** is used as standard units all over the world.
 - **Metre (m)** is the SI unit of length.
 - $1\text{m} = 100\text{ cm} = 1000\text{ mm}$ and $1\text{m} = \frac{1}{1000}\text{ km}$
 - In our daily life we use various types of measuring devices such as metre scale, measuring tape, metre rod etc.
 - The use of a measuring instrument depends on the nature of object and the type of surface of object.
 - The length of a **curved line** can be measured with the help of a thread by placing the thread along the curve line, then measuring the length of thread with the help of metre scale.



- Motion of an object is the **change in its position with time**.
- **Types of motion:**
 - If the object moves in a line such that each point of the object covers equal distance in equal time, the object is said to posses **translatory motion**.

- When an object moves along a straight line, it possesses **rectilinear motion**. For example- Motion of car moving on straight road.
- An object moving in a curve path is said to possess **curvilinear motion**. For example - A car moving in a curvy path
- When there is a change in speed of object moving in a straight line, it is called **non-uniform rectilinear motion** (for example a launching rocket) and when there is no change in the speed of the object, it is called **uniform linear rectilinear motion**(for example a moving convoy).
- When the distance of the object from a fixed point remains constant, it possesses **circular motion**. For example- Motion of electric fan.
- When an object repeats its motion after a fixed time, it possesses **periodic motion**. For example - Motion of a pendulum.
- The motion which does not repeat itself after regular interval of time is called **non-periodic motion**. For example-An athlete running on a field
- When the movement of object swings about a mean position, it possesses **oscillatory motion**. For example - Motion of a swing.
- Vibratory motion is a kind of oscillatory motion in which a part of body always remains fixed and the rest part moves to and fro about the fixed position. Also, in vibratory motion, the shape and size of the body changes. For example- Expansion and contraction of our chest.
- When the motion of path does not follow any path and its speed and direction changes continuously, it possesses **random motion**. For example- the movement of fishes.
- The motion of a ball rolling on the ground is a combination of rectilinear as well as rotational motion.
- The fastness or slowness of the movement of an object is determined by measuring the distance traveled with time.