Transport System History

- Until the beginning of the 19th century, people used animals, boats and ships to transportation.
- The invention of steam engine led to the development of Railroads for steam engine driven carriages and wagons.
- Then came the automobiles like motor cars, buses and trucks.

Length and Distance

- Length is the distance between two points. Distance is the Length of the space between two places or points.
- Basically, length denotes how long an object is while Distance gives the information as to how far two things are.
- In early days, before the invention of scales, length was measured using wooden sticks, threads or strings.
- Similarly, distance was measured in days or the time taken to reach from one place to another.

Measurement

- Measurement is the comparison of an unknown quantity with a known quantity. The known quantity is called the unit.
- The traditional ways of measuring length consist of hand – span, forearm length or footstep but these lack uniformity because these differ from person to person.
- People used foot as a unit of length in different parts of the world.
- Cloth was measured in yard which is the distance between their outstretched arm and their chin.
- But all the above cannot be used as a standard unit of measurement.
- A fixed unit of measurement which has a uniform value that does not change from person to person is called a standard unit of measurement.
- The scientists all over the world have accepted a set of standard units of measurement. This system is now known as International System of Units (SI units).
- The SI unit of length is Metre. One meter contains 100 sub- divisions called centimetre. One centimetre contains 10 sub – divisions called millimetres.

  1 m = 100 cm

  1 cm = 10 mm
- For measuring large distances, A larger unit of length called Kilometre is used.

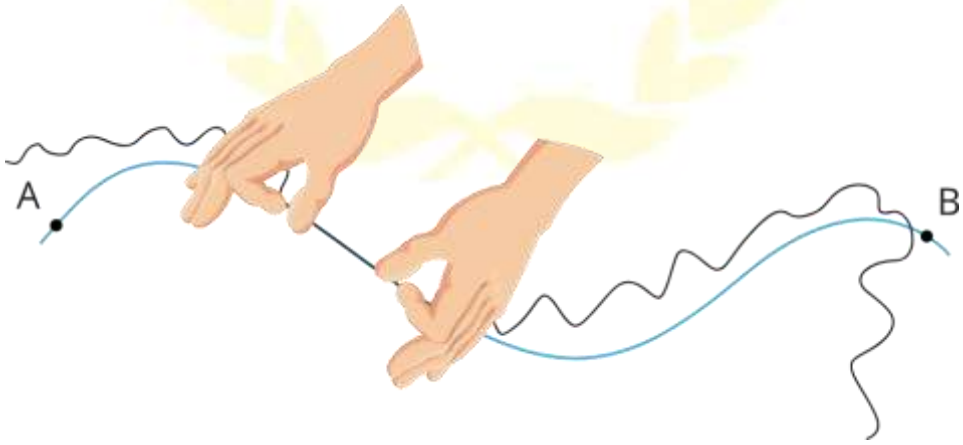
  1 km = 1000 m

Taking correct Measurements

- While taking measurements following points should be taken care of:
    1. First of all, A suitable device should be chosen. For example, larger sizes cannot be measured in metres.
    2. Place the scale besides the object along its length. The zero mark should be clearly visible
    3. Keep your eye on the Correct position. Otherwise, it may lead to incorrect readings.

Measuring the length of a curved line

- It is not possible to measure the length of a curved line directly using a metre scale.
- A thread can be used for this. Tie a knot at one end of the thread.
- Place this knot at the beginning of the curved line and try to measure a small portion of the line which is relatively straight.
- Place your thumb at the other end of the measured portion and measure next portion of the curved thread.
- Repeat the above step till the end of the line is reached. Now tie a knot at the end of the thread.
- Finally straighten the thread and measure the length between the two knots on a scale.



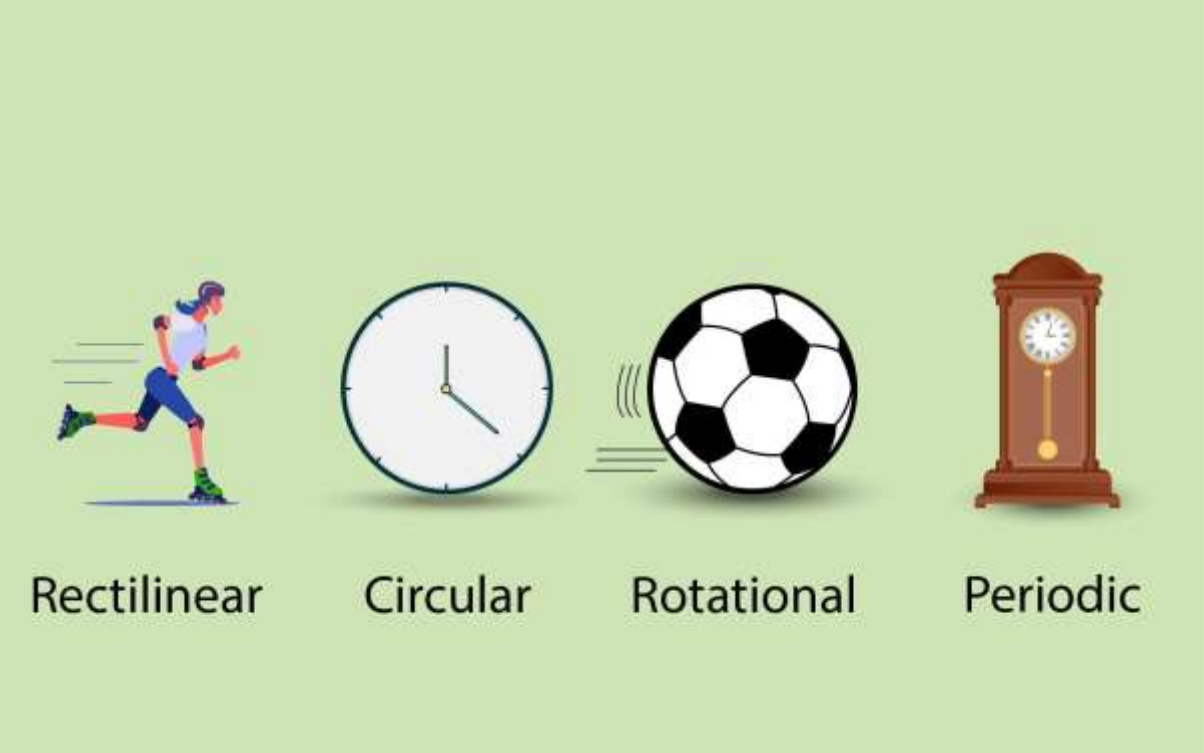
Motion

- Objects that are moving from one place to another are said to be in motion. For example, cars, train, birds, aeroplane etc.
- On the other hand, objects that remain in fixed positions are said to be at rest. For example, tree, house, buildings etc.
- All the moving objects change their position with time. For example, a car changing its position with time is said to be in motion.

- When an object is moving fast, we can easily observe its motion. But if the object is moving very slowly, it becomes difficult to observe its motion.
- For example, in a wrist watch the hour hand and the minute hand move very slowly, so it is very difficult to observe their motion.

Types of Motions

1. **Rectilinear Motion –** Motion in a straight line is called rectilinear motion. For example, sprinters in a 100 m race move along a straight track, march pass of soldiers etc.
2. **Circular Motion –** When objects move in a circular path, it is called circular motion. Examples: hands of a clock, rotation of earth around the sun.
3. **Periodic Motion –** The motion that repeats itself after regular intervals of time, is called Periodic Motion. Examples: pendulum of a clock, motion of a swing.



Rotational Motion

- When an object rotates or spins on its own axis, it is called rotational motion. For example, spinning of earth on its axis, rotation of blades of a fan, motion of a spinning top.
- The difference between circular motion and rotational motion is that in circular motion, the object moves in a circular path but in rotational motion the object spins on its axis.