Class 6 Physics Motion and Measurement of Distance — Transport system evolution

Transport system evolution

Transport is the mechanism by which a thing is carried from one place to another.

- In the earlier times, land transport was done using animals or human backs, while, water transport was done on hollow wooden logs or simple wooden boats.
- After the invention of wheel, bullock carts, chariots, camel carts were developed where animals used to pull vehicles.
- Transport then evolved in the 19^{th} and 20^{th} century to bus, trains, cars, airplane, jets, steam and motor boats, etc.

Transportation in earlier times

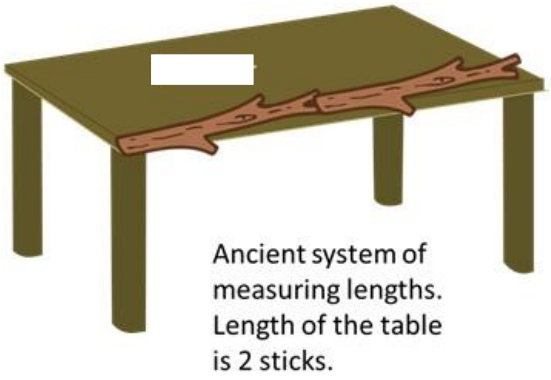
Modern transportation mediums

Class 6 Physics Motion and Measurement of Distance

Length and Distance

Length tells us how long an object is while**Distance** gives the information as to how far two things are.

- Before the invention of scales, length was measured with the help of random wooden sticks, hands or threads.
- Similarly, distances were measured in days or time taken to reach from one place to another.



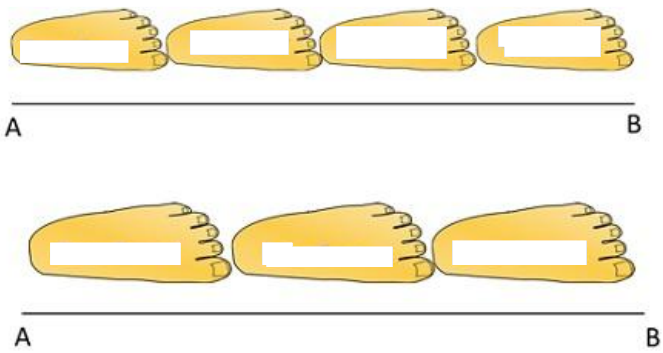
Ancient system of measuring lengths. Length of the table is 2 sticks.

Class 6 Physics Motion and Measurement of Distance

Measurement

Measurement is comparison on an unknown quantity with a known quantity. The known quantity is called **Unit**.

- Measurement consists of two parts, a number (quantity) and a unit. Depending upon the unit, the number changes. For example, distance between point A and B is 4.5 Km or 2.79 miles.
- If the length or distance is measured by the length of foot of a person, then the same length or distance will have different values as the length of foot of different people differ slightly.
- In ancient times, cubit (length from elbow to finger tips), foot, distance between outstretched arm and chin were taken as the unit of length.



When measured by human feet, the measurement of same distance varies based on length of individual foot.

Class 6 Physics Motion and Measurement of Distance Standard Units of Measurements

Standard Units of Measurements

Scientists all over the world have accepted a set of standard units for measurements. This system of units is called **International System of Units (SI units).**

- In 1790, the French created a standard unit of measurement called the **metric system**.
- SI unit of length is metre (m) while for large distances; the unit is kilometer (km).
- 1 km = 1000 m

1m = 100cm (centimetre)

1 cm = 10mm (millimetre)

A centimeter scale

Class 6 Physics Motion and Measurement of Distance Taking Correct Measurements

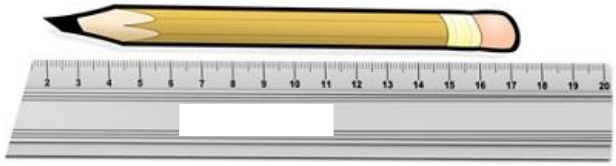
Taking Correct Measurements

Below are a few pointers that need to be followed for taking correct measurements.

- Use appropriate measuring instrument.For eg:
  - For measuring lengths of smaller straight objects like a pencil, a 15 inch scale should be used.

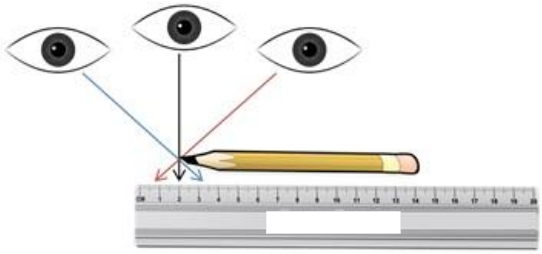
For measuring length of a curved surface like a tree trunk, measuring tapes are useful.

- Use a whole (non-broken) instrument.If using an instrument with broken edges, start from the portion where the instrument is complete.



In case of a broken scale, take the reading from a number from where the scale is fine. i.e. from 2 onwards.

- Keep your eye at the correct position for taking the readings. Incorrect position may lead to slightly incorrect reading.



Viewing from 3 different angles. Blue and Red arrows denote that if viewed from sides, the measurement will be slightly incorrect.

Class 6 Physics Motion and Measurement of Distance Measuring Length of a Curved line

Measuring Length of a Curved line

A curved line or surface cannot be measured by a straight scale, a measuring tape or thread must be used instead.To measure a curved line using a thread, follow the below steps:

- Tie a knot at one end of the thread.
- Place the thread at the beginning of the line and try to measure a small initial portion of the line which is relatively straight.
- Place your thumb at the other end of the measured portion and measure next straighter portion.
- Repeat the above step till the end of line is reached. Make a knot at the end of the line.
- Now, straighten the thread and measure the length of the two knots on a scale.

Measuring a curved line. Take small portions of the line and measure using the thread. First measure from A to 1, then 1 to 2, then 2 to 3 and so on, using the same thread.

Class 6 Physics Motion and Measurement of Distance Moving things around us

Moving things around us

Objects which are moving around us are said to be in **motion** whereas the objects which are not moving are said to be at **rest**.

- Any change in position with time can be termed as motion.
- A motion can be termed as slow or fast based on the distance it covers in a specific amount of time. More distance covered means the motion is fast and vice versa.
- Motion can be the complete object or the parts within it.
- Objects like train, bird, hands of a clock, ants are moving objects whereas house, tree, wall clock are non-moving or stationary objects.

Moving Objects

Stationary Objects

Class 6 Physics Motion and Measurement of Distance Types of Motion

Types of Motion

Motion is classified into various types based on the path they follow.

- **Rectilinear Motion** – This is a motion where objects move along a straight line. Examples march past of soldiers, sprinters in race, falling stones etc.
- **Circular Motion** - This is a motion where objects move along a circular path. Examples hands of a clock, blades of a fan, rotation of earth around the sun etc.A type of circular motion where an object spins on its own axis, it is called **rotational motion**. Example rolling ball, spinning top etc.
- **Periodic Motion** – This is a type of motion where the object repeats its motion after a fixed interval of time. Examples pendulum of a clock, motion of child on a swing etc.