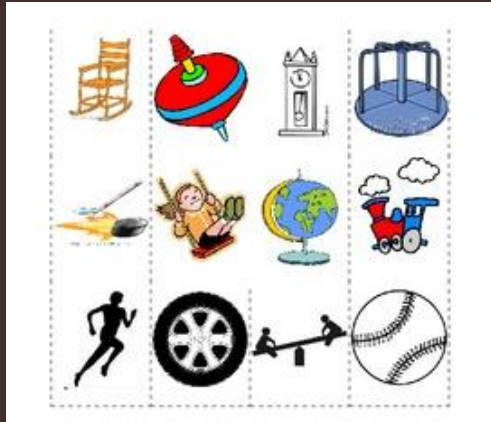


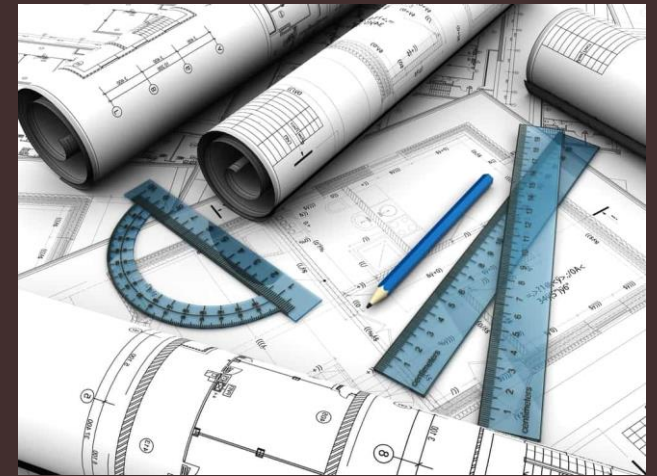
Module 1

Class 6



Chapter 10 - Motion and measurement of distances

Prepared by : Jyoti Gonsalves
TGT (Chem/Bio)
A.E.C.S, KAIGA



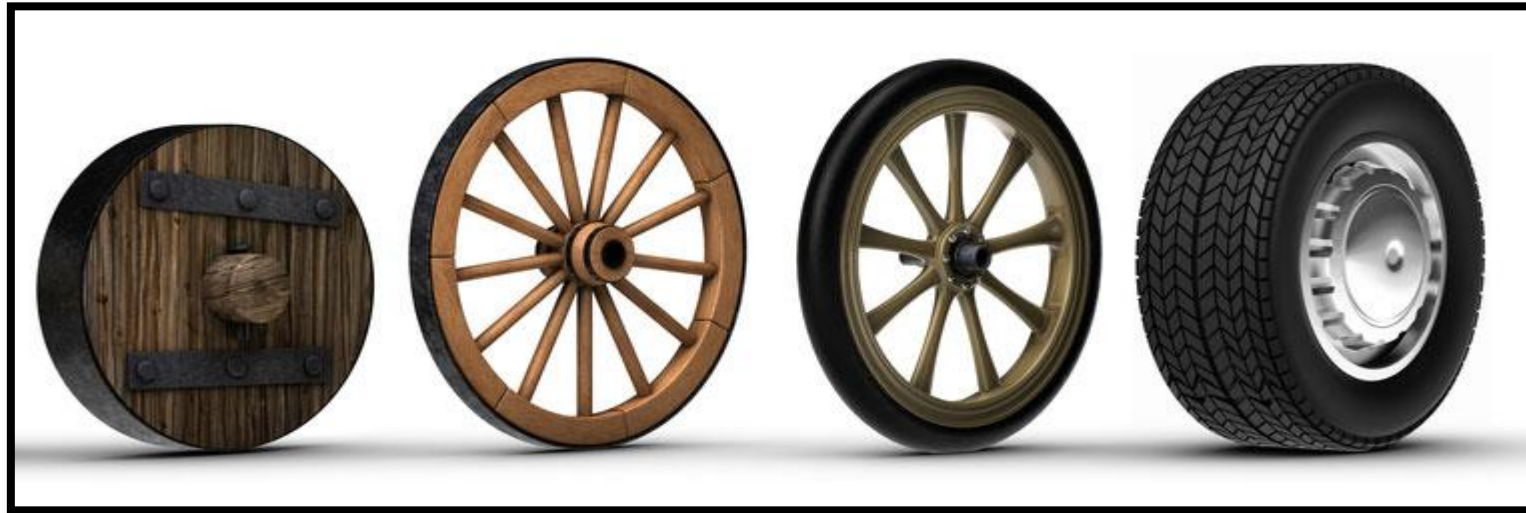
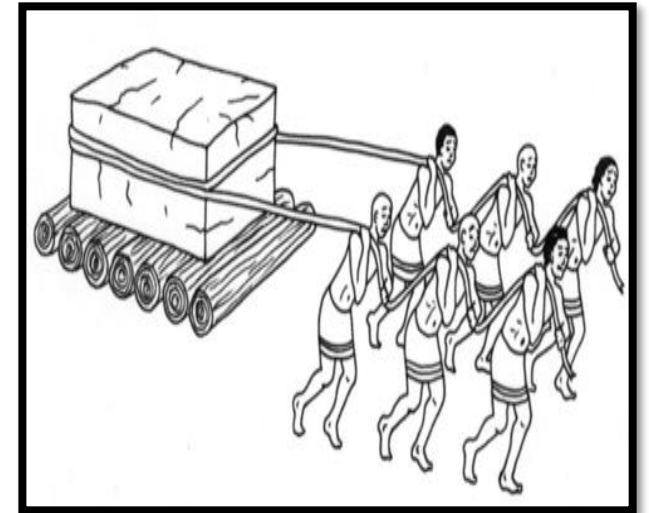
Story of Transport

- *In ancient times, people used to move only on foot and carry goods either on their back or using animals.*
- *For transport along water routes, boats with oars were used.*



Invention of the wheel

- *Invention of the wheel made a great change in the modes of transport.*
- *The design of the wheel was improved over thousands of years*
- *Animals were used to pull vehicles that moved on wheels.*



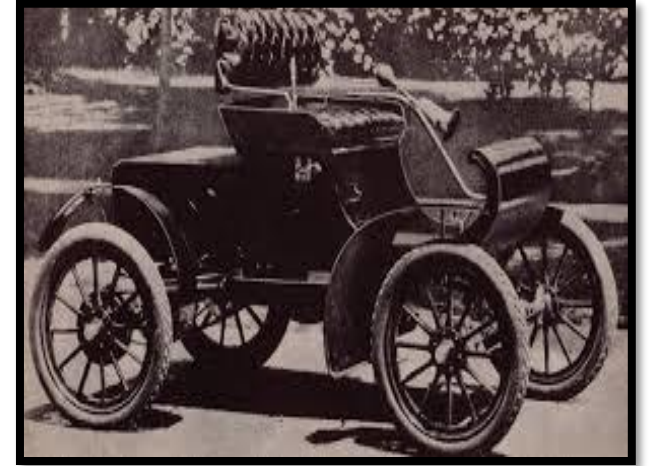
Steam Engines

- *The invention of the steam engine introduced a new source of power.*
- *Rail roads were made for steam engine driven carriages and wagons.*



Automobiles

- *Motorised boats and ships were used as a means of transport on water.*
- *The early years of 1900 saw the development of aeroplanes. These were later improved to carry passengers and goods.*
- *Electric trains, monorail, supersonic aeroplanes and spacecraft are some of the 20th century contributions.*



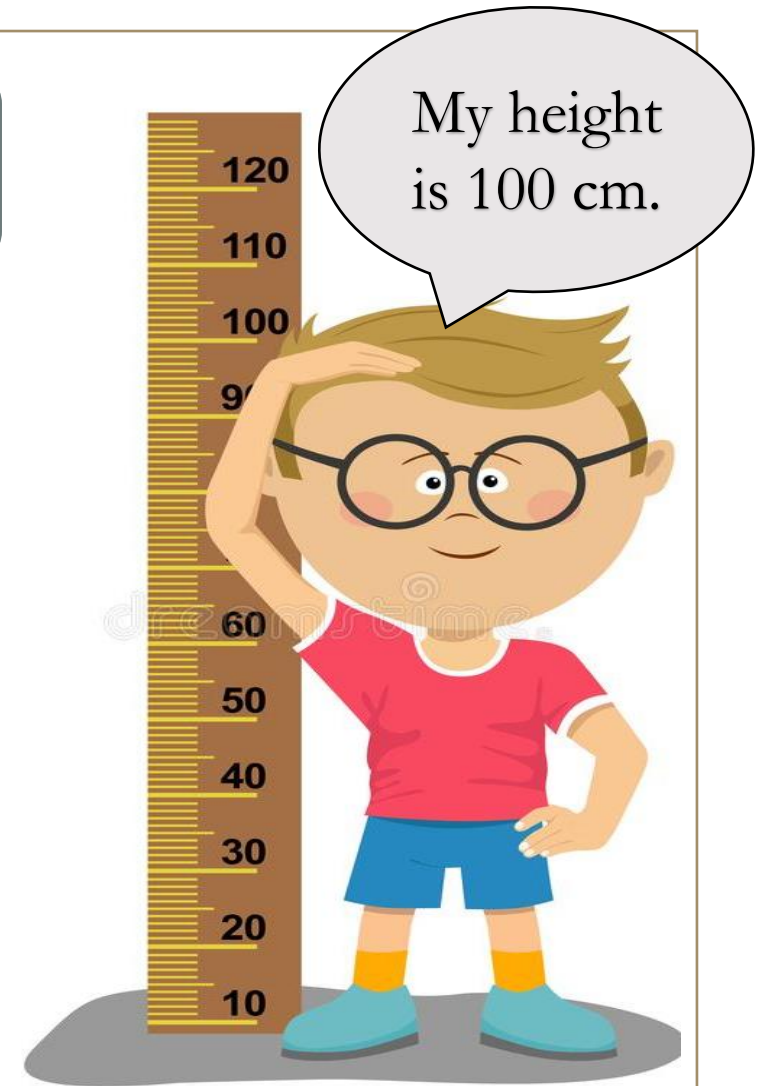
How do people know how far they have travelled?

This is done by a term called Measurement.

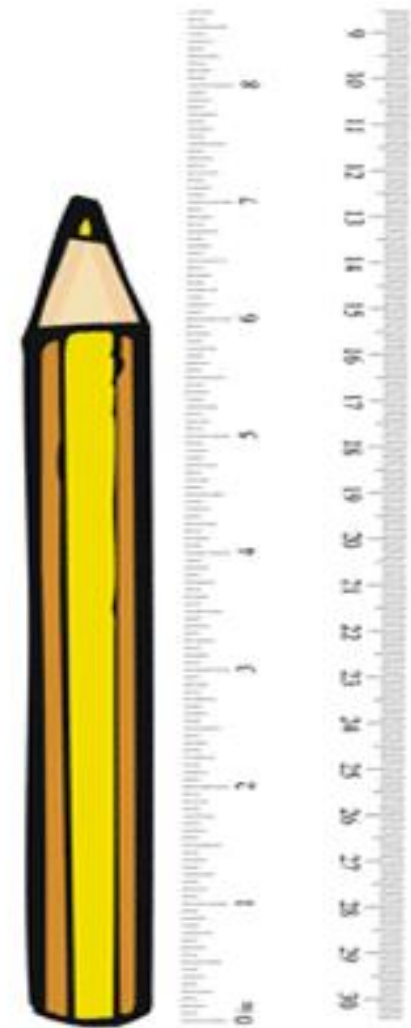
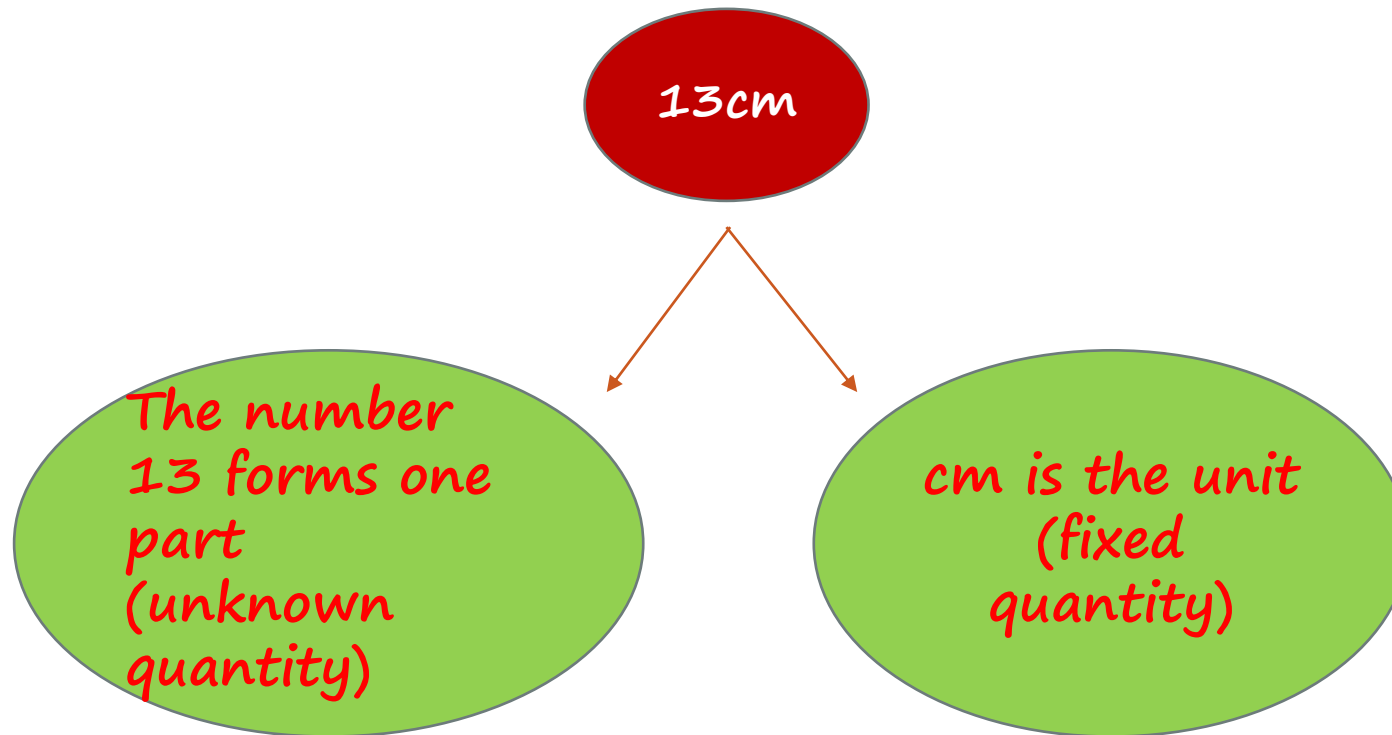
Measurement means the **comparison** of an unknown quantity with some known quantity

The known fixed quantity is called as **unit**

The result of the measurement is expressed in **two parts**. One part is a **number**. The other part is the **unit of the measurement**.



The length of the pencil is 13 cm



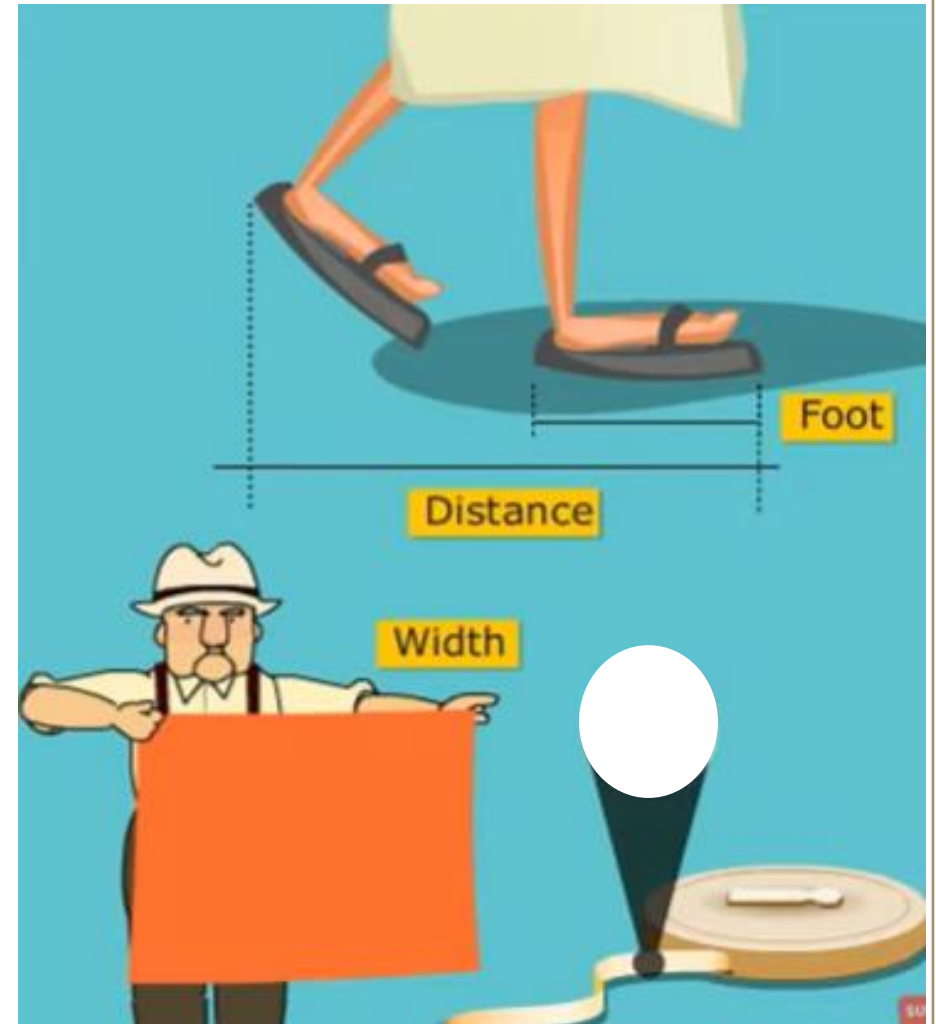
Arbitrary Units of Measurement

- In ancient times, people used arbitrary units of measurement.
- Handspan, foot span, finger-length, cubit, arm length are some of the examples.

Early Units of Measurement

Early units of measurement included are:

- *The length of a foot*
- *The distance of a step*
- *The width of a hand*



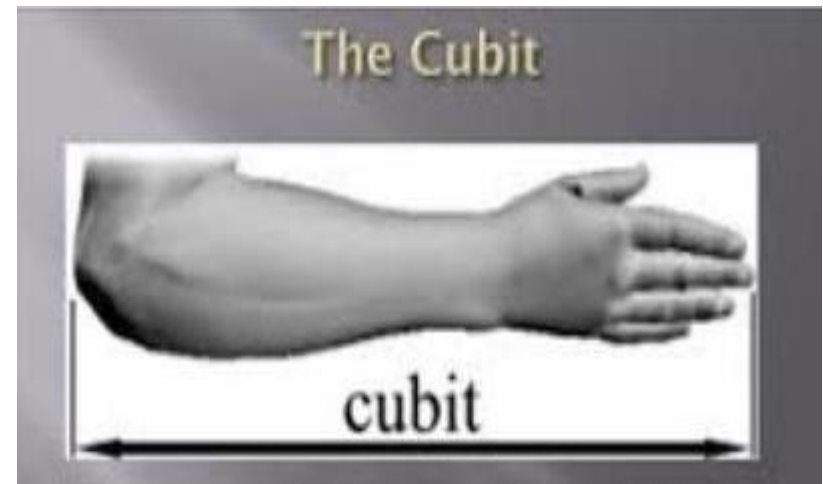
- Hand span

A hand span is the distance measured by a human hand, from the tip of the thumb to the tip of the little finger.

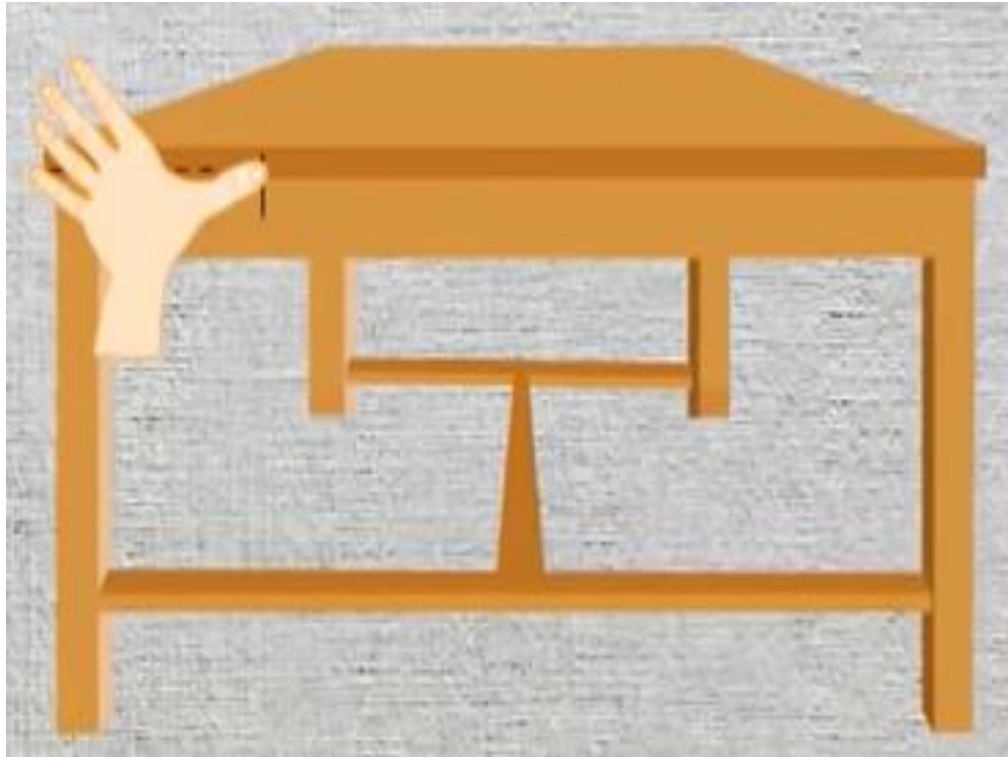


- Cubit

The cubit is the measure from your elbow to the tip of your middle finger when your arm is extended.



Measurement of width using Non standard unit



Name of the student	Number of hand spans
Rajeev	4
Hitesh	5
Jaya	3
Yogita	4

An illustration of the same wooden table as in the first image, but with a hand on the right edge. The top surface of the table is marked with three vertical lines, labeled '1', '2', and '3' from left to right, representing the measurement in hand spans.

Disadvantages of arbitrary units of Measurement

- *Arbitrary units are made up of lengths of different body parts.*
- *These lengths can vary from one person to another.*
- *This can create lot of confusion as there would be no uniformity in measurement.*

Therefore some standard units of measurements are needed that do not change from time to time.

Standard units of measurements

In 1790, the French created a standard unit of measurement called the metric system.

For the sake of uniformity, scientists all over the world have accepted a set of standard units of measurement known as the

International System of Units (SI units)

Different units of measurement

The SI unit of length is a Meter (m)

Each centimetre has 10 parts called millimetres (mm)

Each meter (m) is divided into 100 parts called centimetres (cm)

For measuring large distances we use a larger unit of length called kilometre (km)

Rules for writing symbols of units

- Symbols for units are usually written in small letters.
- Symbols are not written in plural form.
- Symbols should not be followed by a full stop unless they are at the end of the sentence.

For example:

Kilogram is *kg*, Metre is *m*, Centimetre is *cm*, Kilometre is *km*

Instruments used for measuring length

Have you ever observed



*A tailor uses
measuring
Tape to measure
cloths.*



*Whereas the
carpenter uses a
different
measuring tape.*

In taking measurement of a length, we need to take care of the following:

- Place the scale in contact with the object along its length.*
- Take the reading from the zero mark of the scale.*



- In some scales, the ends may be broken. You may not be able to see the zero mark clearly.
- In such cases you should avoid taking measurement from the zero mark of the scale.
- You can use any other full mark of the scale. Then you must subtract the reading of this mark from the reading at the other end.





For example:

- The reading at one end is 1.0 cm and at the other end it is 17.5 cm.*
- Therefore the length of the table is:*

$$(17.5 - 1.0) \text{ cm} = 16.5 \text{ cm}$$

- The correct position of the eye is important for measurement.
- Your eye must be exactly above the point where the measurement is to be taken as shown below. Position 'A' is the correct position of the eye. From positions 'B' and 'C', the readings may be different.

B

A

C



Lets summarize what we have learnt:

- Different modes of transport are used to go from one place to another.
- Measurement means comparing an unknown quantity with a known quantity. The known fixed quantity is called a unit.
- In early days, units of measurements included handspan, foot, finger length, pace and cubit.
- The system of standard units of measurement used now is the International System of Units (SI units). This is accepted all over the world.
- Metre is the SI unit of length.
- For measuring length of any object, we need to choose an appropriate device so as to get accurate results.
- Care to be taken while measuring length.

Thank you

Prepared by : Jyoti Gonsalves
TGT (Chem/Bio)
A.E.C.S, KAIGA