

Exhibit
Catalogue
**MAN
MUST
MEASURE**



**NATIONAL
COUNCIL OF
SCIENCE MUSEUMS**

Mobile Science Exhibits

MAN MUST MEASURE

designed & developed in 1972 at

**VISVESVARAYA
INDUSTRIAL & TECHNOLOGICAL MUSEUM
Bangalore**



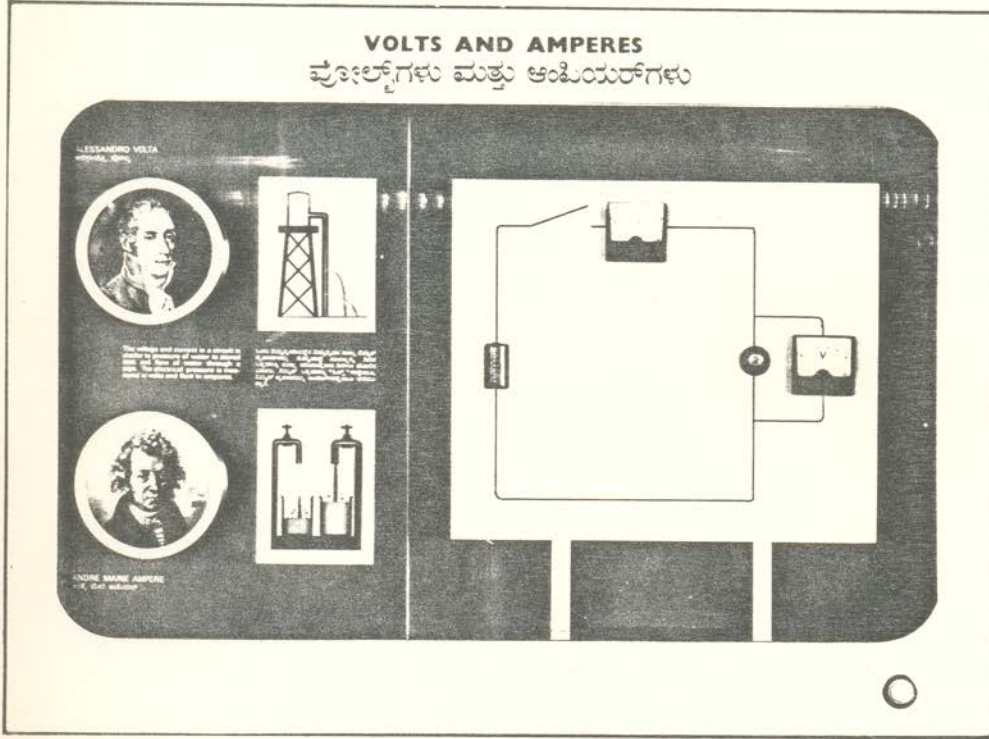
NATIONAL COUNCIL OF SCIENCE MUSEUMS

19A, GURUSADAY ROAD . CALCUTTA 700 019 . INDIA

December 1987

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Exhibit No. 1 : Volts and Amperes



The voltage and current in a circuit is similar to pressure of water in storage tank and flow of water through a pipe. The electrical pressure is measured in volts and flow in amperes.

Agg. P. 2

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Exhibit No. 3 : Rain, Rain come again !



Rainfall in a particular region determines the kind of farming and general weather condition. The rain gauge collects water in a cylindrical container which is poured later into a standard measuring glass. The height of the water indicates the total rainfall in millimeters.

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Exhibit No. 4 : Make things level



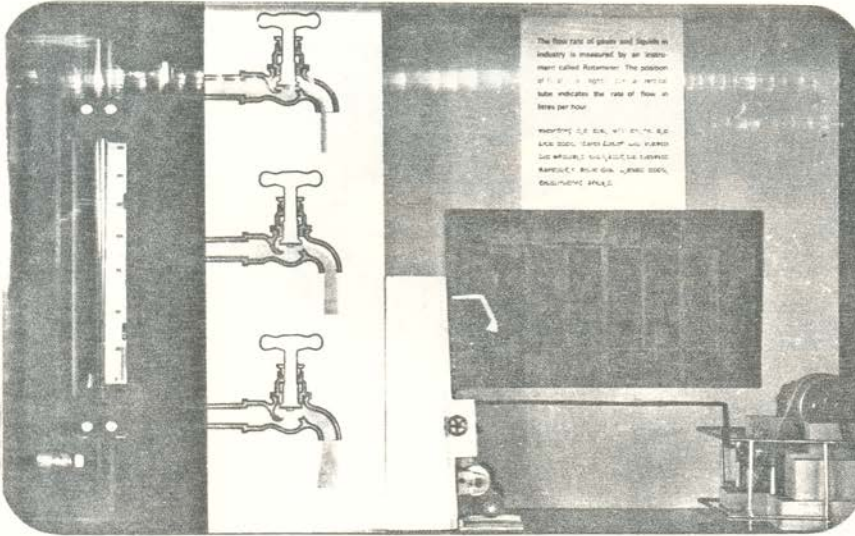
The plumbline is a cord with a conical metal weight used commonly by the mason to check the verticality of wall during construction. The horizontality of a surface is checked by spirit level by bringing the air bubble to the mid-point of tube.

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Exhibit No. 5 : Wind blows but fluid flows

WIND BLOWS BUT FLUID FLOWS

ಗಾಳಿ ಬೀಸುತ್ತದೆ, ದ್ರವ ಹರಿಯುತ್ತದೆ



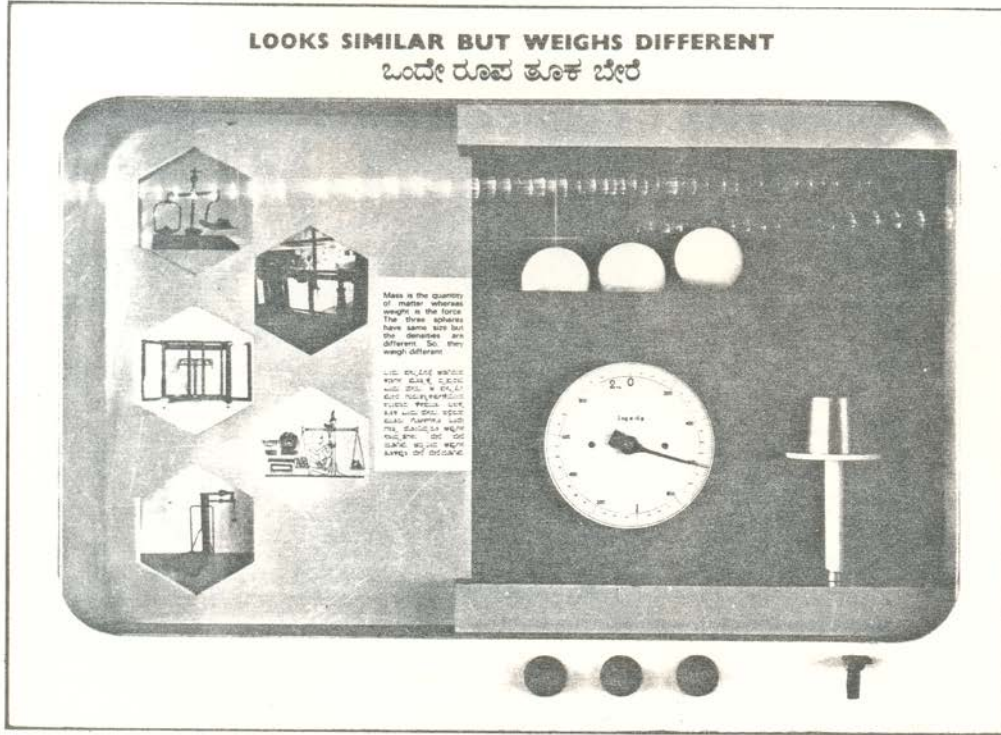
The flow rate of gases and liquids in industry is measured by an instrument called Rotameter. The position of the float in a slightly conical vertical tube indicates the rate of flow in litres per hour.

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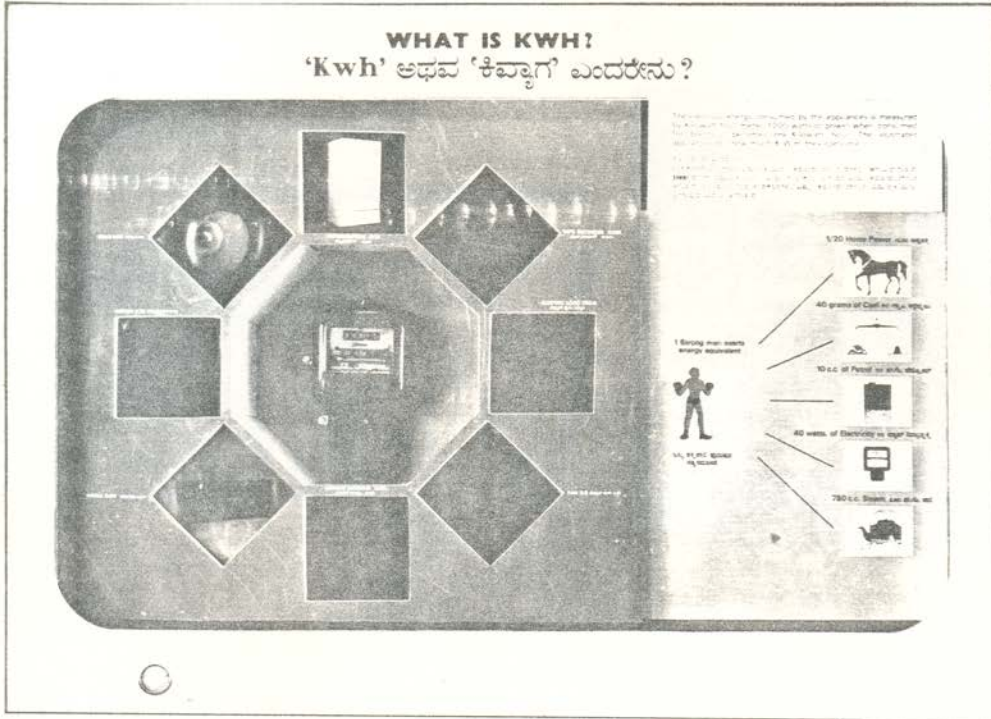
Exhibit No. 7 : Looks similar but weighs different



Mass is the quantity of matter whereas weight is the force. The three spheres have same size but the densities are different. So, they weigh different.

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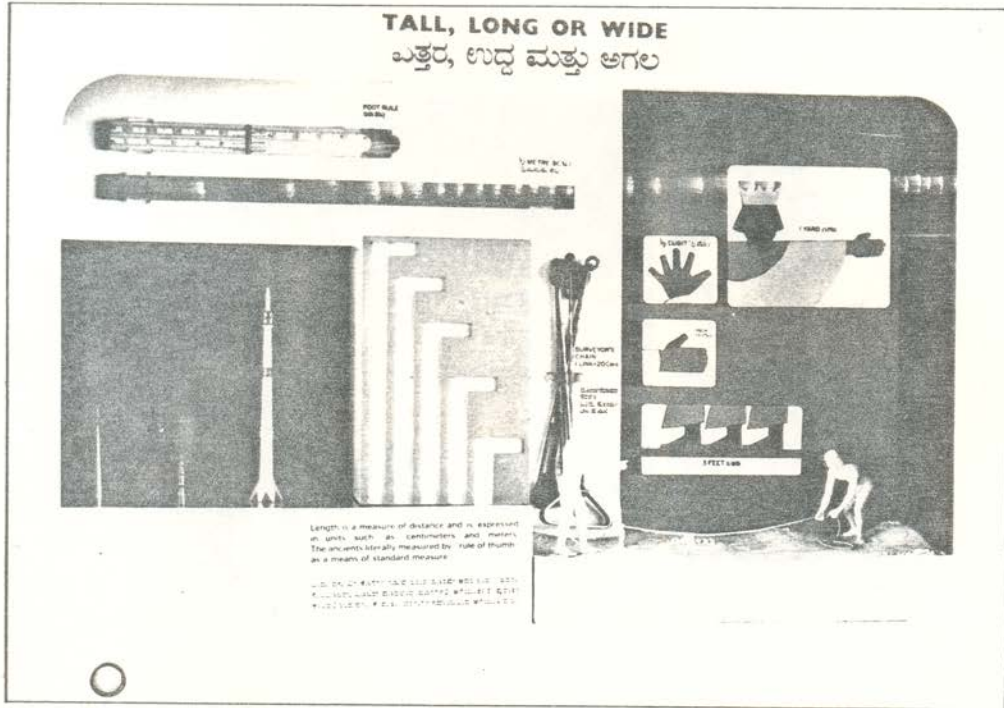
Exhibit No. 8 : What is K.W.H.?



The electrical energy consumed by the appliances is measured by Kilowatt hour meter. 1000 watts of power when consumed for one hr. becomes one Kilowatt hour. The illustrated appliances tells how much K.W.H. they consume.

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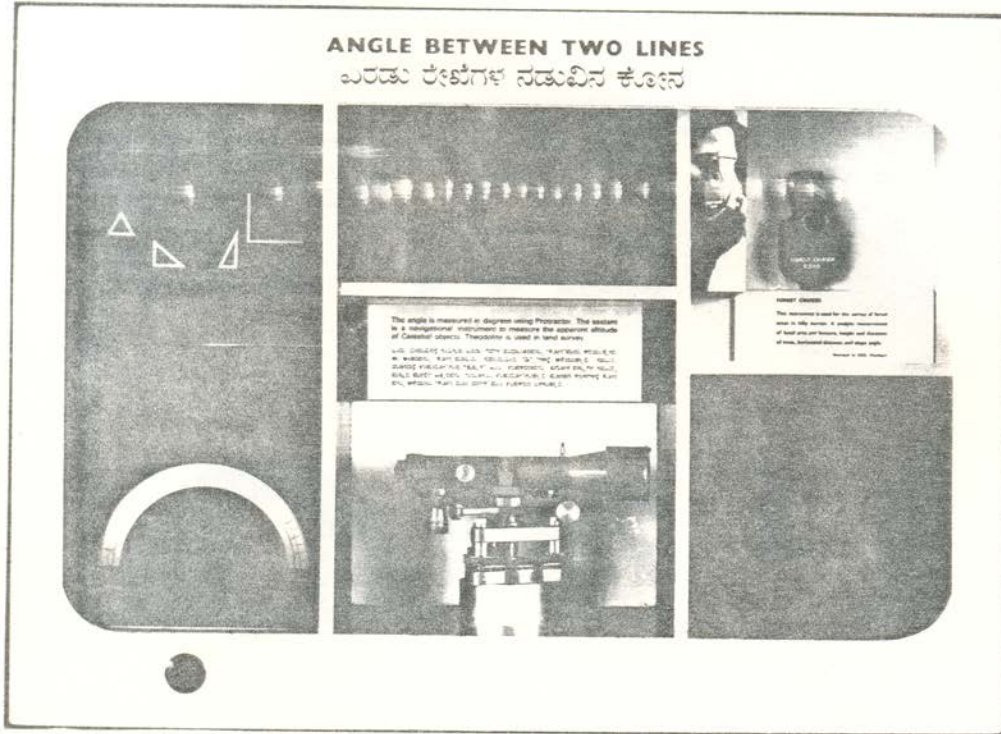
Exhibit No. 9 : Tall, long or wide



The length is a measure of distance and is expressed in units such as Centimeter and meter. The ancients literally measured by " rule of thumb" as a means of standard measure.

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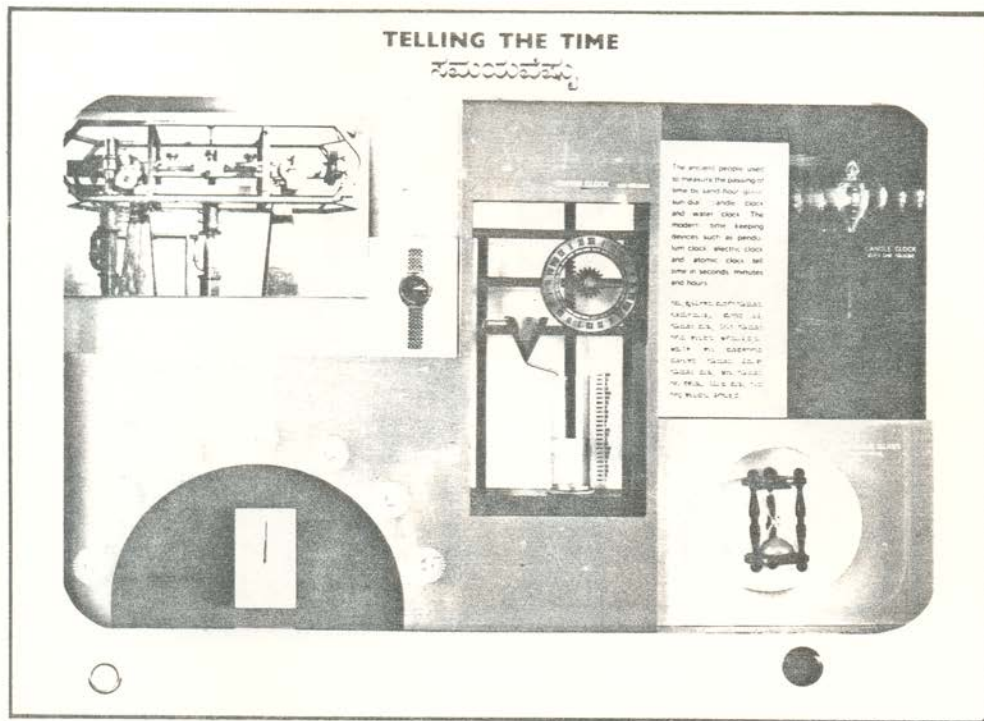
Exhibit No. 10 : Angle between two lines



The angle is measured in degrees using Protractor. The sextant is a navigational instrument to measure the apparent altitude of celestial objects. Theodolite is used in land survey.

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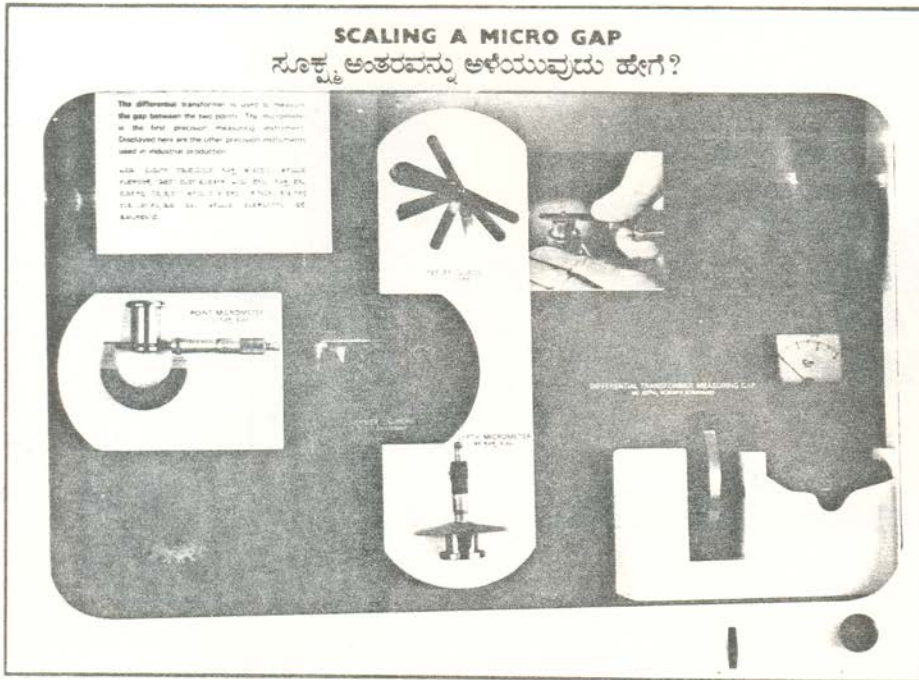
Exhibit No. 11 : Telling the time



The ancient people used to measure the passing of time by sand hour glass, sun-dial, candle clock and water clock. The modern time keeping devices such as pendulum clock, electric clock, and automatic clock tell time in seconds, minutes and hours.

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Exhibit No. 12 : Scaling a micro gap



The differential transformer is used to measure the gap between the two points. The micrometer is the first precision measuring instrument. Displayed are the other precision instruments used in industrial production.

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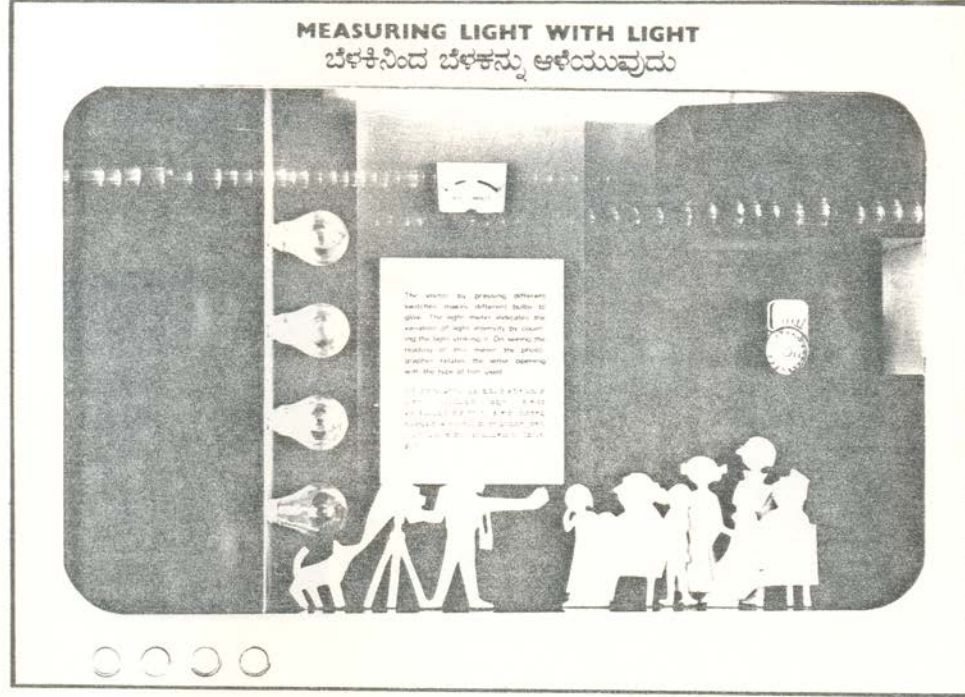
Exhibit No. 13 : Counting Revolution



Number of turns a rotating object makes in one minute is otherwise called as revolution per minute or RPM. There are four illustrated items whose speed of rotation increase from low to high RPM.

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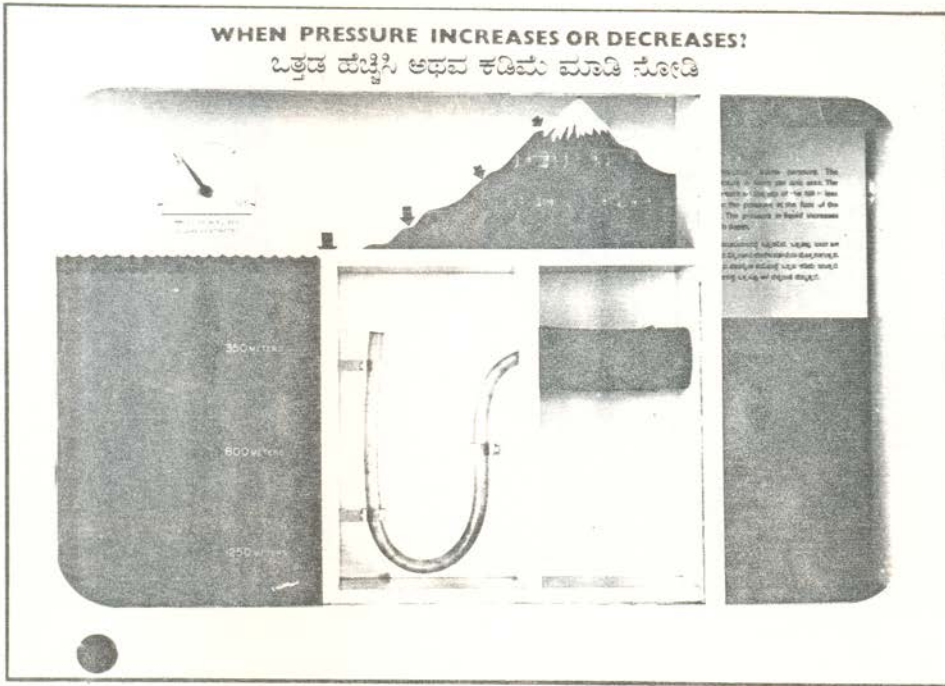
Exhibit No. 14 : Measuring light with light



The visitor by pressing different switches makes different bulbs glow. The light meter indicates the variation of light intensity by counting the light striking it. On seeing the reading of this meter, the photographer relates the lense opening with the type of film used.

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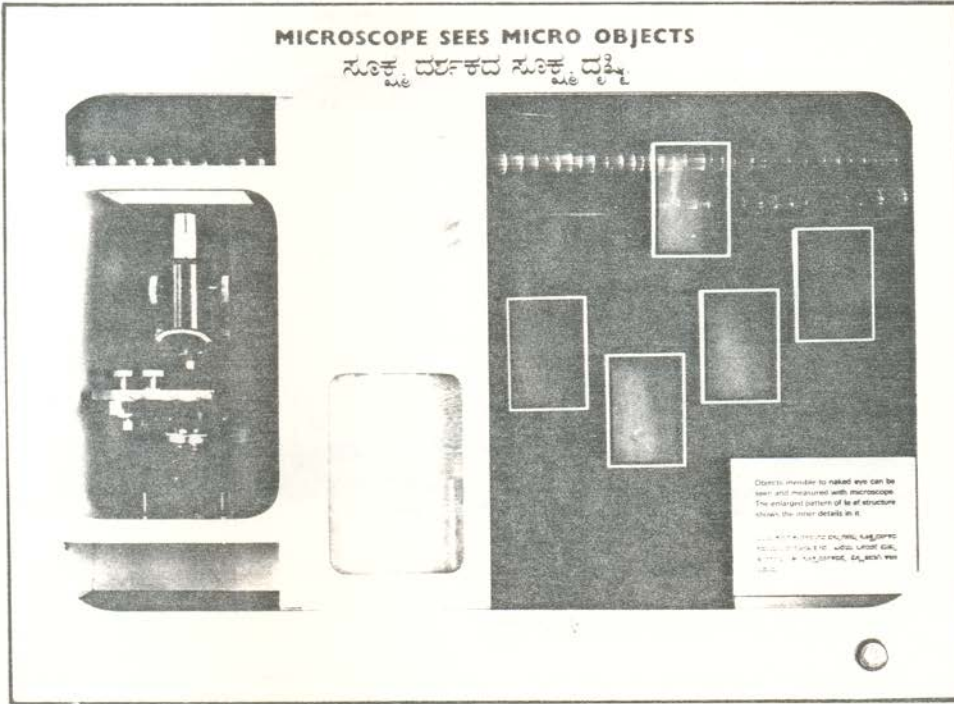
Exhibit No. 15 : When pressure decreases or increases.



Atmosphere exerts pressure. The pressure is force per unit area. The pressure on the top of the hill is less than the pressure at the foot of the hill. The pressure in liquid increases with depth.

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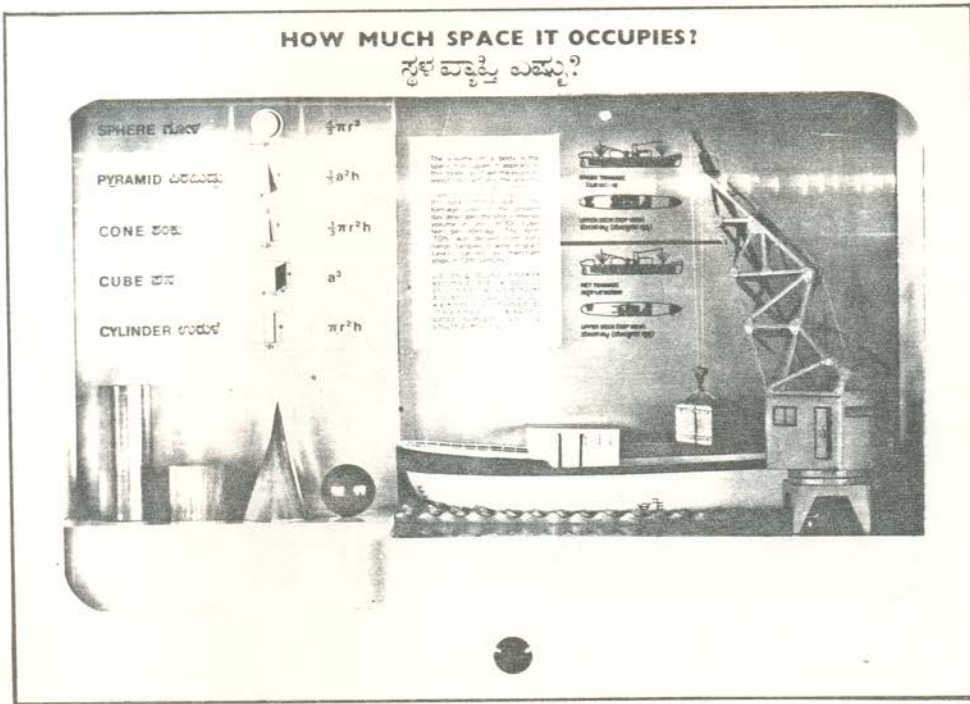
Exhibit No. 16 : Microscope sees micro objects



Objects invisible to naked eye can be seen and measured with microscope. The enlarged pattern of leaf structure shows the inner details in it.

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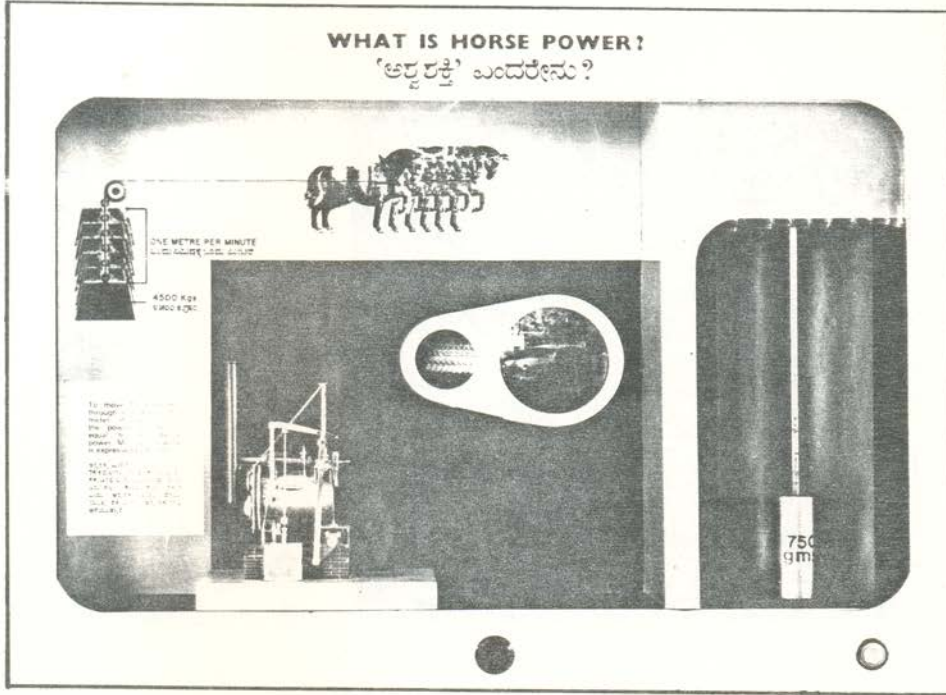
Exhibit No. 17 : How much space it occupies



The volume of a body is the space it occupies. It appears in this model as if we measure its weight but actually the volume is computed. The gross tonnage marked on the hull represents the total internal space. The tonnage used in the present day describes the ship's interior volume in units of 100 cubic feet per tonnage. The term 'TON' was derived from tuns (large cargoes of wine in giant casks) carried by merchant ships in 13th century.

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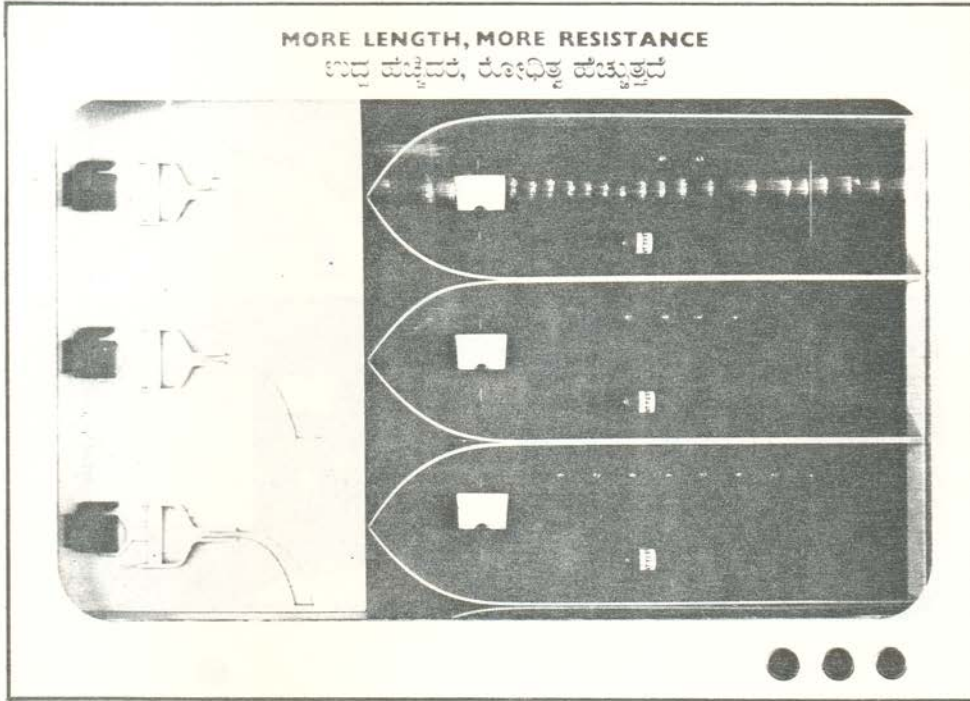
Exhibit No. 18 : What is horse power ?



To move 75 kilograms through a distance of one meter in one second the power referred is equal to one horse power. Mechanical work is expressed by this term.

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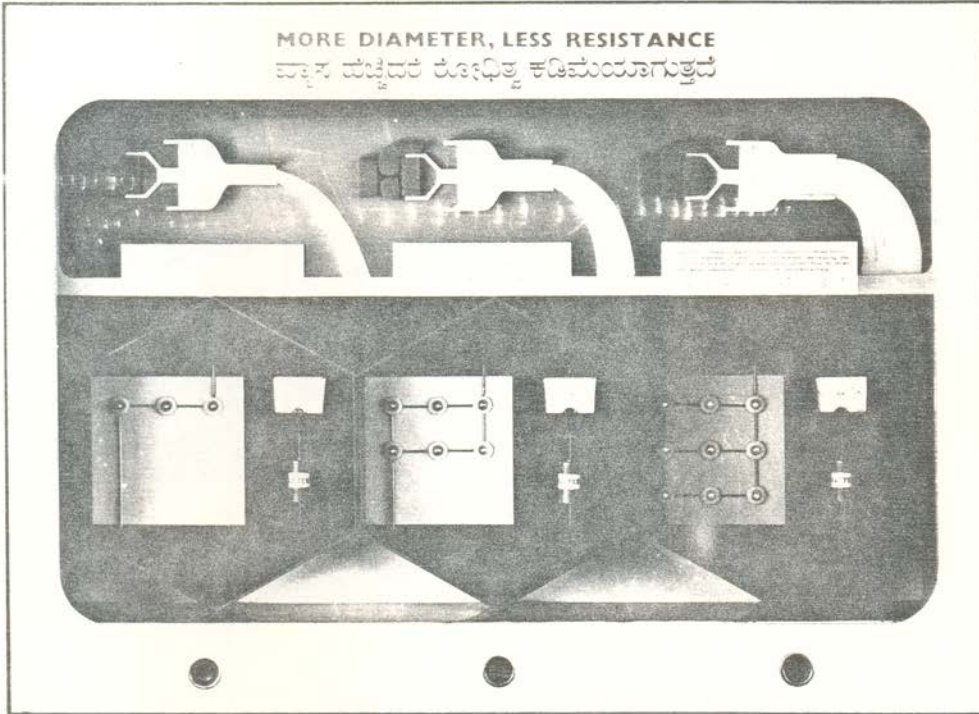
Exhibit No. 19 : More length - more resistance



A constant pressure can push more water through a short tube where as less water through a long tube. Similarly in a series circuit, the resistance increases with the length of the wire. The total resistance in the circuit is the sum of the separate resistance of each bulb.

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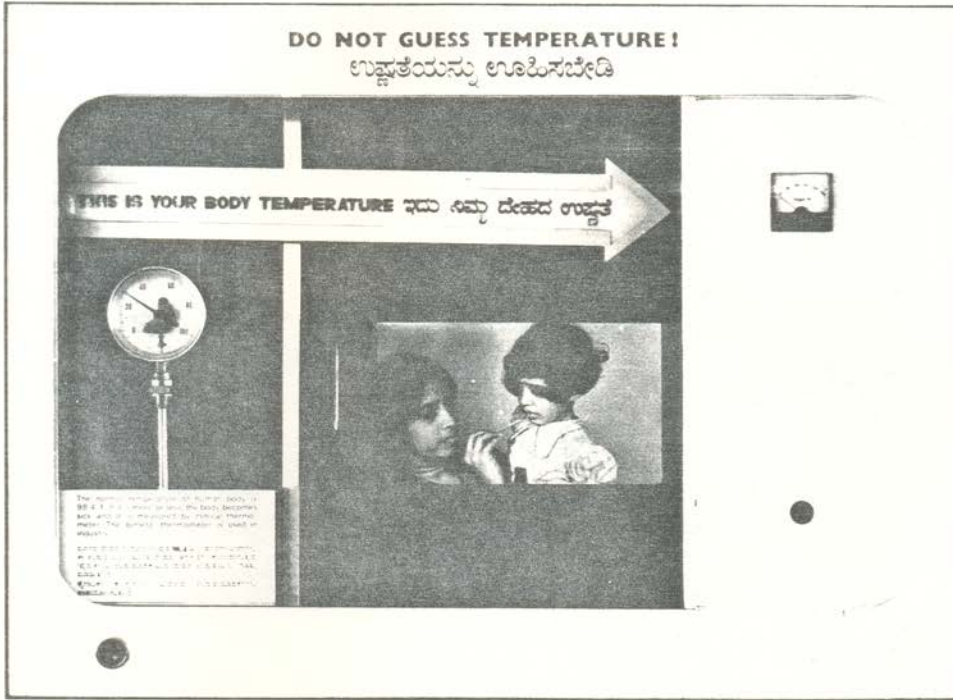
Exhibit No. 20 : More dia - less resistance



A constant pressure can push more quantity of water with increase in diameter. In the shown parallel circuits, the same pressure pushes a large current, so the resistance of the whole arrangement must be smaller. Connecting resistance in parallel reduces their effective resistance.

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Exhibit No. 21 : Do not guess temperature



The normal temperature of human body is 98.4°F . If it is more or less, the body becomes sick and it is measured by clinical thermometer. The bimetal thermometer is used in industry.

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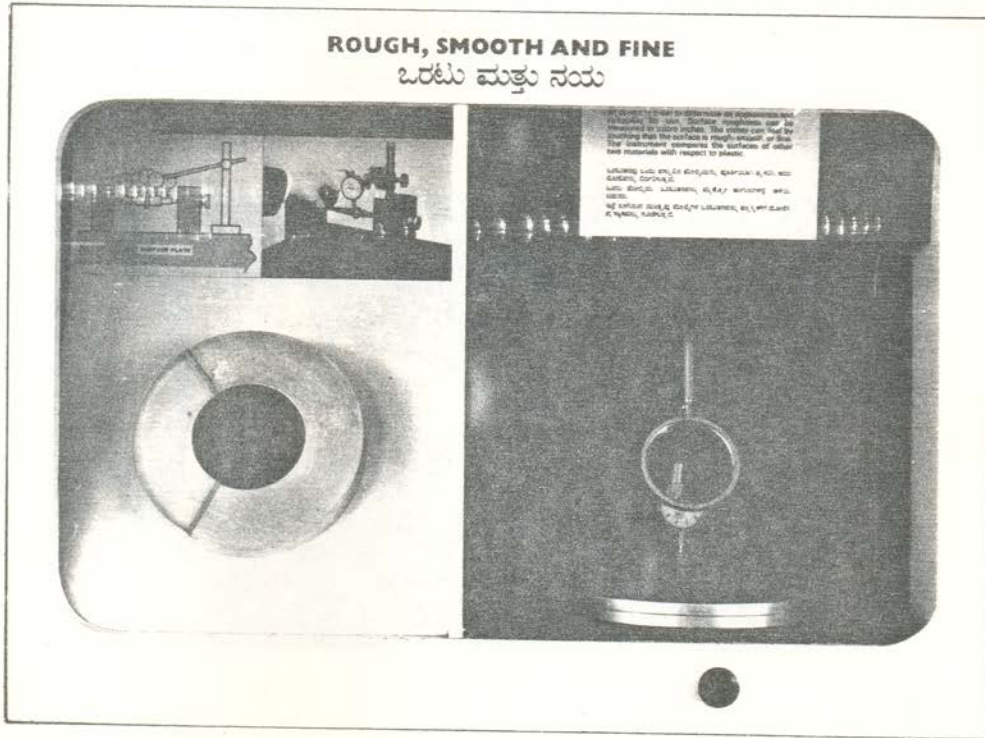
Exhibit No. 22 : Echo Fathoms Depth



The echo sounder transmits unaudible sound impulses into the sea depth and records their echoes. The interval between the transmitted and received echo is translated into meters of sea depth.

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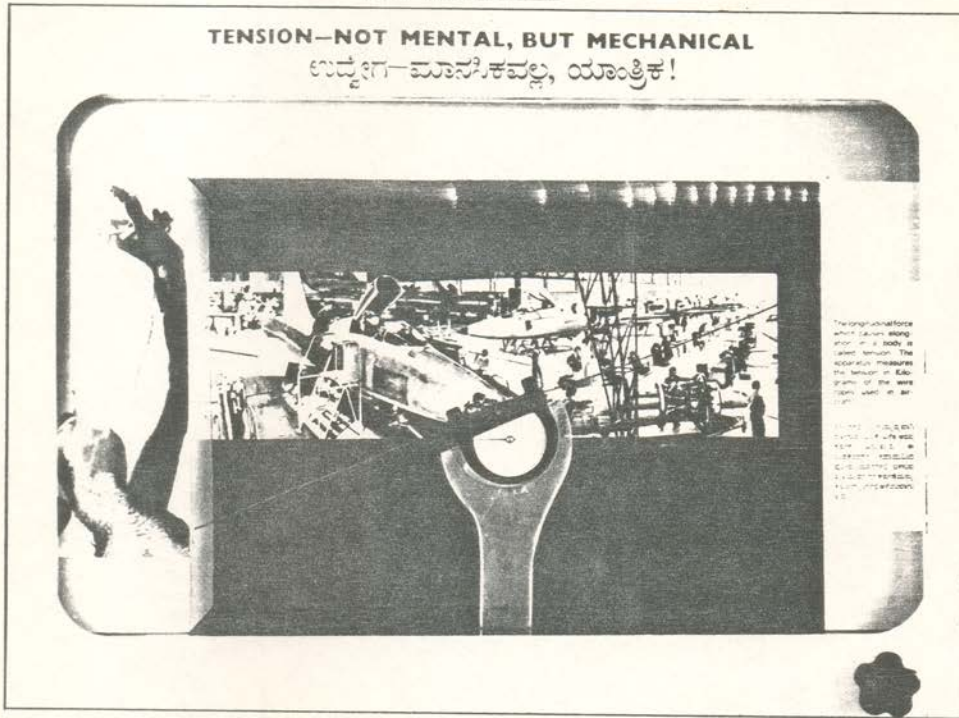
Exhibit No. 23 : Rough , Smooth and Fine



Roughness normally covers the entire surface of an object in order to determine its appearance and suitability for use. Surface roughness can be measured in micro inches. The visitor can feel by touching that the surface is rough, smooth or fine. The instrument compares the surfaces of other two materials with respect to plastic.

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Exhibit No. 24 : Tension - Not mental but
Mechanical



The longitudinal force which causes elongation in a body is called tension. The apparatus measures the tension in Kilograms of the wire ropes used in aircraft.