Sonometer Experiment

Product Categories: (Class 11), Physics Experiment
Product Tags: Lab Measuring Instrument, Labaoratory Equipment, Manufacturer of Laboratory equipment, physics Equipments, Physics Experiment, physics lab instruments
Product Page: https://www.labappara.com/product/sonometer-experiment/

Product Description

Objective
To study the relation between frequency and length of a given wire under constant tension using sonometer. To plot a graph between ν and l.
To study the relation between length of a given wire and tension for constant frequency using sonometer. To plot a graph between l2 and T.
Theory What is a Sonometer ?
Sonometer consists of a hollow rectangular wooden box of more than one meter length, with a hook at one end and a pulley at the other end. One end of a string is fixed at the hook and the other end passes over the pulley. A weight hanger is attached to the free end of the string. Two adjustable wooden bridges are put over the board, so that the length of string can be adjusted.
Production of transverse waves in stretched strings

If a string which is stretched between two fixed points is plucked at its center, vibrations produced and it move out in opposite directions along the string. Because of this, a transverse wave travels along the string.
If a string of length l having mass per unit length m is stretched with a tension T, the fundamental frequency of vibration f is given by;
Laws of transverse vibrations on a stretched string:
Law of Length: The frequency of vibration of a stretched string varies inversely as its resonating length (provided its mass per unit length and tension remain constant.)

Law of Tension:The frequency of vibration of a stretched string varies directly as the square root of its tension, (provided its resonating length and mass per unit length of the wire remains constant).

Relation between frequency and length
From the law of length, $f \times l = \text{constant}$
A graph between f and 1/l will be a straight line.
Relation between length and tension
From the equation for frequency, $\sqrt{T} / l = \text{constant}$
A graph between T and l2 will be a straight line.
Learning outcomes
Students develop the idea about standing waves.
Students understand the sonometer apparatus and its working.
Students get the relation between frequency, length and tension of a stretched string under vibration.