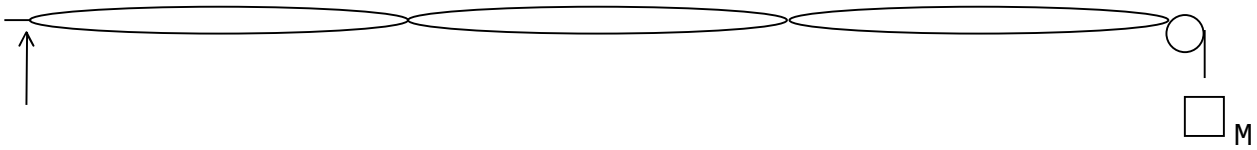
Waves on a String

The equipment used in this experiment is a string driven by a small oscillating bar as shown below. The frequency (f) of the driver is fixed at 120 Hz.



oscillating bar

Since the right end of the string is fixed, waves traveling to the right are reflected and standing waves are formed. The distance between nodes is equal to 1/2 the wave length. (Note that the point where the string is attached to the bar is not a node.)

Measure the wavelength (λ) for several tensions (T). This may require some adjustment of the spacing between the oscillating bar and the pulley in order to get a useable amplitude. (Question: Will such adjustments change the wavelength?) Plot λ^2 vs the tension. Using the graph, find the mass per unit length (μ) of the string. The following relations may be useful:

$$v = \lambda f$$

$$v = \sqrt{T/f}$$