



Concept:

The speed of a pulse, v in a long spring is given by $v = \sqrt{\tau/\mu}$ where τ is the tension in the spring and μ its linear mass density. Stretch the spring tighter to increase its tension and therefore its pulse speed.

Equipment:

- Large Support Stand
- Long Spring
- Large Rod Clamp
- Slotted End Clamp
- 50 ft. Tape Measure
- Timer

Procedure:

1. Loop the end of the spring around the screw in the slotted end clamp and tightly clamp it in place (see top right picture).
2. Grab the free end of the spring and use the tape measure to measure the distance between the clamp and your hand (we recommend a minimum of 4 meters).
3. Give the spring one up-down jerk to create a transverse pulse while starting the timer.
4. Hold the spring steady and stop the timer when the pulse has covered the distance measured ten times.
5. Calculate the average pulse speed using the measured time and distance.
6. Pull up slack in the spring (to create more tension) while keeping the distance constant and repeat steps 1-5.