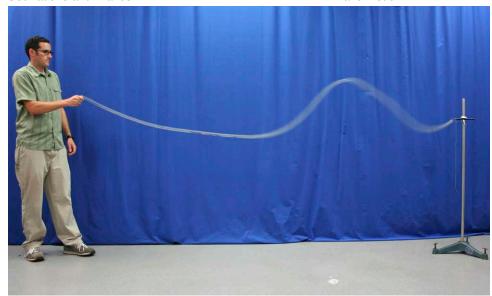
Oscillations and Waves

Wave Motion

Transverse Pulses and Waves







## Concept:

The speed of a pulse, v in a long spring is given by  $v = \sqrt{\tau/\mu}$  where  $\tau$  is the tension in the spring and  $\mu$  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.