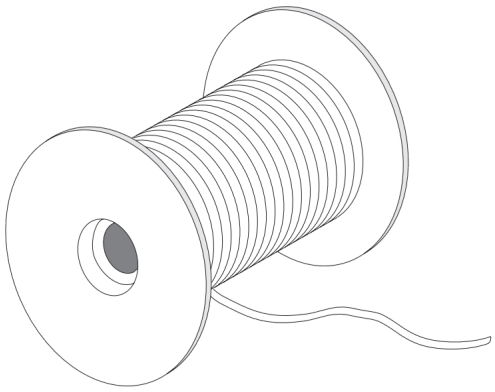
Elastic Cord

SE-9409



Introduction

Elastic cord is a very useful item in the physics class. Just a few of the experiments and demonstrations for which you can use it for are described below.

Example experiments

Horizontal waves, mechanically driven

Use a Sine Wave Generator (WA-9867) to drive the cord. As you vary the frequency, the cord will produce excellent wave patterns at different harmonics. Change the tension and examine its effect on the wavelengths.

Waves driven by hand

Secure one end of the cord and set up standing waves. You will want low frequency waves for this, so use a long length of cord and relatively low tension. You can produce standing waves or produce a wave pulse. Give the cord a sharp pulse and watch it travel down the cord and reflect back. Vertical waves may be performed in the same way as horizontal waves.

A very long spring

Use the cord instead of a spring for large demonstrations. The cord will stretch about two times its length. It is almost impossible to over stretch the cord, which is an advantage over springs.

Hang a mass, let it drop, and observe the period of oscillation. Use a Wireless Motion Sensor (PS-3219) to measure displacement as a function of time.

> **TIP**
>
> To make the elastic cord more visible, dye it with fluorescent dye or use a fluorescent pen.

A safe bungee cord jumper

You can simulate bungee jumping in your classroom by attaching a length of the cord to the ceiling and a mass of about 250 g to the end. Keep the length of the bungee cord to about one-third of the height of the room. If the motion can be kept primarily in the vertical plane, you can monitor the results with a Wireless Motion Sensor.

Energy conversion

Hang a mass from the cord, then pull the mass down and release. The amplitude of each oscillation will be less than the previous. By monitoring the decreases in amplitude, the amount of energy lost per oscillation can be calculated. The total energy of a particle in simple harmonic motion is proportional to the square of the amplitude of motion.

Spring constant

Confirm Hooke's law and determine the spring constant of the cord. Measure an unstretched length of a piece of bungee cord. Hang a known mass m from the end of the cord and measure the cord's stretched length. Determine the spring constant using Hooke's law,

$$k = \frac{F}{x}$$

where $F = mg$ and x is the difference between the stretched and unstretched length. Vary the amount of applied mass and measure the corresponding amount of stretch. Plot applied force versus the amount of stretch.

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include editable student handouts and teacher notes. Visit **pasco.com/freelabs/SE-9409**.

Specifications and accessories

Visit the product page at **pasco.com/product/SE-9409** to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

Technical Support

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