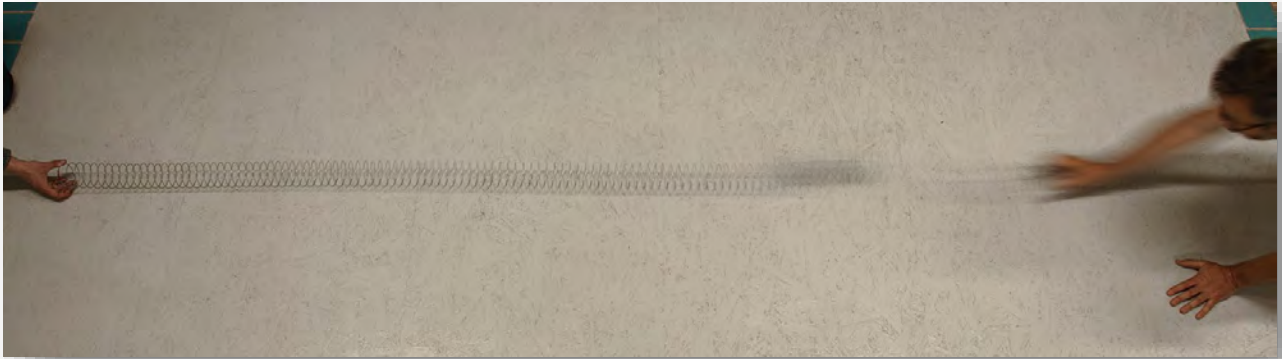


PROPAGATION OF LONGITUDINAL WAVES - SLINKY

SWD 02.02



Material:

Item Code	Qty	Description
DW170-1F	1	Slinky spring

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Goal:

Model experiment to show the propagation of different waveforms

Setup 1:

Slinky spring is placed on a surface as long and smooth as possible and extended to a length of about 300 - 350 cm.



For this purpose, a smooth floor or several tables lined up at the same height is suitable.

The spring is held by the outer two coils.

Experiment 1:

The spring is compressed at one end with a strong and rapid thrust about 20 - 30 cm long.



The movement of the spring is observed.



Result:

The impact pushes the regular coils of the spring together, creating "compression". This compression propagates in the longitudinal direction of the spring.



Such a wave is called a longitudinal wave. Sound waves propagate in this way and are therefore also longitudinal waves.

Arrived at the other, fixed end it is reflected.



Note:

Since the original length of the stretched spring is retained, there must also be "thinning" at other points. Because of the rapid movement, this is difficult to see in the pictures.

If available, you can record the process with a cell phone in slow motion mode. When playing back, this movement becomes more visible.



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Setup 2:

The setup is the same as in experiment 1. The spring is held at the outer two coils.

Experiment 2:

At one end, the spring is set in motion by a lateral deflection of about 25 - 30 cm, forcefully and as quickly as possible.

The movement of the spring is observed.

Result:

The hand movement creates a wave. If this wave is deflected upwards as shown in the picture, it is called a "wave crest".

The wave (the wave crest) propagates over the entire length of the spring. In contrast to the longitudinal wave, the oscillation occurs vertical to the direction of propagation.

Such a wave is called a transverse wave. String oscillations are transversal waves.

