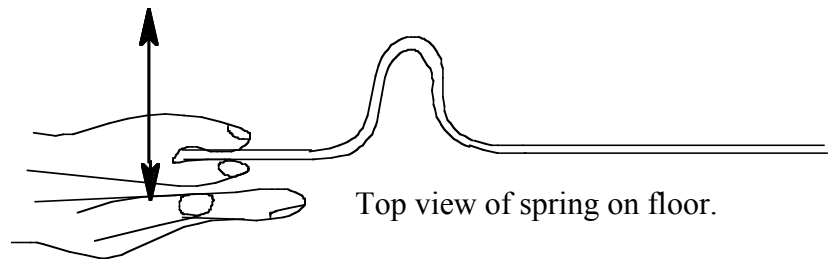


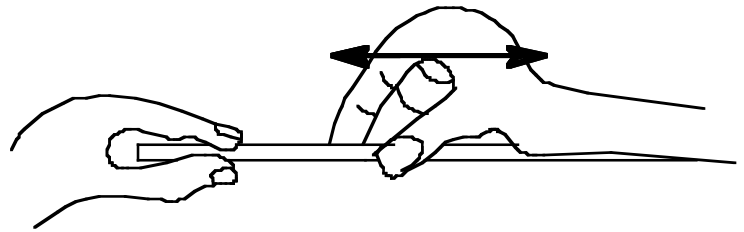
Longitudinal and transverse pulses can be easily demonstrated with a coiled metal spring (often called a snake spring) or, not quite as well, with a slinky. Place the spring on the floor and if the floor friction is low enough, the following techniques should work:

Use your hand to create a quick transverse pulse. The technique is to move outward and back as rapidly as possible, stopping your hand with your other hand when it returns to the central position. This is illustrated in top view on the right.



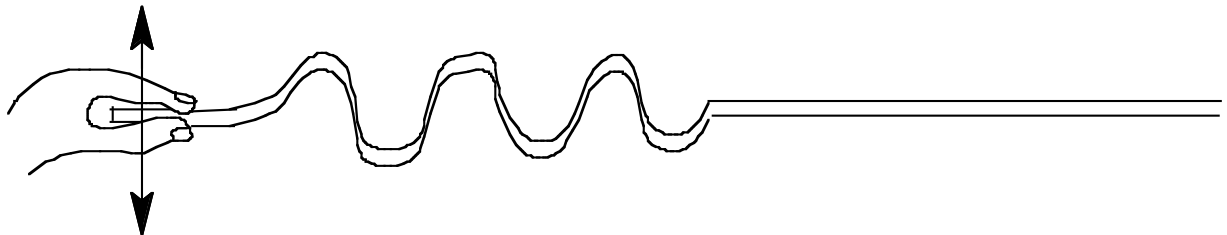
Using this technique, different sized pulses can be created (both in amplitude and pulse length) and it is easy to demonstrate that no matter the size or shape of the pulse, it always moves at the same speed.

It is also possible to produce a longitudinal pulse in a snake spring by gathering spring coils into a tight compressed bunch along the direction of the spring and quickly releasing this bunch of coils.



Producing traveling waves:

Continually shake the spring back and forth parallel to the floor allowing this small transverse wave train to move down to the end of the spring. This will enable the students to see that the waves appear to move down the spring yet the particles move transversely.



Producing Standing Waves:

Firmly fix the far end of the spring and send a traveling wave down the spring until it hits the end.

The reflected waves will return out of phase with the transmitted waves and interference will begin. You should note the nodes beginning to appear as the reflected wave interferes with the transmitted wave.

As the waves return to your hand you should feel how to move your hand in step with the returning wave and set up the standing wave pattern.

Repeat at different frequencies to demonstrate different nodal patterns.

