CHAPTER 7: ELECTRICITY

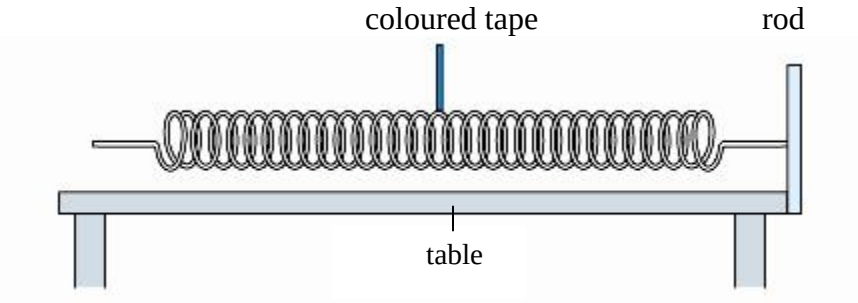
Extra Activity

Transverse and Longitudinal Waves

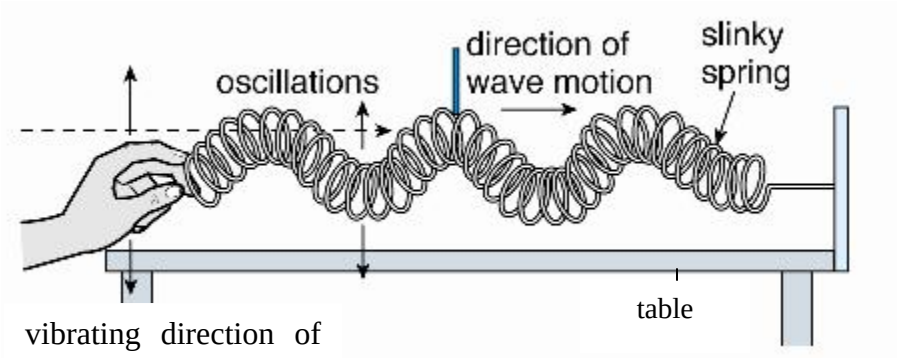
Aim: To study transverse and longitudinal waves using a slinky spring
Material: Small piece of coloured sellotape
Apparatus: Slinky spring

Procedure:

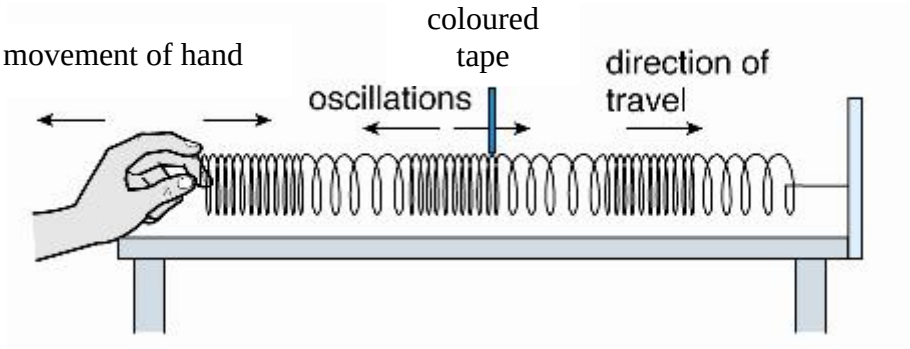
1. A slinky spring is placed on a table and one end of it is tied to a fixed rod as shown in the diagram below.



2. A short piece of coloured sellotape is stuck to the central portion of the slinky spring.
3. A transverse wave is produced when the hand holding the free end of the slinky spring vibrates up and down as shown in the diagram below.



4. A longitudinal wave is set up when the hand pushes the free end of the slinky spring in a to-and-fro direction as shown in the diagram below.



Observations:

1. When a transverse wave is set up along the slinky spring, the coloured sellotape vibrates up and down, perpendicular to the direction of propagation of the wave.
2. In a longitudinal wave, the coloured sellotape vibrates forwards and backwards, parallel to the direction of propagation of the wave.

Conclusion:

A transverse wave is different from a longitudinal wave in the following ways.

(a) In a transverse wave, the wave particle is vibrating perpendicular to the direction of propagation of the wave.
(b) In a longitudinal wave, the wave particle is vibrating parallel to the direction of propagation of the wave.
(c) The compressed coils do not move along the spring, but just vibrate forward and backwards.