

PHYSICAL SCIENCES

GR 10 RESOURCE

Forms part of the Gr 10 Physical Sciences 3-in-1 Class text and Study Guide.
See p. 89 MODULE 2 TOPIC 3 Unit 1 for the theory.



PRACTICAL DEMONSTRATION

Longitudinal waves in a spring

Materials

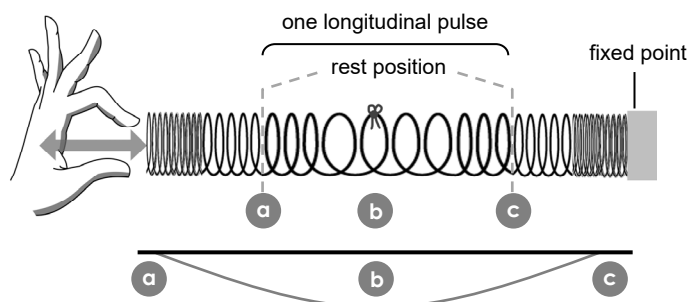
- a slinky spring
- a piece of string

Method

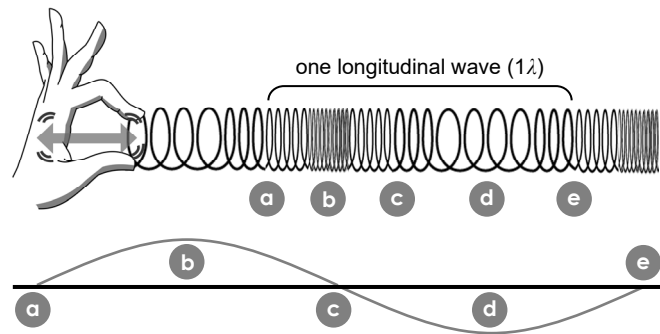
- 1 Attach the one end of a slinky spring to a fixed point. Tie a piece of string to one coil.
- 2 Using the free end of the spring, move it backwards and forwards once.
- 3 Wait until the spring comes to rest. Move it backwards, then forwards through the rest position and slightly backwards (to its original position).
- 4 Finally move it repeatedly back and forth in a regular movement.

Observations and discussion

- The string (attached to a coil) moves backwards and forwards around its original or rest (equilibrium) position and then comes to rest in that position again.
- A section of rarefaction, followed by a compression, moves along the spring. This is a **longitudinal pulse**.



- When the spring is moved back, forth and back to complete one full cycle, one full **longitudinal wave** moves along the spring.



- When it is moved back and forth repeatedly, successive longitudinal waves move along the spring.

Conclusion

- The disturbance at the one end of the spring (medium) transfers energy to the particles of the spring. In this process energy is transferred between the particles.
- The particles of the spring vibrate backwards and forwards around their rest/equilibrium positions, causing rarefactions and compressions parallel to the direction of the disturbance.
- A **longitudinal pulse** or **wave** or **successive waves** are respectively propagated along the spring.