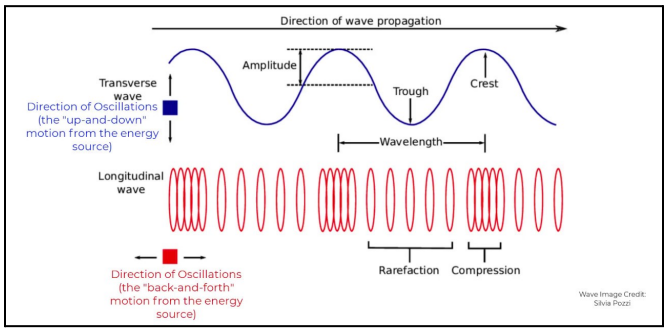
Makin' Waves

Modeling Transverse & Longitudinal Waves

Student Handout

Introduction: Waves are physical oscillations that transfer energy. They can travel in two directions: transverse or longitudinal. Transverse waves travel perpendicular to the direction of travel. For example, a transverse wave travels forward when the direction of initiation is up-and-down. A light wave is an example of a transverse wave. On the other hand, longitudinal waves travel parallel. For example, a longitudinal wave travels forward when the direction of initiation is also forward. A sound wave is an example of a transverse wave.

You can see examples of transverse and longitudinal waves everywhere in the real-world. For example, transverse waves occur when fans in a sports stadium stand up to do "the wave." The people stand up and down, while the wave itself travels sideways across the entire stadium. Longitudinal waves occur when a domino lined up with other dominoes in a line falls forward and pushes all the other dominoes down forward, too. In this demo, you will model transverse and longitudinal waves using a slinky.



Data: Record observations as transverse and longitudinal waves are demonstrated using the slinky.

Type of Wave	Description of What You See	Sketch of What You See
Transverse		
Longitudinal		

Discussion Questions: *Answer these questions after completing the demo.*

#1 What is the MAJOR difference between the physical appearance of transverse and longitudinal waves?

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#2 Which type of wave (transverse or longitudinal) measures wavelength using crests or troughs? Explain the difference between a crest and a trough in YOUR OWN WORDS.

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#3 Which type of wave (transverse or longitudinal) measures wavelength using compressions and rarefactions? Explain the difference between a compression and a rarefaction in YOUR OWN WORDS.

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Teacher Handout

Materials:

Procedure:

1. Call two students to the front of the room.
2. Have them hold opposite ends of the slinky, and stretch it out. DO NOT stretch it too far, leave some slack.
3. Instruct students to model a transverse wave. Encourage their peers in the audience to help them.
4. Once students model a transverse wave, inform them to describe and sketch what they see in the data table.
5. Instruct students to model a longitudinal wave. Encourage their peers in the audience to help them.
6. Once students model a longitudinal wave, inform them to describe and sketch what they see in the table.
7. Have students complete the discussion questions once the demo is complete.