

Name _____

Class _____

Slinky and the Wave Lab

Transverse Waves:

- ___ 1) Measure a straight line 1.5 meters long on the floor with a piece of tape. This is called the ***line of equilibrium***.
- ___ 2) Stretch out your slinky along this line. Place a piece of masking tape at about the middle of the slinky.
- ___ 3) Practice producing a ***pulse*** along the spring by having one person shake the slinky once sideways on the floor. Do this a few times and observe the pulses.

Use an arrow to show the direction of the pulse as the pulse travels down the spring



- ___ 4) Have one person create pulses and keep them going until a standing wave is produced. Look carefully at the wave and try to figure out where the wave is at any one time.

Once you think you have it figured out, draw a diagram of what the wave looked like below and show your teacher.

_____ Line of
Equilibrium



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Show below, with an arrow, the direction the piece of masking tape moves as the pulse travels down the spring



Show below, with an arrow, the direction you vibrate a slinky to produce a **transverse wave**



___ 5) Make a standing wave again.

- a) Mark, with tape or a marker, the highest point of the wave. This is called the **crest**.
- b) Mark, with tape or a marker, the lowest point of the wave. This is called the **trough**.

___ 6) Measure the distance from the line of equilibrium to the crest and the trough. Label and record these measurements on your diagram you drew in step 4. Show your teacher.

___ 7) Make a standing wave, but this time increase the amount of energy.

- a) Use tape to mark on the floor where the crest and trough of the wave is.

Sketch what the wave looked like below. Include the labels and measurements.



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	Line of Equilibrium
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What did you notice about the wave when you increased the amount of energy?

___ 8) Create a new standing wave by moving your hand faster.

Did you notice a difference in the number of crests and/or troughs? Explain!
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Is there a difference in the distance between crests (troughs)? Explain.
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This distance is called the wavelength . Sketch the wave below.
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	Line of Equilibrium
--	------------------------

Longitudinal Waves:

___ 1) Stretch the slinky along the line of equilibrium. Have one person pull several



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coils on the slinky, then release them. This will produce a ***longitudinal wave***.

Show, with an arrow, the direction of the pulse as the pulse travels down the spring



Show, with an arrow, the direction the piece of masking tape moves as the pulse travels down the spring



Show, with an arrow, the direction that you would vibrate a slinky to produce a longitudinal wave

**Questions:**

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Draw a transverse wave below and label the following characteristics on the diagram:

*Crest**Trough**Wavelength**Amplitude*

Line of
Equilibrium

Draw what this wave would look like if you doubled the amount of energy. Explain your reasoning for drawing it like this.



Line of
Equilibrium

What is ***amplitude***? What affects the amplitude of a wave?

Bonus Question:

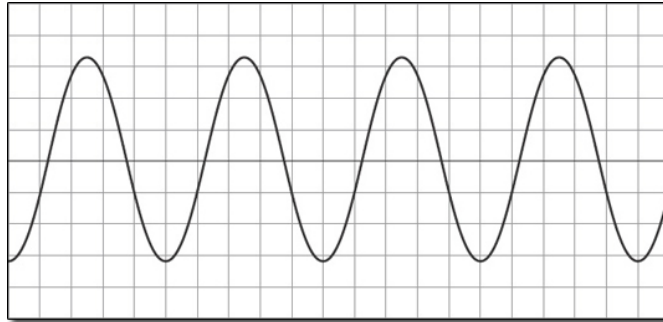


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A **longitudinal** wave is graphed below. Can you label the y axis?



distance

Once you have completed this sheet, clean up your materials and show this to your teacher. They will then give you directions and materials to build your own musical instrument.



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