

## WAVE ACTIVITIES

### Part 1: Observing Wave Shapes

1. Working with a partner, carefully place the Slinky® on the floor. Try to keep it untangled! Hold one end while your partner holds the other. Take turns pushing the slinky toward each other without letting go.
  - *What happened? Describe what you saw.*
  
  - *What did it look like? Draw 1–3 pictures of the effect.*
  
2. Now, use the long spring. Working with your partner in a standing position, each of you should hold one end of the spring about waist high. One person will move the spring up and down, while the other person holds their end still without letting go. Try different movements to make different sizes of waves, then trade turns.
  - *Describe what you saw.*
  
  - *Draw a picture of what it looked like.*

## Part 2: Measuring Waves

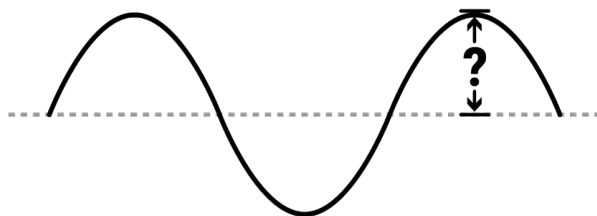
To measure waves, use the long spring and work in groups of four.

1. Measure the wave height. Have one group member stand at each end of the long spring and hold their end. Hold it straight, but do not stretch it tight.

Have another group member use a meter stick to measure the waves. Hold the meter stick vertically—perpendicular to the spring—and near its center. The bottom of the meter stick should be even with the bottom of the spring, but not quite touching it. Use this as the starting point for measuring the wave's height. Hold it steady!

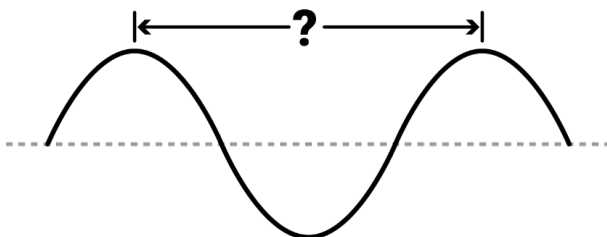
Have one of the two group members holding the spring start shaking it up and down at a constant speed. As they are doing so, have another group member observe the meter stick and note the height that the wave reaches. Do not include when the wave dips below the meter stick—only measure the part of the wave above the starting point.

Have the fourth group member record the data that is measured.



- *How high are the waves?*

2. To measure the length between the peaks of the waves, have the group member who recorded data in the previous step hold a second meter stick horizontally across the top of the waves. (This measurement will be more difficult to take—use the slow-motion camera on your phone if it helps.) Try to measure the distance between the peak of each wave.



- *What is the distance between waves?*

3. Measure the time between waves. Have the group member who recorded data in the first step use a stopwatch and count 10 seconds while the group member holding the vertical meter stick counts the number of times a wave passes the meter stick.

- *How many waves were made in 10 seconds?*

**STOP! Trade jobs and talk about what you did with your group.**

4. In this step, you won't be measuring the height of the waves but will continue to hold a meter stick vertically to count waves. The group member shaking the spring will try to double the number of waves created within 10 seconds. Repeat steps 2 and 3, using the slow-motion camera on your phone if it helps.

- *What is the distance between waves?*
- *How many waves passed by in 10 seconds?*
- *Given your answer above, how many waves passed by in one second? (For example, 10 waves in 10 seconds equals one wave per second.)*

**STOP! Trade jobs and talk about what you did with your group.**

5. Try to double again the number of waves created in 10 seconds (four times the number created in the first round). Repeat steps 2 and 3. Be careful—these waves will be fast!

- *What is the distance between waves?*
- *How many waves passed by in 10 seconds?*
- *Given your answer above, how many waves passed by in one second?*