

Characteristics of Waves ▪ *Skills Lab***Wavy Motions****Problem**

How do waves travel in a spring toy?

Skills Focus

comparing and contrasting, classifying

Materials

spring toy

meterstick

Procedure *Review the safety guidelines in Appendix A.*

1. On a smooth floor, stretch the spring to about 3 meters. Hold one end while your partner holds the other end. Do not overstretch the spring toy.
2. Pull a few coils of the spring toy to one side near one end of the spring.
3. Release the coils and observe the motion of the spring. What happens when the disturbance reaches your partner? Draw what you observe.
4. Have your partner move one end of the spring toy to the left and then to the right on the floor. Be certain that both ends of the spring are held securely. Draw a diagram of the wave you observe.
5. Repeat Step 4, increasing the rate at which you move the spring toy left and right. Record your observations.
6. Squeeze together several coils of the spring toy, making a compression.
7. Release the compressed section of the spring toy and observe the disturbance as it moves down the spring. Record your observations. Draw and label what you see in the space below.

Characteristics of Waves ▪ *Skills Lab***Wavy Motions** *(continued)***Analyze and Conclude**

Write your answers on a separate sheet of paper.

1. **Comparing and Contrasting** Compare the waves generated in Steps 1–5 with the waves generated in Steps 6–7.
2. **Classifying** Were the waves generated in Steps 1–5 transverse or longitudinal? Explain your answer.
3. **Comparing and Contrasting** In Step 3 of the procedure, compare the original wave to the wave that came back.
4. **Classifying** Were the waves generated in Steps 6 and 7 transverse or longitudinal? Explain your answer.
5. **Interpreting Data** What happened to the wavelength and frequency when you increased the rate at which the spring toy moved left and right?
6. **Developing Hypothesis** How might you change the amplitude of the longitudinal waves you made?
7. **Communicationg** Use your drawings to make a poster that explains your observations.

Design an Experiment

Obtain some different spring toys. Look for different sizes and materials, such as metal and plastic. Design an experiment to test whether the differences in the spring toys result in differences in the waves the springs make. Have your teacher approve your procedure before you carry out the experiment.