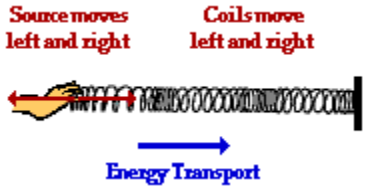
Activity #2

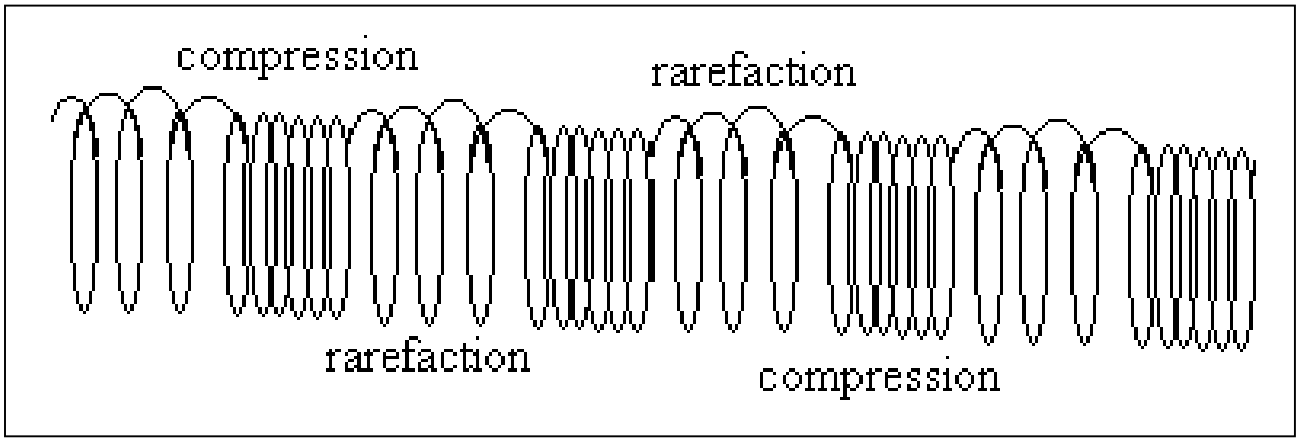


Title: An Investigation into Longitudinal (Compressional) Waves –STUDENT'S RESPONSE SHEET-ANSWER KEY

1. When the hand holding one end of the spring is snapped TOWARDS the opposite end, it produces a region in the spring where the coils are spaced closer together than normal (**further apart than normal, closer together than normal**).

2. When the hand holding one end of the spring is snapped AWAY from the other end, it creates a region in the spring where the coils are spaced further apart than normal.

3. In the box below, diagram the waves you have created in this step and label the two components of the wave (compressions/rarefactions) appropriately.



4. When producing about two waves per second, the length of one wave (wavelength) is about 50 cm.

5. When producing about four waves per second, the length of one wave (wavelength) is about 25 (or ½ the value recorded in #4) cm.

6. As the frequency of a compressional wave increases, the wavelength decreases (**increase, decreases, remains about the same**.)

7a. By observing the string attached to one coil of the spring, I can see that the coil to which it is attached moves parallel to (**perpendicularly, parallel to**) the direction that the wave is traveling.

7b. The actual coils of the spring are not (are/are not) moving from one end of the spring to the other as the wave travels down the spring?

7c. If this was a longitudinal sound wave moving away from a sound source, the actual molecules of air would not (**would/would not**) be traveling though the air at the speed of sound?

8. Some similarities between the production of a transverse wave (from Activity #1) and a longitudinal wave are that they each need some outside source of energy (hand movement) to create the wave; the energy of an outsaide source gets transferred into the material that carries the wave (the springs); the waves travel away from the source of energy creating them; etc.

9. At least one difference between a transverse and compressional wave is (are) the waves do not look the same; they travel at somewhat different speeds; the particles (coils) that carry the waves move in a different manner (perpendicularly vs. parallel to the direction that the wave is traveling); etc.