

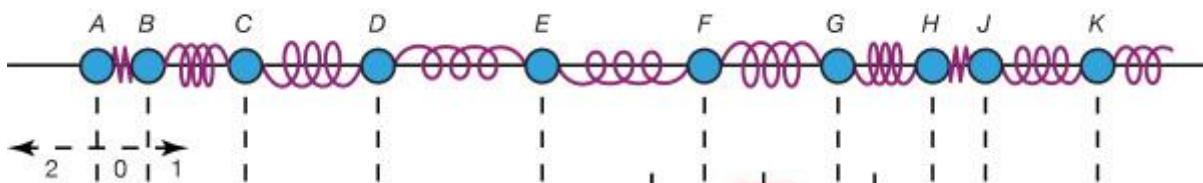
Answer on Question #59242, Physics / Mechanics | Relativity |

Many children are lined up at an ice cream stand. If the child at the back pushes the child in front of him, and she in turn pushes the child in front of her, and so on, will they create a transverse or longitudinal wave in the line?

Solution:

Longitudinal wave, wave consisting of a periodic disturbance or vibration that takes place in the same direction as the advance of the wave.

A mechanical model is helpful in explaining longitudinal waves.



At the top of the figure, small masses A, B, C, etc. are joined together by coiled springs to represent a transmitting medium that has properties of both inertia and elasticity. Because mass B has inertia, motion of A toward the left (arrow 2) extends the spring it is attached to and motion to the right (arrow 1) compresses it. A corresponding motion will be communicated to B through the spring, except that there will be a slight lag in phase. Mass B will impart its motion to its partner C, and so on, the impulse travelling from A to K and the lag progressively increasing.

Answer: Longitudinal because they are moving back and forth.