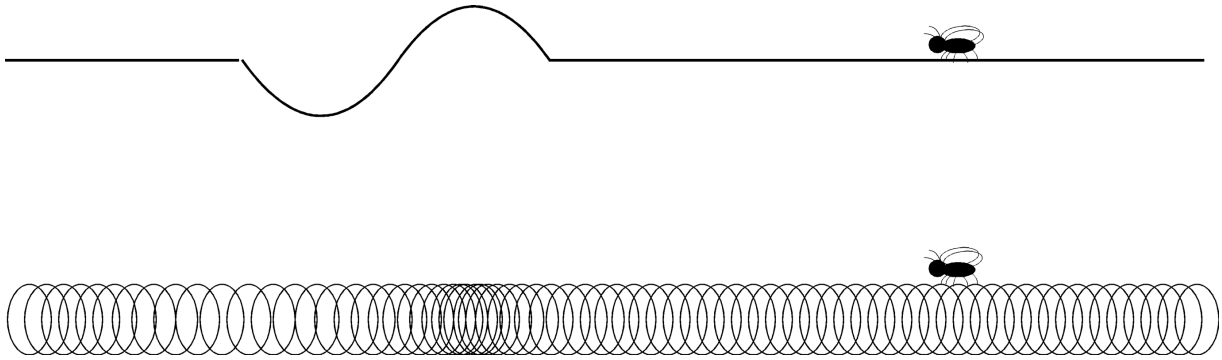
PhyzJob: Wave Basics

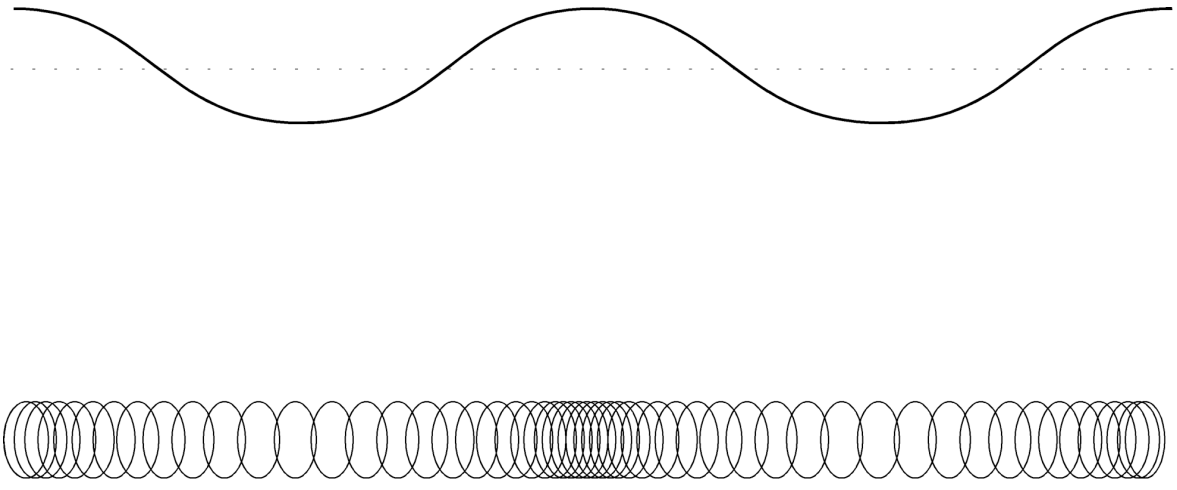
Making Waves: Transverse and Longitudinal

1. a. One fly is resting on a cord; the other is resting on a coil. Each medium has a wave pulse in it (moving from left to right). Label each pulse shown below (“Transverse” or “Longitudinal”).

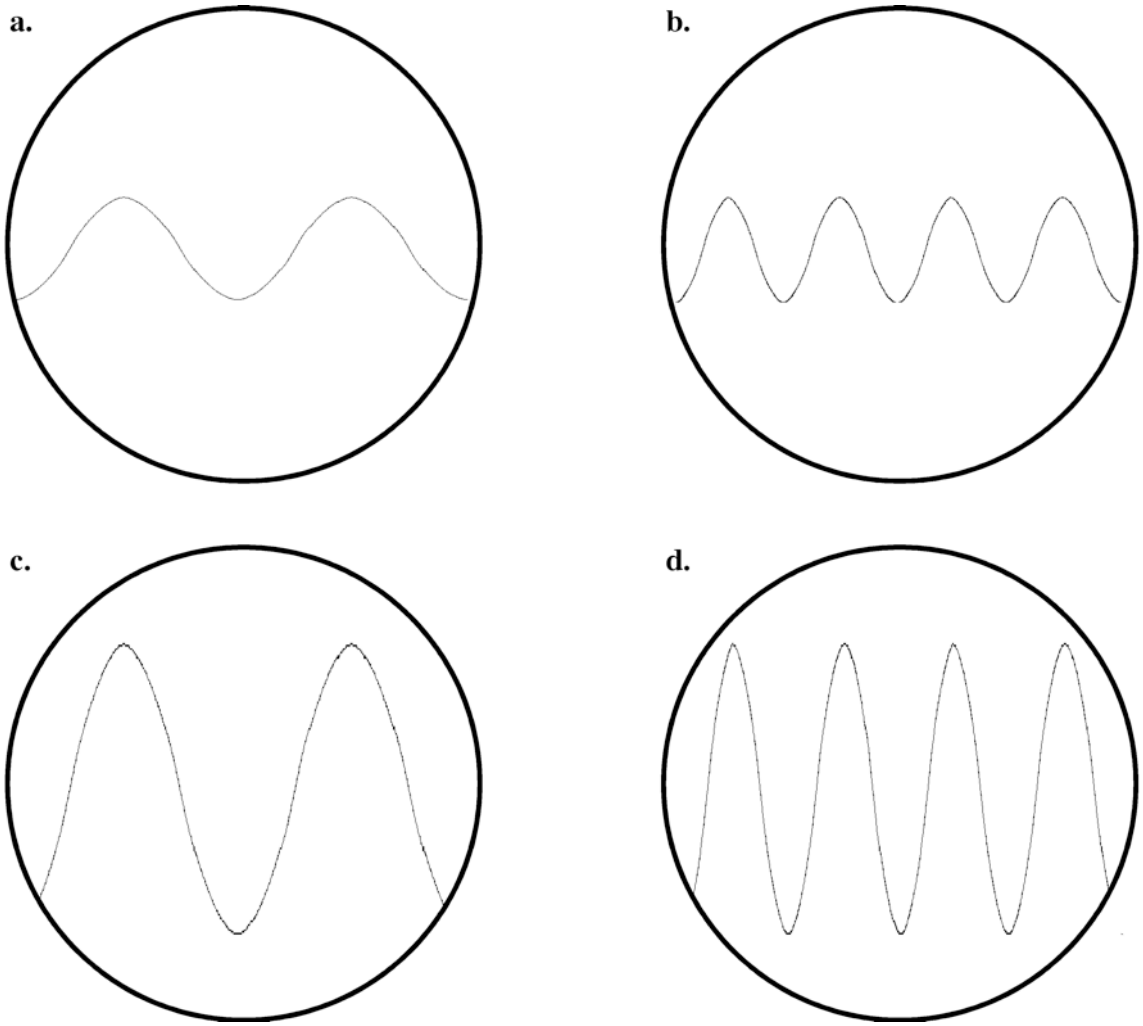
b. For each case shown below, describe the motion of the fly when the pulse passes under it: what type of motion is this and how does the direction of the fly’s motion compare to the direction of motion of the pulse. (Assume the fly does not get startled and fly away.)



2. On the diagrams below, indicate the **wave type** and show **wavelength** (λ). On the longitudinal wave, identify regions of **compression** and **rarefaction.** On the transverse wave, identify **amplitude** (*A*)**,** a **crest** and a **trough.**



Oscilloscope Fun



Which is which? The diagrams above indicate oscilloscope traces for sounds. (Sound is a *longitudinal* wave. When sound waves hit the diaphragm of the microphone, the diaphragm is set into oscillation. This oscillation is transformed into an electric signal. How? Good question. Ask your teacher! Anyway, the oscilloscope, in effect, displays the sound wave—but as a *transverse* wave. The oscilloscope crests correspond to sound wave compressions; the troughs correspond to expansions.)

1. Two of the sounds are low notes, two are high notes. Which are which?

2. Two of the sounds are loud, two are quiet. Which are which?

3. Which sound is high and quiet?

*SURFING: It is important to understand that waves transmit energy **without** transmitting matter. (Throwing a rock transmits energy **and** matter.) But it is possible for matter to "ride" a wave. Look back at the bug on the cord in problem 1. What could happen if the bug were wearing bug roller skates?*