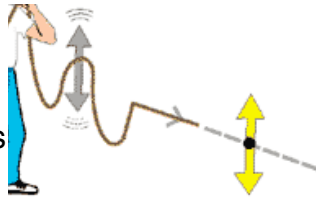
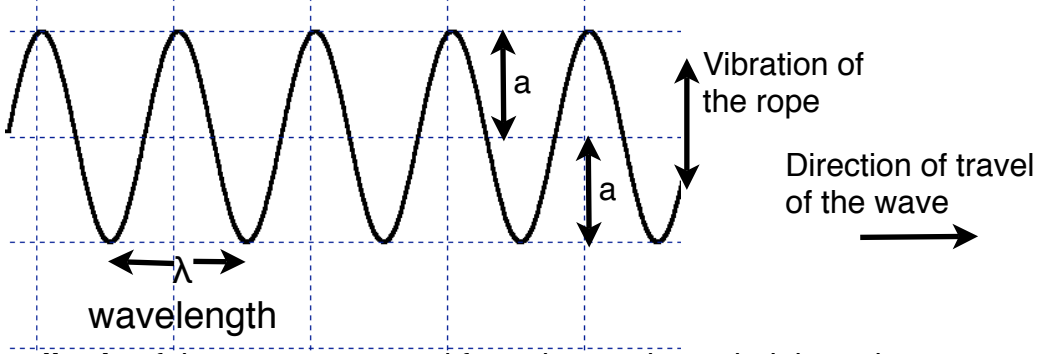
Measuring Longitudinal and Transverse waves

The Fizzics Organisation

Transverse waves
A shaking rope is a good example. The wave moves along the rope but the bits of rope go up and down - across the direction of the wave. “Trans” means across, think of “transatlantic” or “transfer”.



A water wave is another example of a transverse wave.



a is the amplitude of the wave measured from the maximum height to the middle. Think of a water wave, it is the distance from either the crest or the trough to where the water would be if it were calm.

λ is the wavelength. That is the distance from one point on a wave to the same point on the next wave - for example from crest to crest or trough to trough.

f is the frequency of the wave, that is the number of waves which are produced every second (or the number passing every second). This number is given the unit “hertz”. One hertz is one wave per second.

Most of the examples of waves we have to deal with are transverse waves. All the waves in the electromagnet spectrum are transverse waves.

There is a connection between the frequency and wavelength of a wave. If the frequency is increased - if there are far more waves, then they are closer together; in other words the wavelength is less.

The speed is equal to the frequency multiplied by the

$$V = f \times \lambda$$

m/s hertz metres

A longitudinal wave is a “pushing” wave. A line of dominos falling is an example.

If one end of a slinky is pushed and pulled then each coil pushes and pulls the next. The coils oscillate along in the same direction that the wave is traveling.