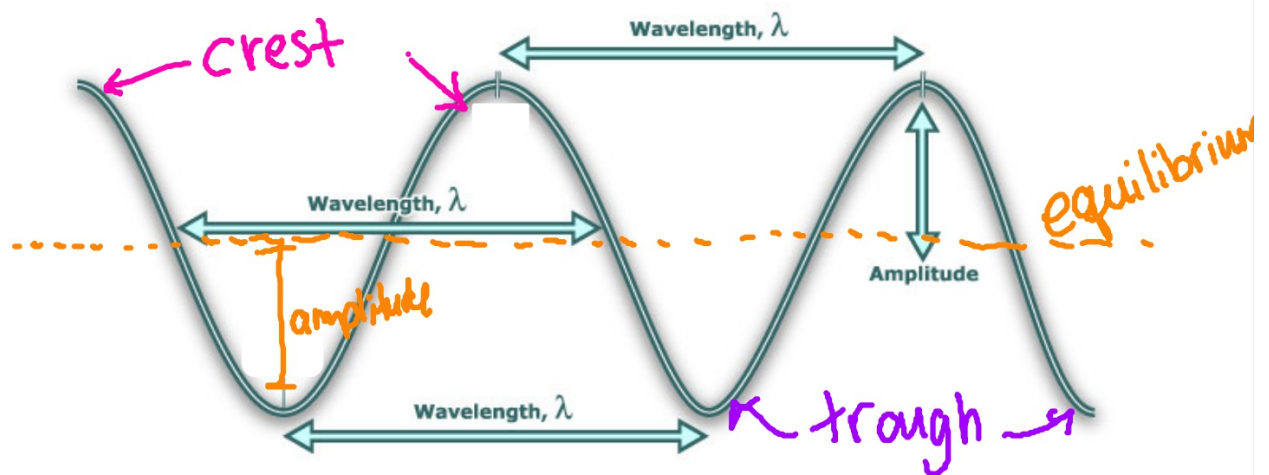


II. Waves

A. Wave characteristics

1. Amplitude: maximum displacement from equilibrium
2. Crest: highest point
3. Trough: lowest point



4. Wavelength (λ): length of one complete wave (unit=m) λ
5. Frequency (f): number of waves that pass a particular point each second (unit=1/s or Hz)
6. Period (T): time it takes for one complete wave (units = seconds)

$$f = \frac{1}{T} \quad \text{or} \quad T = \frac{1}{f}$$

B. Wave equation

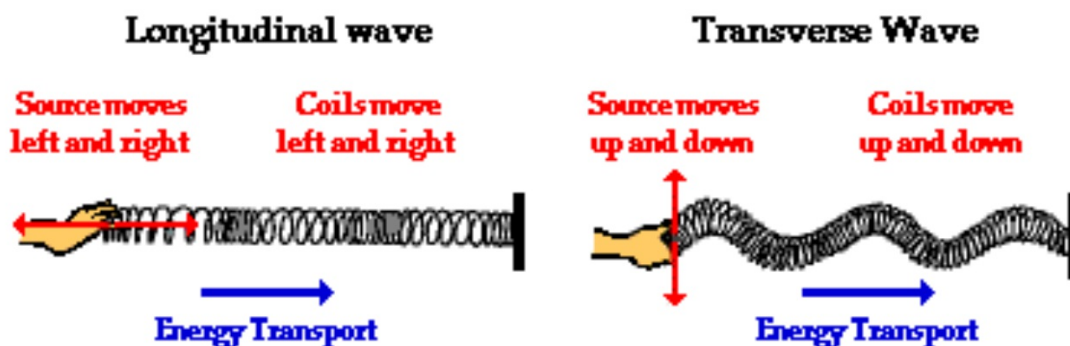
$$v = f\lambda$$

velocity = frequency \times wavelength

units: m/s

C. Two types of waves

1. Transverse: particle motion is \perp perpendicular to the direction of the wave velocity (light)
2. Longitudinal: particle oscillation is parallel to the wave velocity (sound)

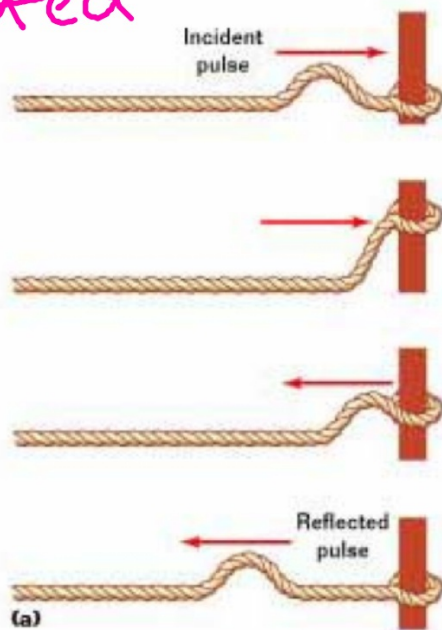


The subsequent direction of motion of individual particles of a medium is the same as the direction of vibration of the source of the disturbance.

D. Wave reflection

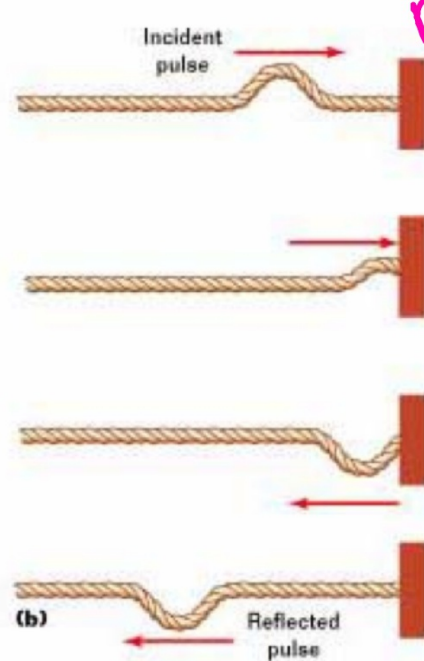
Free boundary:

reflected



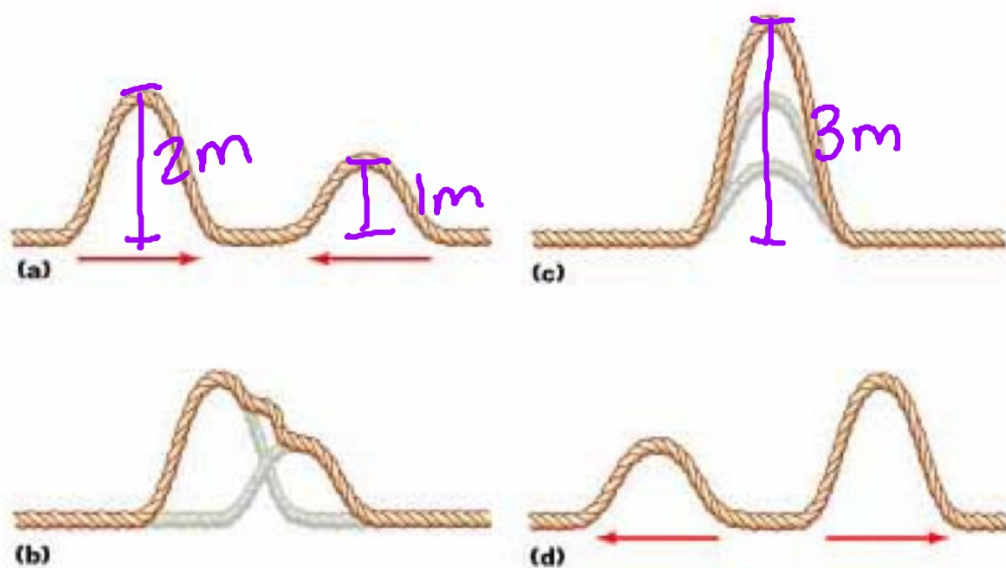
Fixed boundary:

reflected + inverted

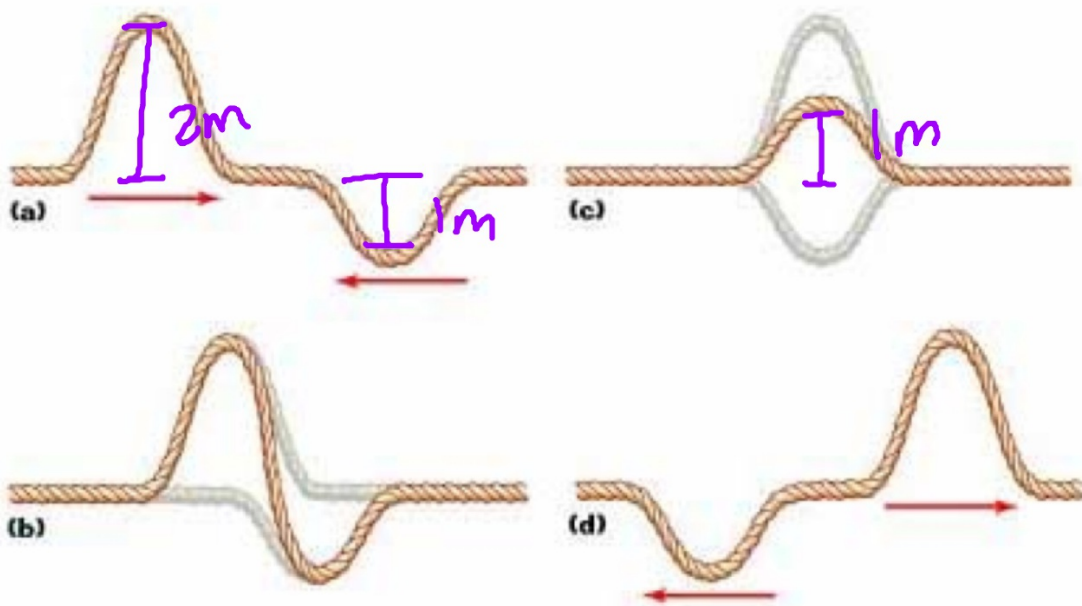


E. Wave interaction

1. **Constructive** interference: when two waves are added together and the resultant is larger than the individual waves (ex: two crests)



2. **Destructive** interference: when two waves are added and the resultant is the difference between the pulses (ex: one crest and one trough)



F. Wave speed

1. Depends on the medium it is traveling through, unless the wave does not require a medium
2. More tension in spring/string = faster wave

<http://kisdwebs.katyisd.org/campuses/SLHS/teacherweb/physicsacad/Pages/Welcome.aspx>