

Wave Review - Quiz

period (T) $T = \frac{\text{time}}{\text{cycles}}$ (time for one cycle)
 units: (S), min, h, days

frequency (f) $f = \frac{\text{cycles}}{\text{time}}$ (# of cycles in a given time)
 units: (S⁻¹ or Hz) or per day, per year etc

Period and Frequency are reciprocals $T = \frac{1}{f}$ or $f = \frac{1}{T}$

Universal wave equation: $v = \lambda f$
 or $(v = \frac{\lambda}{T})$ λ period

The speed of a wave depends ONLY on the medium it travels through

When a wave encounters a boundary (1D or 2D) and enters a new medium, the speed changes. Since the frequency stays the same, the wavelength must also change.



At any boundary, some of the wave is transmitted and some is reflected.

less dense (fast) → more dense (slow)

reflected wave is inverted

more dense (slow) → less dense (fast)

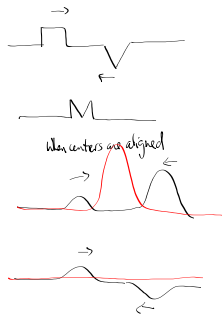
reflected wave is erect (upright = not inverted)

Principle of Superposition

When waves meet each other, they add together algebraically

constructive interference → bigger wave

destructive interference → smaller wave (could cancel out)



Standing Waves

fundamental mode $d = \frac{1}{2} \lambda$
 ↳ achieved with the fundamental frequency (smallest freq to give a standing wave pattern)

node to node is $\frac{1}{2} \lambda$ $d = \frac{2}{3} \lambda$

antinode to antinode is $\frac{1}{2} \lambda$ $d = \frac{3}{2} \lambda$ FOP

The wave length gets smaller with each pattern so the frequency got bigger since the speed stays the same (same media)