Wave Review

period: $T = \frac{\text{time}}{\text{cycles}}$ (time for one complete cycle)

frequency: $f = \frac{\text{cycles}}{\text{time}}$ (the number of cycles per second)

$$f = \frac{1}{T} \text{ and } T = \frac{1}{f}$$

(f and T are reciprocals)

Universal Wave Equation:

$$v = \lambda f$$

You can also use: $v = \frac{\Delta d}{\Delta t}$ (the speed of a wave is constant)

The speed of a wave depends only on the medium.
It does not depend on amplitude, frequency or wavelength.

Waves encountering Boundaries:

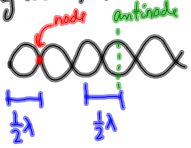
- the frequency stays the same, the speed changes and also the wavelength.

⇒ smaller λ → slower wave
larger λ → faster wave

- at every boundary there is reflection + transmission (the more different the two media, then the greater the reflection)
- wave goes from less dense (fast) to more dense (slow) → reflected wave is inverted.
- wave goes from more dense (slow) to less dense (fast) → reflected wave is not inverted (erect)

Interference of Waves:

- Principle of Superposition (add together)
- waves pass through (going in opp. directions)
- Constructive Interference + Destructive Interference
- Standing Waves → nodes + antinodes



Waves in 2D:

- Reflection ($\theta_i = \theta_R$ ← measured wrt normal)
- Refraction (change in direction)
  - bends toward normal when slowing down
  - bends away from normal when speeding up
- Diffraction (spreading around edges of boundary)