Light is a Transverse Wave

Maxwell (1864) - Light is an Electromagnetic wave

\[ \lambda \text{ is small} \]

400 - 700 \times 10^{-9} \text{ m}

Huygen’s Principle - First Wave Theory (1580)

A) every wave front is a point source of wavelets
B) wavelets move radially with wave velocity
C) wave at time \( t \) later is envelope of wavelets

Principle Explains:
- reflection
- refraction
- interference
- diffraction
Young’s Experiment

Monocromatic light in phase enters double slit

\[ \lambda \]

\[ L \]

\[ \theta \]

\[ d \]

\[ \text{screen} \]

Constructive: \[ d \sin \theta = m\lambda \]

Destructive: \[ d \sin \theta = (m + \frac{1}{2})\lambda \]

*where* \( m = 0, 1, 2, 3, \ldots \)

**Position on screen y**

\[ y = \frac{m\lambda L}{d} \quad \text{where} \quad m = 0, 1, 2, \ldots \]