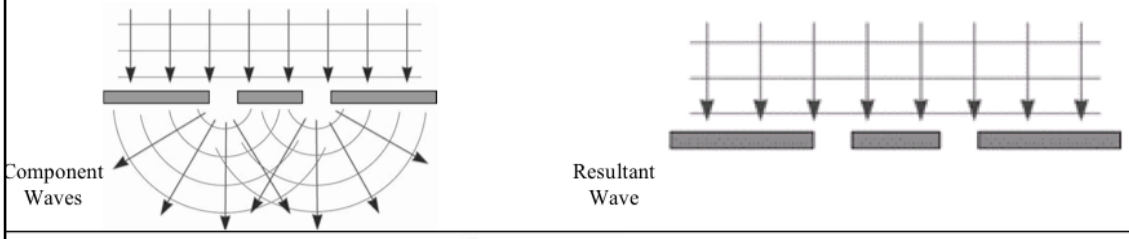
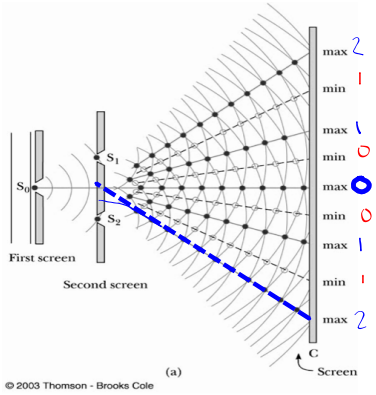
Double Slit Diffraction and Interference





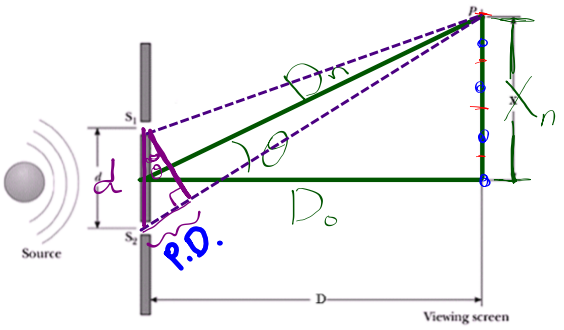
Interference Formulas

Bright Fringes:

$$\frac{X_n}{D_n} = \frac{(n\lambda)}{d}$$

Dark Fringes:

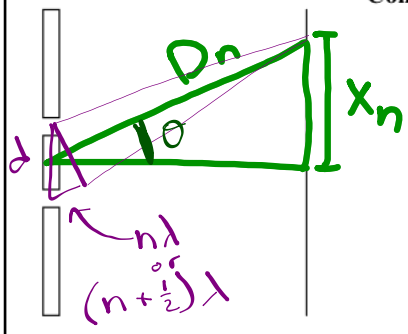
$$\frac{X_n}{D_n} = \frac{(n+\frac{1}{2})\lambda}{d}$$



$$\sin\theta = \frac{X_n}{D_n}$$

$$\sin\theta = \frac{PD}{d}$$

The Fringe Equations



Constructive Interference

$\sin\theta = \frac{X_n}{D} = \frac{n\lambda}{d}$

Destructive Interference

$\sin\theta = \frac{X_n}{D} = \frac{(n+\frac{1}{2})\lambda}{d}$

Variable:	X_n	θ_n	D_n	d	λ
Quantity:	linear displacement	angular displacement	Dist. from center of sources to screen	distance between sources	wavelength
Units:					

Thomas Young's Double Slit Diffraction

In 1801 the English scientist Thomas Young (1773–1829) performed an historic experiment that demonstrated the wave nature of light by showing that two overlapping light waves interfered with each other.

Importance of experiment:

1.

2.

What is the reason for first having a single and then a double slit?