

# Chapter 18

## Interference and Diffraction

Read Pages 637-660

Coherent light

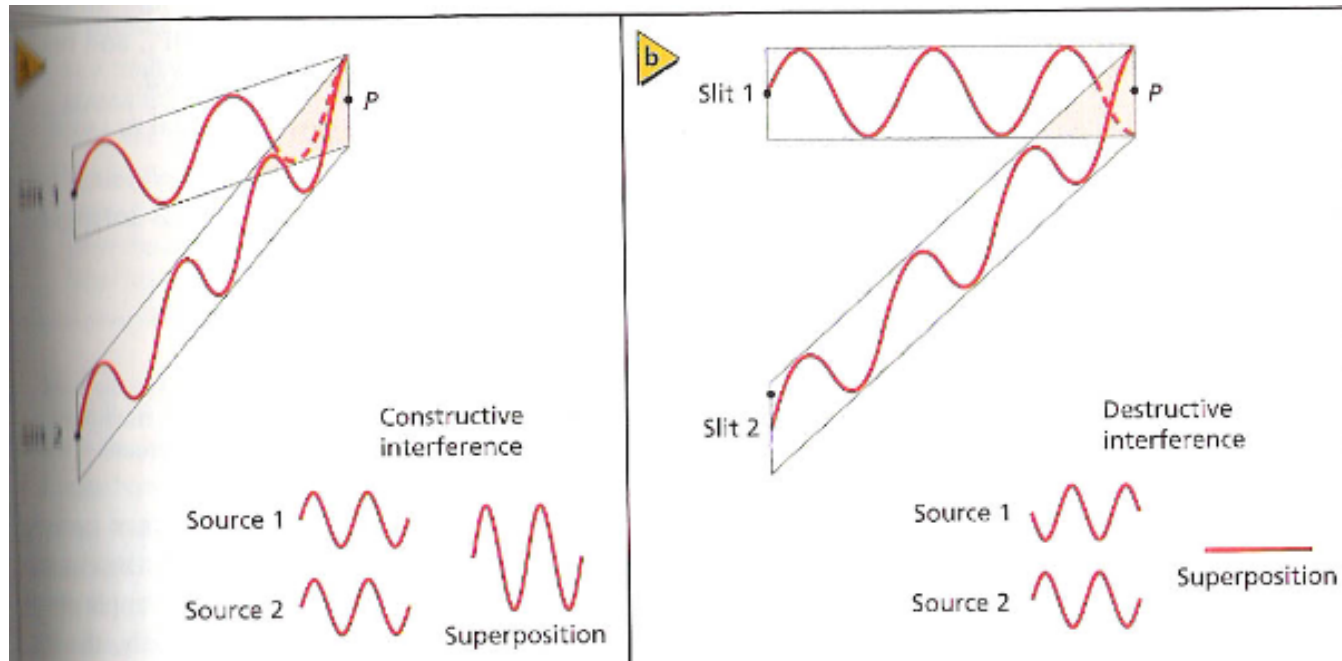
Incoherent light

Monochromatic light

Constructive Interference

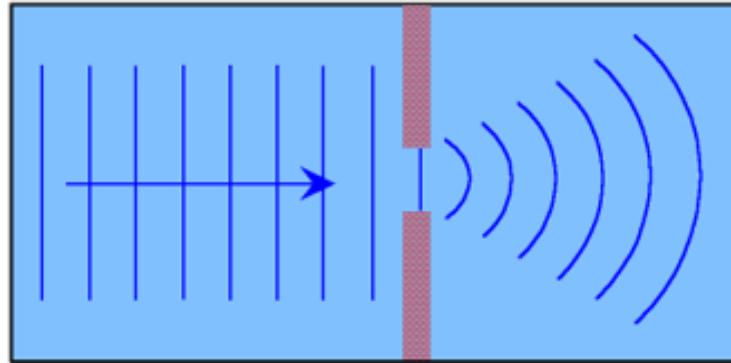
Destructive Interference

# Interference (reminder)



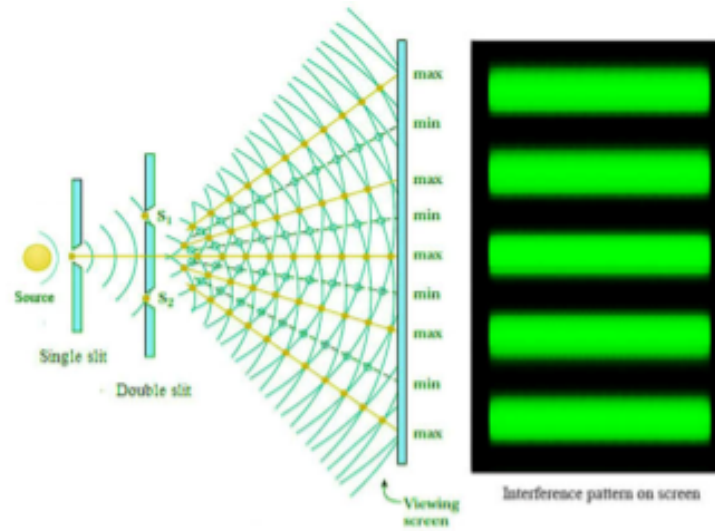
Diffraction:

Bending of a wave as it passes around a small barrier or through a small opening.  
(Small compared to the wavelength.)




## Double Slit Interference Demo

<https://www.khanacademy.org/science/physics/light-waves/interference-of-light-waves/v/youngs-double-split-part-1>




Note: If the link does not work, copy the text of the link and paste it into the address bar of your browser.


## Diffraction Demonstration

 <https://www.youtube.com/watch?v=1bHipDSHVG4>

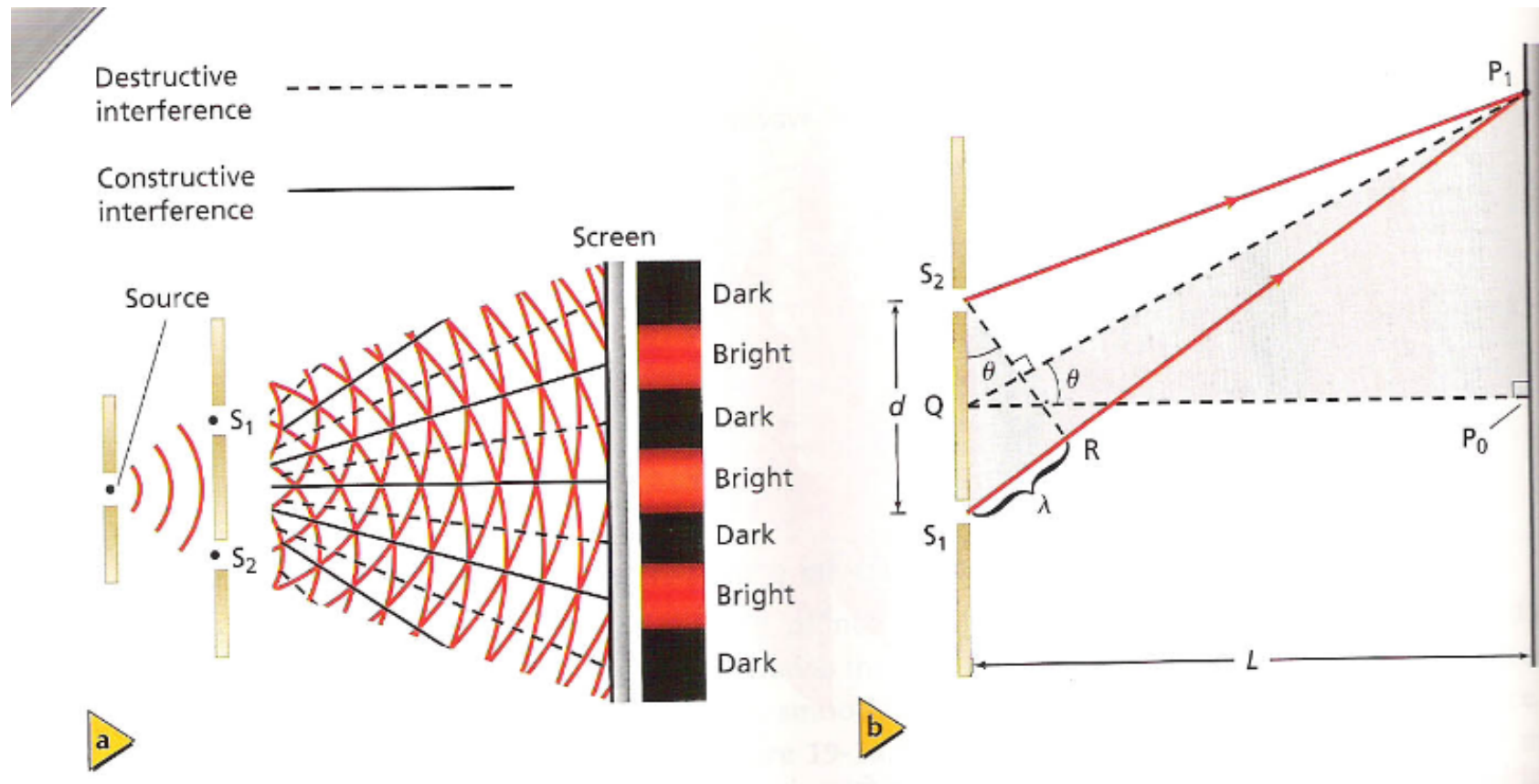
## Diffraction and Interference

 <https://www.youtube.com/watch?v=oYFEWoxuB1I>

## Path Difference - Interference

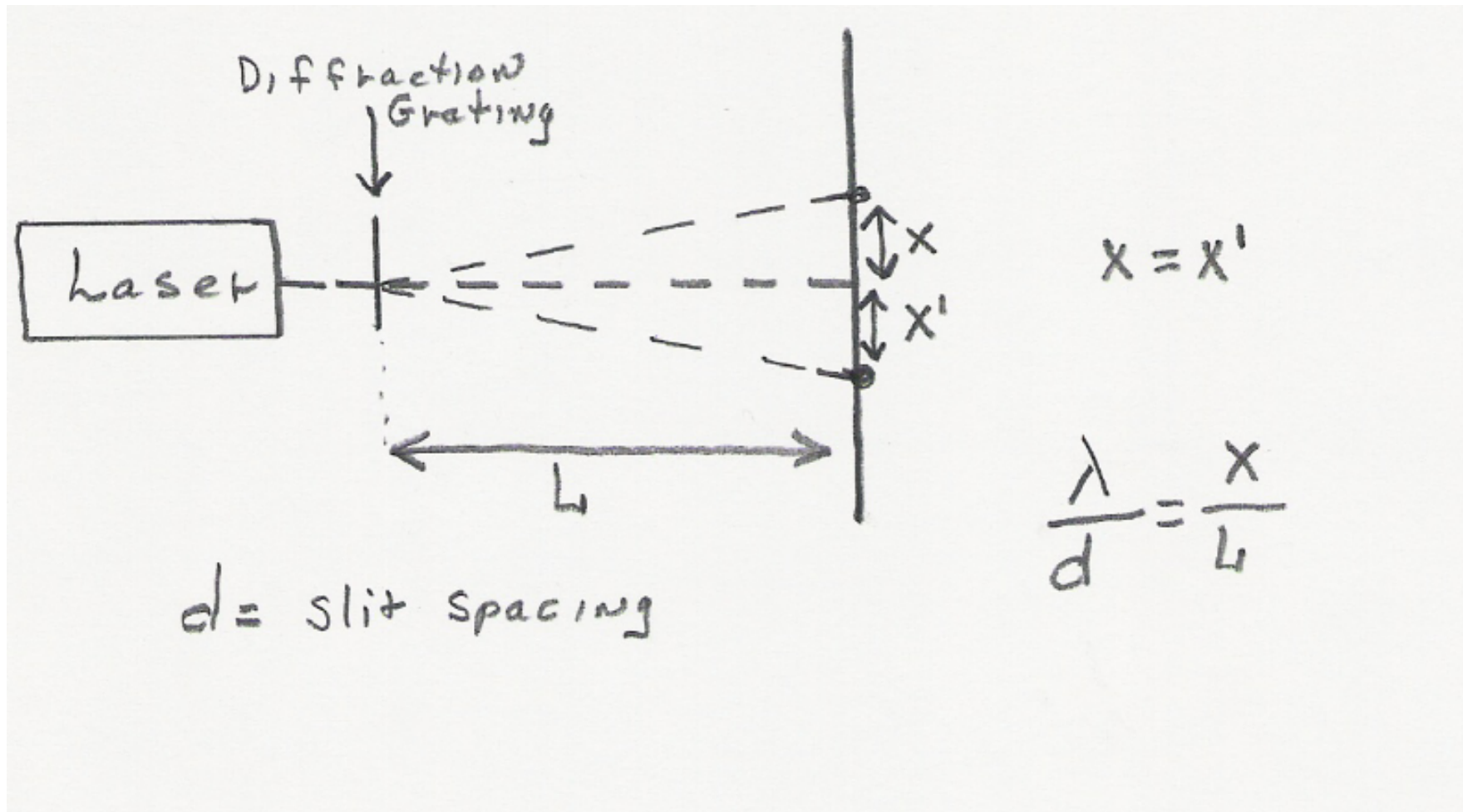
 <http://ionaphysics.org/classroom/Assignments/Interference/index.html>

# Young's double slit interference:



For constructive interference, path difference  
 $= \lambda, 2\lambda, 3\lambda, \dots$

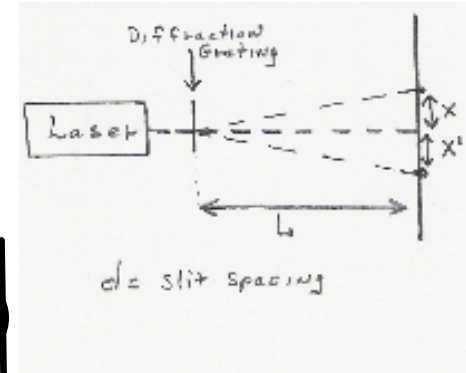
# Experimental Setup:



Data Table:

$$d = 1.75 \times 10^{-6} \text{ m}$$

d(m)	x(m)	L(m)	$\lambda$ (m)



$$\lambda = \frac{d x}{L}$$

Repeat for at least 4 different values of L.  
Calculate the average of the wavelengths.  
That is your conclusion for the wavelength  
of the laser.