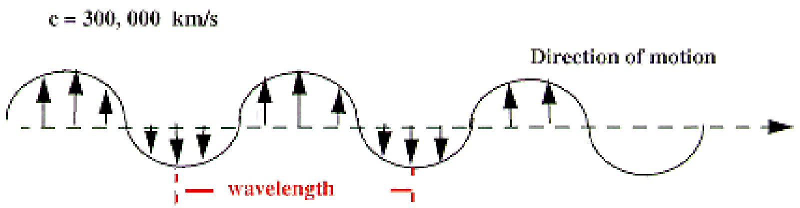
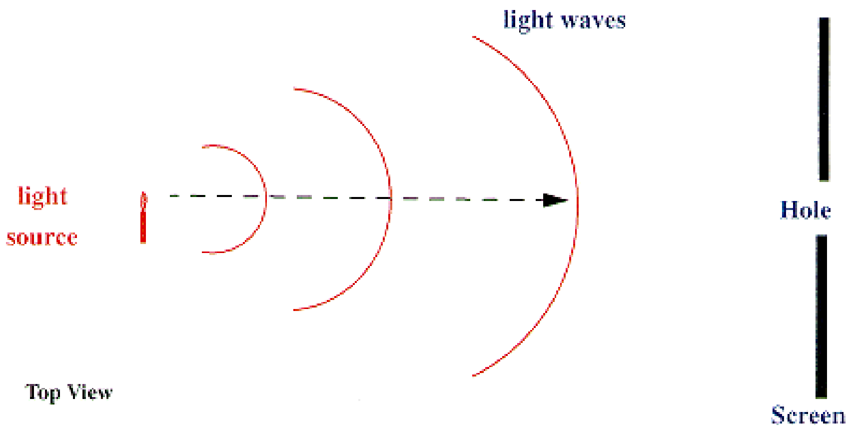
Wave Model for light

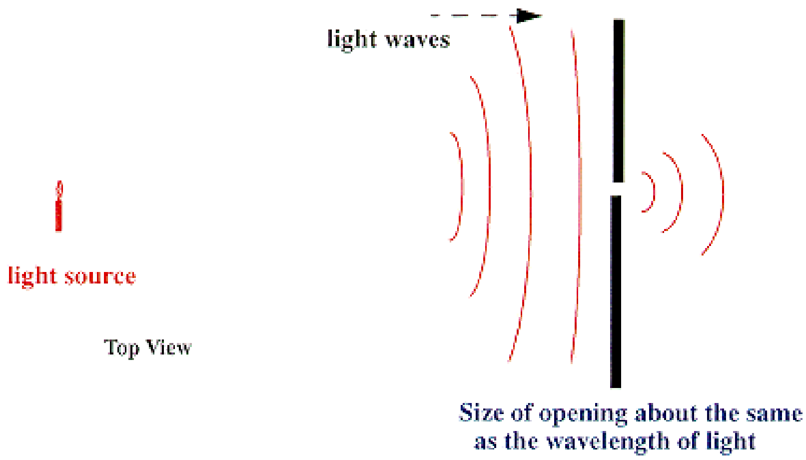
Electromagnetic Wave



What Happens to the Wave When it Encounters the Small Opening?

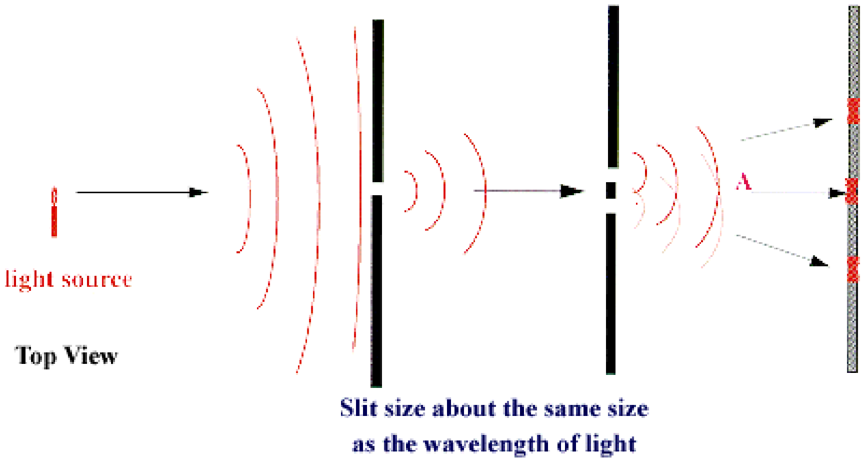


What Will Happen to the Wave When it Encounters a Smaller Opening?



Diffraction: Bending of light when it passes around a sharp obstacle or through a narrow slit. *Different wavelengths (colors) of light diffract by different amounts.*

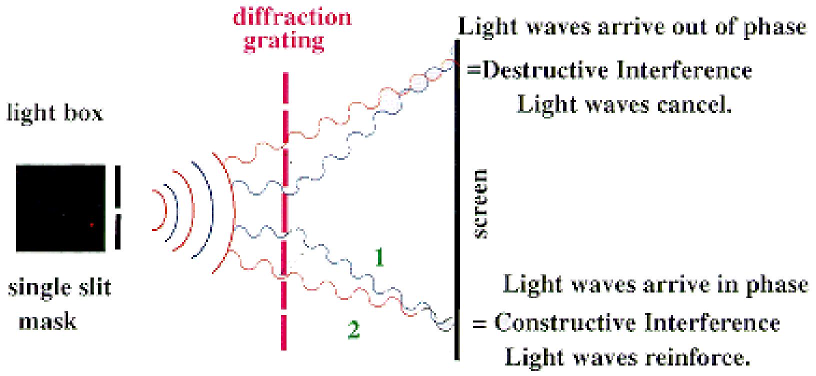
What Will Happen to the Light After it Passes Through Two Slits?



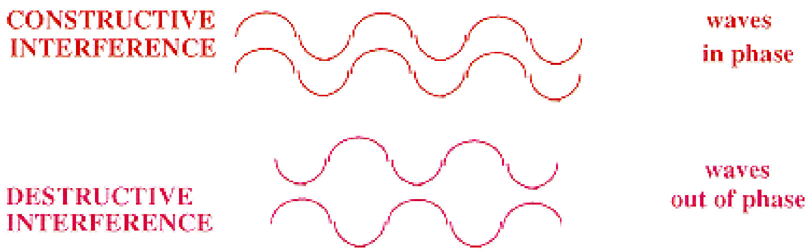
Interference: Superposition of waves. *Constructive interference* occurs when waves reinforce each other (as at point A above). *Destructive interference* occurs when light waves cancel each other.

Diffraction Grating has many narrow "slits". Your diffraction grating has about 20,000 "slits" etched on the plastic.

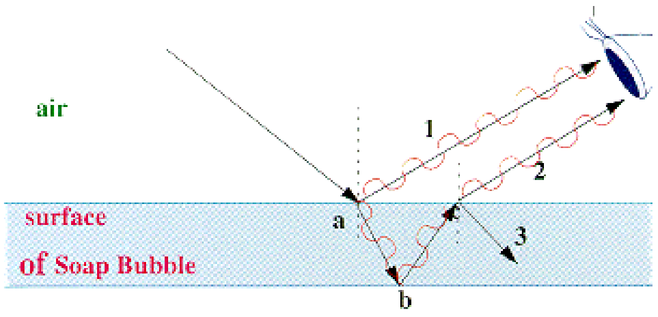
How does a diffraction grating form a spectrum?



Light wave 1 performs exactly one more vibration (up-down cycle) than light wave 2 before striking screen. Both light waves arrive in phase.
= Constructive Interference



What Causes the Colors in Soap Bubbles?



interior of soap bubble (air)

Light is reflected from both the top and the bottom surfaces of the bubble. Light Ray 2 travels extra distance abc compared to light ray 1. If light waves 1 and 2 arrive at the eye in phase (constructive interference), then you see a bright reflection. The colors you see depend on which wavelengths (colors) are in phase when they reach your eye. What will this depend on?

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