Waves are cascading disturbances in coupled oscillators.

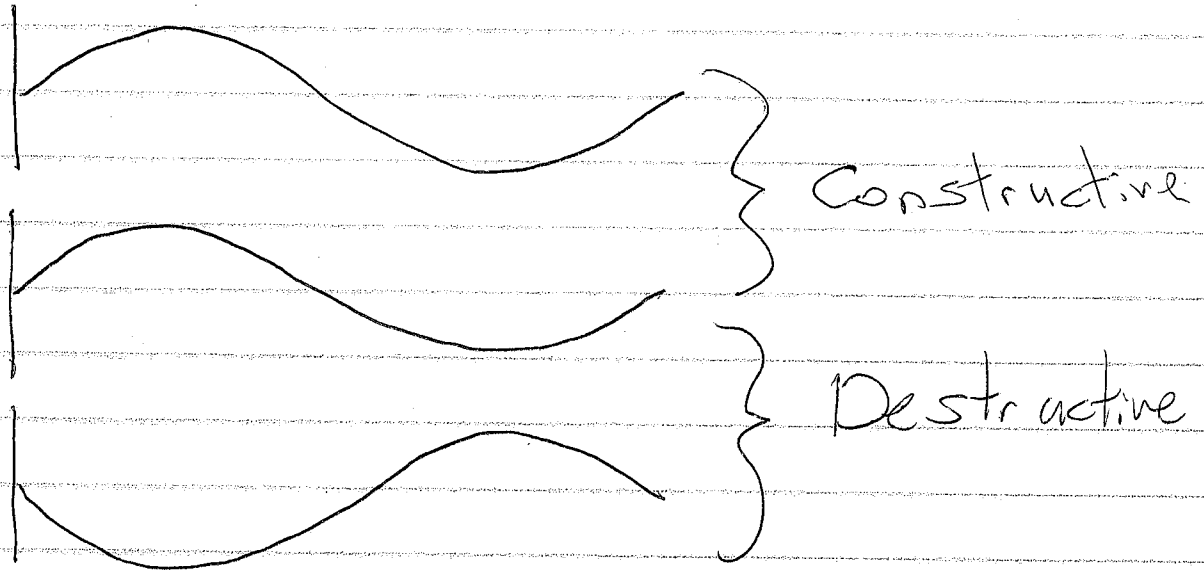
All oscillators take part in making the wave go "straight".

Shut down some participants, and the wave changes.

Exceptions to straight propagation:
- Refraction } Newtonian Optics
- Reflection }
- Diffraction } Physical Optics
- Interference }

Huygens Principle - all parts of the wave front propagate the wave.

(Constructive Interference / Destructive Interference) - Two waves combine and make one point oscillate (a lot / not much) because the peaks and troughs are (in sync / out of sync).



How can we control this?

- Time Delay $\Delta t_0 = mT$
- Path Length Difference $\Delta l = m\lambda$
- Phase Delay $\Delta\phi = m\,2\pi$

m = # of periods or # wavelengths or # cycles

m = integer = constructive

m = half-integer = destructive

(3)

$\lambda = 515$ nm

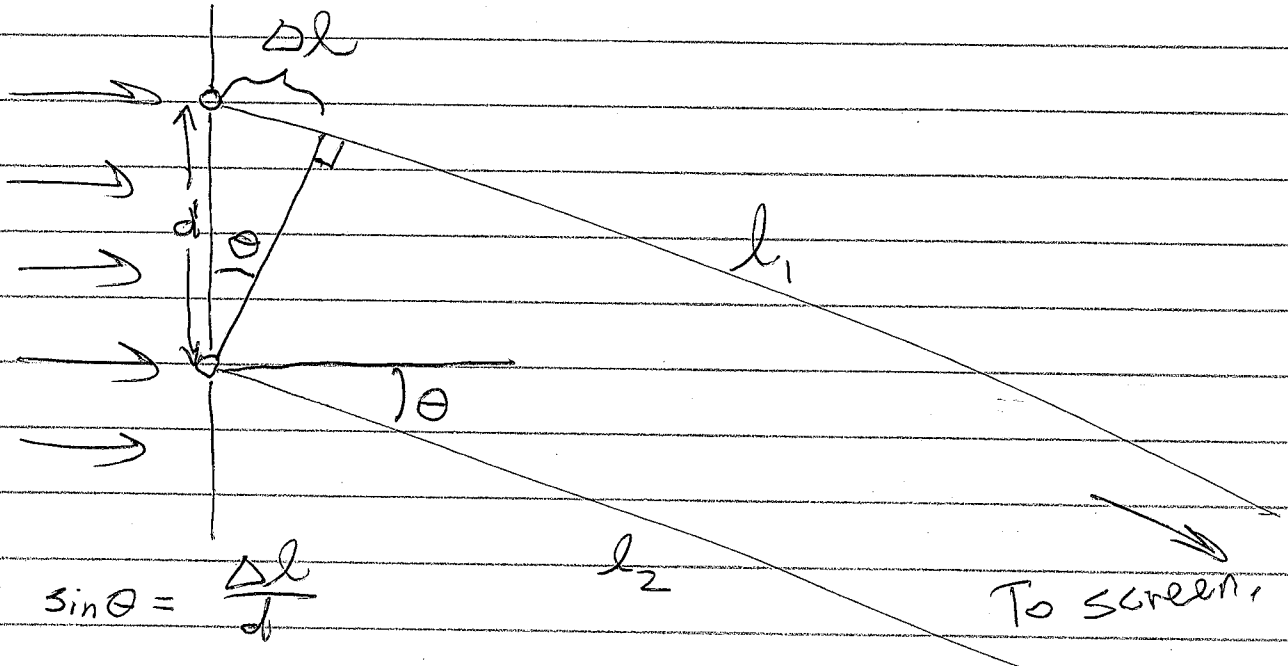
$l_1 = 3833$ nm
$l_2 = 4110$ nm
} $\Delta l =$ 277 nm

$$\frac{\Delta l}{\lambda} = 0.537 \approx \frac{1}{2}$$

This Δl caused destructive interference.

$\Delta l \approx \frac{1}{2}\lambda$

How is Δl related to $\theta_{observation}$?



$\sin\theta = \frac{\Delta l}{d}$

$d\sin\theta = \Delta l = m\lambda$

$m\lambda = d\sin\theta$

m = # λ's of path length difference