Ch14 Concept

Monday, 26 October 2020 13:00

Reflection . Refraction , Diffraction

IRL wave (cross section // Water)

← Brighter (Crest)
← Darker (Trough)

$$v = f\lambda$$

$[m\,s^{-1}] = [Hz] \cdot [m]$
$(t^{-1}\,[s])$

T = time of a period (λ)

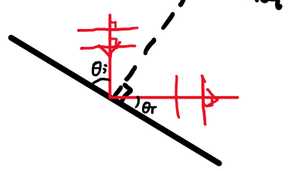
f = how much T per sec

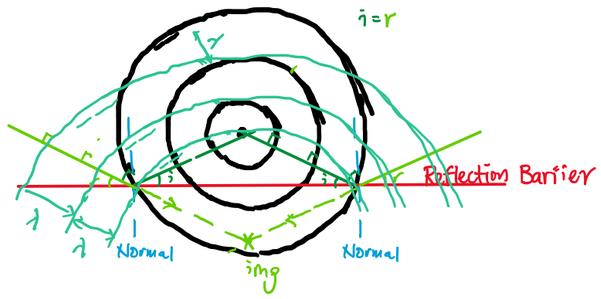
deeper water → v↑
Shallower → v↓

Reflection

- Just as light

$\theta_i = \theta_r$



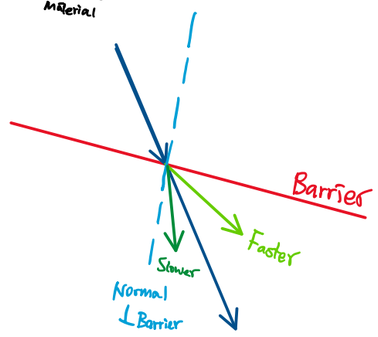


① Find Img point
② Incident ray → Barrier
Reflected ray → Barrier
$\theta_i = \theta_r$
③ Intersection pt. @ Barrier
Draw Reflected Wavefront w/ same λ

Refraction

$n_1 \sin\theta_i = n_2 \sin\theta_r$ (Snell's Law)

$n = \frac{c}{v}$ (material) c: spd of light [const.] → Const $c_{\square}$ [ms^{-1}]



∵ $v = f\lambda$

∴ Slower (v) → Towards Normal → shorter λ

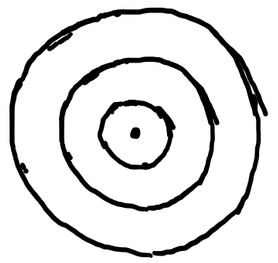
Faster (v) → Aways from Normal → Longer λ

$n = \frac{v_1}{v_2} = \frac{\lambda_1}{\lambda_2} = \frac{\sin\theta_1}{\sin\theta_2}$

Diffraction

Factors = w = width of slit / object
λ = wavelength

Diffraction degree $\propto \frac{\lambda}{w}$



Hand-drawn circle template

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