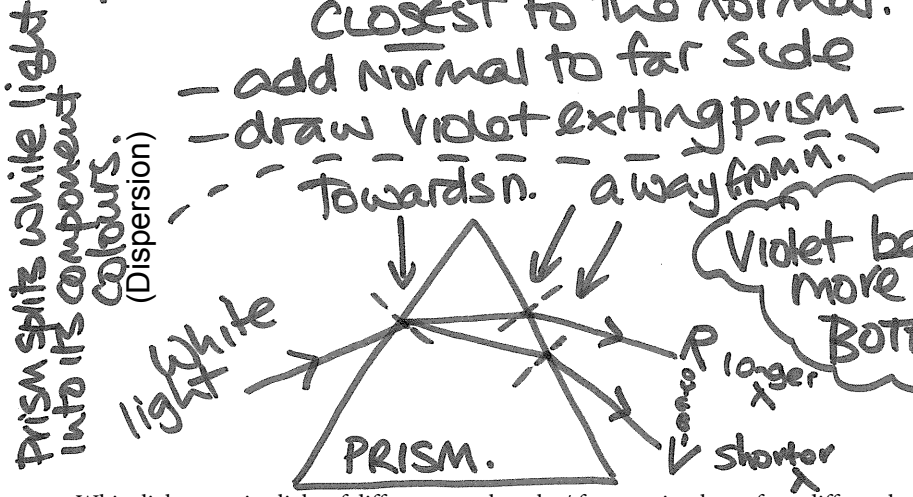
The Perfect Prism Diagram

- While light hits prism
  - draw a normal
- RED - refract towards normal (in prism)
  - add normal to far side
  - draw red exiting prism - refracts AWAY from normal.
- VIOLET - refract towards normal (in prism) CLOSEST to the normal.
  - add normal to far side
  - draw violet exiting prism - refracts furthest away from normal.

towards n. away from n.



White light contains light of different wavelengths / frequencies that refract differently

Violet bends more violently BOTH times.

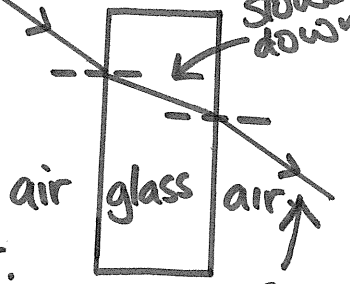
REFRACTION

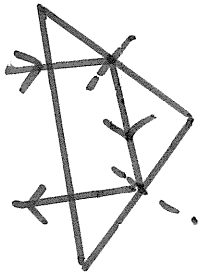
Light changes speed when it moves from one medium to another and/or.... which causes it to change direction.

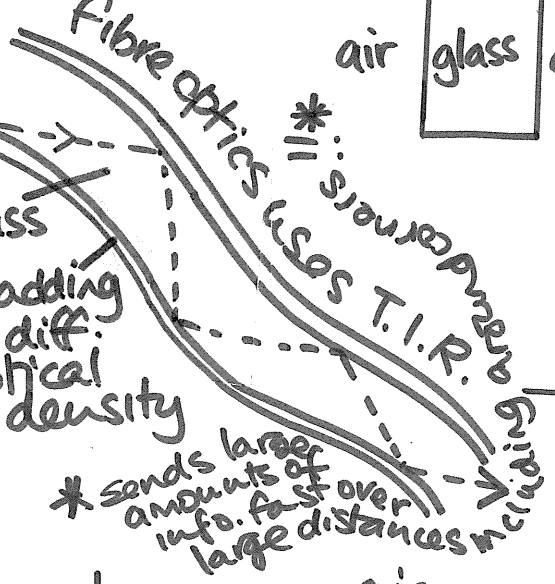
Its frequency does NOT change.

- slows down if it goes into optically more dense medium.... bends towards the normal.

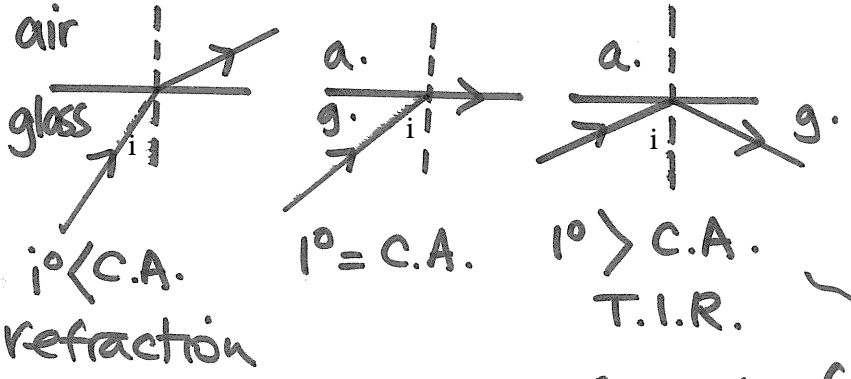
Refraction in a Block







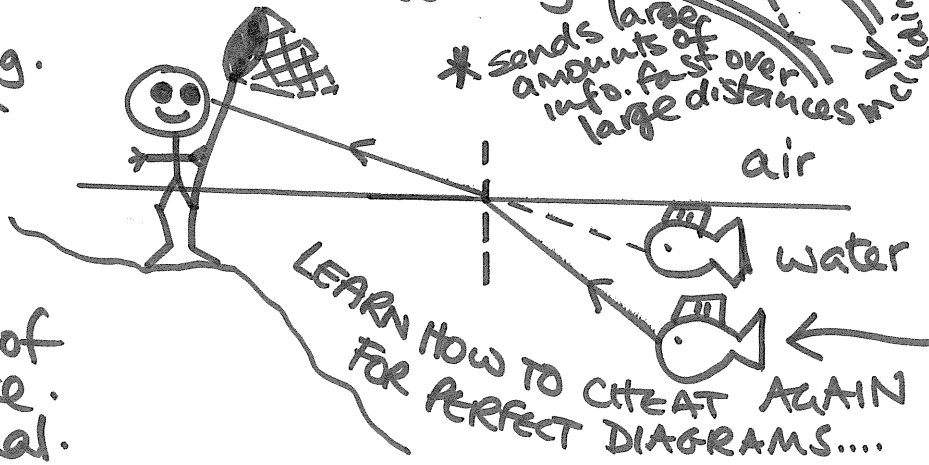
T.I.R. Total Internal Reflection

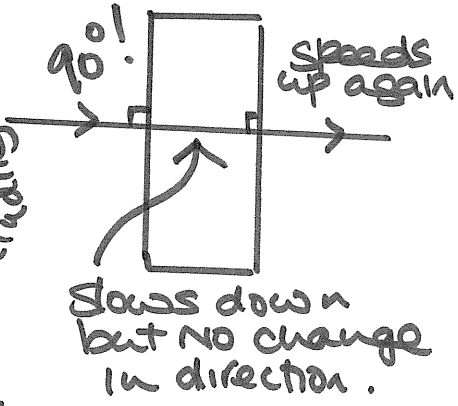


C.A = critical angle (My abreviation!!)

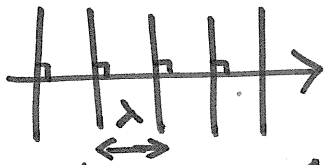
i° = angle of incidence.

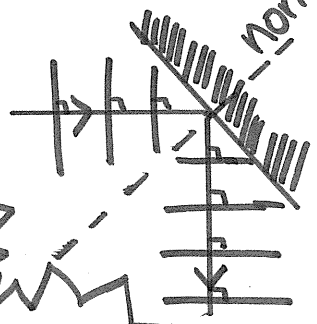
--- = normal.





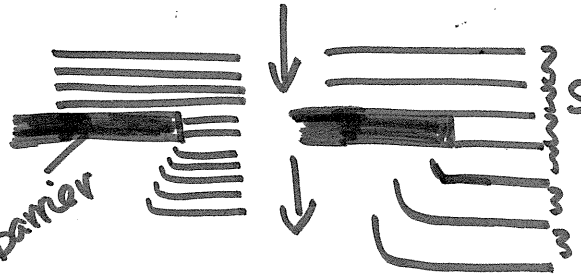
Wavefronts.



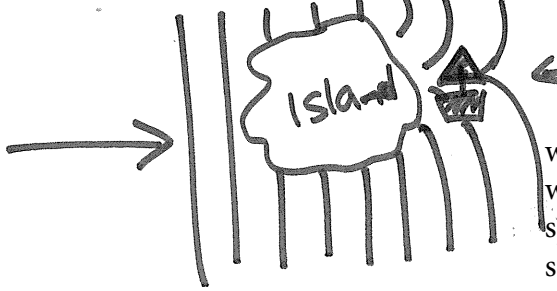


reflection of waves = λ doesn't change

"Diffraction" – waves bend.
As λ ↑, diffraction ↑



waves bend more sharply around barriers/obstacles when the λ is BIGGER.



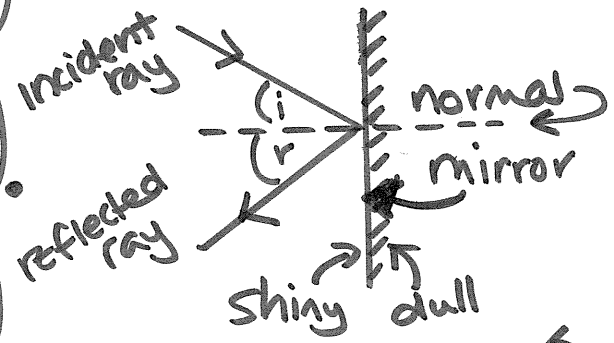
wave fronts travel with the same speed / have the same wavelength

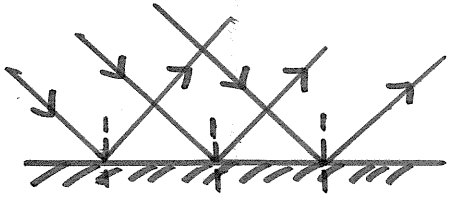
LIGHT is Electromagnetic radiation that occurs as waves — visible light, UV, IR, etc. (x-rays)

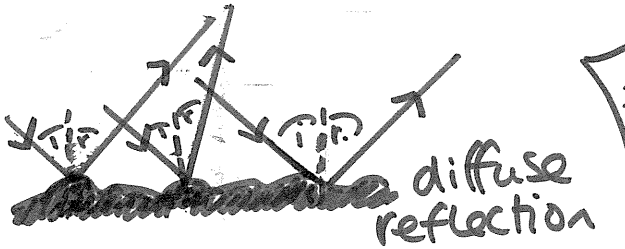
Do NOT require a medium

Laws of Reflection.

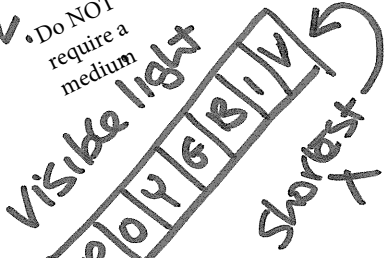
Angle of incidence = angle of reflection, which measured from the normal.

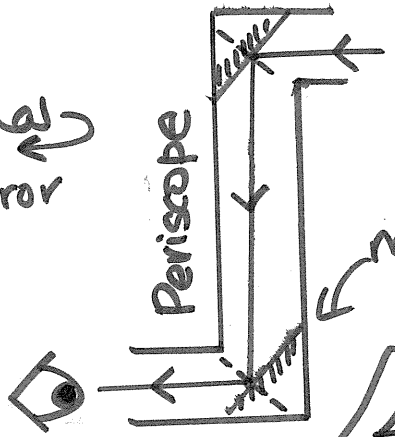






ROYGBIV = SPECTRUM





Images in plane mirror

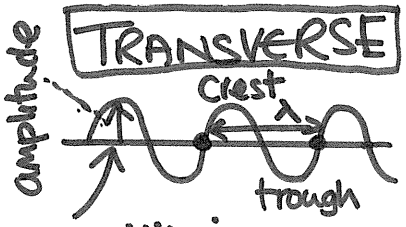
* same size * same distance behind as object is infront
* virtual (rays don't actually go there) * upright
* laterally inverted

Plane Sno19

No Brain Too Small

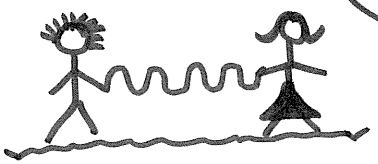
WAVES

TRANSVERSE



→ particles oscillate @ 90° to direction wave is travelling

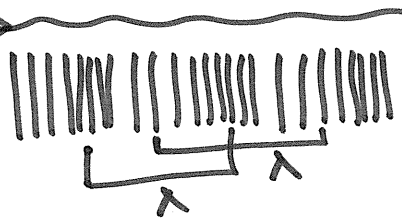
eg light, radio water, rope



λ = distance it takes for wave to repeat itself (m)

A = amplitude – maximum distance wave moves from Equilibrium position (M).

LONGITUDINAL



→ Particles oscillate parallel to direction wave is moving.

||||| = compression |||| = rarefaction.

eg Sound waves
Pwaves (earthquake)

Transfer energy from one place to another without any transfer of matter.

THE WAVE EQUATION

$V = f\lambda$

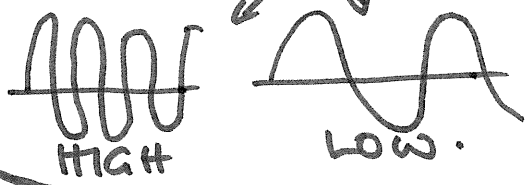
Speed ms^{-1} ... freq. Hz ... wavelength m

AND ... $V = \frac{d}{t}$ ... d = distance m, t = time s

Speed ms^{-1}

Pitch describes the frequency of a sound wave.
FREQUENCY = HIGH PITCH
LARGE or HIGH

BAD DRAWING!!



But... LOUDNESS is related to amplitude – Big amplitude = Louder sound.

FREQUENCY

f = No. of waves that pass a point per second (Hz)

1 Hz = 1 wave per second.

PERIOD

Time for one full oscillation (one wave passing a point). (s)

$f = \frac{1}{T}$ $T = \frac{1}{f}$

1 always on top!!

Period (T) = $\frac{\text{Time taken}}{\text{No. of waves}}$

E.g. 24 waves hit a cork every 60 seconds...
$T = 60/24 = 2.5$ s

Frequency (F) = $\frac{\text{No of waves}}{\text{Time taken.}}$

$F = 24/60 = 0.4$ Hz

UNITS!!

Show your FORMULA, WORKING & PUT UNITS!!