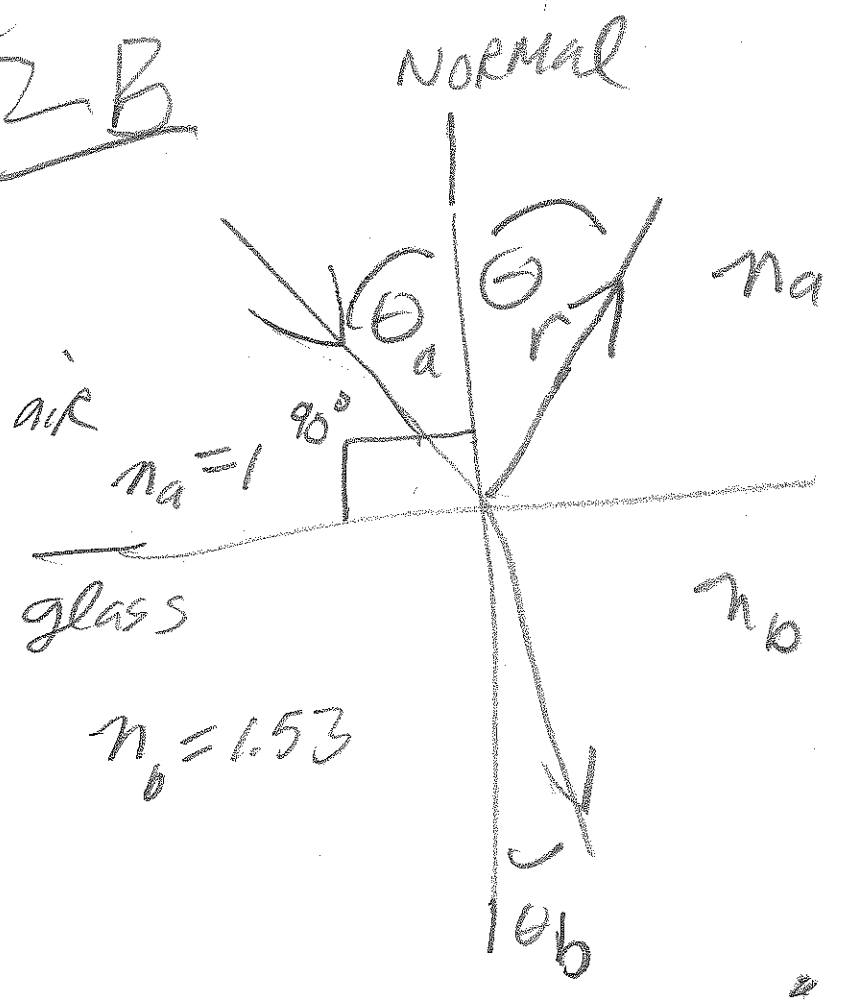
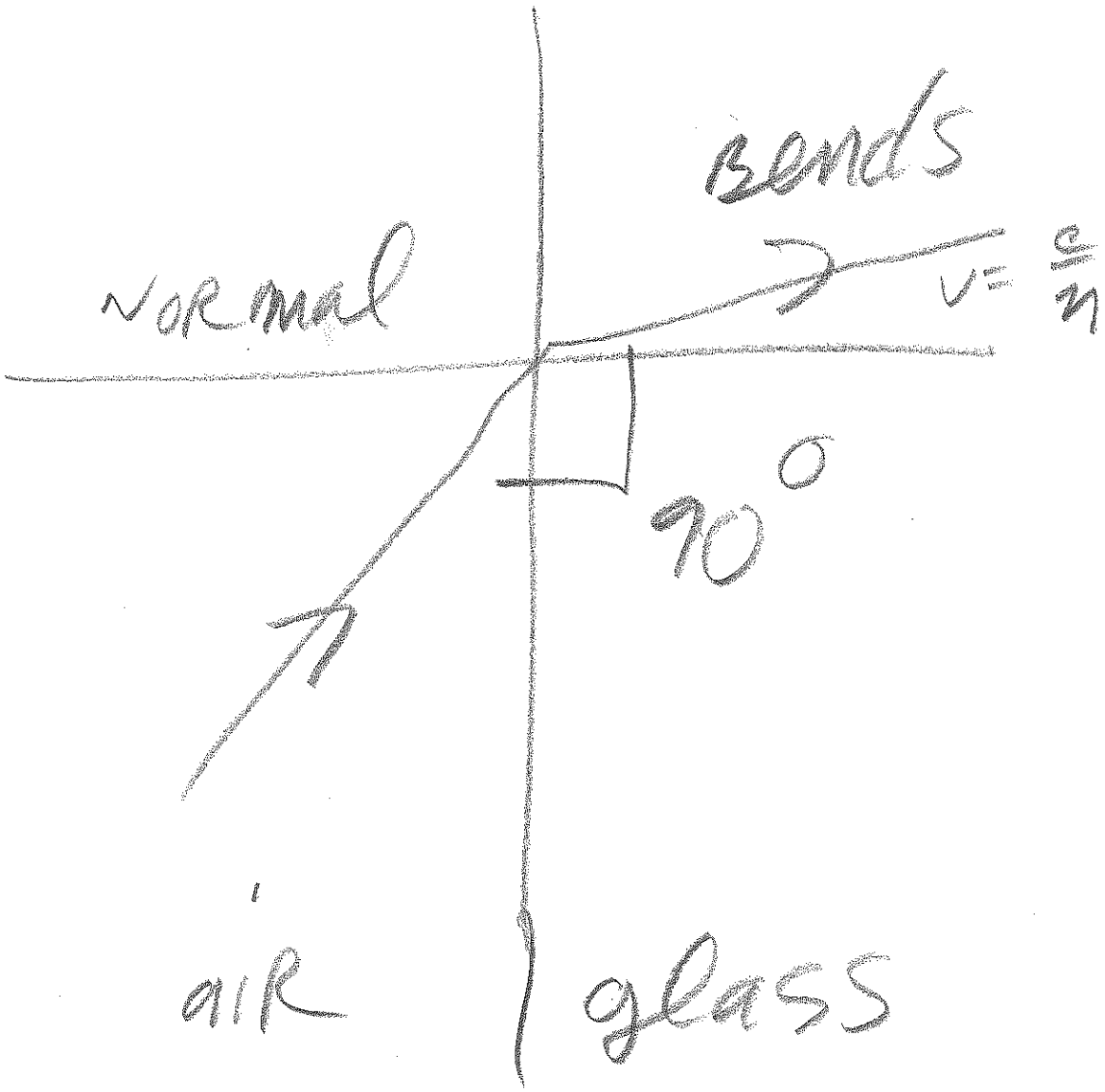
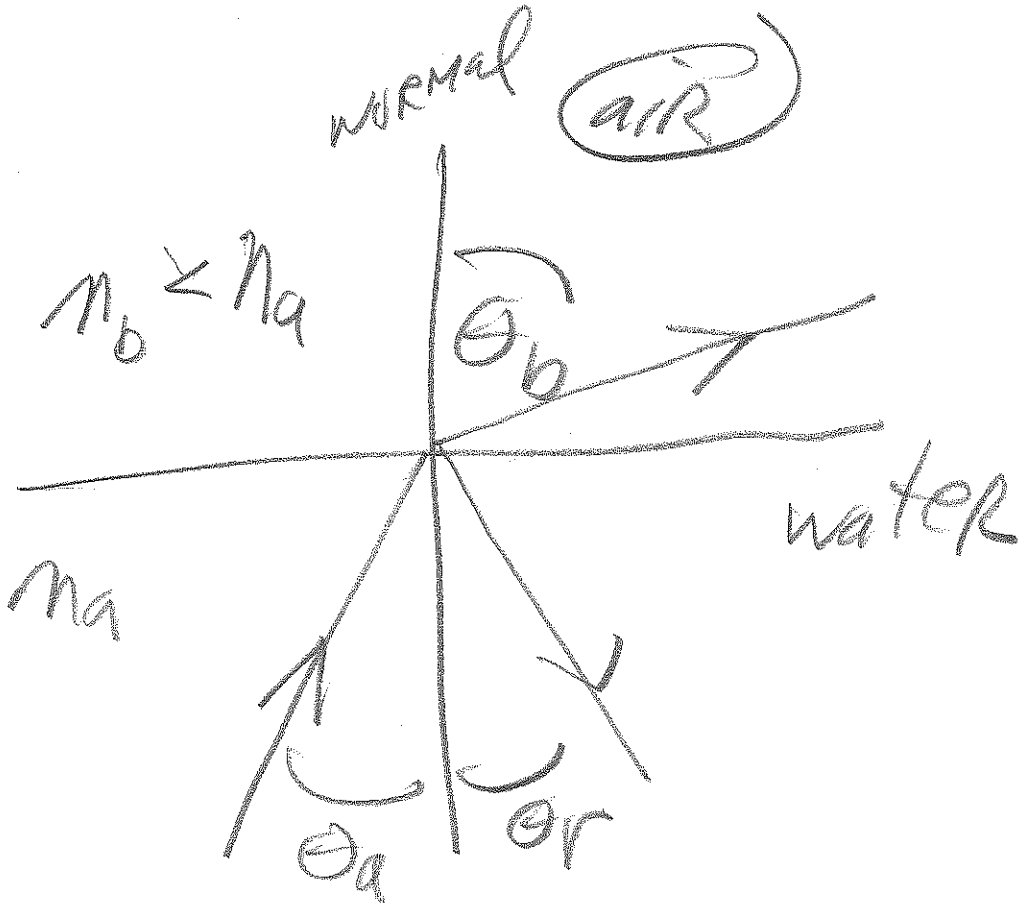
2B

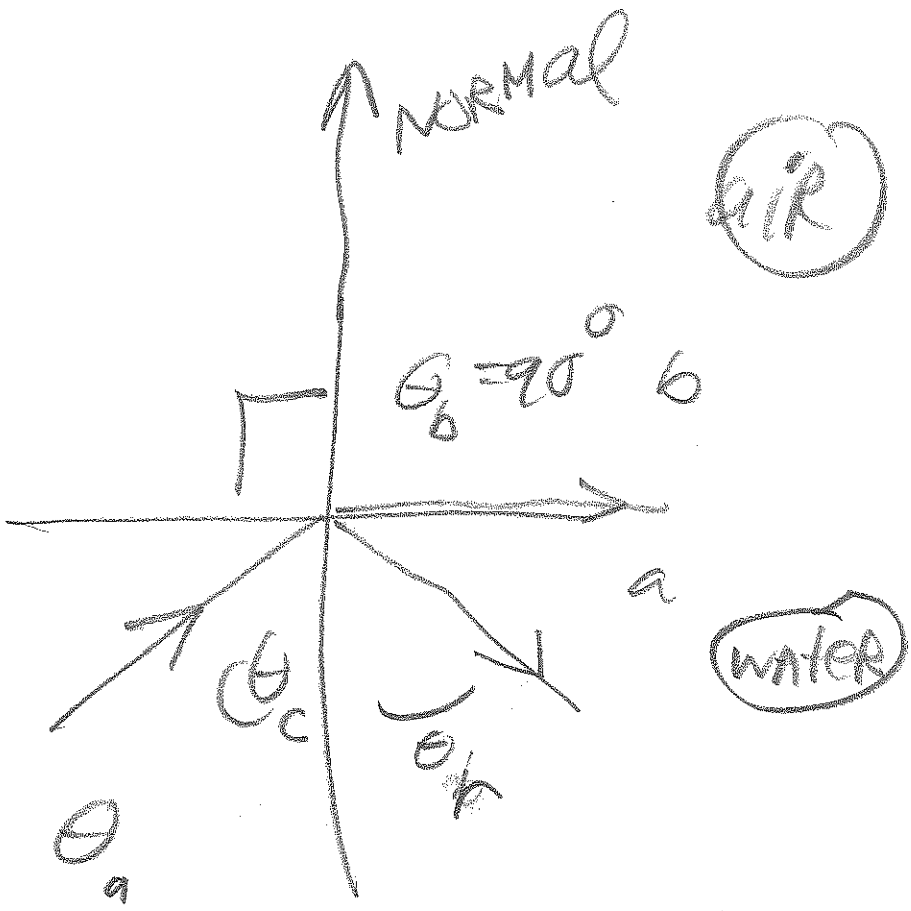
4-23-14



$$n_a \sin\theta_a = n_b \sin\theta_b$$


normal
Bends
90°
air
glass


normal
air
$n_b < n_a$
θ_b
water
n_a
θ_a
θ_r



$$n_a \sin\theta_a = n_b \sin 90$$

$$n_a \sin\theta_c = n_b$$

$$\sin\theta_c = \frac{n_b}{n_a} < 1$$

$\theta_a > \theta_c \Rightarrow$ total internal reflection

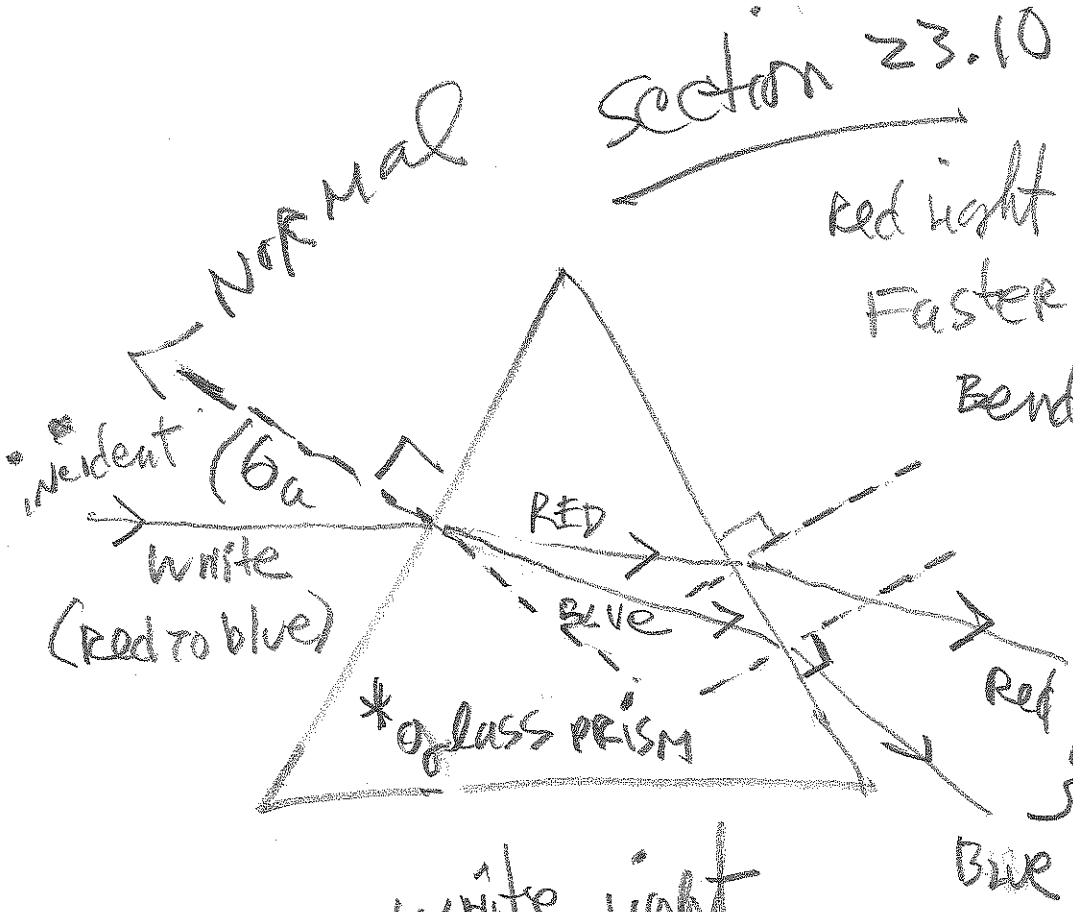
Dispersion (Rainbows)

$$\text{speed} = \frac{c}{n}$$

n = index of refraction of medium

VACUUM (AIR)	GLASS
$v = c = 3 \times 10^8 \frac{m}{s}$	$v = \frac{c}{n} = \frac{c}{1.53} < c$
$n \approx 1$	SLOWS down

Section 23.10



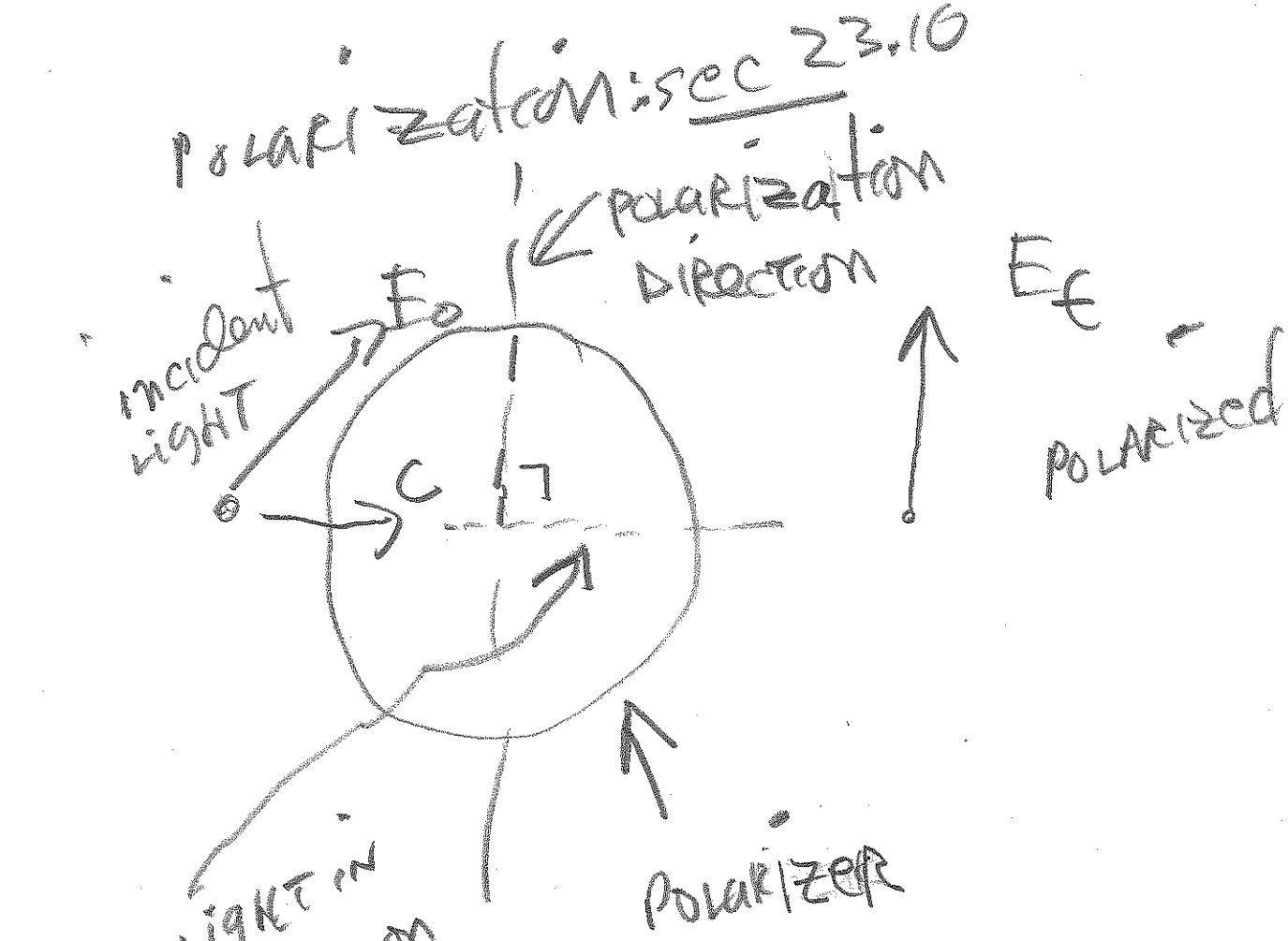
Red light TRAVELS Faster in glass, Bends Less than blue Light TOWARD NORMAL.

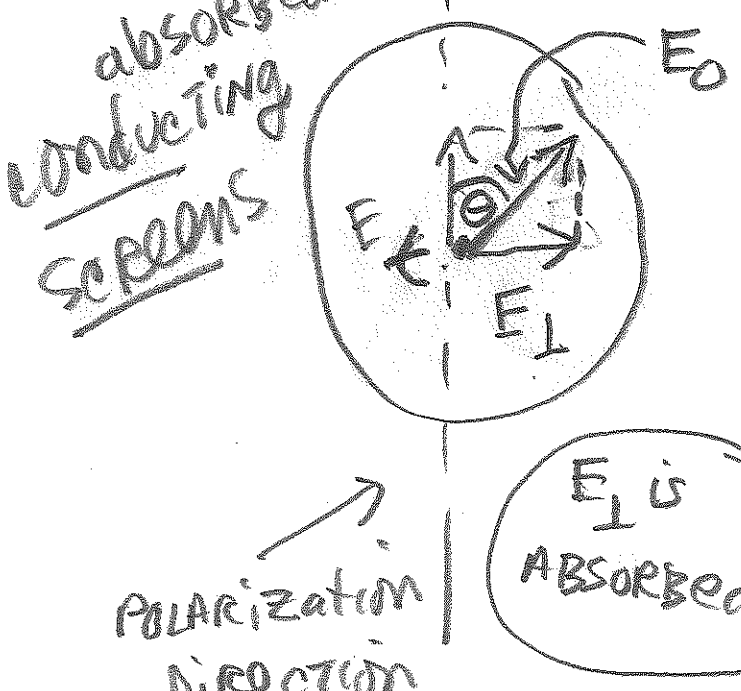
Red, blue and other colors separated: RAINBOW effect. WATER your LAWN when Sun (white Light source) IS OUT

White Light WAS ALL FREQUENCIES

* SAME effect if "PRISM" WAS MADE of WATER.

Polarization: sec 23.10

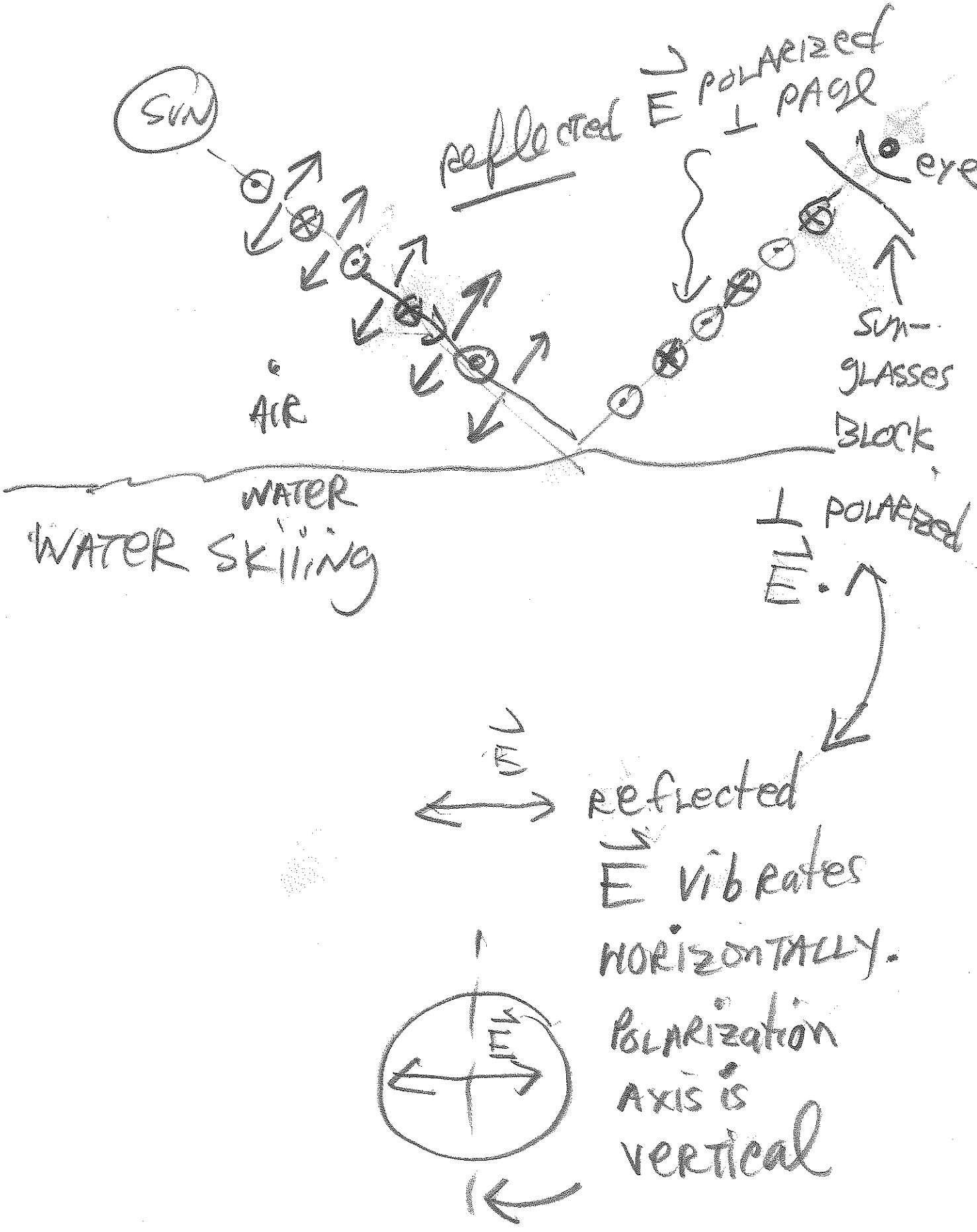




$$E_\epsilon = E_0 \cos\theta$$

$$I_\epsilon = I_0 \cos^2\theta$$

since $I_\epsilon \propto E_\epsilon^2$ and $I_0 \propto E_0^2$


SUN
reflected
E ⊥ POLARIZED
⊥ PAGE
eye
SUN-
GLASSES
BLOCK
AIR
WATER
WATER SKIING
⊥ POLARIZED
E
reflected
E Vibrates
HORIZONTALLY.
POLARIZATION
AXIS IS
VERTICAL