Teflection and refraction • the Surface normal - its alway's Perpendicular to the surface • Surface normal • Surface

Sufface normal

be Fore you do anything when solving a snells law Problem you must identify the surface normal

the angel of incidence 0, is measured from the surface normal to the

he cause up to measuring from the	incorrect						٥٥((ec F			
this here is incorrect this here is incorrect because you are measuring From the surface to the incidence ray Or Or Or Or Or Or Or Or Or O	(ay)				in c	cidence					
because you are measuring From the surface to the incidence ray Or land Or land (exected as) The angel of incidence is equal to the angel of reflection	0,	-					0,				
because you are measuring From the surface to the incidence ray to the surface incidence ray Or and the surface home incidence ray Or and the surface home incidence ray The angel of incidence is equal to the angel of reflection											
because you are measuring From the surface to the incidence ray to the surface incidence ray Or and the surface home incidence ray Or and the surface home incidence ray The angel of incidence is equal to the angel of reflection	· this here is incorrect					• this	is	Collec	t be	cause	904
From the surface to the normal normal incidence ray Or large of incidence is equal to the angel of reflection						ale	Meas	uring	f (ow	the	
in cidence ray Oi Oi Or (expected as) The angel of incidence is equal to the angel of reflection						in	Lidence	e ray	to th	e 50	u(Fac
the angel of incidence is equal to the angel of reflection						1101	mal				
the angel OF incidence is equal to the angel of reflection											
the angel OF incidence is equal to the angel of reflection		Inciden.									
the angel OF incidence is equal to the angel of reflection		7	(ay								
the angel OF incidence is equal to the angel OF reflection			(<-) · Su	tace (mal			
the angel OF incidence is equal to the angel OF reflection		Or >	(ay)								
the angel OF incidence is equal to the angel OF reflection		ected									
		(efle									
	the angel OF incidence	is equal	to the	20401	OF COFIA	ection					
$\theta_i = \theta_{\mathfrak{c}}$	04, 11, 11, 11, 11, 11, 11, 11, 11, 11, 1	1.5 - 1	, , , , ,	000		(())					
	Ø _i	= 0 ₁									

- i	f the	n	vcide	NCe	(a	y	goes	s th	\(ou	gh	the	No	rma	1 i-	t ho	as al	n an	gel	of	Ze	673			
						•	<u> NCid</u>	Jenc 	e (a	<u>y</u>	\\		_	-	*	you (ay	Ca is rFac	Per	ee t	he icul	inc ar t	iden ro t	ce The	
• in	idex	oF	(e	Frac			6																	
-) = C =	Spec	ed (70	(eF	:(ac ht	'n	n a V	اع(ر،	um														
- \	V= ·	SPeed	·) (0 f	lig	ht	lig	ht	in	the	Ma			Slou	ver	ligh	t tra	xVels	in	, tr	nat	Ma	iteri	al
¥	the	Sm	aller	th	e il	lde>	6	۴ (e Fr	acti	on tl	ne s	Fast	ec	the	e ligh	1+ +	(ave	\s	in :	that	W	ater	ial
- if - if	U3 . U3 >	< U' < U'	the th	e	lig1 ligh	nts nts	(4	e F(acti acti	oN ON	be	nd s	to	new you	&	the From	surf the	ace : Su	Nor Lr Fo	Mal (e	no(n	nal		

incidence (ay D_i)

Or

Or

Ferfaction $N_a = 1.33$

- refraction is when light Changes direction because it Changes directions because it Speed as it moves From one material to another
- Speed as it moves From one material to another

 Shells law

- describes how light bends (leFracts) When it Passes From one material to another with

- $\bigcap_{i} \operatorname{Sin}(\mathcal{O}_{i}) = \bigcap_{a} \operatorname{Sin}(\mathcal{O}_{a})$
- n = (e Fractive index of First Medium
- Na = refractive index of second medium
- 0, = angel of incidence (Measured From Surface normal)
 0a = angel of refraction (Measured From the normal)

le Fractive index

• Critical angle	
- at a critical angel Do the refracted	angel 00 is 90° since sinc90°)
Plugging that in:	
0 5:0 (0) - 0 (1)	
$U' \geq U(0^{\circ}) = V^{9} (1)$	
$\sin(0c) = \frac{U^1}{U^2}$	
N _t	
$\emptyset = \operatorname{Sin}^{1}\left(\frac{N_{1}}{N_{2}}\right)$	
the critical angel depends on both Ni ai	nd No, but its only exists
When light travers From the Medium with	refractive index n, into refractive
re Fractive index no where:	
$\sim \sim $	13
- is not not than the is the sciling on	a and which internal Collection
- IF $N_1 \leq N_2$ then there is No critical an Possible	SEL MID NO LOLAL MILECULAL LE LIECTION
total internal reflection	
- light does lefract (doesn't Pass into Second	
- in Stead, it reflects entirely back inside the	e First denser medium
- so the light Keeps traveling inside th	ne original Medium
· For total internal reflection to happen, two	Conditions must be met
1) light must travel From a denser Medium	to a less denser medium
U'>U3	
R) the angel OF incidence O, Must be greater	then the (cital angle)
Made with Goodnotes 0, > 0	