

# THE POWER OF POLARIZED LENSES



Technical Level 1  
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2023

# 100 YEARS AGO

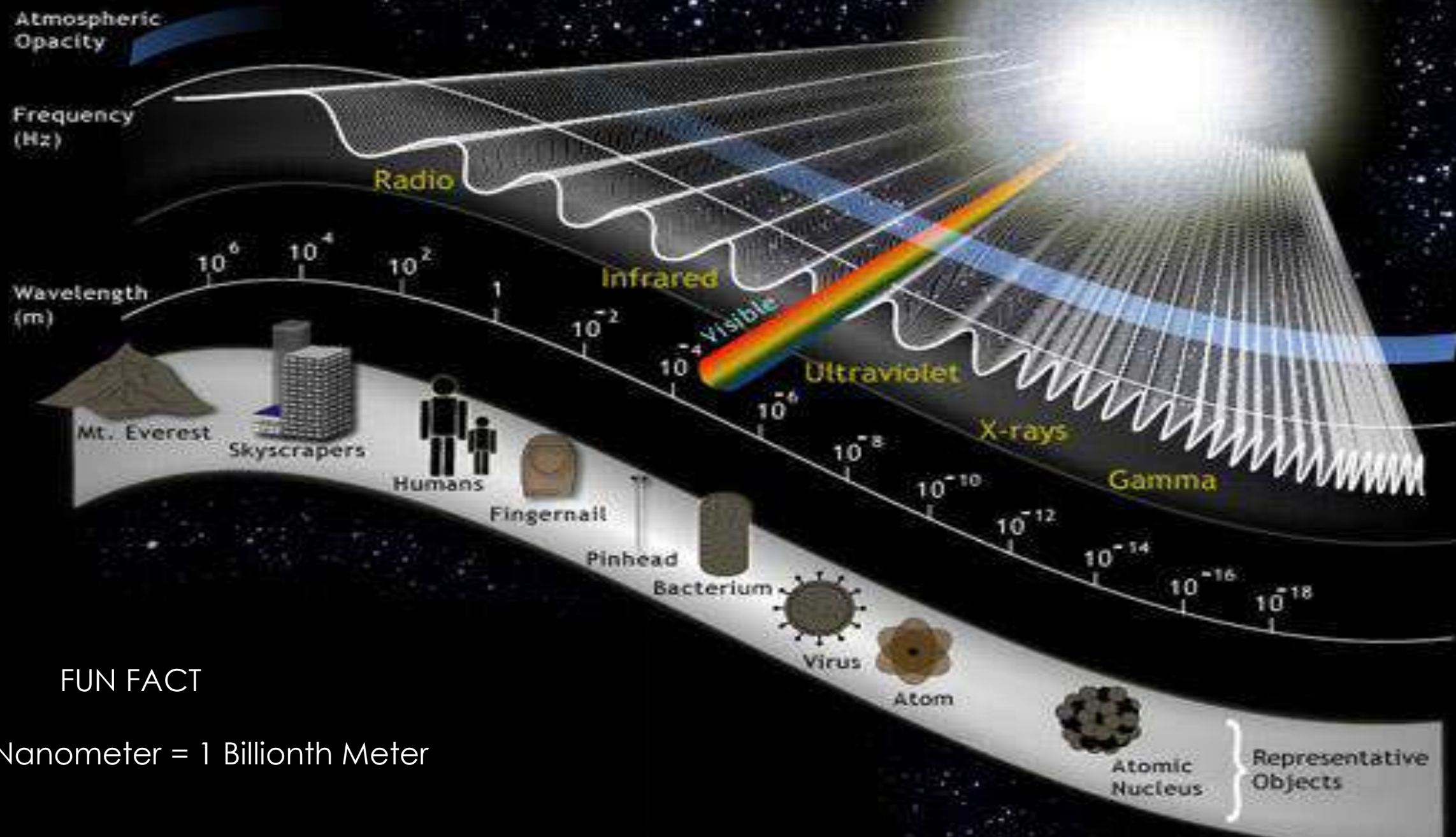
1923

Willson

60 Cents

1939 1<sup>st</sup> Polarized





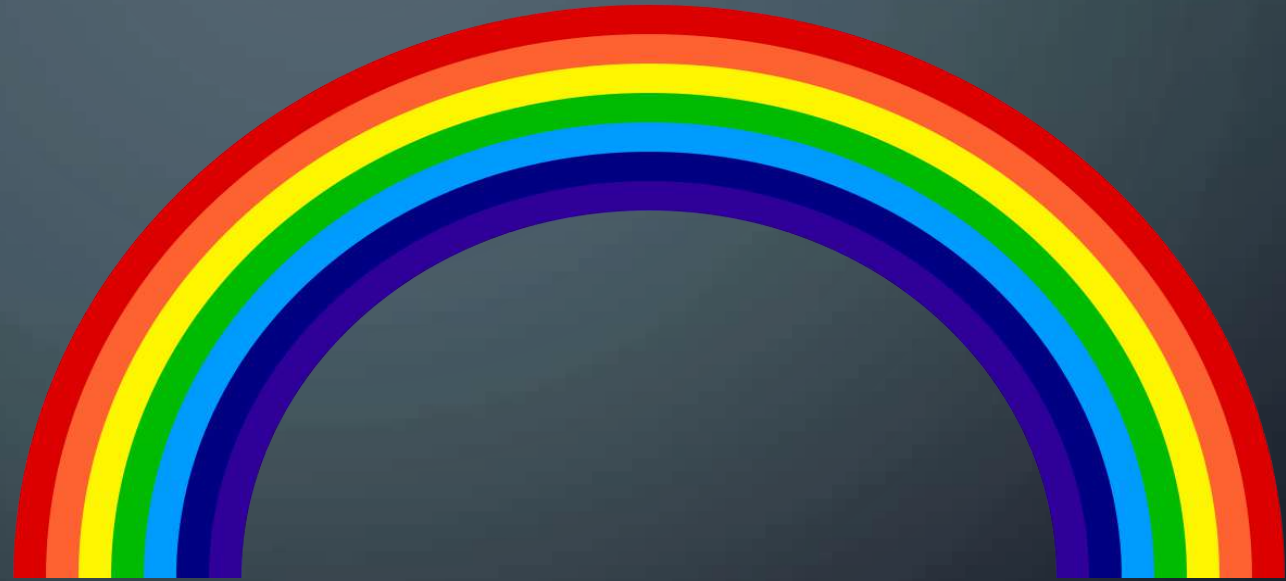
FUN FACT

1 Nanometer = 1 Billionth Meter



# VISIBLE LIGHT

ROYGBIV



# 3 LAWS OF LIGHT

Reflects

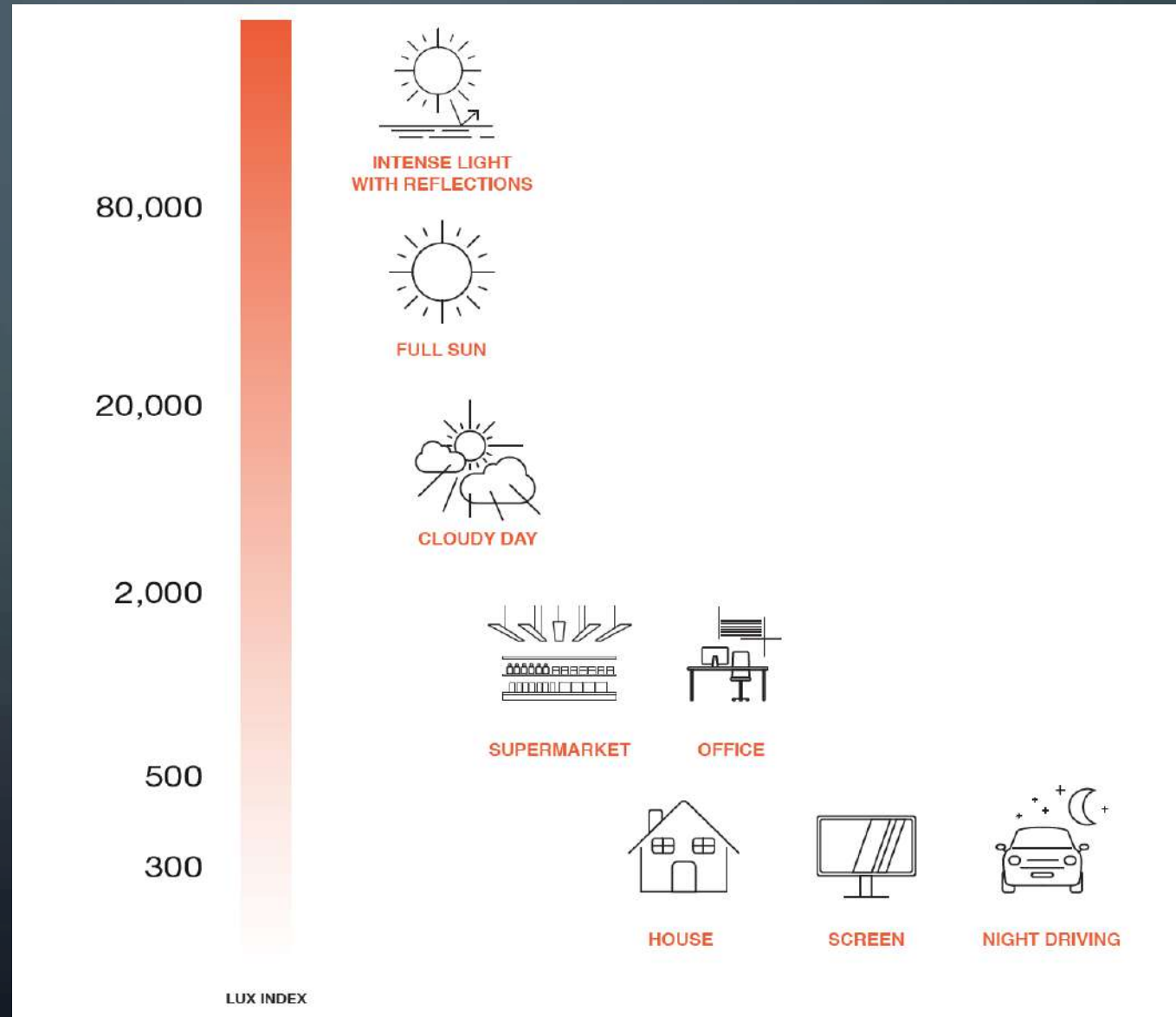
Refracts

Absorbed



# LIGHT INTENSITY

Do The Math  
1 to 80,000+

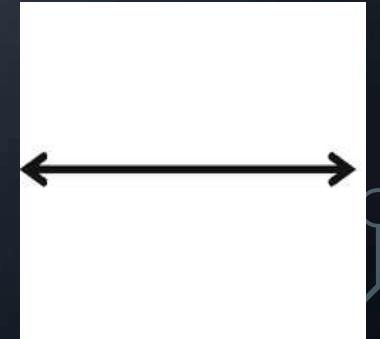
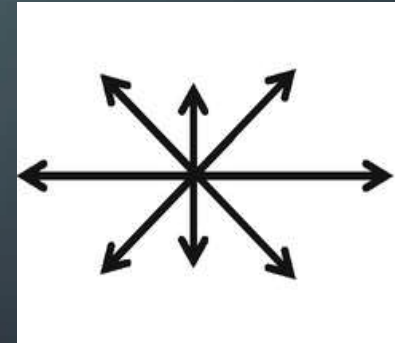
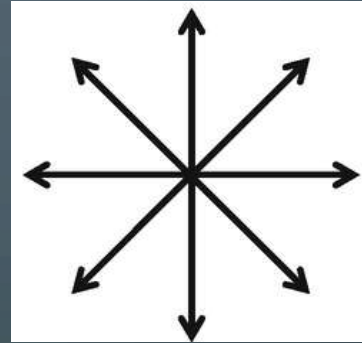


# POLARIZED LIGHT WAVES

Unpolarized Light

Partially Polarized Light

Plane Polarized = Single Plane



# BREWSTER'S ANGLE

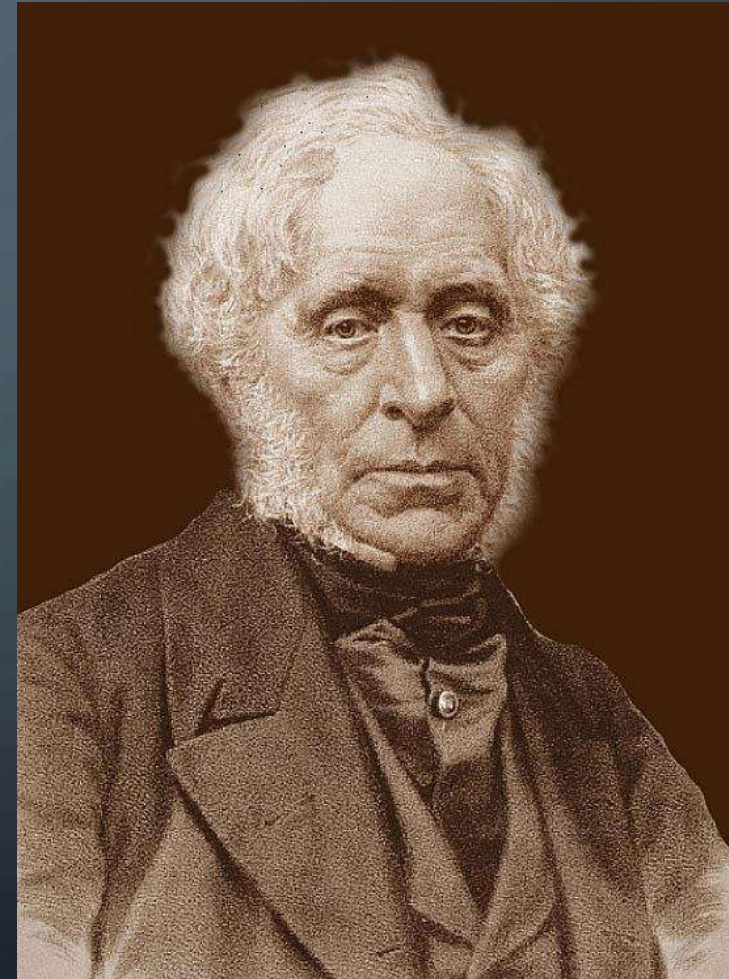
Prof. David Brewster

An Exact Formula

Specific Angle of Light

Plane Polarized

Light Suppression/Skimming





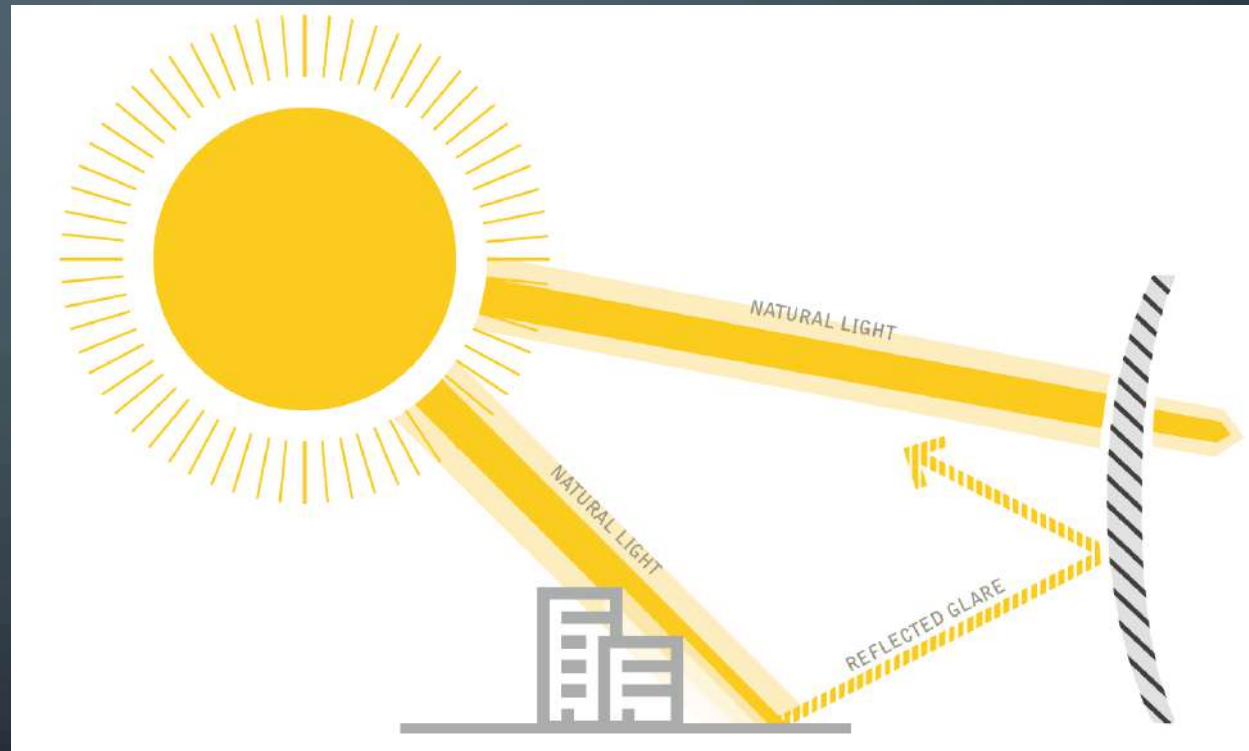
# PLANE POLARIZED LIGHT

Light Incident

PM & AM

Dusk Dawn

Glare Affects



# GLARE DEFINED



- “Reflective light creates polarized light on flat surfaces causing poor visual accommodation and aggravated eyestrain in the human eye.

## Distracting Glare

Caused by reflections from the lens surface  
Causes eye fatigue



## Discomforting Glare

Caused by everyday bright light  
Can occur even when cloudy  
Causes squinting and eye fatigue



## Disabling Glare

Caused by excessive intense light  
Blocks vision



## Blinding Glare

Caused by light reflected off smooth shiny surfaces  
Blocks vision





# GLARE IN OUR WORLD

Light waves normally travel in all directions – horizontally, vertically, and every plane in between.

This blinding, "polarized" light is what we call "glare". 10 times brighter than normal light, it causes discomfort and can damage the unprotected eye.

Only "normal" light reaches the eye – protecting the patient

001110 01110000011  
111001 1010011001  
0010 0101 10101001  
1001101 00110001  
1101101010011001  
0111010111  
1110010101  
0101010101  
00111000  
11001000  
01010101  
100101  
0111000001





# DISABLING & BLINDING



Reflected off the road surface



Glare coming directly from sun and sky.  
Scattered light. All light reflected from  
horizontal surfaces



From the windshield trim, wiper hardware and  
steering wheel hardware



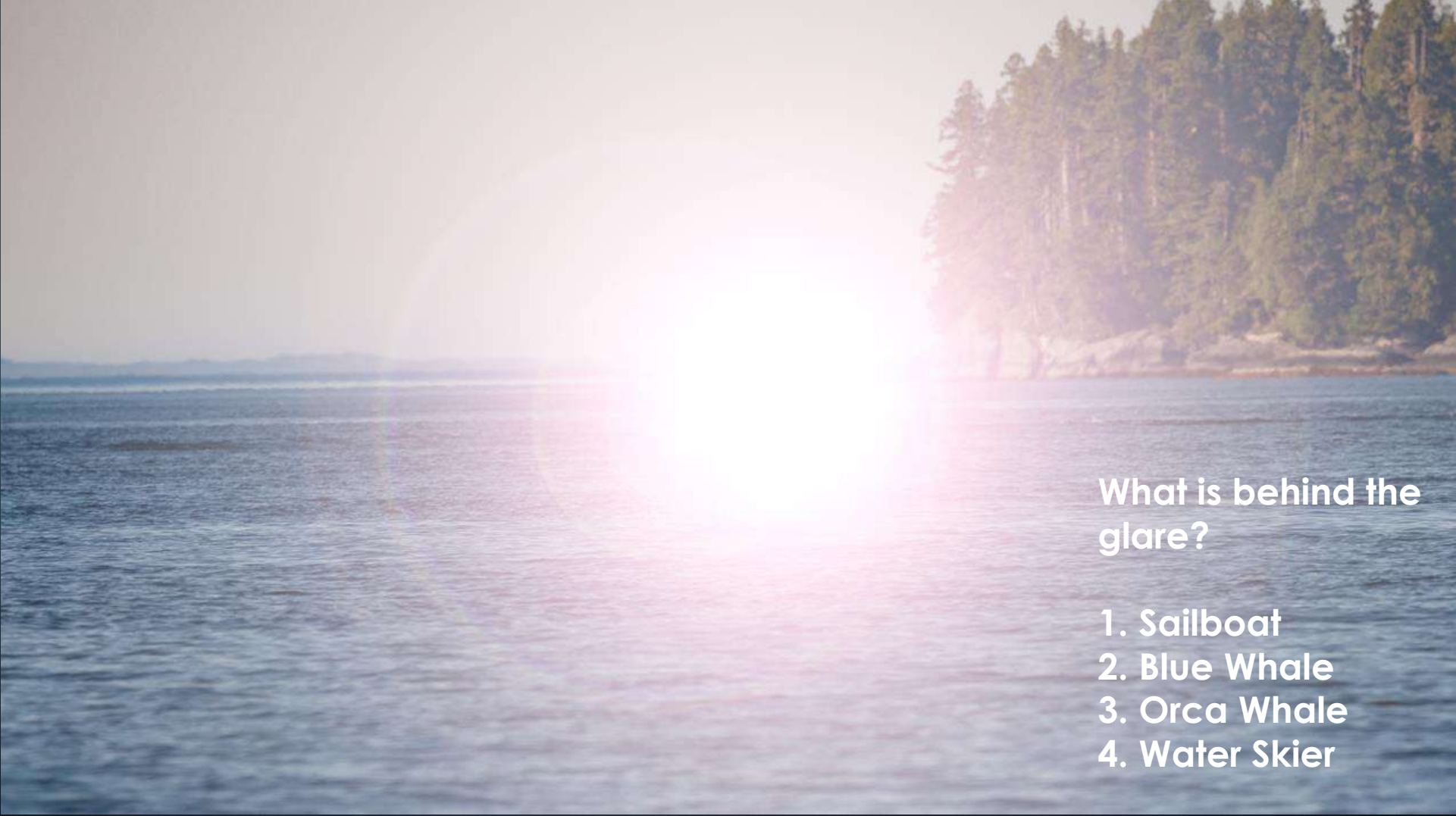
Reflection from mirror hardware and  
glare light directly from the sun/sky

# HAVE YOU EXPERIENCED TRUE GLARE?

Anyone?

The Struggle Is Real





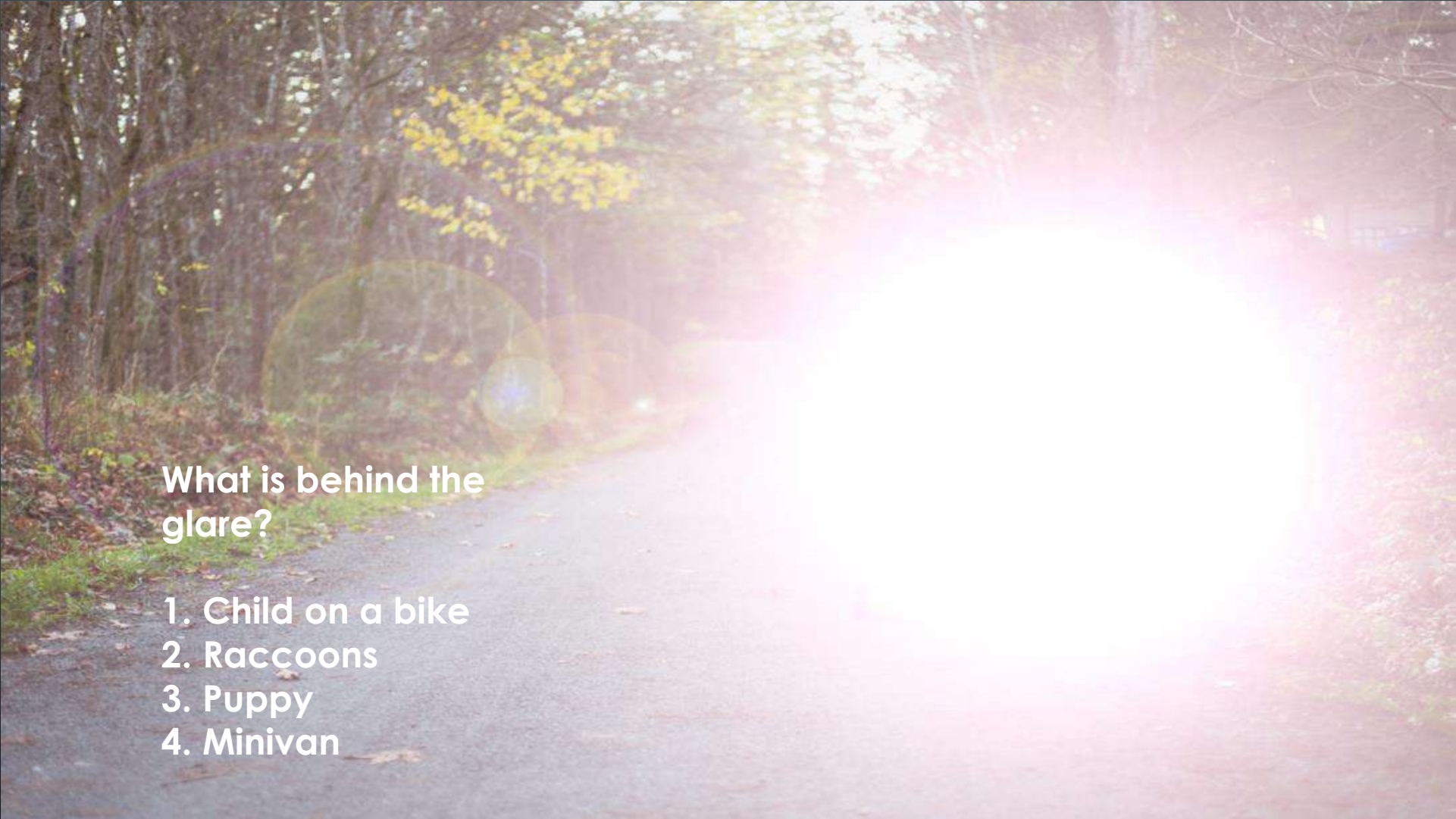
**What is behind the glare?**

- 1. Sailboat**
- 2. Blue Whale**
- 3. Orca Whale**
- 4. Water Skier**









**What is behind the glare?**

- 1. Child on a bike**
- 2. Raccoons**
- 3. Puppy**
- 4. Minivan**









What is behind the image?

1. Deer
2. Family of ducks
3. Semi truck
4. Child









What is behind the glare?

1. Delivery truck
2. Pedestrian
3. Street vendor
4. Cyclist







# HOW ARE POLARIZED LENSES MADE?

It Starts With the Delicate Wafer

PVA Heated x 5

Iodine Crystal Bath

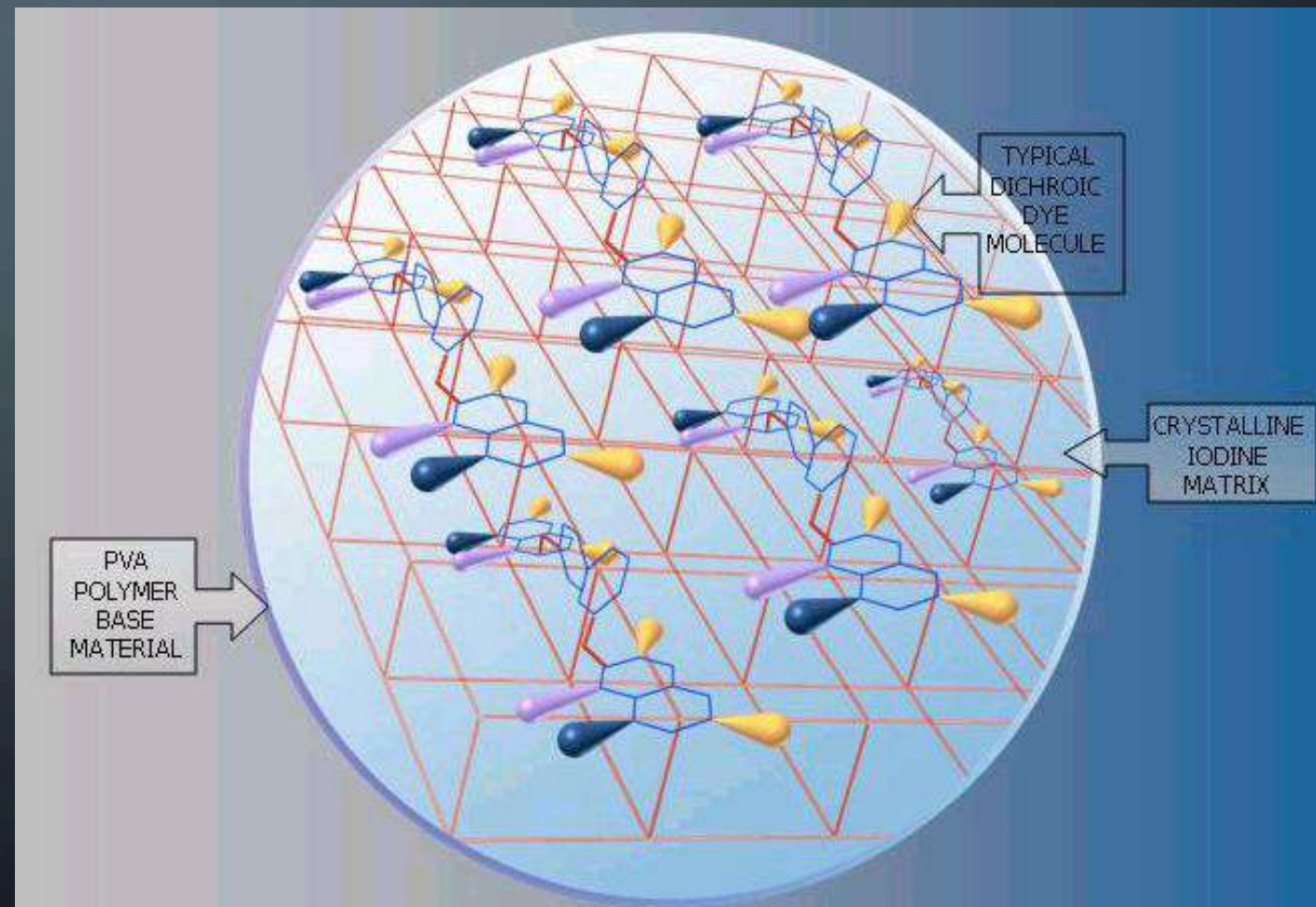
Crystals Form Parallel Chains

Premium Dichroic Dyes

CAB Sandwich = Filter

Raw Material, Substrate, Salt

Cast,/Embedded Laminate .8mm.



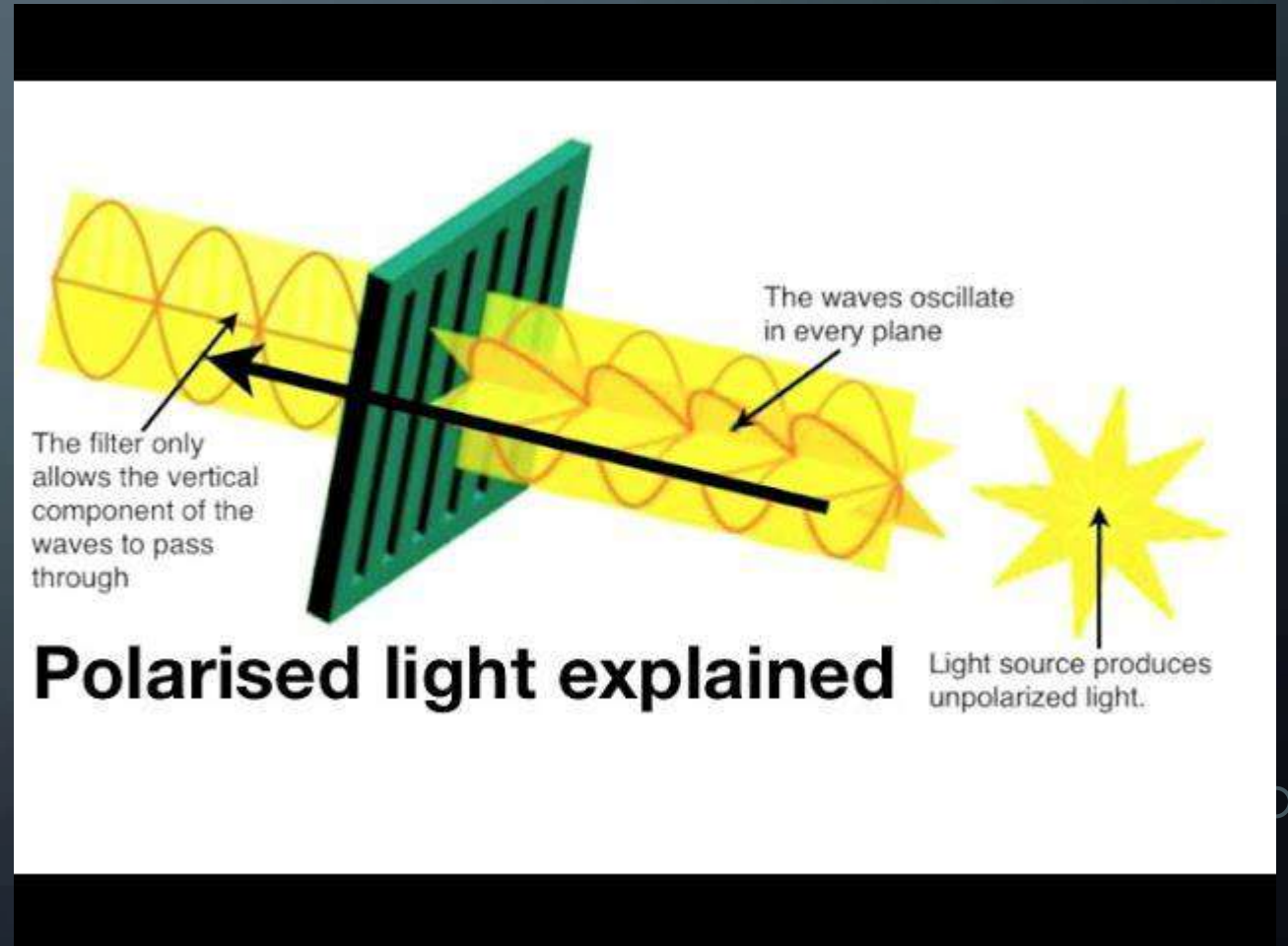
# HOW DO THEY WORK?

Vertical Blind Example

Filter Aligned 90° From  
Horizontal Polarized Light

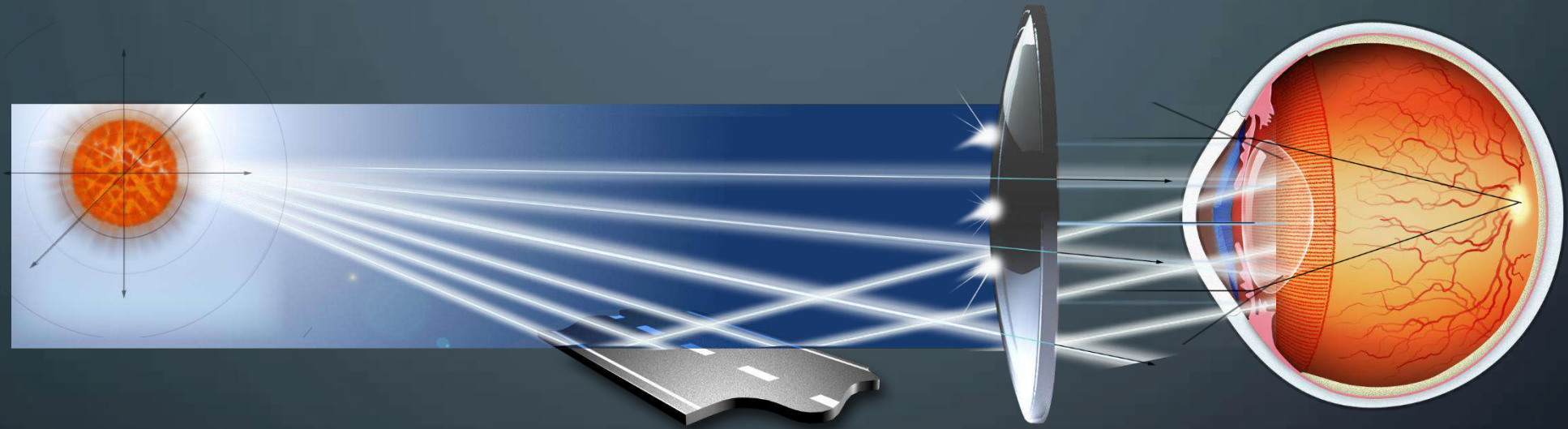
Photographers

Trolley Cars





# HOW DO THEY WORK?



**Light Waves**  
travel in all directions  
from the sun

**Blinding Glare**  
created when light is reflected  
from horizontal surfaces

**Blinding Glare Blocked**  
by polarizing filter  
inside lens

**Only Information Carrying Light**  
reaches the eye, providing visual  
comfort and better vision

# WHAT ABOUT VARIABLE POLARIZATION?

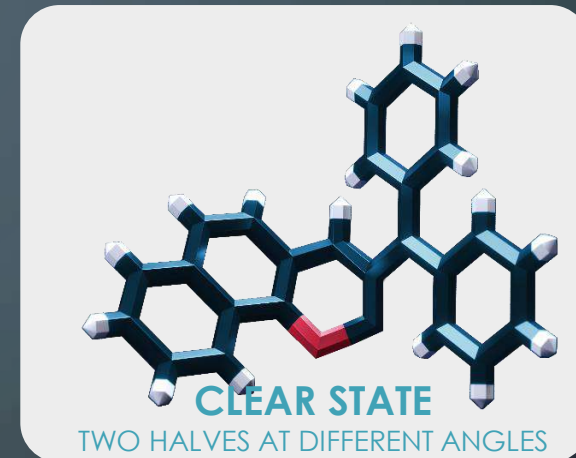
It Starts With The Matrix

Millions of Molecular Dichroic Dyes

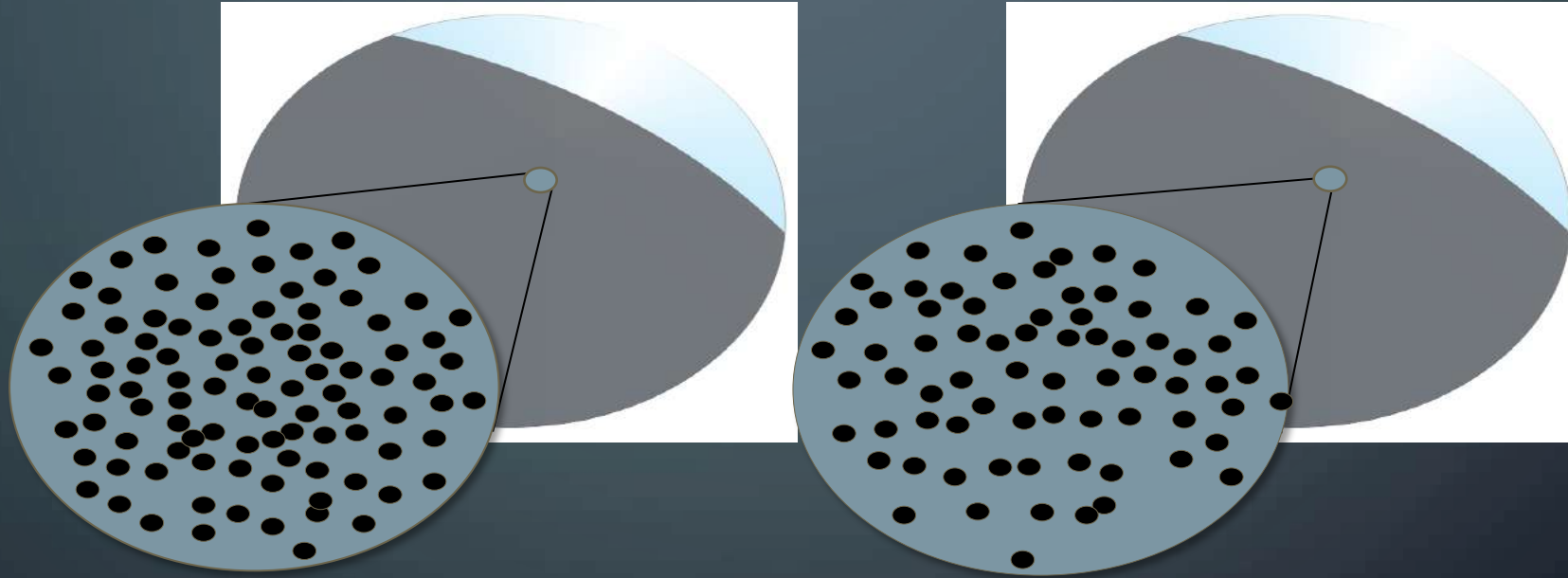
Agile Photochromic Dyes

Molecular Chemical Bond Breaks

Cast, Laminate, Trans bonded



# DICHROIC DYES



Conventional photochromic molecules darken in random patterns

Transitions lens molecules darken + horizontally align to create polarization

# POLARIZED PERFORMANCE

Polarized Effectiveness

High Performance

Scale of 1-100

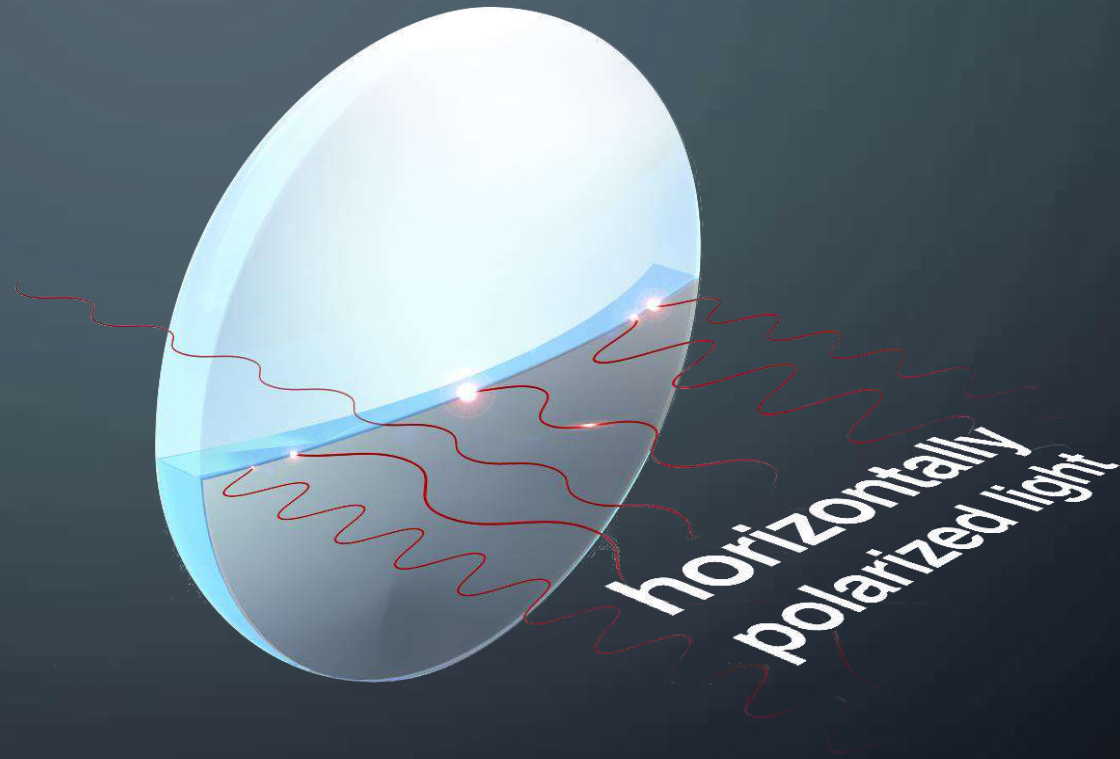
Polarized A=93%

Polarized B=95%

Polarized C=99%

Tinting Has No Affect

AR Has No Affect





# WHAT ABOUT COLOR?

Fashion

Low Performance

Effectiveness

Fashion=50% at best



# WHO IS THE POLARIZED PATIENT?

Elderly, Kids, Surgical

Everyone

Listen To Them

Let Them Play



The image features a dark blue background with white decorative circuit-like lines in the corners. These lines consist of straight segments connected by right-angle turns, ending in small circles, resembling a stylized PCB or network diagram.

***“I hear and I forget...***

***I see and I remember...***

***I do and I understand”***

**Benjamin Franklin**



# GETTING THE MESSAGE THROUGH

Hands On

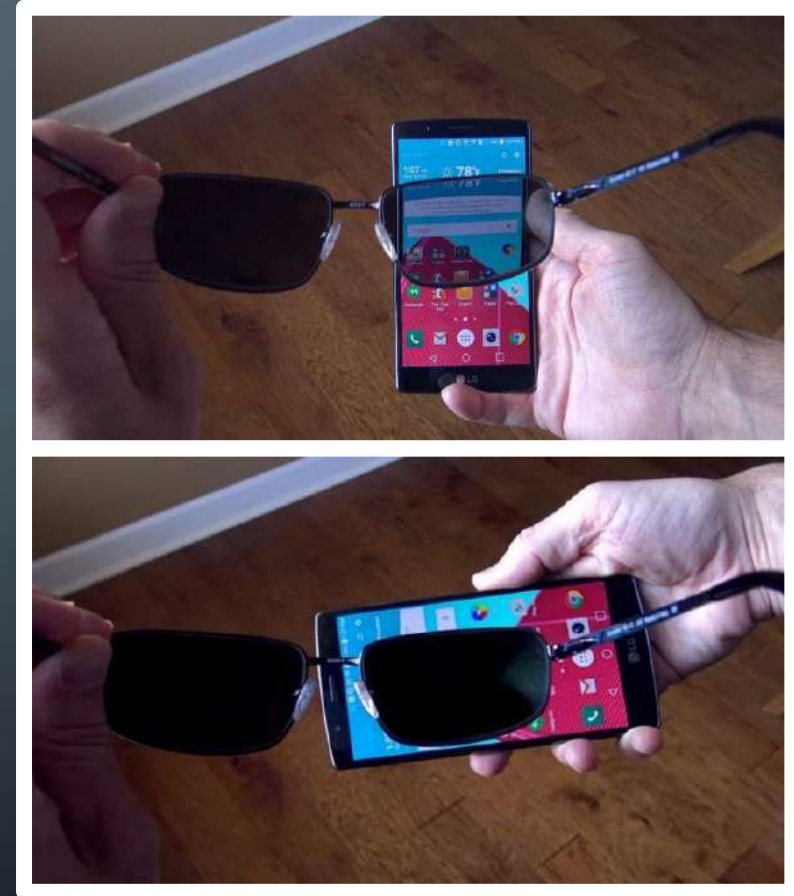
Educate/Demonstrate

Reduction Of Glare

Manufacturers' Demo Devices

Flip Lorgnettes

Cross Polarization



# GETTING THE MESSAGE THROUGH

Patients Need To Visualize

Visual POP

Sunwear Mixed In

Wear By Example



# WHAT DO THEY WANT?

Sharper Vision



Wider Field of View



Vivid Colors





# WHY WOULD THEY OBJECT?

I can buy at drugstore

Check Lens Quality

Backside AR?

Non Rx

CAB Product

To expensive / Managed Care

Poor Experience



# WHY WOULD THEY OBJECT?

I prefer clip-ons

Backside Reflections

Making Contact

Adds Weight

I prefer fit-overs

I wear VTL





# OFFER SOLUTIONS

Polarized Sunwear

Whatever It Takes

