Polarization

as light moves through space it oscillates back and forth, through an electrical plane and a magnetic plane. the orientation of these planes are 90^o from each other

generally light comes at us from all different orientations.the wave of light oscillates in the electrical plane, and thus at a random angle from the observer.

When light is polarized, all the rays of light are oriented in the same planar direction. This is due to the type of light source or it's interaction with different filters

Polarizers

Objects or materials that affect the orientation of light rays

natural polarizers = clouds + road surfaces + crystals

Artificial polarizers = filters, lens covers

Work by allowing light of only a particular orientation through them

this proves that life is a transverse wave, since light is filtered when the polarizer changes orientation, then orientation must matter. Transverse waves have a planar orientation, but longitudinal waves don't.

Be Able to explain polarizing filter

Polarization by reflection

when light hits a non metallic surface, some of the *non* polarized light is absorbed. such that reflected light is disproportionately polarized.

Applications

Vertically polarized lenses, which allow vertically orinented light rough, will block most of the light coming off the road or other surface which cuts down on glare

Double Refraction

some crystals (calcite) take an unpolarized light beam, and one orientation will go straight, the other orientation will be refracted, thus the two exiting rays are seperated, and ore now polarized 90^o from each other

when light travels through our atmosphere it interacts with electrons in the air. the interaciton of the electrical fields results in the partial polarization of ligt, with maximum polarization occuring perpindicular to the ligths original direction.

3d Glasses

by producing two miages with a screen (one in each direction) then use a polarizing filter that on each eye, you can get two different images going into each eye.

Summary

Be able to explain and diagram

- filtering (Polaroid)
- double Refraction (crystals)
- Reflection
- Scattering