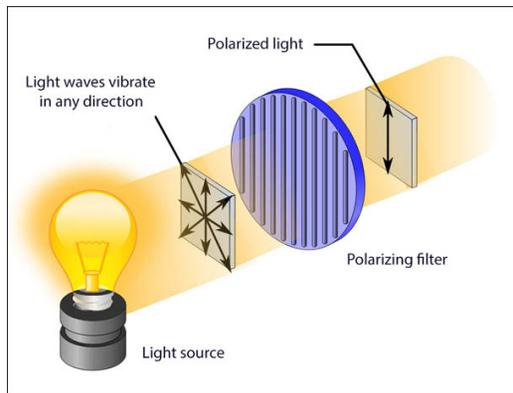




What is Polarized Light?

When we see with our eyes, we observe different wavelengths or frequencies of light as color, and different intensities as brightness. But light has another property our eyes *can't* see: **polarization**. The way light *wiggles* in the direction perpendicular to the one it is traveling in is called its polarization.



. Sky and Telescope Magazine

When light interacts with different materials it's polarization changes—which is why polarized sunglasses work! Glare is caused when light reflects off a surface and becomes partially polarized. This polarization is blocked out by a polarized filter layer on your sunglasses.

Imagine a very special swimming pool – if you swim in one direction it feels like normal water, but if you swim in a different

direction it's like swimming through thick maple syrup! This is what happens to polarized light in special materials we call "*birefringent*". Some polarizations pass through the material like you would in water, and others get slowed down like you could in maple syrup. This causes the polarization to rotate and change.



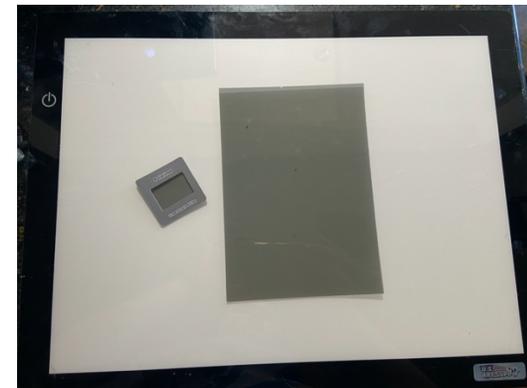
Birefringence depends on wavelength, material thickness and pressure, causing crazy polarization patterns as light passes through them. However, these cool patterns are invisible to the naked eye, so we have to build a simple instrument called a polariscope to reveal them.



Build Your Own Polariscope!

What you'll need:

1. A light source
2. 2 sheets of polarizing filters
3. Some clear objects to investigate



First, affix your first polarizing sheet onto your light source—this will generate linearly polarized light! To reveal the rainbow pattern, look through your second sheet of polarizer at your sample. Try rotating the sample or the second filter. What changes?

Now that you know how to see birefringence, try looking around your house for transparent objects and use your polariscope to reveal their polarized secrets!