



## BIG IDEA

You can learn if your sunglasses are polarized or not by using this test!

## MATERIALS

- Screen (computer or phone)
- Sunglasses

## INSTRUCTIONS

1. This activity is a test you can run to see if your sunglasses are polarized or not.
2. Find a pair of sunglasses and a screen.
3. Hold the sunglasses up to the screen. You don't have to put them on – just hold them in front of your eyes. Does it get dimmer? Probably!
4. Now rotate the sunglasses slowly. Does the screen ever go almost completely black? If so, then you've got a pair of polarized sunglasses! If not, your sunglasses are not polarized.
5. Try it out with different pairs! Once you get the hang of it, take the glasses outside and try looking at something flat with a reflection. A car hood is a great example. Do you see it dim significantly?

## THE SCIENCE

Light goes in many different directions and orientations. For this example, we are going to talk about the **horizontal** and **vertical** orientations of light. When you put the two together, it looks like a grid. Imagine if you hold two fingers on your hand up and then lay two more across it from your other hand to make a # sign. Each finger is a beam of light and they can be horizontal or vertical. When you aren't wearing sunglasses, that light goes right into your eye.

Polarized sunglasses have a filter that blocks either horizontal or vertical beams of light. It does this by only having thin lines (either horizontal or vertical) that the light can pass through. Imagine the puzzle game that children play with where they put shapes in their corresponding holes. Only the triangle can go through the triangle hole. That's what a polarized filter does! It only lets light of one orientation pass through to reach your eyes.

Most screens have a filter on them that makes them only put out light beams of one orientation. When that orientation is blocked by the sunglasses, no light is hitting your eyes and it looks completely dark! Lastly, *most* sunglasses block horizontal light because we see more glare from horizontal surfaces (like roads, car hoods or the ocean) than vertical ones.