

Safely Viewing Solar Eclipses

A solar eclipse occurs when the moon passes between the earth and the sun, totally or partly obscuring the image of the sun.

What Is a Solar Eclipse?

A total solar eclipse occurs when the moon's apparent diameter is larger than the sun's, blocking all direct sunlight. Total solar eclipses occur in narrow paths across the earth's surface, while a partial solar eclipse can cover regions thousands of miles wide.

A total solar eclipse will be seen in North America on Monday, August 21, 2017; for this eclipse, the longest duration is 2 minutes, 41.6 seconds, and it will be the first total solar eclipse visible across the continental United States from coast to coast in the last 99 years.

Dangers of Watching a Solar Eclipse

Watching a solar eclipse without proper eye protection can burn the **macula** (the center part of the retina, the light-sensitive tissue that lines the inside back wall of the eye, specially designed to read or recognize faces). When the moon completely blocks the sun at the minute of a total solar eclipse, dangerously, a person might look at the eclipse without protection and falsely believe that it is safe to view. However, within a few seconds, as the moon continues to move, bright sunlight suddenly might be focused on the unprotected macula. Even a few seconds of such viewing can temporarily or permanently burn the center of the retina. Once retina tissue is destroyed, like brain tissue, it cannot regenerate, resulting in permanent central vision loss.

Safe Ways to Watch a Solar Eclipse

Never view the sun or a total solar eclipse with the naked eye or by looking through optical devices such as binoculars, telescopes, or a cell phone camera. Sunglasses alone also are not safe. Some safe ways to view an eclipse include the following:

- **Direct viewing through shade No. 14 welder's glasses:** available at welding supply stores and online
- **Direct viewing through aluminized Mylar filters:** Aluminized Mylar plastic sheets are available as eclipse vision but should be used only if totally intact, without any scratches.
- **Pinhole projector:** Make a pinhole in a piece of cardboard and hold it in front of the sun just before the eclipse. With your back to the sun, focus the light going through the pinhole onto another piece of cardboard behind the pinhole so that you see the sunlight focused onto the second piece of cardboard. As the eclipse occurs, you can see the focused sunlight become blocked by a dark circle (the shadow of the moon). Look only at the image on the paper.

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Source: Cogan DG. On viewing the eclipse. *Arch Ophthalmol.* 1963;69(6):690-692.

Safety Recommendations for Viewing a Solar Eclipse

Warning: Never look directly at a solar eclipse.

Devices for Safely Viewing a Solar Eclipse

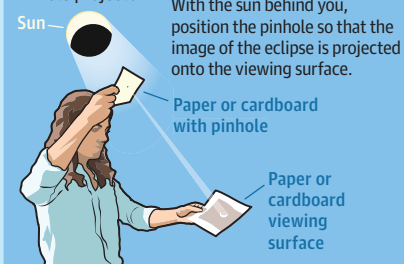
Filters

Shade No. 14 welder's glasses Aluminized Mylar filters



Indirect viewing

Pinhole projector



Do Not Use

Unfiltered binoculars or telescopes



Sunglasses



Cell phone cameras



What to Do if Vision Loss Has Occurred After Viewing a Solar Eclipse

Promptly see an **ophthalmologist**, an eye doctor who can recognize symptoms and signs of solar burns on the retina. The diagnosis might be made on clinical evaluation or with diagnostic tests such as **optical coherence tomography**, a noninvasive imaging technique that can identify solar damage to the retina. Treatment is observation; sometimes there is partial recovery of vision.

FOR MORE INFORMATION

Prevent Blindness

www.preventblindness.org/solar-eclipse-and-your-eyes

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