

# How to View an Eclipse Safely

Information adapted from <http://www.starnetlibraries.org/wp-content/uploads/2017/03/2017-Eclipse-Guide-WEB-032317.pdf>

*It's not the eclipse that is dangerous to observe, it's the Sun! The Sun's visible (and invisible) rays can cause serious damage to the sensitive tissues of the eyes, often without being immediately aware of it! Normally, our common sense protects us from looking directly at the Sun for more than a second. But during an eclipse, astronomical enthusiasm can overwhelm common sense, and people can wind up staring at the Sun for too long.*

## Ways to watch the eclipse safely

### A. Sun Filters to Look Directly at the Sun

To look at the Sun directly, except during the total phase of the eclipse, you need a good filter that can cut out not just its intense light, but also its ultraviolet and infrared waves.

- **Sunglasses or smoked glass are NOT OK!**
- If you have access to welder's supplies, #14 arc-welder's glass is an excellent filter (but it has to be #14 and not lower numbers).
- Or you can use special black or aluminized polymer filters that are sold as eclipse glasses; but make sure you get them from a reliable source and that they are certified. [The glasses JCPL is handing out came from StarNetLibraries\*, a reputable source]

*\*The Space Science Institute (SSI) was awarded a grant from the Moore Foundation that will provide 1.26 million FREE eclipse glasses and other resources for 1,500 public libraries across the nation. The Research Corporation and Google will also be providing glasses and materials that add an additional 750,000 glasses, bringing our total to over 2 million glasses!*

### B. Pinhole Projectors to Indirectly View Sun

If you don't have safe glasses, a good way to see the eclipse is to project an image of the partially eclipsed Sun. One easy method is to make a pinhole projector:

- Take two pieces of cardboard or thick paper.
- Put a pinhole in one (taking care to make a small, neat hole).
- Then stand with your back to the Sun, and let the Sun's light fall through the hole and onto the other sheet. You'll get a small but distinct image of the Sun. (To get a sharper pinhole, cut a square out of the middle of one cardboard, tape a sheet of aluminum foil over the hole and put the pinhole in the foil instead of paper.)
- The further apart the two pieces of paper, the larger the image of the Sun will be (but it will be a small image in any case).

You can also make a pinhole projector inside a box, such as a shoebox, cereal box or a tube (e.g. poster shipping box). You can find links at the following sites:

**Shoebox:** <http://static.nsta.org/extras/solarscience/chapter3/3.10PinholeProjectionInABox.pdf>

**Cereal box:** [http://hilaroad.com/camp/projects/eclipse\\_viewer/eclipse\\_viewer.html](http://hilaroad.com/camp/projects/eclipse_viewer/eclipse_viewer.html)

## When is the 2024 eclipse viewable in Central Indiana?

Partial phase: **1:50 pm** (EDT) to **4:23 pm** (EDT)

Totality phase: **3:05:52 pm** (EDT) to **3:10 pm** (EDT)

Duration of Totality: 4 minutes 1.7 seconds

# How to use your eclipse glasses safely

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- Before you put the glasses on, make sure that the black plastic within the paper frames is not scratched or broken. Carefully check any glasses that children will be wearing as well.
- Make sure that the glasses fit behind your ears; try moving your head around to make sure they don't fall off. Also make sure any children under your supervision also have their glasses on so that the handles fit behind the ears. Keep children within your view while they are looking at the Sun.
- When any part of the Sun's bright disk is visible, it's never safe to look at the Sun without the eclipse glasses or other indirect viewing technique.
- Limit to 3 minutes of continuous use, intermittently for several hours.
- Note that these glasses will not be able to protect you if you look at the Sun through a telescope or binoculars that don't have a certified solar filter attached.
- Do not wear the glasses when moving around, driving or operating machinery.
- Do not use with diseased eyes or after eye surgery.
- Children should only use them with constant adult supervision.



## When do you need to wear the glasses?

- You need to wear the glasses whenever any part of the bright Sun is visible.
- The only time it is safe to view the Sun without the glasses is the period of a few minutes when the eclipse is total (when the Moon completely covers the Sun.) [This will not happen in Indiana]

## Can I use the glasses when there is no eclipse?

- Yes, you can view the Sun any time with the glasses (but check them carefully each time before you use them to be sure there are no cracks or other damage)
- When looking at the Sun through the glasses, you may occasionally be able to see tiny dark spots on it (these are groups of sunspots – cooler areas on the Sun's surface that look darker to us.)

## Are eclipses of the Sun dangerous to watch?

- The few minutes of total eclipse (when the Sun is completely covered) ARE safe, but anytime that even a small piece of the bright Sun shows, your eyes are in danger. Paper glasses with special filters made of protective material will be sold in lots of places. (Make sure that on the back, in small print, they say that they are ISO 12312-2 certified.) **Sunglasses are NOT sufficient to protect your eyes!**
- To summarize: If you are lucky enough to be in the path of the total eclipse [Indiana is not], you can and should remove your glasses during the few minutes that the eclipse is total, so you can take in the beauty of the scene. But **if you are viewing the partial eclipse only, you must keep your glasses on anytime you are looking in the direction of the Sun.**

## Other Eclipse Safety Tips

- Be sure to wear a broad-spectrum sun screen of 30 SPF or higher
- Wear a broad-brimmed hat
- Drink plenty of water
- Bring a chair or blanket to sit on
- Take breaks into an air-conditioned building if the heat is excessive