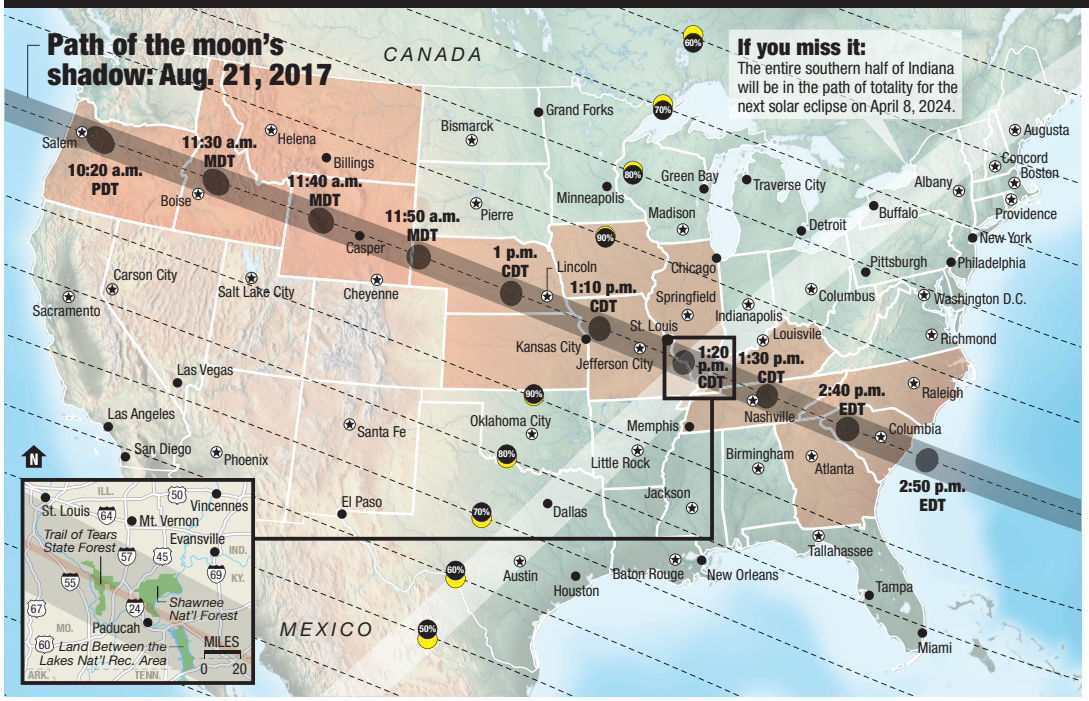
YOUR GUIDE TO THE 2017

TOTAL ECLIPSE



WHERE TO WATCH

The path of the moon's umbral shadow will pass through 14 states on Aug. 21. The shadow will enter the U.S. near Lincoln City, Oregon, at 9:05 a.m. Pacific Daylight Time. Totality — where the moon will completely obscure the sun — will begin in Lincoln City at 10:16 PDT and end in Charleston, South Carolina, at 2:48 p.m. Eastern Daylight Time. All times shown on map are local times.

- **Percentage of sun obscured**
- **States that will experience totality**
- **Path of moon's umbral shadow**

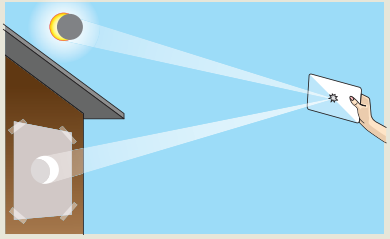
HOW TO WATCH

Safe ways to experience the eclipse

Do not look directly at the sun without eye protection except during the totality, when the entire sun is blocked by the moon. It can cause damage to your eyes or even blindness. Regular sunglasses are not enough protection. Either purchase special eyewear or use one of these methods.

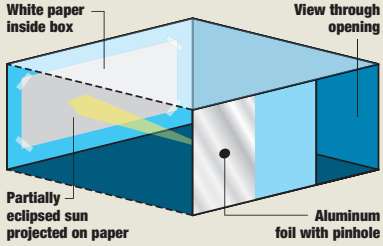
Mirror and envelope method

Slide a mirror into an envelope with a ragged hole (about 5/8 of an inch wide) cut into one side. Hang a white piece of paper on a nearby surface. Position the mirror so that the eclipse is reflected onto the paper about 15 feet away (the farther away, the larger the image). Do not look at the mirror. Look at the image reflected onto the paper.



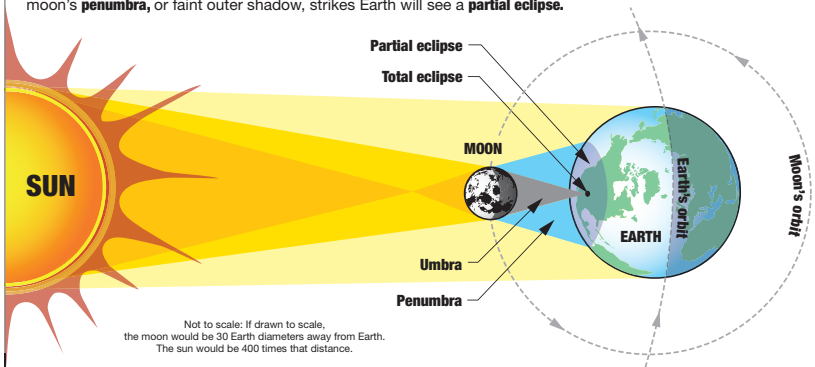
Projector method

Use a cardboard box, white paper, tape and aluminum foil to create an eclipse projector. With your back to the eclipse, align the the hole in the foil so that the eclipse is projected onto the white paper.



What happens during a full solar eclipse

When the moon passes directly between the sun and an observer on Earth, the moon completely blocks the sun from view for a period of 2-3 minutes. In this area of total eclipse, the moon's direct shadow, or **umbra**, is cast on the surface of the Earth creating a **total eclipse.** Those who are within the area where the moon's **penumbra,** or faint outer shadow, strikes Earth will see a **partial eclipse.**



Not to scale: If drawn to scale, the moon would be 30 Earth diameters away from Earth. The sun would be 400 times that distance.

TAKING PHOTOS

Keys to capturing the solar eclipse

Did you know?

We all know that looking at the sun with the naked eye can damage our eyes and potentially blind us. But did you know that the those same, powerful rays can potentially destroy your camera as well? Here are a few tips for safely capturing images of the upcoming eclipse.

Graphic by **Kevin Burkett**
Logansport Pharos-Tribune
SOURCES: NASA; Nikon USA; MrEclipse.com

Solar filters

Whether you plan to photograph the eclipse with your smartphone or a higher-end DSLR camera, it is important to protect your camera's optics from the extreme brightness before and after the totality of the eclipse. **Filter sheets** can be cut down to fit over the lens of your smartphone or taped over your DSLR's lens and are an economic alternative. On DSLRs, **full-aperture filters** are best because they screw on and completely cover the lens. Prices ranges from less than $20 for a 4-inch square filter sheet to around $200 for higher-end screw-on filters. **During the totality, filters must be removed to capture the total eclipse.**

Smartphone shooting

There are a number of accessories that can help you produce a better picture on your smartphone. Because of your phone's wide-angle lens, consider purchasing a **clip-on telephone lens.** They still won't allow you to get super close, but they're better than going without. And, a **tripod** is an absolute necessity. Use your smartphone camera's **timer** to take the photo to avoid any shaking. There are packages available online that include an 18x zoom lens and tripod for around $30. High-end telephoto lens for smartphones run closer to $100.

One type of solar filter

DSLR shooting tips

- **Do not look through your optical viewfinder,** even after the camera is equipped with a filter. Use the live view screen to find the sun.
- Use a **tripod**
- Use an **electronic or remote shutter release**
- Be sure your **flash is off**
- **Practice.** Use the few days before the eclipse to experiment with photographing the mid-day sun with all of the equipment you will use on Aug. 21. Practice finding the sun with your live view screen. Experiement with settings. Find a basic solar eclipse exposure guide at **www.mreclipse.com/SEphoto/image/SE-Exposure1w.GIF**