

SOLAR ECLIPSE 2017

Dark but delightful

On Aug. 21, a total solar eclipse will be visible along a narrow path from the Northwest to the Southeast of the United States. This will be the first total solar eclipse visible in the U.S. in 38 years.

WHAT IS A SOLAR ECLIPSE?

A solar eclipse happens when the moon casts a shadow on Earth, fully or partially blocking the sun's light in some areas.

It's just an illusion

The sun is actually about 400 times larger in diameter than the moon but the moon is also about 400 times closer to the Earth than the sun. Therefore, the sun and the moon appear to be about the same size in our sky. This fact explains why we see total solar eclipses - the moon has an apparent size that just barely covers the sun completely.

How it happens

1. The sun, moon and Earth align.
2. The moon casts a shadow on part of the Earth as it orbits into the sun-Earth alignment.

Salem, Ore.

Totality begins: 10:17 a.m. PDT
Duration: 1 min., 54 sec.

Casper, Wyo.

Totality begins: 11:42 a.m. PDT
Duration: 2 min., 25 sec.

Hopkinsville, Ky.

Totality begins: 1:24 p.m. CDT
Duration: 2 min., 41 sec.

St. Joseph, Mo.

Totality begins: 1:06 p.m. CDT
Duration: 2 min., 39 sec.

Idaho Falls, Idaho

Totality begins: 11:33 a.m. PDT
Duration: 2 min., 18 sec.

Best places to view the eclipse

Sandhills of western Nebraska

Totality begins: 11:49 a.m. MDT
Duration: 2 min., 30 sec.

Carbondale, Ill.

Totality begins: 1:20 p.m. CDT
Duration: 2 min., 41 sec.

The sweet spot

Nashville, Tenn.

Totality begins: 1:27 p.m. CDT
Duration: 1 min., 57 sec.

Great Smoky Mountains National Park

Totality begins: 2:35 p.m. EDT
Duration: 1 min., 17 sec.

Greenville, S.C.

Totality begins: 2:38 p.m. EDT
Duration: 2 min., 10 sec.

HOW TO WATCH

Never look directly at the sun without proper eye protection, except when the solar disk is completely occluded (during the brief period of totality); serious and permanent eye damage can result. The only safe way to look directly at the uneclipsed or partially eclipsed sun is through special purpose solar filtered glasses.

Cover your eyes with your eclipse glasses before looking up at the sun. After, turn away and remove your glasses - do not remove while looking at the sun.



Did you know?

- Local animals and birds often prepare for sleep or behave confusedly during totality.
- Total solar eclipses cannot be seen from the North and South poles.

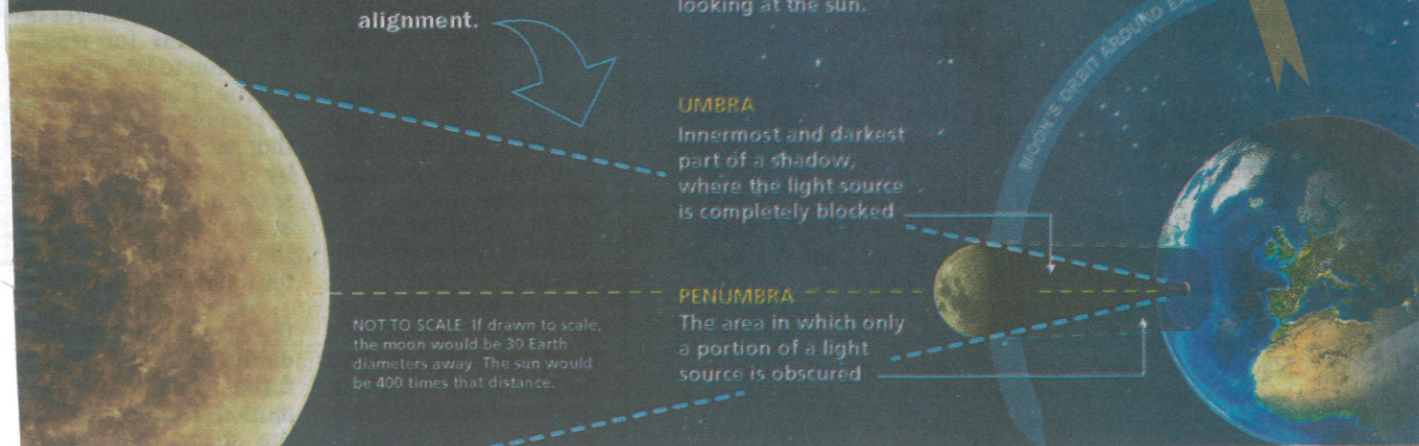
UMBRA

Innermost and darkest part of a shadow, where the light source is completely blocked.

PENUMBRA

The area in which only a portion of a light source is obscured.

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



WHAT TO EXPECT

From beginning to end, the eclipse can last nearly three hours if you are within the narrow path of totality. Here's a look at a few things to watch for:

First contact

The moment the moon first nicks the sun. For the next hour, this bite will steadily grow larger until the sun becomes a narrow crescent. Daylight will still appear bright, but look at shadows cast on the ground, you'll see crescent shapes.

10-15 minutes before totality

You will start to see an eerie quality of daylight. It will diminish minute by minute and shadows will grow sharper. You will also start to noticeably feel the temperature drop.

1-2 minutes before totality

Sunlight looks strangely different; not day and not night. The sky will display a gradient of colors, dark to the west and blue to the east. Look at the ground, especially white surfaces. You may see the elusive shadow bands that are sometimes seen just before and just after totality.

Totality

You are now standing under the shadow of the moon and it will become suddenly dark. If you have been wearing eclipse glasses, you can take them off. Throughout the brief totality, you will see something like a 360-degree sunset, brighter toward the north and south, which are outside the path of totality. You'll notice darkening first to the west and as the eclipse progresses, the darkening moves to the east.

SOURCES: NASA,
Getty Images, Eclipse
2017.org, Great
AmericanEclipse.com

RESEARCH AND GRAPHIC
BY KENT TRAVIS—USA
TODAY NETWORK