

The Great American Eclipse

On Aug. 21, 2017, a total solar eclipse will cut a swath across Missouri

on its path over 14 United States. For about two minutes, the sky within the path, about 70 miles wide, will go dark. This period of darkness is called **totality**.

A total solar eclipse happens somewhere in the world at least once a year. In the Continental U.S., the last total solar eclipse was in 1979. But it has been 148 years since daylight went out somewhere in Missouri, and 575 years since the last total solar eclipse in the central part of the state.

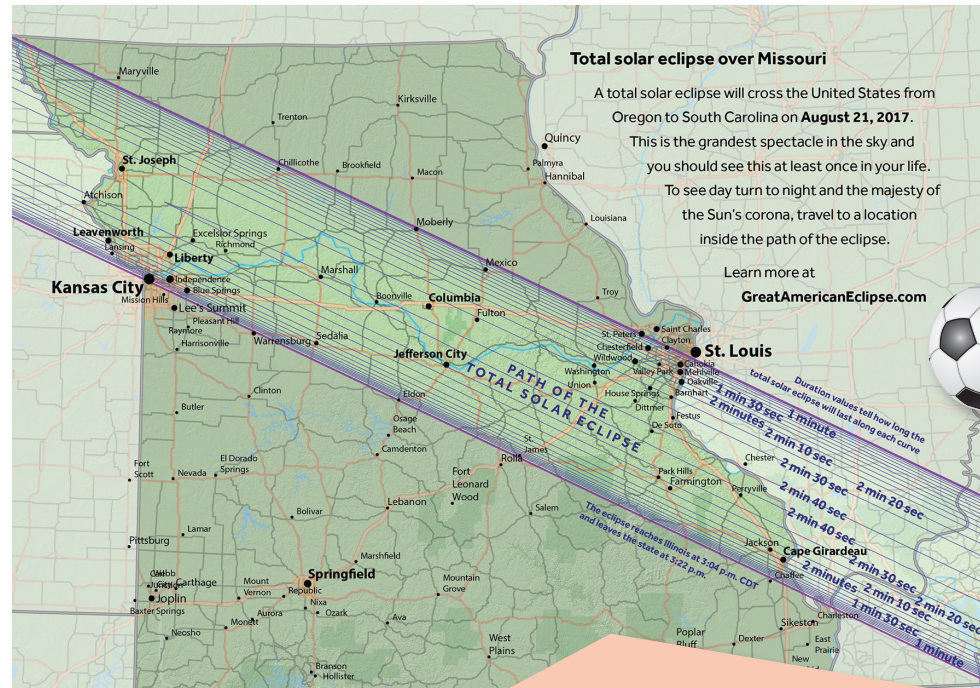
What was happening in 1869 when Missouri had the last total solar eclipse? Ulysses S. Grant became president,

Jesse James robbed his first bank, a "golden spike" marked the first transcontinental railroad, the Cincinnati Red Stockings open the season as the first fully professional baseball team.

A solar eclipse happens when the sun and the moon line up so that the shadow of the moon falls on the earth. People in the moon's **umbra** experience a total solar eclipse, while those in the **penumbra** see a partial eclipse. (see graphic)

The bright glow coming from behind the moon during the eclipse is called the **corona**. This is a part of the sun we don't normally see; it is always there, but the glare of the bright sun hides it.

Bits of hydrogen gas, called the **chromosphere**, may be visible as red and pink colors.



Source: GreatAmericanEclipse.com

Eclipse watcher: Is it true that the moon's atmosphere focuses the light of sun, making it dangerous to be outside on eclipse day?

Doctor Speck: The moon does not have an atmosphere, and so it cannot behave this way. It is no more dangerous than any other day.

Eclipse watcher: My textbook says that the sun's corona gives off harmful X-rays and UV rays — shouldn't we be scared of them?

Doctor Speck: The corona does give off those rays, but it does that every day, it's just that the bright sun makes it difficult for us to see the corona on a normal day — so we don't notice it. The earth's atmosphere protects us from those harmful rays on eclipse day and on every other day.

Dr. Angela Speck is Director of Astronomy at University of Missouri, Columbia.

Create a Solar Eclipse Model

In this activity, you will create a replica of a solar eclipse.

Materials Needed:

Flashlight or Table Lamp (represents the sun), Soccer or Soft Ball (represents the earth), Ping Pong Ball (represents the moon), Wire or String, Tape, 3 People, A Dark Room

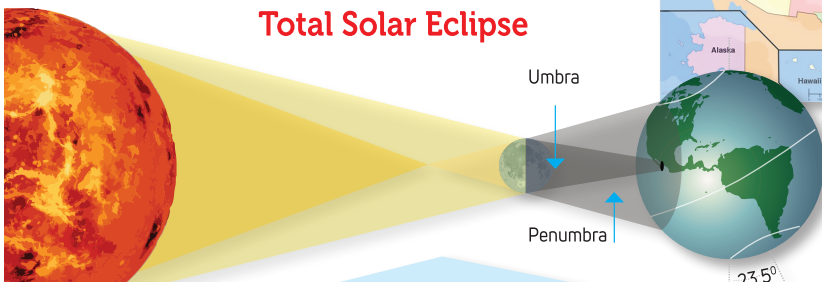


Procedure:

1. Use tape to secure the wire or string to the soccer/softball (earth) and the ping pong ball (moon).
2. One person will hold the wire with the earth at arm's length in the middle of the room, one person will hold the wire with the moon at arm's length, and one person will stand behind the light source against the wall.
3. When the room is completely dark, switch on the light and aim the light source straight at earth.
4. The moon will need to be between the sun and the earth at a distance where it will cast a shadow on the earth (this may take some trial and error to find the perfect spot).
5. The moon will very slowly orbit around the Earth.
6. Note the various points in the orbit that create night and day. At what point is there an eclipse?

Learning Standards: I can follow sequential directions to create a replica. I can draw conclusions and analyze results. I can make text-to-world connections.

Total Solar Eclipse



Get Smart

Look up the following vocabulary words:
Totality · **Umbra**
Penumbra · **Corona**
Chromosphere

Solar Eclipse Facts

- ▶ Air temperatures can drop 10 degrees.
- ▶ Animals and insects will react as if it's nighttime. Insects will start chirping, cows will head to the barn.
- ▶ The sky will be dark, but will appear as if there's a full moon.
- ▶ Stars and planets will be observable: Venus will be the brightest!

Use Proper Glasses

It's never safe to look at the sun without protection, and the view leading up to the total solar eclipse is no different. Wearing safe eyewear is essential. Even cameras and cell phones can be damaged by their view of the sun. Learn more about safe viewing at eclipse.aas.org/eye-safety.



Ask Doctor Speck



Learn more:
eclipse.aas.org



Read more: "When the Sun Goes Dark," by Fraknoi and Schatz

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