

## PINHOLE PROJECTOR CARD

Create a small hole  
using the point of a sharpened pencil



**WARNING:**  
**DO NOT LOOK AT THE SUN DIRECTLY  
THROUGH THE PINHOLE**

On April 8, 2024, a total solar eclipse will cross North America. West Virginia will be treated with a partial solar eclipse of up to 98% coverage of the Sun by the Moon. Follow the instructions in the kit brochure to safely use this pinhole projector. To learn more about the upcoming eclipse, visit [solarsystem.nasa.gov/eclipses/2024/apr-8-total](https://solarsystem.nasa.gov/eclipses/2024/apr-8-total).



A Collaboration Between



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Experiment No. 16

# TRY THIS

AT

# HOME

## SOLAR

# PINHOLE PROJECTOR

[extension.wvu.edu/stemcare](https://extension.wvu.edu/stemcare)

# Experiment No. 16

## SOLAR PINHOLE PROJECTOR

### Safety:

- Never look at the Sun directly without special eye protection like the eclipse glasses included in this kit.
- Do not use the included eclipse glasses if they are scratched or damaged.
- Always keep your back toward the Sun when using the pinhole projector.
- Do not look directly at the Sun through the pinhole.

### Additional Materials Needed:

Sharpened pencil, piece of white paper

### HOW DO I START?

Watch the step-by-step video at: [extension.wvu.edu/stemcare/pinholeprojector](https://extension.wvu.edu/stemcare/pinholeprojector)

1. Cut off the card along the dashed line.
2. Poke a small hole in the designated spot on the card using the point of a sharpened pencil.
3. Smooth the hole to the correct size by spinning the pencil.

### How to Use the Pinhole Projector:

4. Go outside and place a piece of white paper on the ground so it is in the sunlight.

5. With your back to the Sun, hold the pinhole projector card 3 or 4 feet above the paper.



Image Source: NASA JPL

6. The pinhole projector should cast a shadow onto the paper with sunlight shining through the hole.

7. You should see a small disk on the lower paper. This is an inverted image of the Sun. During the eclipse, this image will show all of the eclipse phases.

8. Try experimenting with different hole sizes. A large hole will make the image bright but blurry; a small hole will make it dim but sharp.

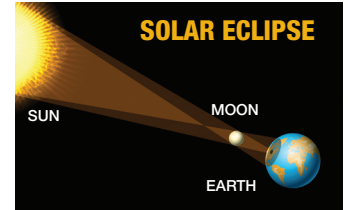
9. Keep your pinhole projector card, safe viewing glasses, and these instructions protected inside the kit bag until the eclipse on April 8, 2024.

### WHAT'S HAPPENING?

#### Why Solar Eclipses Occur:

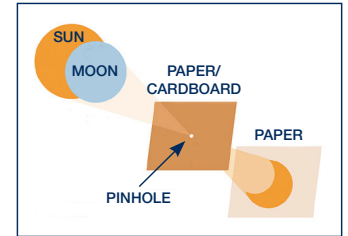
Sometimes when the Moon orbits Earth, it lines up directly between the Sun and Earth. When this happens, the Moon casts a shadow on the Earth,

blocking the light of the Sun and causing daylight to grow dim. This is known as an eclipse of the Sun or a solar eclipse. You should NEVER look directly at the Sun, not even during an eclipse when the Moon blocks the sunlight! A solar eclipse is exciting, but looking at the Sun is dangerous and can damage your eyes.



### How a Solar Pinhole Projector Works:

The pinhole projector is similar to the aperture of a camera or telescope. All light, including sunlight, travels in straight lines. If a pinhole is placed in the path of light, some of the rays will pass through it. These rays can be projected onto a screen to form an image of the light source. Since the light rays intersect at the aperture (the pinhole), the projected image will be flipped (inverted) from the original on the other side of the hole.



Adapted from: MacRobert, Alan *How to Safely See a Partial Solar Eclipse*. [skyandtelescope.org](https://www.skyandtelescope.org).